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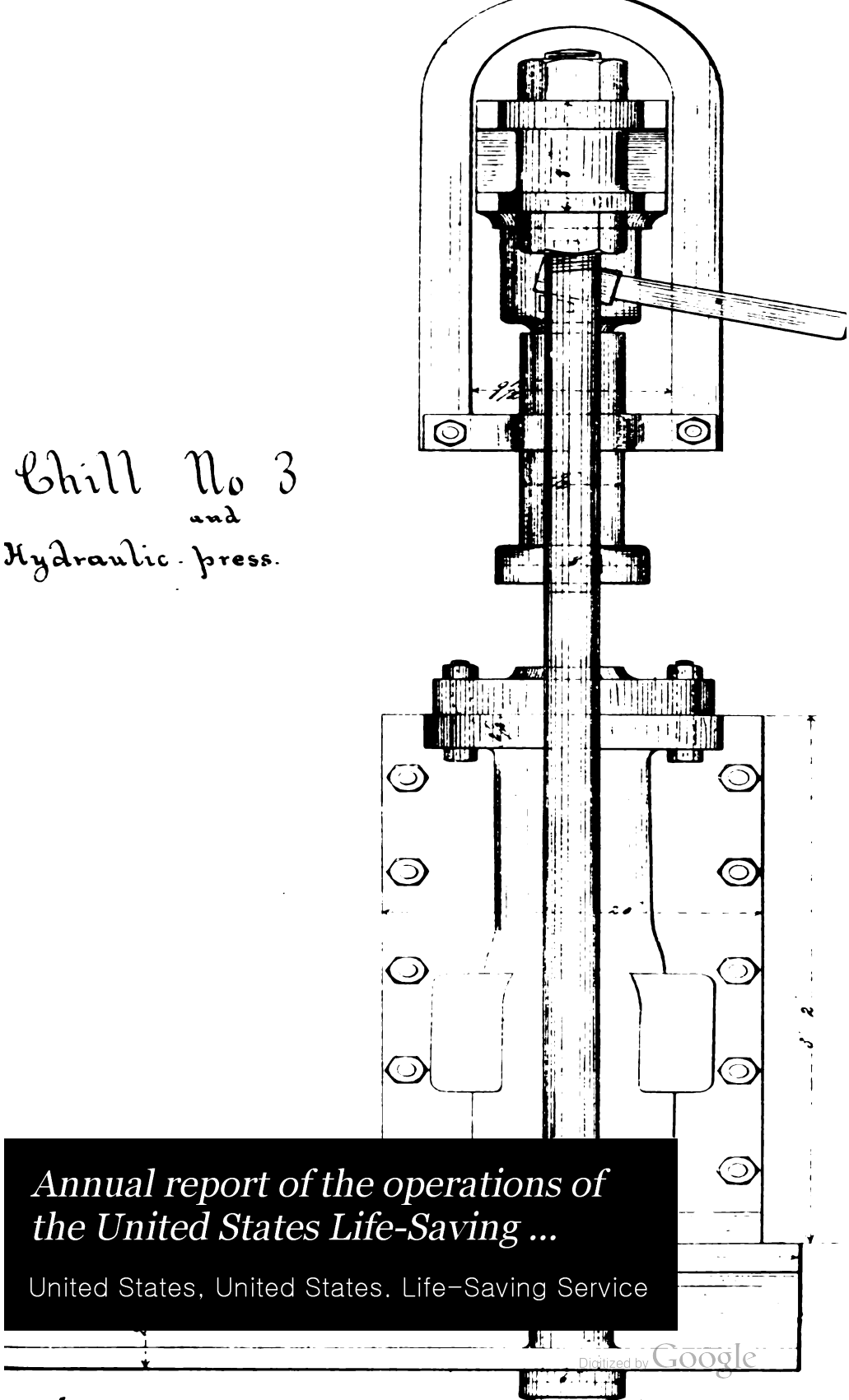
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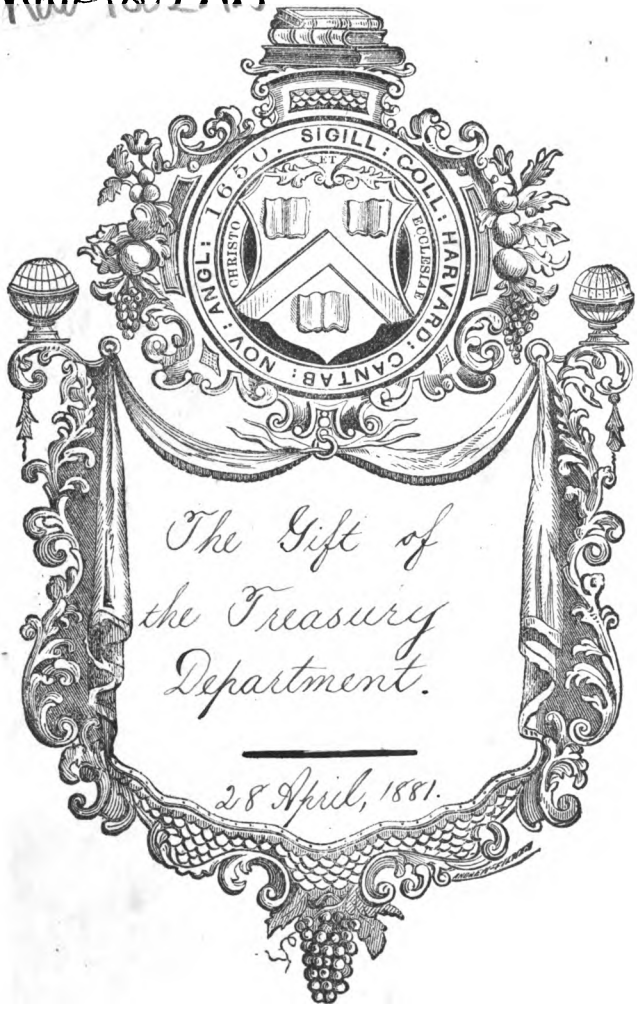


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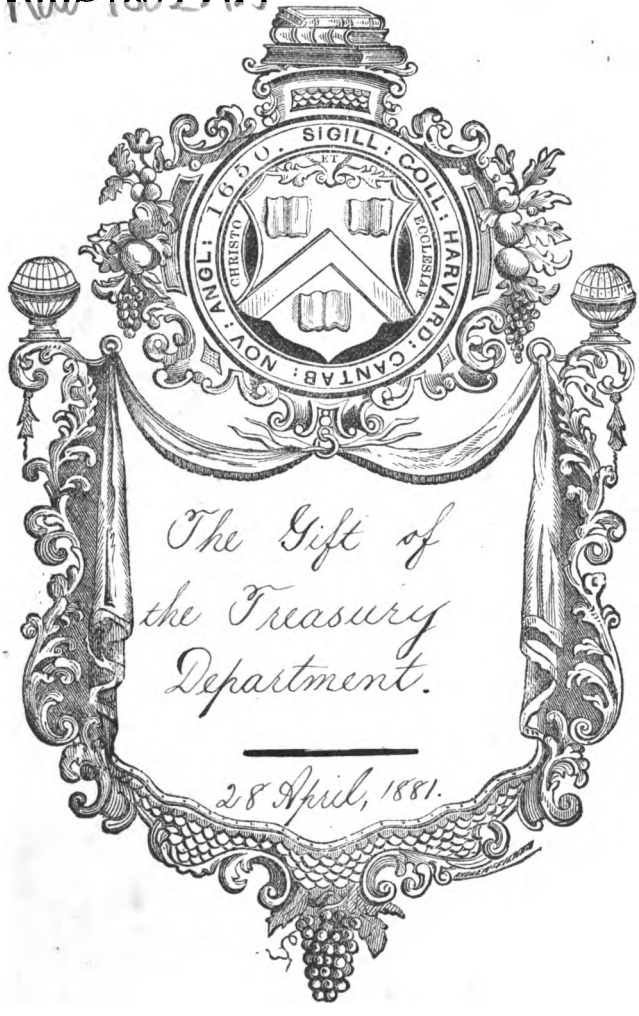
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28 April, 1881.

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28 April, 1881.

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9

ANNUAL REPORT

OF THE

OPERATIONS

OF THE

UNITED STATES LIFE-SAVING SERVICE

FOR THE

FISCAL YEAR ENDING JUNE 30, 1880.

WASHINGTON:
GOVERNMENT PRINTING OFFICE.
1880.

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1881. April 28.
Gift of
The Treasury Dept.

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ORGANIZATION

OF THE

UNITED STATES LIFE-SAVING SERVICE.

(In conformity to act of Congress approved June 18, 1878.)

SUMNER I. KIMBALL, General Superintendent.
WILLIAM D. O'CONNOR, Assistant General Superintendent.

CAPT. JAMES H. MERRYMAN, United States Revenue Marine, Inspector of Life-Saving Stations.

CAPT. JOHN MCGOWAN, United States Revenue Marine,
CAPT. JAMES H. MERRYMAN, United States Revenue Marine, } Superintendents of Construction of Life-Saving Stations.

ASSISTANT INSPECTORS.

First District.—CAPT. EDWARD L. DEANE, United States Revenue Marine, Eastport, Maine.
Second District.—CAPT. DANIEL B. HODGSDON, United States Revenue Marine, Boston, Massachusetts.
Third District.—LIEUT. CHARLES H. MCLELLAN, United States Revenue Marine, Bay Shore, New York.
Fourth District.—LIEUT. WILLIAM C. DE HART, United States Revenue Marine, Tom's River, New Jersey.
Fifth District.—LIEUT. WILLIAM J. HERRING, United States Revenue Marine, Chincoteague, Virginia.
Sixth District.—LIEUT. FRANK H. NEWCOMB, United States Revenue Marine, Manteo, North Carolina.
Seventh District.—CAPT. CHARLES M. SCAMMON, United States Revenue Marine, Key West, Florida
Eighth District.—CAPT. LEONARD G. SHEPARD, United States Revenue Marine, Galveston, Texas.
Ninth District.—CAPT. JOHN G. BAKER, United States Revenue Marine, Oswego, New York.
Tenth District.—CAPT. GEORGE R. SLICER, United States Revenue Marine, Detroit, Michigan.
Eleventh District.—LIEUT. WALTER WALTON, United States Revenue Marine, Milwaukee, Wisconsin.
Twelfth District.—CAPT. JOHN W. WHITE, United States Revenue Marine, East Oakland, California.

LIEUT. CHARLES F. SHOEMAKER, United States Revenue Marine, on special duty, Washington, D. C.
LIEUT. THOMAS D. WALKER, United States Revenue Marine, on special duty, New York City.

DISTRICT SUPERINTENDENTS.

First District.—JOHN M. RICHARDSON, Portland, Maine.
Second District.—BENJAMIN C. SPARROW, East Orleans, Massachusetts.
Third District.—HENRY E. HUNTTING, Bridgehampton, New York.
Fourth District.—JOHN G. W. HAVENS, Metedeconk, New Jersey.
Fifth District.—BENJAMIN S. RICH, Onancock, Virginia.
Sixth District.—JOSEPH W. ETHERIDGE, Manteo, North Carolina.
Seventh District.—WILLIAM H. HUNT, Biscayne, Florida.
Eighth District.—CAPT. LEONARD G. SHEPARD, United States Revenue Marine (Acting), Galveston, Texas.
Ninth District.—DAVID P. DOBBINS, Buffalo, New York.
Tenth District.—JEROME G. KIAH, Detroit, Michigan.
Eleventh District.—LIEUT. WALTER WALTON, United States Revenue Marine (Acting), Milwaukee Wisconsin.
Twelfth District.—CAPT. JOHN W. WHITE, United States Revenue Marine (Acting), East Oakland California.

ASSISTANT DISTRICT SUPERINTENDENT.

Third District.—NICHOLAS BALL, New Shoreham, Rhode Island.

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BOARD FOR THE EXAMINATION OF PLANS, DEVICES, AND INVENTIONS (EXCEPT WRECK-ORDNANCE AND SIGNALS).

R. B. FORBES, Esq., *President.*
CAPT. GEORGE W. MOORE, United States Revenue Marine.
LIEUT. CHARLES F. SHOEMAKER, United States Revenue Marine, Assistant Inspector Life-Saving Stations, *Recorder.*
BENJAMIN C. SPARROW, Superintendent Second District Life-Saving Service.
FRANKLIN C. JESSUP, Keeper Station No. 17, Third District, Life-Saving Service.

BOARD FOR THE EXAMINATION OF DEVICES AND INVENTIONS RELATING TO WRECK-ORDNANCE.

CAPT. J. H. MERRYMAN, United States Revenue Marine, Inspector Life-Saving Stations, *President.*
LIEUT. D. A. LYLE, Ordnance Department, United States Army.
LIEUT. T. D. WALKER, United States Revenue Marine, Assistant Inspector Life-Saving Stations, *Recorder.*
DAVID P. DOBBINS, Superintendent Ninth District, Life-Saving Service.
JOHN C. PATTERSON, Keeper Station No. 1, Fourth District, Life-Saving Service.

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LETTER OF TRANSMITTAL.

TREASURY DEPARTMENT,
UNITED STATES LIFE-SAVING SERVICE,
Washington, D. C., December 3, 1880.

SIR: I have the honor to submit the following report of the operations of the Life-Saving Service for the fiscal year ending June 30, 1880, and of the expenditures of the moneys appropriated for the maintenance of the service for that period, in accordance with the requirements of section 7 of the act of June 18, 1878.

A compilation of the statistics of wrecks and casualties which have occurred on or near the coasts and on the rivers of the United States, and to American vessels at sea or on the coasts of foreign countries, collected under the authority of the act of June 20, 1874, is included.

I have the honor to be, very respectfully,

SUMNER I. KIMBALL,
General Superintendent.

Hon. JOHN SHERMAN,
Secretary of the Treasury.

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OPERATIONS

OF THE

UNITED STATES LIFE-SAVING SERVICE.

1880.

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TREASURY DEPARTMENT,
Document No. 92.
Life-Saving.

REPORT

OF THE

UNITED STATES LIFE-SAVING SERVICE.

OPERATIONS.

The number of stations at the close of the last fiscal year embraced in the Life-Saving Establishment was 179, distributed upon the sea and lake coasts, as follows:

District No. 1 (coast of Maine and New Hampshire)	7
District No. 2 (coast of Massachusetts)	15
District No. 3 (coast of Rhode Island and Long Island)	38
District No. 4 (coast of New Jersey)	40
District No. 5 (coast from Cape Henlopen to Cape Charles)	11
District No. 6 (coast from Cape Henry to Cape Hatteras)	23
District No. 7 (eastern coast of Florida)	5
District No. 9 (Lakes Erie and Ontario)	9
District No. 10 (Lakes Huron and Superior)	9
District No. 11 (Lake Michigan)	16
District No. 12 (Pacific coast)	6
Total	179

It will be seen that there were 139 stations on the Atlantic, 34 on the Lakes, and 6 on the Pacific.

The following statement shows the periods of the employment of surfmen at such of the stations as were manned with crews during any portion of the year, which periods respectively constituted what is termed the active season:

Employment of surfmen, season of 1879–'80.

District.	Stations.	Number of stations.	Number of surfmen.	Period of employment.
1	1, 2, 3, 5, 6, and 7	6	36	September 1, 1879, to April 30, 1880, inclusive.
	4	1	6	November 10, 1879, to April 30, 1880, inclusive.
2	1, 2, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, and 15.	14	84	September 1, 1879, to April 30, 1880, inclusive.
	3	1	6	December 7, 1879, to April 30, 1880, inclusive.
3	2, 5, 7, 8, 9, 14, 15, 18, 19, 21, 23, 25, 27, 28, and 32.	15	90	September 1, 1879, to April 30, 1880, inclusive.
	1, 4, 11, 13, 17, 20, 22, 24, 26, 29, 33, 34, 36, and 38.	14	84	September 1, 1879, to April 15, 1880, inclusive.
	3, 10, 12, and 16	4	24	September 15, 1879, to April 15, 1880, inclusive.
	31	1	6	September 1, 1879, to February 11, 1880, inclusive.
	37	1	6	September 1, 1879, to March 31, 1880, inclusive.
	35	1	6	September 15, 1879, to April 30, 1880, inclusive.
	30	1	6	September 17, 1879, to April 30, 1880, inclusive.

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Employment of surfmen, season of 1879–'80—Continued.

District.	Stations.	Number of stations.	Number of surfmen.	Period of employment.
4	1, 2, 3, 6, 7, 8, 9, 10, 11, 14, 15, 18, 20, 21, 22, 24, 27, 28, 29, 30, 32, 33, 34, 36, 37, 38, 39, and 40.	28	168	September 1, 1879, to April 15, 1880, inclusive.
	5	1	6	September 1, 1879, to April 18, 1880, inclusive.
	12, 17, 23, 25, 31, and 35	6	36	September 1, 1879, to April 30, 1880, inclusive.
	16	1	6	September 6, 1879, to April 15, 1880, inclusive.
	13	1	6	September 10, 1879, to April 15, 1880, inclusive.
	4 and 19	2	12	September 15, 1879, to April 15, 1880, inclusive.
5	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, and 11.	11	66	September 1, 1879, to April 30, 1880, inclusive.
6	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, and 23.	23	138	September 1, 1879, to April 30, 1880, inclusive.
9	1, 2, 3, 4, 5, 6, 7, 8, and 9	9	52	July 1, 1879, to December 15, 1879, inclusive.
	1, 2, 3, 4, 5, 6, 7, 8, and 9	9	52	March 20, 1880, to June 30, 1880, inclusive.
10	2, 4, 5, 6, and 8	5	32	July 1, 1879, to December 15, 1879, inclusive.
	9, 10, 11, and 12	4	24	July 1, 1879, to November 30, 1879, inclusive.
	9, 10, 11, and 12	4	24	May 15, 1880, to June 30, 1880, inclusive.
	2, 4, 5, 6, and 8	5	32	April 1, 1880, to June 30, 1880, inclusive.
11	4, 6, 10, 12, 14, 16, and 17	7	50	July 1, 1879, to November 30, 1879, inclusive.
	9, 11, and 15	3	25	July 1, 1879, to December 31, 1879, inclusive.
	4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, and 17.	14	90	April 1, 1880, to June 30, 1880, inclusive.

Districts Nos. 7, 8, and 12 are, it will be noticed, excluded from the foregoing statement. In the first of these districts, which comprises the eastern coast of Florida, there are provisioned houses of refuge instead of the ordinary stations, the peculiarities of the coast making escape to the land from stranded vessels comparatively easy, and the shipwrecked being mainly in danger of perishing from hunger and thirst after gaining the shore. In further protection of such persons, the keepers of these houses are required, with the assistance of their families, to search the beach for them, in both directions, after a storm, going as far as possible either way.

District No. 8 takes in the Gulf coast, on which none of the stations authorized by law were in operation during the fiscal year, and in District No. 12 (Pacific coast) none of the stations were manned, the services of volunteers being depended upon in cases of shipwreck.

STATISTICS.

The reports of the district officers show that 300 disasters to vessels have occurred within the scope of the operations of the service during the year. There were 1,989 persons on board these vessels, of whom 1,980 were saved, 9 only being lost. There were succored at the stations 449 shipwrecked persons, to whom 1,202 days' relief in the aggregate was furnished. The estimated value of the vessels involved in these disasters was $2,616,340, and that of their cargoes $1,195,368, making the total value of the property imperiled $3,811,708. Of this amount $2,619,807 was saved, and $1,191,901 lost. The number of disasters involving the total loss of the vessels was 67.

In rendering assistance the surf-boat was used 184 times, 286 trips

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being made by it. The self-righting and self-bailing life-boat was used 10 times, making 13 trips. On 40 occasions smaller boats were used, making 49 trips. The life-car was used on one occasion, and made 14 passages. The breeches-buoy was used 17 times, making 125 passages. The wreck-gun was brought into requisition 16 times, and 25 shots were fired by it. By the surf-boat 390 persons were landed; by the life-boat, 23; by the small boats, 67; by the life-car, 65; by the breeches-bouy, 109. The crews by casting lines over vessels landed 34 persons without other appliances; 3 were saved by surfmen swimming to them as they clung to capsized boats, and assisting them to right; 4 were aided in landing in their own boats by surfmen going and helping them through the breakers; and 11 were rescued by surfmen dragging them out of the surf and undertow.

In 128 instances vessels were hove off when stranded, piloted out of dangerous places, repaired when damaged, or similarly assisted by the life-saving crews, sometimes working in conjunction with other wrecking agencies, but in most cases by themselves and the ships' companies alone. Without this aid both vessels and crews, in many of these instances, would have been destroyed. A detailed statement, showing exactly what was done by the life-saving crews upon the several occasions of disaster, will be found in another part of this report.

The apportionment of the foregoing statistics to the several districts is as follows:

District No. 1.

Number of disasters	25
Value of vessels	$102,235
Value of cargoes	$25,305
Total value of property	$127,540
Number of persons on board vessels	123
Number of persons saved	123
Number of persons lost	None.
Number of shipwrecked persons sheltered at stations	11
Number of days' shelter afforded	21
Value of property saved	$111,120
Value of property lost	$16,420
Number of disasters involving total loss of vessels	4

District No. 2.

Number of disasters	25
Value of vessels	$177,500
Value of cargoes	$102,330
Total value of property	$279,830
Number of persons on board vessels	149
Number of persons saved	149
Number of persons lost	None.
Number of shipwrecked persons sheltered at stations	48
Number of days' shelter afforded	92
Value of property saved	$208,805
Value of property lost	$71,025
Number of disasters involving total loss of vessels	9

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District No. 3.

Number of disasters	22
Value of vessels	$229,795
Value of cargoes	$110,865
Total value of property	$340,660
Number of persons on board vessels	144
Number of persons saved	144
Number of persons lost	None.
Number of shipwrecked persons sheltered at stations	63
Number of days' shelter afforded	115
Value of property saved	$269,135
Value of property lost	$71,525
Number of disasters involving total loss of vessels	8

District No. 4.

Number of disasters	49
Value of vessels	$267,925
Value of cargoes	$180,949
Total value of property	$448,874
Number of persons on board vessels	273
Number of persons saved	271
Number of persons lost	2
Number of shipwrecked persons sheltered at stations	96
Number of days' shelter afforded	332
Value of property saved	$276,806
Value of property lost	$172,068
Number of disasters involving total loss of vessels	16

District No. 5.

Number of disasters	28
Value of vessels	$374,415
Value of cargoes	$258,370
Total value of property	$632,785
Number of persons on board vessels	239
Number of persons saved	237
Number of persons lost	2
Number of shipwrecked persons sheltered at stations	72
Number of days' shelter afforded	168
Value of property saved	$518,925
Value of property lost	$113,860
Number of disasters involving total loss of vessels	7

District No. 6.

Number of disasters	13
Value of vessels	$343,500
Value of cargoes	$26,985
Total value of property	$370,485
Number of persons on board vessels	121
Number of persons saved	117
Number of persons lost	4
Number of shipwrecked persons sheltered at stations	52
Number of days' shelter afforded	297
Value of property saved	$312,660
Value of property lost	$57,825
Number of disasters involving total loss of vessels	4

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District No. 7.

(There were no disasters in this district during the fiscal year within the field of station operations.)

District No. 8.

(This district was not in operation during the year.)

District No. 9.

Number of disasters	55
Value of vessels	$298,040
Value of cargoes	$87,537
Total value of property	$385,577
Number of persons on board vessels	273
Number of persons saved	272
Number of persons lost	1
Number of shipwrecked persons sheltered at stations	54
Number of days' shelter afforded	75
Value of property saved	$313,902
Value of property lost	$71,675
Number of disasters involving total loss of vessels	5

District No. 10.

Number of disasters	16
Value of vessels	$156,050
Value of cargoes	$73,775
Total value of property	$229,825
Number of persons on board vessels	169
Number of persons saved	169
Number of persons lost	None.
Number of shipwrecked persons sheltered at stations	None.
Number of days' shelter afforded	None.
Value of property saved	$156,515
Value of property lost	$73,310
Number of disasters involving total loss of vessels	4

District No. 11.

Number of disasters	65
Value of vessels	$606,880
Value of cargoes	$247,452
Total value of property	$854,332
Number of persons on board vessels	465
Number of persons saved	465
Number of persons lost	None.
Number of shipwrecked persons sheltered at stations	47
Number of days' shelter afforded	96
Value of property saved	$440,139
Value of property lost	$414,193
Number of disasters involving total loss of vessels	9

District No. 12.

Number of disasters	2
Value of vessels	$60,000
Value of cargoes	$81,800
Total value of property	$141,800
Number of persons on board vessels	33

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Number of persons saved	33
Number of persons lost	None.
Number of shipwrecked persons sheltered at stations	6
Number of days' shelter afforded	6
Value of property saved	$11,800
Value of property lost	$130,000
Number of disasters involving total loss of vessels	1

REMARKS ON STATISTICS.

The foregoing record of service surpasses any yet made by the establishment. While the weather of the year was generally milder than usual, it was marked by numerous storms of exceptional severity, resulting in a much larger number of casualties within the sphere of station operations than in any previous year, and the total loss of a greater number of vessels. The highest former number of disasters was that of the year preceding, being 219, and the greatest number of vessels totally lost was in the same year, being 54. The number of casualties upon the Atlantic coast within the scope of the service last year was one less than in the previous year, being 162, while on the Lakes the number is more than doubled, being 136 against 53 of the year anterior. In these 136 disasters only a single life was lost. The total loss of life within the scope of the service is the smallest ever reached since its general extension, the lowest previous number being 22. Of the 9 persons lost, one was a woman cook left asleep in the cabin of a foundering vessel by the deserting crew, and drowned while the life-boat was on its way to the rescue; two were fishermen, who sank from a capsized yawl before the surf-boat could reach the scene; four were sailors, who perished on a fair night by the swift breaking up of a rotten vessel on stranding; the other two were seamen, who fell through exhaustion from the rigging of a schooner as she dragged her anchors along the coast in the great storm of February 3, followed on the beach by the life-saving crew, with the apparatus, who had to await her coming to a stand to effect line communication. The full particulars in each case of loss of life are given further on.

The subjoined table gives a summary of results in the field of life-saving operations for the last nine years, the period since the introduction of the present system:

GENERAL SUMMARY

*Of disasters which have occurred within the scope of life-saving operations, from November 1, 1871 (date of introduction of present system), to close of fiscal year ending June 30, 1880.**

Total number of disasters	1,097
Total value of vessels	$13,339,073

* It should be observed that the operations of the service during this period have been limited as follows: Season of 1871–'72, to the coasts of Long Island and New Jersey; seasons of 1872–'74, to the coasts of Cape Cod, Long Island, and New Jersey;

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Total value of cargoes	$7,118,662
Total value of property saved	$12,130,215
Total value of property lost	$8,327,520
Total number of persons on vessels	10,381
Total number of persons saved	10,010
Total number of lives lost	*371
Total number of persons sheltered	2,203
Total number of days' shelter afforded	5,990

LOSS OF LIFE.

The following narratives give in detail the circumstances of each disaster involving fatality, and show the relation borne to the several cases by the life-saving crews.

WRECK OF A YAWL.

The first loss of life of the year within the scope of life-saving operations took place on the 13th of October, 1879, near Station No. 8, Fifth District. At seven o'clock in the morning, the weather being clear and the wind moderate, but the surf rough, a yawl manned by a white man, named Thomas Sturges, and two colored men, James Davis and Thomas Nock, put out to sea through a new cut or inlet which had formed a half mile north of the station. In view of the condition of the sea, the keeper of the station, who was watching the boat through a marine glass, anticipated trouble, and ordered his crew to stand ready with the surf-boat to assist the three men in case of accident. The yawl presently reached the bar about 300 yards from the point of the beach, where a sea broke upon and partially filled her. A second sea knocked one of the oars from its rowlock, forcing it away from the rower. A moment after, the boat was swept fore and aft by the water, and completely filled. The men then headed her for the shore. In the mean time the keeper of the station had ordered the surf-boat launched for the rescue. While the order was being hurriedly executed, the keeper saw the yawl capsize, and the men thrown out, the steersman going over with the oar in his hand. Nothing could be seen of them after they struck the water. The life-saving crew pulled vigorously for the scene of disaster, which they reached in a few minutes, passing on their way the capsized boat and other floating articles without seeing anything of the men. One of them, however, who proved to be Thomas Nock, one of the colored men, was soon discovered lying on the yawl's

season of 1874–'75, to the coasts of New England, Long Island, New Jersey, and coast from Cape Henry to Cape Hatteras; season of 1875–'76, coasts of New England, Long Island, New Jersey, coast from Cape Henlopen to Cape Charles, and coast from Cape Henry to Cape Hatteras; season of 1876–'77, and since, all the foregoing, with the addition of the eastern coast of Florida and portions of the lake coasts.

*One hundred and eighty-three of these were lost at the disasters of the steamers Huron and Metropolis—in the case of the former when the stations were not open, and in the latter when service was impeded by distance; and fourteen others in the same year, owing to similar causes.

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foresail, which, having been spritted out, lay flat on the water, affording a sort of support to the man who had been thrown upon it, although he was nearly beaten to death by the heavy seas continually flung upon him. He was at once seized and hauled into the boat in a state of great exhaustion, and informed the crew that it was useless to search for the other two men, as he had seen them both go down soon after the boat capsized, having held on to one of them till the man was nearly drowned, and he could sustain him no longer. The life-saving crew returned to the shore, and as the rescued man was suffering considerably from sickness, owing to the quantity of water he had swallowed, he was subjected, immediately upon reaching land, to that part of the method of resuscitation practiced by the service, prescribed for the ejection of fluids from the stomach and chest. He was then taken quickly to the station and given some brandy, being almost in an ague fit, and, as soon as possible, coffee was made and freely given him, hot and strong. By these means he was restored, in the course of an hour, so that he was able to take care of himself, although his face remained badly swollen. He was furnished with a hat by one of the surfmen, and a short time afterwards departed for his home. The body of the other colored man, James Davis, was found, washed ashore, the next day, and delivered to his friends. That of the white man, Thomas Sturges, does not appear to have ever been found.

WRECK OF THE HENRY RONEY.

Eleven days afterward another life was lost within the limits of the service, from the brigantine Henry Roney, of Kingston, Canada. The vessel, which was heavily laden with lath and limestone, and bore a low rate on the register, left Kingston about the 23d of October, with a crew of nine persons, including the captain and a woman cook, and before long sprung a leak, which steadily increased under the action of a northwest wind and a heavy sea, and kept the crew at the pumps during the entire night. About half-past six o'clock in the morning of October 24, the schooner sighted the port of Charlotte, N. Y., and failing to make good her course, the wind being scant, appears to have made signal of distress when about five miles east of Station No. 4, Ninth District (Lake Ontario). The signal was made at the main with the burgee so set that not being clearly distinguishable from the shore, it was not understood to indicate distress, by several persons who saw it, but to be the usual signal for a tug. It was not until the schooner was seen to be careening unduly and taking in sail, that suspicion was aroused as to her condition. The keeper of the station (J. O. Doyle) at once summoned his volunteer crew, and put out in the surf-boat, which was taken in tow by a tug, hailed in passing, and made all possible speed, but arrived at half-past eight, forty minutes after starting, to find nothing but the mast-heads of the schooner, which had sunk about half an hour before in 50 feet of water. The captain and crew had launched

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the ship's yawl and gained the shore before the vessel went down, but the cook was left on board to perish. It appears that the unfortunate woman, Mrs. Charlotte Fisk, was asleep at the time in the cabin, which was on deck. Although the vessel was certainly in danger for at least two hours before sinking, no movement (probably through carelessness) was made to rouse Mrs. Fisk during that time, and it is likely that in the fright which fell upon the ship's company in hastily deserting the vessel at the moment of foundering, the poor creature was absolutely forgotten.

WRECK OF THE M. AND E. HENDERSON.

Little more than a month later, four lives were lost at the wreck of the three-masted schooner, M. and E. Henderson, on the coast of North Carolina, about a mile and a half south of Station No. 17, Sixth District. The circumstances attending this disaster were singular. It appears from the evidence taken, that on the 30th of November, 1879, patrolman Tillett, who had the morning watch on the beat south, returned to the house a few minutes after five o'clock in the morning, lit a fire in the stove and called the cook, then went up-stairs, and looking with the marine glass from the south window, perceived, at some distance in the clear moonlight which lay upon the beach, a man whom he at first thought was a fisherman. Presently noticing that the man was without a hat, it at once occurred to him that he might have been washed ashore from a wreck. He immediately aroused the keeper and crew, and starting out in advance, soon came up to a haggard and dripping figure, a sailor, tottering along very much exhausted, and only able to feebly articulate, "captain drowned—masts gone." The patrolman's surmise had proved correct, and this man was one of the three survivors from the crew, seven in number, of the schooner M. and E. Henderson, which, as was subsequently ascertained to be probable, had struck and gone almost immediately to pieces within an hour before.

The survivor come upon by patrolman Tillett was at once conducted to the station and put in charge of the cook, and the keeper and crew started for the beach. They had gone about a mile and a quarter south of the station when they came upon a great strew of *débris* from the wreck, and saw, at the same time, some part of the vessel rising and falling upon the sea in the moonlight, about 300 yards from shore. Continuing on three-quarters of a mile further, searching for bodies among the fragments of wreck stuff with which the beach was strewn, they arrived at New Inlet, where they met some fishermen who reported having found one of the sailors floating in the channel, whom they had rescued and taken to their camp on Jack's Shoal, a small island back in the inlet. They were now looking for others, and were joined in the search by the life-saving crew, except the keeper and two of his men who boated over to the camp on Jack's Shoal, where they found the sailor rescued by the fishermen. In crossing the inlet to the camp they saw what appeared to be a sitting figure upon the beach behind them,

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and the keeper upon reaching the island sent back the two men to discover what this object was. They found it to be another sailor, the third survivor. He was quite insensible, but although far gone, still breathing, and no time was lost in conveying him to the camp, where restoratives from the station medicine chest gradually revived him. The man first found, nearly dead when taken from the water by the fishermen, having been given hot coffee and rubbed and wrapped up in bedclothes by them, was already so far restored as to be out of danger.

Of the four men lost from this vessel, the bodies of two only were recovered. The first came ashore on the 16th of December, and was that of the master, Silas Swain. The hair and face were gone from the skull. The body was identified by certain marks upon it, and also by articles found in the clothing. On the 29th of December following, another body, much decomposed, came ashore and was buried, like the other, by one of the station keepers. This body could not be identified.

The names of the four men drowned, as reported to this office, are Silas Swain (the captain), Hess and Prentice (probably the two mates), and William (which would seem to be the first name of the cook). The names of the ship's company, excepting the captain's, were unknown to the owners, and were obtained from the survivors in the imperfect form given, these three men being Spanish negroes or mulattoes, crudely speaking English. Their names are reported respectively as Abram Annight, Samuel Manilla, and Sanders Manilla. They constituted the crew, and this circumstance combined with their survival as a body when their officers all perished, and considered in connection with their race or breed, gave rise to the belief, held particularly by some of the owners, that they had murdered the officers and run the vessel ashore. This suspicion of foul play subsequently caused their arrest and imprisonment in Baltimore, but after a long detention they were released, no evidence of criminality having appeared.

The cause of the loss of the vessel remains mysterious. She had been seen at sunset working along the coast in a northerly direction, and had attracted attention by her nearness to the shore. As the disaster involved loss of life, it was made, as is usual in such cases, the subject of special investigation, in the course of which the fact was established that the patrolman had left New Inlet on his return beat a little before four and reached the station a little after five o'clock, encountering no wreck upon his way. It is certain, therefore, that the vessel must have grounded on the bar where she went to pieces about the time when the patrolman reached the station, a mile and a half distant, and it is equally certain that she must have been almost immediately demolished by the surf, since a short time after the patrolman's return to the station she was found in pieces on the beach, the rottenness of her fragments also showing that a vessel in such a condition of unsoundness, heavily laden beside with phosphate rock and pinioned on a bar, could not have long held together under the blows of the breakers. Although the surf was

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heavy and a stiff breeze blew, it was a clear, moonlight night, and how a vessel could have stranded when the atmosphere was lit to the horizon is unaccountable, except upon the supposition that she was navigated with the grossest carelessness or purposely run ashore. The unintelligible English spoken by the three survivors made it impossible for the life-saving crew to obtain from them any explanation of the disaster.

WRECK OF THE GEORGE TAULANE.

The last wreck of the year attended with loss of life within the scope of the operations of the service was that of the schooner George Taulane, and took place on the 3d of February, 1880, in the vicinity of Station No. 12, Fourth District, coast of New Jersey. On this day of dreadful tempest, there were upon the Jersey coast six wrecks within the scope of five stations, one of them being the George Taulane. The story of the splendid series of rescues which accompanied these disasters is fully told further on in illustration of the efficiency of the life-saving methods in use and the magnificent courage and mastery of the crews. It will be seen from the recital that of the lives imperiled on that eventful day, all were saved by the men of the stations, except in the case of the George Taulane, two of whose sailors, through fright or exhaustion, fell from the rigging and perished while the vessel, dragging her anchors, rolled and drifted along shore in the trough of the tremendous seas before her final grounding enabled the life-saving crew, following her upon the beach, to use the life-lines already cast aboard for the deliverance of the five men who still clung to her shrouds. (See pages 106 to 120.)

Of the great multitude of seafarers imperiled upon our coasts within the range of the stations, during the last fiscal year, these nine persons constituted the whole number of the drowned. Thankfulness that the loss of life has been so small is augmented by the fact that no person has perished through the defect or fault of the service or any of its agents.

LOSS OF THE POINT AUX BARQUES LIFE-SAVING CREW.

The gratifying record of so many human lives preserved has the sad obverse of the loss, on the 23d of April last, of the men of Station No. 2, Tenth District, one of the most gallant and skillful crews in the service. It is the second time in its history that the establishment has had to deplore the loss of a life-saving crew. The first instance was at the wreck of the Italian bark Nuova Ottavia, on the coast of North Carolina, in 1876. Upon that occasion, it will be remembered, the men put out at night through a heavy surf, which they passed in safety, and came up alongside the stranded vessel. The disaster which followed presents lineaments as vague as terrible, and can never be clearly known. In the obscurity which made the bark appear to the witnesses on shore no more than a mass of shadow out on the shadowy waters, the presence of the surf-boat under her bulwarks was only known by the glimmer of

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the boat's lantern. The sudden extinction of this light, a scream from the sea, the corpses a few minutes later rolling in the dark surf at the feet of the beachmen, the empty boat tumbling in upside down, gave proof, abrupt and horrible, of the catastrophe; but how it came to happen remained undisclosed, and it is only from the broken report of some of the Italians saved, pieced out by probable conjecture, that it can be concluded that the fatality was occasioned by some of the foreign sailors, seized with a panic, having precipitated themselves in a mass into the boat, which was thus capsized and the sailors and surfmen drowned. The degree of uncertainty which envelops this tragic occurrence, making it like an object imperfectly seen, removes it from the region of definite conception. On the contrary, the Point aux Barques disaster is fully known through the evidence of a single survivor, and the piteous calamity in all its details can be vividly realized. Nothing could be sadder than the story of this sacrifice. It is here given in the report of the district superintendent, who immediately visited the locality and investigated the circumstances.*

"I arrived at Sand Beach the evening of the 24th, and learned there that the life-saving crew were lost in their attempt to reach a vessel in distress off their station, and that the vessel had afterwards got out of trouble and was then lying at the breakwater at Sand Beach. As the steamer on which I was going up was to remain there a little while, I went out and saw the master of the vessel and got his statement, which is substantially as follows:

"'I am the master and owner of the scow J. H. Magruder, of Port Huron. Her tonnage is 136.71. The crew consists of myself and four men, namely, Frank Cox, Thomas Purvis, Eddy Hendricks, and Thomas Stewart. I have my wife and two little children aboard. I left Alcona with a load of 187,000 feet of lumber for Detroit at noon the 22d instant, wind north, fresh. Sighted Point aux Barques light at ten o'clock that night, wind east, light, but breezing up. Took gaff-topsails in at eleven o'clock. When abreast of light we commenced listing bad to starboard. Saw we were making great leeway and the lee rail under water. Discovered here, for the first time, that the vessel was leaking badly, with two feet of water in the hold. About midnight was laboring very heavy, with high wind and heavy sea. I feared we would roll over, and was satisfied we could not weather the reef. Got both anchors ready and let go about 2 a. m. the 23d, when she immediately righted. Had fourteen feet of water under the stern, and at every heavy surge on the chains she would drag anchor, the seas breaking over her bows. Hung a red light in main rigging, as a signal of distress to the life-saving station. I cer-

* The superintendent referred to is Capt. Joseph Sawyer, an able and devoted officer, who, since the close of the fiscal year, has himself perished, by drowning, while engaged in official duty. Mr. George Feaben, the keeper of Station No. 8, Tenth District, Lake Huron, was with him at the time and shared his fate. The circumstances of this melancholy occurrence will be given in the next annual report.

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tainly feared the vessel would be lost, and that our lives were in great danger, if assistance was not rendered. The vessel would strike bottom between every heavy sea. At daybreak I displayed my ensign at half mast, union down, and about 7.30 a. m. observed the answering signal from the station. About eight o'clock saw the surf-boat coming out. We were about three miles southeast from the station. Lost sight of surf-boat in a few moments; thought the sea was too heavy for her, and that she had gone back, but in about 1½ hours (9.30) saw her again about one mile north of us, pulling to the eastward, to get out of the breakers on the reef. In a short time I saw her go down in the troughs of a heavy sea, and when she came up we saw she had capsized. We saw them right her and bail out, when she again started to pull for us. In about twenty minutes she again capsized. Saw several men clinging to her, for some time, but finally saw only one. Our boat was in good condition. She is 16 feet long. Did not think of launching her. No ordinary yawl-boat could live in such a sea. I thought the life-saving crew used good judgment in crossing the reef where they did. I then commenced throwing my deck-load overboard, and at noon, the wind shifting to the northeast, we made all sail and started, cleared the reef, and arrived in Sand Beach all safe, but leaking badly. The weather was piercing cold, and all that day the spray would freeze as it came aboard of us.'"

The superintendent continues:

"I arrived at Huron City at one o'clock Sunday morning (25th). The two dead bodies of surfmen Petherbridge and Nantau were put aboard of the steamer here, and sent down to Detroit, by direction of their friends. I arrived at the station at 3 a. m., and found Keeper Kiah in a very bad condition, both mentally and physically. The sad story of his experience, and the loss of his brave crew, is as follows:

"'A little before sunrise on the morning of the 23d, James Nantau, on watch on the lookout, reported a vessel showing signal. I got up, and saw a small vessel about three miles from the station, bearing about east and by south. She was flying signal-of-distress flag at half mast. I saw that she was at anchor close outside the reef. All hands were immediately called; ran the boat out on the dock; and, when ready to launch, surfman Deegan, on patrol north, came running to the station, having discovered the vessel from McGuire's Point, 1½ miles north from the station. At this time a warm cup of coffee was ready, of which we all hastily partook, and a little after sunrise (5.15 by our time) we launched the boat. Wind east, fresh, sea running northeast, surf moderately heavy. We pulled out northeast until clear of the shore surf, and then I headed to cross the reef where I knew there was sufficient water on it to cross without striking bottom. We crossed the reef handsomely, and found the sea outside heavier than we had expected, but still not so heavy as we had experienced on other occasions. After getting clear from the breakers of the reef, the boys were in excellent spirits, and we were all congratulating ourselves how nicely we got over. I then bore

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down towards the vessel, heading her up whenever I saw a heavy sea coming. When heading direct for the vessel, the sea was about two points of the compass forward of our port beam, and for the heaviest seas I had frequently to head the boat directly for, or dodge them. When about a quarter of a mile from the vessel, and half a mile outside the reef, and very nearly one mile from the nearest point of land, I saw a tremendous breaker coming for us. I had barely time to head her for it, when it broke over our stern and filled us. I ordered the boys to bail her out before the sea had got clear of her stern, but it became apparent at once that we could not free her from water, as the gunwales were considerably under water amidships, and two or three minutes after she was capsized. We then righted her, and again were as quickly capsized. We righted her a second time, but with the same result. I believe she several times capsized and righted herself after that, but I cannot distinctly remember. As near as I can judge, we filled about one hour after leaving the station. For about three-quarters of an hour we all clung to the boat, the seas occasionally washing us away, but having our cork jackets on, we easily got back again. At this time Pottenger gave out, perished from cold, dropped his face in the water, let go his hold, and we drifted slowly away from him. We were all either holding on the life-lines or upon the bottom of the boat, the latter position difficult to maintain owing to the seas washing us off. Had it been possible for us to remain on the bottom of the boat, we would all have been saved, for in this position she was buoyant enough to float us all clear from the water. My hope was that we would all hold out until we got inside the reef where the water was still. I encouraged the men all I could, reminded them that there were others, their wives and children, that they should think of, and to strive for their sakes to keep up, but the cold was too much for them, and one after another each gave out as did the first. Very little was said by any of the men; it was very hard for any of us to speak at all. I attribute my own safety to the fact that I was not heated up when we filled. The men had been rowing hard and were very warm, and the sudden chill seemed to strike them to the heart. In corroboration of this theory I would say that Deegan, who did the least rowing, was the last to give out. All six perished before we had drifted to the reef. I have a faint recollection of the boat grating or striking the reef as she passed over it, and from that time until I was taken to the station, I have but little recollection of what transpired. I was conscious only at brief intervals. I was not suffering, had no pain, had no sense of feeling in my hands, felt tired, sleepy, and numb. At times I could scarcely see. I remember screeching several times, not to attract attention, but thought it would help the circulation of the blood. I would pound my hands and feet on the boat whenever I was conscious. I have a faint recollection of when I got on the bottom of the boat, which must have been after she crossed the reef. I remember too in the same dreamy way of when I reached

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shore; remember of falling down twice, and it seems as if I walked a long distance between the two falls, but I could not have done so, as I was found within thirty feet of the boat. I must have reached the shore about 9.30 a. m., so that I was about 3½ hours in the water. I was helped to the station by Mr. Shaw, light-keeper, and Mr. McFarland; was given restoratives, dry clothes were put on, my limbs were dressed, and I was put to bed. I slept till noon (two hours), when my wife called me, saying that Deegan and Nantau, had drifted ashore, and were in the boat-room. My memory from this time is clear. I thought possibly these two men might be brought to life, and, under my instructions, had Mr. Shaw and Mr. Pethers work at Deegan for over an hour, while I worked over Nantau for the same time, but without success. I then telegraphed to the superintendent and the friends of the crew. The four other men were picked up between 1 and 2 p. m., all having come ashore within a quarter of a mile from the station. The surf-boat and myself came ashore about one mile south of the station, the bodies drifting in the direction of the wind, and the boat more with the sea. I ordered coffins for all. On the 24th, Hiram Walker, of Detroit, telegraphed to ship the bodies of Petherbridge and Nantau to Detroit, which I did, together with their effects. The other four men were delivered to their friends, all residents of this county.

"'The following are the names of the lost crew: William I. Sayres, Robert Morison, James Pottenger, Dennis Deegan, James Nantau, and Walter Petherbridge. Sayres and Morison were widowers. Sayres leaves five children, the youngest eight years old. Morison leaves three children, the youngest six years old. This would be the third season for these two men at the station. Pottenger and Deegan each leave a wife and four children, the youngest two months old each. This was the second season for these two men at the station. Nantau and Petherbridge were single men, and this was their first season at the station.'

"Mr. Samuel McFarland makes the following statement:

"'I am a farmer, and was working on the farm about one-fourth of a mile from where the surf-boat came ashore, when I heard gulls screeching, as I supposed, several times, but paid no attention to it. Presently my two dogs started to run for the cliff, and thinking that somebody might be calling from the shore, I went to the edge of the high cliff overlooking the lake, and saw a boat bottom up about 100 rods from shore, with one man on it. Not knowing that the station crew were out, started to notify them of what I saw. Upon getting to the station, about 9 o'clock, and learning that they were out, concluded it was the surf-boat I had seen, and went to the light-house after Mr. Shaw to accompany me to where the boat was drifting in. When we got there the boat was ashore, and Captain Kiah was standing on the beach about 30 feet from the boat, with one hand holding on to the root of a fallen tree, and with the other hand steadying himself with a lath-stick,

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and swaying his body to and fro, as if in the act of walking, but not stirring his feet. He did not seem to realize our presence. His face was so black and swollen, with a white froth issuing from his mouth and nose, that we did not at first know who he was. We took him between us, and with great difficulty walked him to the station. Several times on the way he would murmur, "Poor boys, they are all gone." At one time he straightened out his legs, his head dropped back, and we thought he was dying, but he soon recovered again. Upon reaching the station he was given restoratives, his clothes were removed, and he was put to bed. His legs from above the knees were much swollen, bruised and black.'

"Mr. Shaw corroborates this statement from the time he took part in it.

"I attended the funerals of Deegan and Pottenger, the 25th, and hope I may be spared from ever again witnessing so sad a scene. The wives of these two brave men were almost crazed by their great loss, and the cries of the poor children left fatherless, were heart-rending in the extreme. It is sincerely to be hoped that the bill now pending in Congress, granting pensions to the families of surfmen who lose their lives in the discharge of their duty, will become a law, so that the families of these truly brave men may be compensated to the extent of its provisions.

"In conclusion, I would state that I feel very keenly the loss of this crew, but I can lay the blame at no one's door. It was one of those unfortunate accidents that are liable to occur with the best of men and under the best management, but not likely to occur twice in a lifetime. Had the boat been two seconds earlier or later, the sea would have broken ahead of her, or she would have passed over it before breaking; but upon straightening up the boat there was no time left to back or dodge. The sea broke when she lay in the most critical position to take it. Certainly it was the duty of the crew to answer to the signal of distress, and certainly they responded most promptly. There was no discord here; there was more than a friendly feeling existing between the keeper and crew. They had together made a good record at their station, and when duty called each strove to be foremost in the boat.

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"I have conversed with several who have served with Keeper Kiah, and all speak in the highest praise of him as a man, and of his superior skill in handling a surf-boat. He has the sympathy of the entire community, including the friends and relatives of his dead crew, in his present trouble."

The closing incident in the Point-aux-Barques tragedy was the resignation of the stanch keeper, too shattered in mind and body, for the time at least, to retain his position. Thus the heroic station was by a day's experience left at once vacant of its crew, who, this very year, had saved nearly a hundred lives.

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EXAMINATION OF KEEPERS AND CREWS.

The limited amount appropriated for the contingent expenses of the establishment made it necessary to omit last year the customary examination of keepers and crews by a board composed of an inspector of the service (an officer of the Revenue Marine), a medical officer detailed from the Marine Hospital Service, and a surfman distinguished for professional ability. The advantages of this examination are obvious. It determines by a judgment wholly impartial, because wholly removed from local influences or personal bias, the character and qualifications and the physical soundness of the men found at the beginning of the season at the several stations, the general condition of which in regard to their appliances is also brought under a fresh and independent scrutiny. Any deficiency, therefore, either in the personnel or the appointments of the several stations, becomes at once the subject of remedy. The omission of this examination for a single year has not operated seriously to the disadvantage of the service, partly, it is believed, because the expectation in each district of the arrival of the board led those in immediate charge of the respective stations to start them, in respect to both crews and apparatus, at as high a point of efficiency as possible, and partly because of the excellent supervision of the local inspectors and superintendents. But the good condition in which, so far as known, the stations have remained has not been without some slight exception, occasional reports for example having reached this office, generally from citizens in the neighborhood of the stations, of the comparative unfitness, physical or professional, of certain members of the crews, defects or disqualifications which an examining board would be quickest to detect and least likely to pass over. It is, moreover, quite certain that a continued omission of these wholesome board examinations would gradually result in a lowering of the station standards, and effect serious harm to the service. The board examinations are indeed, as the reports of the establishment have from year to year shown, of vital importance to the efficiency of the service, and it is hoped that the appropriations for contingent expenses may hereafter be sufficiently ample to admit of their resumption and continuance without interruption.

ESTABLISHMENT OF STATIONS.

The five stations mentioned in the last annual report as being in process of erection in the Eighth District (Gulf coast), have been completed and are now manned and in operation, with the exception of one (No. 6, Brazos Santiago), which the acting district superintendent reports was so injured in the great hurricane of the 11th and 12th of August last that the building will have to be taken down and re-erected before it can be used. The water from the Gulf flooded it for a depth of several feet, coming upon it with such force as to wash away the underpinning and cause the house to careen, making one side of it bulge out,

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and wrenching the floor joists from the sills. The sinking of the house into the sand forced up the floor nearly six feet. The platform, steps, and all the doors of the lower story were washed away, and most of the outfits and equipments were badly damaged or entirely carried off. The building was stanch and well made, and the condition to which it was reduced shows that the storm was one of great fury, a fact also evidenced by the havoc wrought upon other buildings in the vicinity, including the State quarantine structures, which were entirely destroyed, seven feet of water being left where they stood, while much damage and destruction were suffered by shipping.

The station at Ludington, Mich., which was also mentioned in the last report as approaching completion, was ready for service in the following spring, and has been in operation throughout the season of Lake navigation just closed.

The foregoing six stations are all that have been established during the year. It was hoped that several others, on different parts of the coasts, would have been erected, but difficulties in procuring proper titles to the sites selected in some cases, and the necessary rejection of bids deemed excessive in others, have prevented the accomplishment of the purpose.

REBUILDING, REPAIR, AND IMPROVEMENT OF STATIONS.

The report for 1877 set forth the discomforts to which the crews were subjected at the Amagansett station (No. 10, Third District) and the station at Seabright (No. 3, Fourth District), in the first case mainly owing to the cramped proportions of the upper story of the building, and in the second to the extreme dilapidation of the roof and walls. The necessity for reconstruction in both cases was stated, but, to accomplish this end, enough could not be spared from the means at the command of the service which more pressing wants required until the past fiscal year, when the work was undertaken, and new and comfortable stations at both points are now near completion.

On the 27th of August, 1879 (three days before the crew were to go on duty), between four and five o'clock in the morning, or just before sunrise, Station No. 10, Fifth District (Cobb's Island, Virginia), was discovered to be in flames, and in a short time was wholly consumed. All the equipments of the station were destroyed except the guns and projectiles, which were damaged. No explosion accompanied the conflagration, although there were ten pounds of powder in the building, a fact which creates the presumption that the powder had been previously removed, and, in conjunction with other circumstances, leaves no doubt tha he fire was the work of an incendiary. A liberal reward was at once offered for the detection and conviction of the guilty party, but up to this date without result.

In order that the operations of the service might suffer the least possible interruption from the destruction of the station, new boats and apparatus

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were speedily procured, and a large room in the keeper's private house, being fortunately available, was roughly fitted up for their reception and the accommodation of the men, and the crew were fully prepared for emergency soon after the commencement of the active season. Early steps were also taken for the rebuilding and equipment of the station, and the work is now near completion.

Station No. 17, Sixth District (Pea Island, North Carolina), was also destroyed by fire on the night of the 29th of May following, a few days after the crew had gone off duty for the season. In this case, as in the other, the few circumstances which could be collected by investigation indicate the work of an incendiary, the reward offered for whose detection, however, failed to accomplish its purpose. Nothing was left of the house and its equipments; but the stable and wood-pile, a little distance from the main building, remained intact. The work of rebuilding and refurnishing the station was impeded by the difficulty of getting materials to that remote locality, but was pushed forward as rapidly as possible, and is now nearly done. Meanwhile, the undestroyed stable was hastily patched up and altered to serve the purpose of an impromptu station, and fitted with the most important apparatus as fast as it could be procured, so that the crew were enabled to go upon duty soon after the opening of the present active season.

Station No. 13, Second District (Chatham, Mass.), has been removed from its former position south of the town to a point about two miles north of Chatham lights. The removal became necessary on account of encroachments of the sea, which for some time have been carefully watched by the keeper, and at length reached a point threatening the security of the station. The new site gives at least as great advantages to station operations as the old, and brings the patrol of Station No. 13 into communication with that of Station No. 12, formerly barred by the intervening inlet, while it also affords the opportunity for combination of the two crews in case of shipwreck occurring north of Chatham.

Work similar to that done upon several of the Lake stations, mentioned upon page 47 of last year's report, has been accomplished at Station No. 17, Eleventh District (Two Rivers, Lake Michigan) and considerable minor repairs and renovations to a great number of the stations in all the districts, necessary to the comfort of the crews and the preservation of the buildings, have been effected, the details of which it is unnecessary to enumerate.

In this connection, mention must not be omitted of the great amount of work done upon the stations everywhere, especially upon the Lakes, by the voluntary labors of the keepers and crews. This work extends in various instances from the beautifying of the interiors and surrounding grounds by ornamentation and embellishment, to the most solid additions and repairs. In some cases, annexes have been built for the greater accommodation of the boats and apparatus; in others, lookouts

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or sentry boxes upon certain elevations overlooking the sea, wooden ways for launching, projecting piers and cribs to facilitate the arrival and departure of the boats, roads through woods or toward beaches for the readier transportation of the apparatus, and other works of like nature, have been constructed. There are instances where even the lumber and other materials involved, have been, equally with the labor, the free contribution of the crews. In certain solitary places, miles from human habitation, stations have been wrought upon by these fine-spirited men until they have become objects of surprise and charm amidst the rudeness and barrenness around them. At several localities the repute of these attractive spots in the rough coast wilderness, has been such as to draw visitors widely from their ordinary course to see them. In most of these cases, the improvements thus effected have been such as to greatly enhance the value of the government property. The spirit manifested in such works, highly esteemed by the officers in charge of the service, cannot fail in time to receive the general appreciation it deserves.

IMPROVEMENT IN LIFE-SAVING APPLIANCES AND METHODS.

The two boards for the examination of plans, devices, and inventions intended for use at life-saving stations, announced in last year's report as having been organized, and whose rules and regulations were published, have continued their investigations upon the various appliances which have been submitted by inventors and others, holding their meetings as occasion required.

BOARD ON MISCELLANEOUS APPLIANCES.

This board, which, it will be remembered, is presided over by Mr. R. B. Forbes, the continued availability of whose veteran experience and ripe judgment, furnished the service gratuitously, is a matter for gratification, has had presented to it a number of devices. Many of these, however, as might be expected, were manifestly of no practical value, and were rejected. Several others were so deficient in description and specification that action upon them had to be deferred until the requisite data should be supplied. In one or two instances the devices were promising, but were not considered fit for adoption without certain improvements, which the inventors have not yet effected.

SELF-RIGHTING SURF-BOAT.

The self-righting surf-boat, devised by Capt. D. P. Dobbins, superintendent of the Ninth Life-Saving District, the satisfactory action of which at the wreck of the schooner Carlingford was noticed in the last annual report, was purchased and placed at one of the stations, where, however, no further occasion for the test of its qualities has occurred. Captain Dobbins, has in the meantime constructed another boat which he considers an improvement, but has not yet had opportunity to submit it to the judgment of the board.

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SAND-WHEEL FOR BOAT-WAGON AND MORTAR-CART.

Capt. Douglass Ottinger, of the Revenue Marine, has obtained a patent for a sand-wheel for facilitating the transportation of heavy burdens over sand-beaches, and gratuitously assigned it to the government. The drawings and specifications of this device were submitted at a recent meeting of the board, the first held since it was brought to the attention of the service. The board considered the plan sufficiently promising to justify the recommendation that a set of wheels be constructed for practical test. This will be done, and the device subjected to trial as soon as may be.

LIFE-RAFTS.

The board had hoped that at some of its meetings the conditions of the weather and surf would afford the opportunity of personally witnessing the action of the different life-rafts submitted for its consideration. No such opportunity occurring, however, it was decided to place the ratts at certain exposed stations, to be tested by the keepers as occasion should offer. The reports thus far received from the keepers have not been favorable to the adoption of the rafts as a means for getting out from the shore to wrecks.

BOARD ON WRECK-ORDNANCE.

The board on wreck-ordnance, presided over by Capt. J. H. Merryman, has also pursued its labors. It is a pleasure to state that the invaluable services of Lieut. D. A. Lyle, of the Ordnance Department of the Army, have been continued on this board through the courtesy of the War Department. The great value of the professional abilities of this officer to the establishment from the beginning of his connection therewith, has been much enhanced by the experience he has gained in its particular problems.

Since the last annual report this board has had submitted to it for action Capt. John G. Butler's line-carrying projectile; Capt. J. H. Meyers' kedger-rocket apparatus and swinging line-boxes; Mr. Charles Smith's grapple-shot and safety-hammock; the Lyle-Emery grapple-shot; Mr. L. W. Spencer's line-throwing gun; and Mr. Thomas H. Dunham's tarred ropes and shot-lines. There has also been submitted a plan for sheet-iron faking-boxes. In addition the board has examined the English Boxer, the Russian, the German and the Hooper rocket apparatus, which have been for some time in the possession of the service.

The board has taken definite action upon the Butler projectile, the apparatus of Captain Meyers and Charles Smith, the Lyle-Emery grapple-shot, and the several line-carrying rocket systems. The other matters yet remain as unfinished business. The reports upon the matters disposed of, with accompanying illustrations, will be found further on. They possess scientific value, presenting a comprehensive and exhaustive analysis of the several objects and systems.

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The recommendation by the board of the adoption of the Lyle-Emery grapple-shot for use in the service has not yet been acted upon for want of available funds.

Further trials, as recommended by the board, will be made with the English Boxer and the German rocket systems.

The English wreck-illuminating lights remaining from the experiments of the board will be distributed, as suggested, at some of the stations for trial upon actual occasions.

The trials have been conducted at the ordnance proving grounds at Sandy Hook, New Jersey.

The board have labored under considerable disadvantage for want of an experimental firing ground, and a store-house for apparatus, and have requested that provision be made for this need. In view of the fact that experiments of this nature are constantly required, the request should be complied with, but want of funds prevents. Up to this time the board have been obliged to depend for the necessary accommendations upon the courtesy of Col. S. Crispin, constructor of ordnance, U. S. A., who has offered every facility in his power, although at the sacrifice of his own convenience.

AWARDS OF MEDALS.

A number of medals have during the year been awarded for acts of heroism in saving life.

The case first in order was that of Morris Dowd, a private soldier of Company A, Fifth United States Infantry, who, at the risk of his own life, saved a fellow soldier, Private Charles Loch, of the same company, from drowning in Frenchman's Creek, Montana Territory, on the 20th of July, 1879. The following graphic account of his heroic action, as given by Assistant Surgeon A. C. Girard, U. S. A., who was an eye witness of the affair, officially submitted with other testimony from the War Department, bears ample evidence of the title of Private Dowd to the distinction bestowed upon him by the award of the silver medal of the Life-Saving Service:

"On the 19th of July, 1879, General Miles' expeditionary force arrived on that river, 25 miles above its confluence with Milk River. The 'creek' was at all times fordable only at a few places, owing to quicksands. On our arrival it was a seething torrent, and, although not more than four feet deep at the ford, the current was so swift that only a few of our Indians could swim their ponies across.

"The next morning the waters had somewhat subsided, though still running like a mill-race over the quicksands which formed the bed of the ford. But General Miles ordered a crossing. The advance guard passed through without accident, then General Miles and his staff. We posted ourselves on the steep bank to watch the crossing. All went well (our troops were mostly veteran campaigners) until by the grinding of the wheels of the train the ford had been nearly washed away. An

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unfortunate recruit then, finding that he was losing his seat and demoralized by the rushing of the waters, got below the ford. His animal lost footing, reared, and he fell off. His foot caught in the stirrup and he was dragged by the current. Suddenly he became released, rolled over once or twice, wildly beating the water, and was being carried off by the current. At that moment, Private Dowd, having already crossed, saw the man in his extreme peril. Without a moment's hesitation he pushed his horse into the current, heedless of the almost certainty of his own destruction. He grasped the drowning man as he was being swept by, and skillfully managing his animal while retaining a hold on the recruit, he succeeded in reaching the shore. Finding his horse sinking in the quicksands, he left the limp body on the ground and saved the animal by a few rapid leaps.

"Dowd retired and moved on with his company, apparently unconscious of his great act of heroism."

The exploit won the plaudits of the whole force in whose sight it was performed, and in regard to it the chief of the Army, General Sherman, in bringing the facts to the notice of the Secretary of War, remarked, that "the act of Private Dowd, in rescuing a comrade from drowning, was worthy of all praise, and should be recognized by a medal;" an opinion concurred in by the Secretary of the Treasury, who awarded the brave soldier a silver medal in honor of the generous heroism of his deed, for which indeed a gold medal would have been given, but for the terms of the law which confines its bestowal to cases of rescue from the "perils of the sea."

A silver medal was also awarded to Mr. John Delaney, a roundsman of the Municipal Police of the city of New York, who saved from drowning, on the 4th of December, 1879, a little boy, seven years old, named George McFadden. The child had fallen from a canal-boat lying at a pier in the East River, New York, and was carried by the tide under the boat, which was moored alongside of another. He would certainly have been drowned, the tide being at strong flood, had not the alert policeman, who happened to hear the alarm given by the bystanders, sprang upon and unmoored one of the canal-boats, calling out to the captain to unloose the other, the object being to allow the boy to come to the surface. The moment he appeared, which was at some distance out in the stream, Roundsman Delaney sprang into the water, swam to him, and brought him back to the canal-boat, on board of which the little fellow was taken insensible, and only brought to by considerable effort.

Another officer of the New York police, Mr. Thomas Farley, received a gold medal for having saved from drowning in the East River four persons on different occasions. One of these was a widow, Mrs. Maria Freeman, who on June 21, 1877, while waiting on the pier for the return of her children from an excursion, fell overboard, and was brought to shore again through the daring efforts of the sturdy officer, in an uncon-

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scious condition. On June 15, 1879, he rescued a man named George Bremmer in the same way. On July 27, 1879, he saved a boy twelve years old, named Charles Stock, who was drowning in the river. The last rescue was that of a man named William Bentfield, who went overboard from a pier in the darkness an hour after midnight on February 8, 1880, and was only saved from death by the courage of Officer Farley, who came running at the sound of his cries, leaped into the water, and sustained him there by a resolute struggle, calling meanwhile for help, which at length arrived, and both men were taken from the water quite exhausted.

A gold medal was awarded to Mr. Cheney R. Prouty, collector of customs at Indianola, Texas. On the 4th of May, 1878, Mr. Prouty was returning in a sail-boat from Matagorda Island to Indianola, having with him Mr. S. N. Townshend, the correspondent of an English journal, Mr. Henry Bailey, and a colored man named Henry Jerrold, and about seven o'clock in the evening, when off Alligator Head, the boat in tacking, a puff of wind and a heavy sea striking her at the same time, was suddenly capsized. Finding it impossible to right the boat, the men were obliged to climb up on her side, where they remained floating about in the moonlight from seven until eleven o'clock in the evening, hoping for deliverance by some passing vessel. The moon set at the latter hour, and the alarm and misery of the group were then increased by the discovery that the boat must sink unless lightened by one of the four men leaving her. In this exigency Mr. Prouty insisted on being the man. Against the remonstrances of his companions he threw off his boots and upper clothing, and clinging to the main boom, which they cut adrift for him, he struck out in the darkness through the shark-infested waters in the direction where the land was supposed to be. After a hard struggle with the waves, lasting four hours, he succeeded in landing and at once set out, running and walking for eight miles along a shore full of sharp shells and ridges of stiff grass, by which his feet were so badly lacerated that for a long time after the adventure he could not walk without torment. The end of this painful tramp brought him to a bayou south of Indianola, where, without pausing for rest or refreshment, he made for the first schooner therein anchored. At six o'clock in the morning his forlorn companions of the evening before, who had floated all night about the bay, saw with joyful hearts this vessel with the staunch collector on board bearing down to their rescue.

Upon Mr. Townshend's representation to the British Royal Humane Society of the chivalric action above related, that institution awarded its medal to Mr. Prouty, which has heretofore been only given upon the direct application of the person entitled to it, the presentation being made through the governor of Texas. To this proud distinction the gold life-saving medal is fittingly added.

Another gold medal was awarded to Ensign Lovell K. Reynolds, of the United States Navy, in honor of an act of gallantry and hardihood,

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involving the rescue of a ship's company of twelve persons at sea during a heavy gale, by exertions which lasted from eight o'clock in the morning well into the darkness of the night, and were fraught with peril throughout.

It appears that on the morning of the 24th of November, 1879, while the United States frigate Constellation, of which Ensign Reynolds was an officer, was lying to under close-reefed sails, in the vicinity of the Azores, in a storm which had lasted nearly a week, a vessel, which proved to be the Austro-Hungarian bark Olivo, commanded by Capt. Luciano Barbarovich, was discovered six miles to the westward, with her colors at half-mast and flying a signal for immediate assistance. Sail was made and the bark approached within practicable distance, when the Constellation was hove to, and a small whale-boat, manned by six men, with Ensign Reynolds in command, was cleared from the frigate with great difficulty and danger, and pulled for the distressed vessel. She was found in a sorry plight, leaking, her rudder gone, her crew worn out with five days' labor at the pumps, which had become choked, and her cargo of grain, to which the sea had gained entrance, so swollen as to force the planks from her sides. The boat could not board her on peril of being stove to pieces against her hull, and only by skillful management Ensign Reynolds was enabled to lay to under her lee quarter and rescue four of her crew, who were obliged to jump overboard and be picked up by the boat, which then made its way back to the frigate, where all hands were got on board by means of life-lines. The whale-boat, manned by a fresh crew, and still commanded by Ensign Reynolds, then returned to the sinking ship, and as the time, in the slow and dangerous labor, was wearing into the afternoon, and there were still eight persons on board the Olivo, a greater number than could be taken into the boat at one time, another boat, for the sake of dispatch, was manned and sent out from the frigate, but was unable to get near the vessel. Ensign Reynolds, however, contrived to accomplish the feat, and brought back five persons to the Constellation.

Darkness was now setting in, and although it seemed almost foolhardy to attempt another trip, young Reynolds, fearing that the vessel would not last until daybreak, offered to go to her again at once, if a crew would volunteer. Twice the required number of sailors at once responded, and the boat again left the frigate. The darkness now made the enterprise doubly hazardous, but one by one the three men were taken from the wreck. The duty yet remained of destroying the bark, which, as she lay in the track of passing vessels, a danger to navigation while her hulk floated, the commander of the Constellation directed should be scuttled or burned, if possible. This was accomplished by the daring young officer swimming to her, clambering on board, and firing her in two places. He then swam back, and the boat with the rescued men rowed to the Constellation, which was reached by eight o'clock, two hours after nightfall. The perilous adventure was closed

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in the dangerous work of hoisting the boat full of men to the quarter davits, the ship giving a lee roll just as the boat, hooked to the falls, left the water, dashing her against the frigate's side, staving her fore and aft, and nearly pitching all on board into the ocean. Then as the vessel rose on the top of the sea, the suspended boat swung off with the brave ensign, who had lost his footing in the shock, hanging over the water from its side, but before it could swing back again and crush him against the hull, eager hands hauled him clear, and the next minute they were all safe on board the frigate.

In recognition of his gallant conduct upon this occasion, the Massachusetts Humane Society and the New York Live-saving Benevolent Association have also bestowed their medals upon Ensign Reynolds.

On the 20th of November, 1879, two men, the forlorn survivors of a crew of seven, were rescued from the wreck of the schooner W. B. Phelps under circumstances in which ingenuity, persistence, endurance of extreme hardship, and the most perilous daring mingled to form a striking instance of heroic enterprise. The evening previous, at about 7 o'clock, during a heavy northwest gale and a very severe snow-storm, the vessel drove ashore about a mile east of the dock of Glen Arbor, Michigan. She came on stern foremost, and her center-board being down broke up her decks so completely that only a small fragment of them remained on the extreme forward part of the vessel. On this fragment, hardly sufficient for a foothold, her mate and one of the sailors remained all night; the vessel being covered with ice, heeled over with her lee rail under water, the rail upon her weather side all gone, and the sea pouring across her between stem and stern like a cataract. Five of her crew had perished, and it was only at daybreak that a citizen of Glen Arbor discovered the two miserable survivors clinging to the bows. The alarm he gave brought to the scene a number of the townspeople, who sledded to the spot an old leaky flat-bottomed fish-boat, the only craft obtainable, which was at once launched by William A. Clark, Charles A. Rosman, John Tobin, Welby C. Ray, and Willard W. Tucker. The effort these brave men made to reach the wreck was soon baffled, the terrible sea and wind driving back the boat, half filled with water, with her crew drenched. Amidst the cries of the two men on the wreck for help, the boat was dragged about twenty rods to windward to get the advantage of a strong current, and the same crew, with the exception of Willard W. Tucker, whose place was supplied by Howard Daniels, made another attempt and succeeded in reaching the stern of the vessel, to which they made fast by a line and surveyed the situation. The two sailors were away from them in the bows, unapproachable on the windward side of the hull by reason of the terrible sea, and inaccessible on the leeward side on account of a great mass of spars, timbers, sails, rigging and deck plank, which hung over the whole length of the bulwarks and thrashed and bounded in the water constantly, menacing approach with destruction. The prospect of rescue was therefore gloomy, and as the

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boat was fast filling it was concluded that what could possibly be done must be decided on shore, to which the crew then returned, with their boat stern foremost, not daring to turn it for fear of the heavy seas.

When they gained the land they were so drenched, chilled, and covered with ice from head to foot, that, leaving a man on the beach so that the poor sailors would not think they were deserted, they ran to their homes and put on dry clothing. Returning as soon as possible, they matured the resolve to wedge the boat into the mass of wreckage which crashed up and down alongside of the vessel, and endeavor to get the sailors across it. With this purpose they again started for the wreck, the place of Howard Daniels being this time filled by John Blanchfield.

Despite their efforts to make headway, the boat at times fell astern, the unhappy sailors meanwhile shouting, "Pull hard, boys; pull hard!" The hard pulling thus implored, at last enabled them to drive the boat into a small opening in the floating *débris*, about sixty feet from where the two men were standing. Here their position was one of extreme danger, all their strength and skill being brought into constant play to prevent the boat from being crushed by the spars and timbers which almost inclosed them. Still more hazardous was the task of getting the two nearly helpless sailors for a distance of sixty feet over this mass. A line was thrown to the mate, John Hourigan, the end of which he fastened around his body, and, steadied by it, he began his desperate journey over the pitching and tossing tangle, pausing frequently, and clinging, as the seas flew over him. By these efforts, he contrived to crawl to within about fifteen feet of the boat, and on to a piece of deck. The crew then worked the boat over an intervening piece of deck, letting it remain partially resting thereon, and thus getting within reach of Hourigan, took him on board. The other man, Edward J. Igoe, who had followed in the same way, being weaker than his companion and nearly helpless through exposure, came very near being lost. As he crept along over the constantly mixing spars and timbers, some of them caught his leg and held him so fast that he had not strength enough to get it free. He was feebly struggling in this terrible strait, when two of the gallant rescuers sprang out, leaping from point to point over the tumbling *débris*, reached and extricated him, and one of them, gripping him by the collar, dragged him on the run along a spar about twenty feet, until the piece of deck was reached on which the mate had been, where he was seized by the others, and got into the boat. The boat was now shoved off the slab of deck on which it partly lay, and cautiously manœuvred, stern foremost, to land, followed by the furious seas. It was filled with water by the time the shore was reached, and a score of men rushed into the surf from the délirious crowd, and hauled it with its load up on the beach. The terrible work thus triumphantly ended had lasted about eight hours.

When the mate stepped from the boat upon the land, he threw up his arms, and, with the tears flowing down his face, he cried: "Thank

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God! I shall see my children again!" To men capable of the noble rescue achieved by these five heroes of Glen Arbor, it is certain that no tribute from admiring fellow-townsmen, nor from the public at large, could equal the sweet honors of these words.

The two sailors, saved from an exposure on the wreck of twenty hours, were taken a mile away to a hotel (Igoe being carried a part of the distance), where they were cared for during their stay of about a week at Glen Arbor.

The gold medal of the Life-Saving Service was severally awarded to the five rescuers, William A. Clark, Charles A. Rosman, Welby C. Ray, John Tobin, and John Blanchfield. No men ever better deserved the token by which the nation commemorates such deeds of valor and charity.

The relation of the melancholy loss of the brave life-saving crew at Point aux Barques, Lake Huron, is contained in another part of this report. The catastrophe, as is stated, left but one survivor, Capt. Jerome G. Kiah, and to this true man, in commemoration of the sturdy bravery with which he entered upon the perilous endeavor to aid the shipwrecked upon that occasion, and the intrepidity, the fortitude, and the tenderness which marked his conduct in the calamity which befell him and his crew, the gold medal of the service was awarded.

A medal of the same class was also awarded to Richard Stockton, esq., of Trenton, N. J., in recognition of his valiantly rescuing from drowning a gentleman at Long Branch, on the 31st of July, 1879. This gentleman was Emory Clapp, esq., of New Orleans, who swam out too far while bathing, and was caught in a current called a "sea-puss," and swept seaward. Of all the people upon the beach at the time none ventured to respond to the drowning man's cries for help, except Mr. Stockton, who, although he had himself a short time before been caught in the "sea-puss," and had extricated himself with difficulty, at once dared the current again, swimming out through it to the aid of its probable victim. His perils received upon his arrival a sudden and terrible accession, for the endangered man at once caught him by the neck with the frantic grip so common to persons in his situation, and for a few moments the lives of both men were at the greatest hazard. Succeeding in releasing himself, however, by a violent effort, Mr. Stockton gave the other his right arm, to which the latter clung with a grasp that made it lame for a long time, and in this manner the gallant young gentleman, with great effort, reached the line of men which had been formed and stretched out into the water, and receiving their assistance succeeded in landing upon the shore.

The gold medal of the establishment commemorates alike in this case a signal manly feat and a perfect act of courage and compassion. The father of Mr. Stockton, when a Senator in Congress, did much for the Life-Saving Service, and it is a happy circumstance that the proudest honor that service can render should fall to the lot of his son.

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Gold medals were also awarded to Charles H. Valentine, keeper of Life-Saving Station No. 4, Fourth District, and to Garret H. White, Benjamin C. Potter, Nelson Lockwood, William H. Ferguson, and John Van Brunt, members of his crew, in honor of their achievements at the wrecks of the E. C. Babcock and the Augustina during the great storm of February 3, on the coast of New Jersey, a full account of which is given in another part of this report in connection with the story of the services of other crews on that occasion.

The close of the year's record of awards is graced with the name of Edith Morgan, of Hamlin, Mich., the young daughter of Capt. Sanford W. Morgan, keeper of the life-saving station at Grand Point au Sable.

On the 23d of March, 1878, during a northerly gale, when a heavy sea was breaking in upon the shore, and the weather was very cold, two unfortunate men were seen three miles out upon the lake clinging to a capsized boat. The spring navigation not having opened, the crew was not yet on duty, and the only persons at the station were Captain Morgan, his two sons, one of whom was a little boy, and his daughter Edith. The surf-boat could not be launched by these four, and the rescue it was at once decided to attempt had to be undertaken with a fish-boat. To employ all the strength available, the child, Frank, was detailed to steer, and the girl took her place with her father and elder brother at the oars. She did her part in the hard work which followed, but, with so small a crew, the boat could not be forced through the opposing breakers, and by the time it reached the second bar it was nearly swamped and had to put back to land. From thence the elder brother, James, at once started for the town to gather a crew, while Edith, in order that there might be no delay, fell to work with her father to clear a track for the launch of the surf-boat, through a great mass of logs and driftwood which covered the beach, the pair laboring with such energy that when, a short time after, the crew arrived, the work was done. The true girl then helped the men to launch the heavy surf-boat, which put out to the rescue.

Upon yet another occasion her service was no less useful and noble. It was at the wreck of the steamer City of Toledo, which took place a mile south of the station, on the 21st of December, 1879, after navigation was closed. The steamer, which had grounded in the night, about 200 yards from land, in a thick snow-storm, lay the next morning broadside on in ten feet of water, with the seas flying over her and freezing as they fell, until she resembled an iceberg rather than a vessel. The weather was so cold that the crew were unable to get out to the wreck in the boat, the oars and thole-pins clogging up with the ice so rapidly as to arrest the rowing, and the rescue had to be effected by the slow process, terribly retarded under the circumstances, involved in the use of the station hauling-lines, which the ice upon the vessel prevented from being fixed at a sufficient height above deck to keep them from immersion in the water, where the ice formed on them so quickly as to make them hard to

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manage, and where they were at the same time subjected to the heavy drag of a strong current. There being scant help at hand, Edith Morgan took her stand with the few men upon the ice banks, in snow a foot and a half deep, and tugged away with them upon the whip-line for five or six hours, until every one of the eighteen persons were safely landed. It is testified that but for her assistance some of the people on the steamer must have perished.

In recognition of her conduct on these two occasions, the silver medal of the service was awarded her.

By a regretted error in last year's report, the name of Capt. Thomas F. Sandsbury was omitted from the statement of awards to the men who rendered brave service on the 1st of April of that year in the waters of Nantucket. The paragraph should have read, "A gold medal was awarded to Capt. Thomas F. Sandsbury, and silver medals to James C. Sandsbury, Henry C. Coffin," &c.

RECOMMENDATIONS.

The recommendations in the last annual report are still considered to be of grave moment to the service, and are earnestly renewed.

The first of these related to such an increase of the appropriations as would provide for the employment of an additional man at each station. On this point the following explanation was given in the report referred to:

"The crew of a life-saving station is at present composed of seven persons, a force which is simply adequate to the manning of six oars and the oar of the steersman. To a great extent the beaches are barren outlying strips of sand, separated from the mainland by intervening bays, and absolutely destitute of other inhabitants than the groups of seven surfmen, several miles apart, in the solitary stations, rendering it impossible to obtain outside assistance for any of the operations of the service, or for any suddenly created need. The conditions are such that in each case two more persons could be usefully employed, but at least one additional man at each station is considered indispensable. In the state of the surf which exists in stormy weather, the time when a life-saving crew is likely to be called upon to put off to a wreck, it is of great importance that some one should be upon the beach to assist in launching the boat, and, what is still more important, to receive her upon her return, thus aiding in both instances to prevent her from capsizing or broaching to. An extra man at each station would also materially lighten the labor of patrol, by adding a relief to the crew and enabling the men to be successively spared from a watch. Enough has been said elsewhere, perhaps, to afford an adequate comprehension of the hardships involved in the protracted marches of the patrolmen by night upon our winter beaches. It is no little matter, as every one will concede, for these solitary men to be compelled to plod and grope for miles over the rough levels of the seaside in the icy darkness, watching meanwhile the

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obscure offing for endangered ships, while all the world lies comfortably in bed. No man among these crews ever gets a whole night's sleep during the eight months of station duty. From sunset to dawn the beach must be patrolled, and for the space of at least four hours each member must perform this duty. It hardly needs to be said how wearing such a life is to the crews. The addition of another member to the station *personnel* would obviously afford a considerable relief by allowing each man to be off patrol duty for an uninterrupted night's rest once a week. Another advantage would arise from the extra help thus made available in hauling the apparatus on severe occasions, in setting it up and working it at wrecks, or in sending back to the station for an implement or article that may be wanting to replace one broken or expended, when the present complement of men are fully needed for operations upon the scene of disaster. The addition would also, on all ordinary occasions, enable a man to be left at the station to guard its property, which the absence of the crew at a wreck, under existing circumstances, now leaves without a custodian. Still further, and more important, it would give a chance for the preparation, in advance, of the necessary culinary and hospital arrangements at the station which usually succeed a rescue. At present a crew frequently returns to the house, after the racking labors of a whole day or night, faint with hunger, cold, drenched through and through, cut or bruised, and spent with fatigue. They bear with them a terrible group of the rescued, sometimes with women and children in the number, livid, ragged, half naked, hurt, famished, wet, and frozen. The station fire is out or burnt low; no food is prepared; nothing is ready; everything has to be begun. With an extra man at the station, the miserable assembly would enter an interior fully prepared for their reception."

The same report also dwelt upon the necessity of providing horses for hauling the life-saving gear to scenes of wreck, using the subjoined language:

"Another urgent requirement for the promotion of efficiency is the provision of horses. The lighest burden of apparatus or life-saving appliances needed at a wreck is at least a thousand pounds, and at present, in most instances, this has to be drawn by the men. It is probable that to fully realize the heavy task involved it would be necessary to actually see with the eye the group of seven surfmen harnessed to the loaded hand-cart, violently tugging in oblique positions, almost inclined to the ground under the strain of the burden, as they toil forward to the scene of the shipwreck. It must be borne in mind that their load has often to be dragged through a slough of wet sand, against the stress of a winter gale, and that the journey will generally vary from one to three or four miles from the station. Hence they must arrive seriously fatigued at the point where the severe labors of the direct operations at the wreck are to begin, and where they need their freshest energies. Equally bad, owing to the circumstance of their nec-

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essarily plodding progress with their grievous load, is the delay involved in reaching the wreck, a speedy arrival at which is so obvious a necessity that every one could wish that the rescuing party might come tearing along the beach at a gallop, with the speed of an engine racing to a fire.

"In order that the life-saving apparatus may be conveyed with the utmost possible dispatch to the spot, and the operations of rescue commenced promptly, and also that the crew may come to the work with undrained strength and vitality, it is necessary that draught horses should be provided, and it is hoped that the appropriations may be augmented sufficiently to attain this very desirable end."

In regard to both of these recommendations, it may be stated that the appropriations made for the current year were sufficiently increased to permit the employment of an extra man at each of the stations on the Atlantic coast from the first of December until the close of the active season; and also that the need of horses in certain particularly rough and dangerous localities has been felt to be so imperative, that a single one has been placed at each of several stations for the severest portion of the season, some rude accommodations for the animals being in addition afforded. The outlay involved is, however, only met by restricting expenditures, for matters of scarcely less importance.

It is hoped that provision may be made for the ensuing year sufficiently ample to fully cover these two needs without depleting the sum required for other necessities of the service.

An additional reason for some enlargement of the appropriations arises from the desirability of having at each station at least three sets of the breeches-buoy apparatus, with hawsers and hauling lines, where there is now but one. Only a single person at a time can usually with safety be landed by the breeches-buoy, and it is feared that there may be some occasion of shipwreck with a large number of persons on board when, either by the vessel rapidly breaking up, or by the sea sweeping her decks, or by freezing, lives will be lost before, with the present limited appliances, the ship's company can be brought ashore. In any case, the speediest possible wreck-delivery is desirable, and as this can manifestly be better effected with three sets of apparatus in play than with one, it is hoped the means for the desired triplication may be furnished. The simple operation of hauling the buoy off and on in landing people, after connection has been made and the apparatus set up by the life-saving crew, can be readily done under the direction of the keeper by gangs improvised from the spectators often present at scenes of shipwreck, when they occur near inhabited places, or in unpeopled regions by the crews of the adjacent stations who could arrive much quicker when not impeded by the burden of their apparatus. The life-car, by which a larger number of persons can be simultaneously brought ashore than by the breeches-buoy, has the disadvantage of being too bulky for multiplication in the narrow space of the

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station, and too heavy to be transported speedily to the scene of a wreck, besides being much more expensive than the other appliance.

The necessity has long existed for supplies of clothing, blankets, etc., and also for certain restorative or delicate articles of food and drink for the use of shipwrecked persons, who are often brought to the stations in a deplorable condition. Sometimes persons are rescued in a state of nudity. Others come to land in torn garments, and nearly always, men, women, and children alike are drenched to the skin. The only resource has generally been the benevolence of the surfmen, to whom, of course, their charity, although unfailing, has often been a grievous drain. The rescued often arrive completely exhausted or severely ill from their sufferings on the wreck, and remain in this condition for days afterward, requiring a regimen different from the hearty fare the station crews furnish themselves, which enfeebled or disordered digestions cannot assimilate. These needed supplies would long ago have been provided had the means at the command of the service been sufficient to more than barely enable it to effect the simple rescue of the shipwrecked, which was felt to be the first necessity. The extension of the establishment, involving continual increase in the number of rescues, has recently so multiplied the piteous cases of destitution and bodily distress at the stations that the treatment of the matter, in view of the meagerness of the appropriations, has become a serious problem, which now, however, bids fair to be gratefully relieved through the instrumentality of the Woman's National Relief Association, a society lately formed in New York, whose first purpose is to supply the life-saving stations with stores for the use of the shipwrecked.

The present report shows, by its exhibition of the services rendered at wrecks, of what superior material the station crews are composed. Apart from their native quality, the drill and discipline to which they have been accustomed, and the habitudes of their life at the stations, make them all valuable to the service, and the places of many of them, if vacated, could not be satisfactorily filled. Already, however, there has been a great deal of difficulty in retaining them in certain localities, where, owing to the general revival of business, the rates of wages have so increased as to make the compensation paid the crews much less than that offered by private enterprise. This embarrassing situation has developed itself at a number of places on the Atlantic coast, and is rapidly extending to others. In the Lake region, however, this state of things has become so manifest as to create serious alarm for the welfare of the service. Previous reports have shown how near the brink of ruin the stations were once brought in that region by the insufficient compensation allotted to the volunteer life-boat crews. This was remedied by the provision of law, which placed the reward of these crews in just line with that received by other men of their degree, and called into service a corps of daring and able men, whose deeds of rescue have been famous on the Lake coasts, and whose splendid record has been shown

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only too faintly in the reports of the establishment. The very men who have done these deeds—whose story for this year shows of over 900 persons on imperilled vessels, only a single one lost—are the men whose disappearance in a mass there is every reason to fear, leaving their positions to be filled by men whose worth is below market value, and in whose hands the work of the establishment must greatly deteriorate in usefulness. Already since spring, in a single Lake district, where there are employed 52 regular surfmen, as distinguished from enrolled volunteers, there have been 56 changes by desertion or discharge, every change being likely to impair more or less the efficiency of the station operations. Thus the service on the Lakes is menaced by a paralysis even more grievous than threatened it in the years before 1878. Here the establishment has largely to avail itself of the services of seafaring men, and seamen's wages upon the Lakes the past summer have been $2 a day, with board beside, the rate advancing in the autumn to $4 per diem. The prescribed pay of a member of a life-saving crew is only about $1.33 per day, which at 40 cents per day for board leaves him only 93 cents. When seamen's wages are so much higher, with subsistence added, it is of course impossible to get, or if gotten to retain, the services of proper men at the rate allowed. Heroes on 93 cents a day, especially if they have large families to support, however full of human kindness or prone to daring exploits, will inevitably yield to the plump $2, or the fat $4 per diem of the Lake schooner or steamer, with the flesh-pots of the cook's galley thrown in by way of garnish. The consequence is that all the best men will be drawn from the stations by the Lake marine, and by the commerce and business on certain parts of the Atlantic coast, if these conditions continue, as they are apparently certain to do, and the most unfavorable results must be expected to follow from the enforced employment of raw, crude, unskilled, or commonplace surfmen to fill the deserted places.

To avert this calamity, it is imperative that in one way or another the pay of the station crews be advanced and regulated by the current wages of the locality, and to meet this necessity, inasmuch as the present rates of pay are, although in every case inadequate to the value of the service rendered, still sufficient to secure good men in particular regions, it is recommended that the restriction which has heretofore been imposed in making appropriations for the pay of the crews be omitted, and that the matter be left to the discretion of the General Superintendent, under the provision of the seventh section of the act of June 18, 1878, within the limits of the amount appropriated for the purpose.

A third recommendation of last year's report relates to increasing the remuneration of the district superintendents, upon which the following remarks were made:

"The subject of the low compensation received by the superintendents of the several life-saving districts is one deserving of serious consideration. The pay of these trusty and able men, all of them profi-

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cient and all enthusiasts in the business of life-saving, is, with two exceptions, only $1,000 per annum. These exceptions are the compensation of the superintendents of the Third and Fourth Districts, which is in each instance $1,500 per annum, a sum fixed before the inauguration of the present system, and which is very little, considering that one district embraces thirty-eight stations, and the other forty, and that the officers are under bonds of $25,000 and $30,000, respectively. No allowance is made to any of the district superintendents for clerk-hire, and they are all heavily bonded and charged with the keeping of their own accounts and all their correspondence. They are responsible for the efficiency of their districts, and their task necessarily occupies their whole time. During the active season they have frequently to personally visit and inspect every station on their respective coasts, and see that all the implements and apparatus are in order, making requisition for whatever is lacking, and being charged with a considerable part of the purchases of needed supplies and outfits. They are intrusted with the selection of the keepers of the several stations, a duty requiring much knowledge, judgment, and probity, and with the payment of them and their crews, upon their quarterly visits to the stations. They have, in a word, the direct and immediate government of these important districts.

"It is plain that for duties so arduous and responsible, and ever increasing in seriousness and magnitude, suitable compensation should be accorded, and that less than the pay of a clerk of the lowest grade, which is what eight out of ten of these officers receive, is far from being suitable, while the pay of the other two, burdened with heavier duties, equally merits increase; and the recommendation is earnestly made that the annual compensation of all the district superintendents be raised to an amount justified by their professional ability, their high character, and their laborious and responsible positions."

It may be forcibly added that another reason for suitably increasing the compensation of these officers can be found in the perilous nature of the service in which they are engaged, their duties in addition to those named oftentimes involving the serious risk of life. From district superintendents to station surfmen the business of saving human beings from the perils of the sea is no child's play. There are eleven districts presided over by superintendents, and two of these officers have already perished in the line of their duty by drowning, and a third has recently only escaped the same fate by the narrowest chance, and after hours of suffering in the water. Men like these, who upon occasion have to confront danger and destruction in the public interests, are no fit subjects for a paltry compensation. A man should be helped to meet life who in the service of his fellows knows how to face death; and the duty of providing for his proper maintenance becomes doubly imperative when, as in this case, the man who has assumed this noble hazard is also burdened with the gravest cares and responsibilities.

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The suitable recompense of these officers, the recommendation for which is again warmly renewed, formed the subject of a provision in "A bill to promote the efficiency of the Life-Saving Service and to encourage the saving of life from shipwreck," which was introduced in the House of Representatives by the Hon. S. S. Cox, at the last session of Congress, but failed of action before adjournment. It is hoped that this bill, which contains other measures of importance to the development and welfare of the service, may become a law at the approaching session. It includes provisions for the discontinuance of stations which coast changes or other circumstances have rendered unnecessary, and for the transfer of their equipments to stations in active operation; for the special reward of keepers and crews who render signally gallant service at scenes of shipwreck; for the reduction of the compensation of such keepers as local conditions make little more than custodians of stations; and for the award for successive acts of heroism in saving life, of bars to be attached to the medal given for the first of such deeds, together with such other tokens of honor as are customarily bestowed by the government upon foreigners rescuing our citizens from shipwreck. The propriety of these measures is regarded as self-evident. The bill also provides for the establishment of additional stations as follows: One at or near the entrance to Portland Harbor, Maine; one on Gerrish's Island, or near the entrance to Portsmouth Harbor, New Hampshire; one between Cohasset and Scituate Harbors, Massachusetts; one in the vicinity of Peaked Hill Bars, Cape Cod, Massachusetts; two in the neighborhood of Nantucket and adjacent islands, Massachusetts; one at or near Lewes, Delaware; five on the coast between Cape Henlopen and Cape Charles; two on the coast of North Carolina; one at or near Pentwater, Lake Michigan; one at the falls of the Ohio River, opposite Louisville, Kentucky; and six houses of refuge on the eastern coast of Florida. All these were recommended in the last annual report, and the reasons for their establishment fully stated. The bill adds provision for additional stations at Damariscove Island, Maine; Cape Ann, Massachusetts; and Grand Marais, Lake Superior, places in need of this protection.

It is deemed a duty to recommend, in addition to the foregoing, the establishment of stations at Hunniwell's Beach, Maine; Cape Poge, Massachusetts; Brigantine Beach, New Jersey; Seven Mile Beach, New Jersey; Quintana, Texas; Frankfort, the mouth of White River, Holland, South Haven, and Michigan City, all on the coast of Lake Michigan; also three houses of refuge on the coast of Florida, between Saint John's River and Cape Canaveral. The establishment of these stations would greatly conduce to the saving of life and property.

In one of its sections the bill provides for the extension of the benefits of the pension laws to the widows and orphans of members of life-saving crews who may perish in attempts at rescue. Such a provision has been repeatedly recommended in the reports of this service, and it is

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assumed that its equity is too obvious to require argument. No soldier or sailor ever laid down his life in the defense of his fellow-citizens more truly than did the brave young surfmen of the Point-aux-Barques crew last April. To hedge around with social protection the groups of weeping women and children whom the fate of these heroes bereaved is surely a sacred duty. The same duty is due to the wives and little ones of the ardent crew who died in 1876, in an effort to save the sailors of the Nuova Ottavia, and to every widow and orphan brought to this estate because there were husbands and fathers in this service who ranked the public good above their own safety.*

The last section of the bill embodies the important provision that the appointment and employment of all officers and crews of the Life-Saving Service shall be made solely with reference to their fitness and without reference to their political or party affiliations.

Much has been said in previous reports of the service, upon the necessity of selecting its agents strictly upon grounds of professional qualification, entirely ignoring, to insure an unbiased choice, all considerations of party or creed, and everything, in fact, but the plain business in hand. The sober sense of every thinking person, will, it is believed, approve this line of conduct. The purpose for which the establishment is organized is simply to save life from wrecks, and, secondarily, property; and to most effectively carry out this purpose the service must not be conducted in the interest of any platform or doctrine, but must aim solely to accomplish the design for which it was created. The Life-Saving Service is eminently one of experts, and its agents must be the ablest trained professionals that can be secured. General good character, of course, premised, no matter what else they are if they are this; and to obtain such it is indispensable that their qualification, and that only, should be brought into view and weighed with single-eyed sincerity. When the wrecked vessel is swept fore and aft by the winter seas, and haggard sailors and sobbing women and children are clinging to shroud and bulwark, the man who can best take out the life-boat through the breakers to their rescue is the man of all men for this service, though he be a pagan. The gunner that can cast at the first fire the shot-line over the breaking deck when the stormy night is blackest, and there is nothing to guide his aim but the spot of light made by the ship's lantern in the rigging amidst the rending surf and overleaping spray, will be proclaimed by the sufferers his

* Since the above was written, this record of noble death and suffering has received a lamentable addition. On November 30th last, in the darkness before dawn, the boom of the stranded sloop C. E. Trumbull struck and capsized the surf-boat of Station No. 7, Second District, Massachusetts, which had come up alongside to the rescue. Of the six men composing the surf-boat crew three perished—the keeper, Capt. D. H. Atkins, one of the bravest of the brave, and two of his men, Elisha M. Taylor and Stephen F. Mayo. Of the survivors, one, Isaiah Young, remains disabled for life, and the two others, Charles P. Kelley and Samuel O. Fisher, were badly injured.

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wreck-craft brings to shore the man this service demands, though every caucus on the coast denounce his politics. If a patient be in mortal danger, and to save his life a capital operation is to be performed, we send for the surgeon. We raise no question of creed or party—we want only the surgeon, and we want the best. When the wreck is beating into ruin on the lee-shore, the case is equally one of life and death, and equally, to the exclusion of every other consideration, is the highest professional ability required.

Limiting the consideration simply to politics, it may be said, and with some show of reason, that the required expert might be found in the ranks of the dominant party, and therefore chosen in the interests of that party. But the moment the principle of a political qualification is admitted, the selection, even from the party itself, is liable to be fatally influenced, because another object is introduced, namely, to reward some past political service or to secure such service in the future, and the choice, as in the case of most political appointments, would then be made upon the recommendation of men of political prominence and aspirations in the locality of the position to be filled, in whom personal interest, the desire for party triumph, or the heat of party contest might bias the judgment or create the temptation to ignore or lower the professional standard, to palter with the facts of character and conduct, or to blink defect and incapacity, thus leading to the imposition upon the establishment of officers and surfmen in respect to their ability to control votes and carry elections, rather than to save human lives at shipwrecks. Such a rule, once put in operation, however good in intention, would end by supplanting superior agents with agents less good or good for nothing. This conclusion is not a mere conjecture, nor reached by reasoning or speculation. The experience of the service proves it to be only too well founded. The annual report for 1877 showed how, for a short time in two of the districts, unknown for that brief period at headquarters, several of the stations fell into the most incompetent hands through the action of local politicians who had managed to cajole and intimidate the district superintendents. The injury, in this case speedily remedied, would be irremediable if such action became a fixed and general rule, proceeding from the principle of allowing political considerations to become a criterion.

The effort to conduct the service without reference to such considerations has not been accomplished, it is needless to say, without serious difficulty. The success is only due to constant firmness on the part of the officers in its immediate charge, invariably supported, it is gratefully acknowledged, by superior official authority. But other men must succeed them, who, perhaps, unwarned by an official experience, may have less resolution, or entertain different convictions, or who may simply serve the policy of future administrations possessed with views of the entire compatibility of such a service with party politics. The time for such a change in the fortunes of the Life-Saving Service may come,

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and in the stations trained surfmen may one by one give way to mere party hacks, perhaps even to the point of entire substitution. But if it does come—and this conviction it is desired to put on record—from that time the usefulness of the service will be on the wane. Its efficiency is co-existent with its continuance in the hands of the best surfmen, chosen only for their professional mastery of the methods it employs.

The section of the bill referred to would erect the only solid barrier which can protect the service from the dreaded encroachment, and at the same time rid all its officers and men of the importunities and embarrassments which constantly beset them, and which, in the case of the chief officers, take away their time and thought from the current business of the institution and the development of necessary measures for the enhancement of its efficacy. When by statute there can be no question of the singleness of purpose of the service, the answer to those who would use it for other ends is made before they arrive. This provision of the bill is therefore earnestly recommended.

CONCLUSION.

The successes of the past year cannot but be regarded with satisfaction and pride. They show that ends which once were thought unattainable are within human compass, and that still greater triumphs over the perils which perpetually menace seafarers from the ambush of the surf are within the range of man's craft and courage, when directed by organization and aided by sufficient means.

Although, in respect to both means and organization, a considerable advance has of late years been made, the life-saving crews still labor under serious disadvantages. Yet their achievements are incontestably great, a fact never better shown than by their past year's record. There are few feats at scenes of coast disaster that can outdo those of the crews at the wrecks of the Bertschey, the Amazon, the Mercury, and others upon the Lakes during the year, or such as many upon the Atlantic beaches in the same record, of which the deeds of rescue in the storm of February on the shores of New Jersey are examples. At the time of each rescue, what the station men did, although perhaps, no longer remembered, threw around their rough figures the blaze of heroism. The Lake towns and cities and those of the Atlantic seaboard rang with their praise, and the public journals of every complexion and degree vied with each other in their honor. The rescues on the New Jersey coast had the special distinction—not less deserved by those wrought on other beaches—of receiving the official tribute of the State in the form of the subjoined concurrent resolutions of thanks and praise from the legislature:

Whereas, during the late terrible gale and storm on the New Jersey coast, on the night of the second and morning of the third of February, one thousand eight hundred and eighty, several vessels were driven on shore with their passengers and crews, between Sandy Hook and Cape

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May, on said coast, and were wrecked; *and whereas*, during the said gale and storm the captains and crews of the Life-Saving Stations in District Number Four, State of New Jersey, by their courage and discretion, at the great peril of their own lives, rescued and delivered from imminent death almost the entire number of persons so imperiled; therefore,

1. *Be it resolved by the Senate (House of Assembly concurring) of the State of New Jersey*, That the Legislature of this State hereby expresses its sincere gratitude for, and earnest admiration of, the heroic conduct evinced during the said gale and storm by the captains and crews of the said Life-Saving Stations in the said District Number Four.

2. *And be it resolved*, That the Life-Saving Service, under its present efficient management, has been so successful in its humane endeavors to rescue shipwrecked passengers and sailors, that we would respectfully recommend the Congress of the United States to not only increase the facilities of the service, but to also provide an adequate compensation, if the same is not now sufficient, for the services of the men whose heroism in this humane work excites and commands the admiration of the world.

3. *And be it resolved*, That his Excellency, the Governor of the State of New Jersey, be requested to transmit a copy of these resolutions to the Senators and Representatives of this State in Congress, now in session.

These crews received the further honor of having these resolutions introduced and read in the national Senate and House of Representatives.

For several years past the merits of the American life-saving system have been steadily growing into bold relief, and the concession of its superiority has now become general not only at home but abroad. Each year brings to the official files of the institution feeling tributes from shipmasters who with their sailors, and often their vessels also, have been rescued in desperate straits by its bold crews. Among these are letters from the captains of foreign vessels, which give to the establishment no stinted measure of praise. It has been asserted by eminent official authority abroad that it performs, and in the most efficient manner, the important tasks confided in Great Britain to the three large and liberally supported branches of British life-saving effort, and the statement has been virtually made by the same authority that the institution in this country excels all others of the kind. The assertion of its superior utility has also come from other foreign quarters, coupled with applications for the assistance of its officers in extending the American system to the coasts of Europe and European possessions. Such testimonies are cheering and sustaining in a measure only below the solid results which, more than any tribute, attest the pre-eminence of the service. There are none who will not hope that this pre-eminence may long continue. But it cannot be maintained unless a greater liberality than heretofore is shown in making appropriations for the support of the establishment, and for the development of measures in its interest—measures which its growth and attendant circumstances make necessary, and which for the present are contained in the foregoing recommendations, or embodied in the provisions of the bill already referred to, and recommended to be enacted into law.

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SERVICES OF LIFE-SAVING CREWS

DURING

FISCAL YEAR ENDING JUNE 30, 1880.

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SERVICES OF LIFE-SAVING CREWS DURING FISCAL YEAR ENDING JUNE 30, 1880.

July 4, 1879.—At about three o'clock, while a number of persons were bathing in the surf near Station No. 4 (Charlotte, New York), Ninth District, Lake Ontario, one man, in diving, struck his head on a ridge of sand and became insensible in the water. He was rescued by one of the station crew, who plunged in after him, brought him to the beach, and subjected him to the method of resuscitation practised by the service. After respiration was induced, the man still remained unconscious, and, a physician being summoned, his spine was found to be injured, producing paralysis of his lower extremities, and rendering recovery doubtful.

July 6.—Mr. George Platt, with two ladies, was out in a boat on Lake Michigan, when the wind shifted to the northwest, and blew so hard that the boat became unmanageable, and was fast filling with water, to the great peril of those on board, when two of the crew of Station No. 10 (Saint Joseph), Eleventh District, went out to their relief in a skiff and brought them safely to shore without further damage than a thorough drenching, there being at the time a pouring rain. The same day a member of this crew saved from drowning a boy, twelve years old, who had fallen into the river.

July 6.—At 4.30 p. m., the yacht *Mischief*, of Chicago, while upon an excursion on Lake Michigan, with six men on board, was struck by a heavy squall from the northwest, accompanied by torrents of rain and a rough sea. All canvas was taken in, and the yacht drifted under bare poles, water-logged and unmanageable, with her flag at half-mast. This signal of distress was seen at Station No. 11 (Chicago), Eleventh District, three miles away, and the life-saving crew at once launched the surf-boat and pulled for the yacht in the very height of the storm. Upon reaching her, they found the occupants thoroughly drenched, and so terrified that they could not be induced to stay on board their vessel and be towed in. They were taken into the surf-boat, three men from which took charge of the yacht and sailed her ashore.

July 7.—The crew of Station No. 7 (Fairport, Lake Erie), Ninth District, went out to the assistance of the schooner *Groton*, of Chicago, Illinois, which had grounded on a bar at six o'clock in the morning, and succeeded in getting her off, helped to put up her sails when she floated, and brought her into harbor. The next day the life-saving crew helped to recover the schooner's anchor and chain, which she had slipped.

July 8.—The schooner *Lydia B*, of Cape May, New Jersey, bound from Allowaystown to Atlantic City, New Jersey, with two men on board, owing to a dense fog missed the channel and stranded on the north bar a mile and a half northeast of Station No. 27, Fourth District, New Jersey. The keeper of the station discovered her situation at about seven o'clock in the morning and immediately went out to her assistance with the life-saving crew, and before noon succeeded in floating her off the bar and taking her safely into harbor.

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July 9.—The yacht *Dana*, of Charlotte, New York, having on board a party of six persons, five of them ladies, sailing about the lake for pleasure, broke her peak halyards, and becoming unmanageable was partly swamped two miles from the shore and about the same distance from Station No. 4, Ninth District, just at dusk. The keeper, who was on the beach at the time, saw her peril as she was drifting down the lake, and hastened to the station for his men and boat. As he was leaving, a young man rowed out in a skiff to the yacht, and his help in managing her, kept her afloat until the arrival of the life-boat and a tug, when she and her passengers were safely brought to harbor. The keeper states that there is little doubt that all on board would have perished but for the timely assistance of the young man with the skiff, pending the arrival of the life-saving crew.

July 11.—At about eight o'clock in the evening two men attempted to cross the river at Charlotte, New York, in a skiff during a strong gale. A heavy sea was rolling in from the lake, which swamped the boat and left the men struggling in the water. Their cries were heard at the life-boat station on shore (No. 4, Ninth District, Lake Ontario), and the keeper and a surfman went to their assistance and rescued them, saving also the boat.

July 11.—The crew of Station No. 6 (Presque Isle, Erie, Pennsylvania), Ninth District, Lake Erie, saw at about 2 o'clock p. m. a fish-boat belonging to Richard Slocum, which had been moored to the public wharf, driving down the bay on to the breakwater. A strong gale was prevailing, with a heavy current. The life-saving crew at once went out, and with difficulty saved the boat.

July 11.—On the same day a fish-boat, owned by Charles Nelson, coming into Erie from the fishing-grounds, was swept by the current out of the channel against the breakwater, had her port bow stove in, and sunk with the two men on board about a quarter of a mile southwest of Station No. 6, Ninth District. The crew at once went to the rescue, which they accomplished, with great exertion, saving also the boat. In these operations the life-saving men were compelled a portion of the time to swim.

July 13.—The crew of Station No. 15 (Milwaukee), Eleventh District, Lake Michigan, discovered in the afternoon, during a squall from the northeast, with rain, a sail-boat capsized about a mile south of the station, and at once put out in the surf-boat to the rescue. Upon arriving alongside the capsized boat, they took off two men, apparently intoxicated, who were clinging to the boat's bottom, and two boys who had been in the boat and had managed to crawl into a skiff towing astern. After landing these four persons the life-saving crew returned, succeeded in righting and bailing out the capsized boat, and towed it ashore. Immediately after their return to the station they saw a yawl swamped in the channel between the outer ends of the piers, upon arriving alongside of which, in the surf-boat, they found that the accident had been caused by four boys attempting for sport to tow in the yawl alongside of a steam barge. The boys had contrived to clamber up on the pier and had made off. The surf-boat crew towed the yawl to the schooner *Mapleside*, to which it belonged.

July 16.—The schooner *John Rose*, of New York, was wrecked a little more than two miles north of Station No. 5, Fifth District, Maryland. The life-saving crew not being on duty at this season of the year, she was not discovered until daylight of the following morning, when one of the life-saving surfmen saw her and immediately went out to her, but found that the crew of six men had gone ashore in their own boat.

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He assisted in securing her sails and ran a line to shore. The vessel was given into the hands of the Coast Wrecking Company, but she could not be got off, and was a total loss.

July 19.—The barge *Northern Light*, of Bay City, Michigan, in entering Niagara River, in tow of a steam-tug, got out of the channel and brought up on the rocks at the head of the rapids, when the barge *St. Clair*, in the same tow astern, ran afoul of her and stove in her stern and quarter. The life-saving crew of Station No. 5 (Buffalo, New York), Ninth District, Lake Erie, launched the surf-boat and rowed out to her, but found that no assistance was needed.

July 26.—The yacht *Magic* was capsized about 7 o'clock a. m. four miles from shore, on Lake Ontario, while altering her course to stand out in the lake in a fresh south wind and heavy sea. The four men on board clung to her bottom. In a few minutes the crew of Station No. 1 (Big Sandy Creek, New York), Ninth District, Lake Ontario, launched the surf-boat and pulled out to the rescue. The men were taken off and brought to the station, where two of them were succored from Saturday (the day of the rescue) until the following Monday. The yacht was also towed ashore by the life-saving crew, righted and bailed out, and moored near the station.

July 27.—The schooner *Congress*, of Bridgeton, New Jersey, bound from Cape May to Philadelphia with a cargo of pine wood, and four persons on board, grounded on the bar of Townsend's Inlet, New Jersey, and filled. The keeper and crew of Station No. 34, Fourth District, boarded the vessel with the surf-boat and by the use of a hawser which they took with them, succeeded in getting her off.

July 27.—The lookout of Station No. 5, Ninth District, at Buffalo, New York, hearing a splash in the river late at night, at once launched a dingey, rowed out and found a woman, cook of the barge *Coan*, who had fallen into the river while attempting to board the barge from the pier, and whose life was saved by the timely action of the patrol.

July 27.—The crew of Station No. 11, Eleventh District, were the means of saving a scow loaded with stone for the government breakwater at Chicago. The lines which held the scow parted, and a strong wind blowing off shore, she was fast drifting out on the lake, when the station crew went out with lines, pulled the scow back as far as the station, and secured her.

July 27.—The sloop *Falcon*, of Bay View, Wisconsin, having on board four persons, two men and two lads, the men intoxicated, was struck by a squall and capsized at half past three in the afternoon, about two and a half miles south of Station No. 15, Eleventh District, Lake Michigan. The accident was seen by the surfman on the lookout, and the surf-boat launched at once. The wind was blowing heavily off shore, and the crew, using oars and sails, reached, in half an hour, the capsized vessel, to which the men and boys were clinging. After taking them into the surf-boat the crew righted the *Falcon*, bailed her out, and towed her to her moorings at Bay View, where they delivered her to her owner, from whom the men had stolen her.

July 29.—A gentleman while bathing at Grosse Point in the vicinity of Station No. 12 (Evanston, Illinois), Eleventh District, Lake Michigan, became exhausted in the breakers and could not resist the undertow. A surfman of Station No. 12, seeing his critical condition, swam out to him and with great difficulty and risk succeeded in getting hold of him and taking him to land.

August 1.—The British steamer *Lizzie*, of Whitby, England, bound from New York to London, with a cargo of cattle, wheat, and general

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merchandise, and a crew of twenty-three men, all told, stranded at 4.40 a. m., in a dense fog, on the coast of Long Island, a half mile west of Station No. 12, Third District. The station not being manned at this season of the year, and there being consequently no patrol of the beach, the keeper did not learn of the disaster until 6 a. m., when he immediately summoned such of his crew as lived in the vicinity of the station, and two volunteers, procured a team of horses, and conveyed the surf-boat to the beach, where it was launched and the steamer was boarded. The keeper learned upon his arrival on board that the steamer was hard and fast, and advised the captain to telegraph to New York for the assistance of a wrecking steamer, offering at the same time such aid as he could render. After taking a telegram ashore and sending it to the office, the life-saving crew returned to the steamer and assisted in running two anchors to keep the ship from working inshore. Toward evening the breeches-buoy and apparatus were rigged to the ship, as a precautionary measure. The weather being mild and surf smooth, with every indication of continuing so, the keeper left, with his crew, to return on the following morning. The next day (August 2) the Coast Wrecking Company having arrived, took charge of the steamer. The cattle, one hundred in number, were landed, and a part of the cargo loaded into lighters, the life-saving crew assisting all day, and at high water on the following day (August 3) the steamer was towed off and taken to New York.

August 2.—The yacht *Crusoe*, of Evanston, Illinois, was capsized on Lake Michigan, with two men on board, at 2.30 p. m., about three-quarters of a mile from Station No. 12, Eleventh District. The keeper and two of his men instantly launched the surf-boat and put out for the yacht, which was reached first by a yawl sent from a vessel nearer than the station to the scene of disaster. A line made fast to the top of the mast and hauled upon, righted the vessel, which, however, being full of water, immediately began to sink, but was kept up by the life-saving men boarding her, bailing her out, and throwing her ballast overboard. The yacht was then taken in tow, and, with her crew, was brought safely to land.

August 4.—A lad of twelve years, whose parents were summering at Charlotte, New York, Lake Ontario, went in bathing near the wreck of the *Star*, lying near the shore. The sand had drifted around the stranded hull, forming a sort of socket or cradle in which the vessel lay. In attempting to walk down the seaward side of this bank from the hull, the boy suddenly found himself beyond his depth, became frightened, and, after a struggle, went down. Although the accident happened not far from his home, there was no one at hand who could venture to his rescue, and word was sent to Station No. 4, Ninth District, half a mile away, for the keeper, who, with one of his surfmen, hurried to the rescue. The boy was apparently dead when taken out, but, by the prompt employment of means of resuscitation, he was at length returned alive to his parents.

August 6.—News was received at Station No. 5, Ninth District, that a boy was drowned some distance out in the lake. A part of the life-saving crew hastened immediately to the place indicated, but after repeated diving and careful searching failed to find him. They then took out two boats and grapnels and made further search until night without avail. The next morning they returned to the work, and finally found the body and returned it to the parents.

August 8.—The yacht *Favorite*, of Put-in-Bay, Ohio, while sailing on Lake Erie, with one man on board, had her throat halyards carried away

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about 7 a. m., and the man, not knowing how to hoist sail with the peak halyards, made a signal of distress, which was seen by the keeper of Station No. 9 (Marblehead Point, Ohio), Ninth District, two miles distant. The keeper and crew at once launched the surf-boat, and in about an hour reached the yacht, which was drifting helplessly about the lake. The keeper took charge of the vessel and sailed her, with the man on board, safely into harbor.

August 12.—At 5 p. m., the keeper of Station No. 2 (Point aux Barques, Michigan), Tenth District, Lake Huron, saw the tug *J. N. Sprague*, with a raft in tow, heading right toward the inside reef in that locality, and at once rowed out in the surf-boat and warned the captain of the tug of his danger, causing the vessel to steer clear of the reef.

August 13.—At 2 o'clock in the morning, the keeper of Station No. 1, Ninth District, Lake Ontario, saw the propeller *City of St. Catherine*, of St. Catherine, Canada, bound to Kingston, Ontario, come steaming along the shore in the darkness, with the appearance of looking for some place. The keeper built a fire at the mouth of the river, abreast of which the steamer then ran, and stopped. The life-saving crew launched the surf-boat, and pulled out to the propeller, which they found had lost her way, the captain having been misled by his compass. The keeper gave him the course to Kingston and all necessary directions.

August 15.—The schooner *Volunteer*, of Oswego, New York, stranded on a bar in mid-channel. The keeper and crew of Station No. 1, Ninth District, Lake Ontario, went at once in the surf-boat to her assistance, ran out her anchor, and made three attempts to heave her off, but without success. The following morning, the wind having changed and the water risen on the bar, the life-saving crew went out again and succeeded in getting her off the bar and inside the harbor of Big Sandy without damage.

August 16.—The patrol of Station No. 14 (Racine, Wisconsin), Eleventh District, Lake Michigan, reported a vessel ashore near Racine. The keeper and crew at once proceeded to the scene of disaster, and finding no assistance there required, set a watch over the stranded vessel, which proved to be the schooner *Alleghany*, of Erie, Pennsylvania, in case their services should at any time be required, and returned to the station. The watch was continued until the 20th of September, when the life-boat crew assisted in endeavoring to work the vessel off, and continued the labor each day until the 1st of October, when she was got afloat, and taken in tow and to harbor by a wrecking tug.

August 18.—The schooner *Emma D. Blew*, of Bridgeton, New Jersey, bound to New York, with a load of watermelons, and a crew of four men, was disabled in consequence of her rudder giving out, and wrecked one mile north of Station No. 21, Fourth District, New Jersey. She ran well up on the beach, and in a short time both her masts fell. A surfman belonging to Station No. 20 was on the shore at the time and threw a line aboard which was fastened around the body of the captain, he being lame, and he was safely landed. The remaining three men waded ashore. The captain was assisted to his home, which was about half a mile away. The vessel and cargo were a total loss.

August 18.—At about three o'clock in the afternoon the schooner *Flora Curtis*, of Perth Amboy, New Jersey, bound from Old Point Comfort, Virginia, to New York, laden with wood, went ashore at Atlantic City, New Jersey, about half a mile from land and three-quarters of a mile southeast of Station No. 27, Fourth District, New Jersey. At the time, the wind was blowing a living gale from the northeast,

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the record of the Signal Service at Atlantic City showing it to have been sixty miles an hour, and the weather was thick and rainy, while a very heavy surf was thundering upon the beach. Half an hour after the vessel struck, the sea boarded and swept her from end to end, and her crew of four persons were obliged to take to the rigging, where they remained. The wreck occurred at a season when the life-saving stations are not open for service, but at four o'clock the condition of the schooner was discovered by people on the shore, and Purnell Bowen, the keeper of Station No. 27, was notified, and at once made up a crew, two of whom were surfmen belonging to the station, and hastened with the surf-boat to a point abreast of the vessel. Here a launch was attempted, the keeper yielding his post of command to Edward Wilson, in deference, as he deposes in the testimony procured upon the investigation of the matter, to Mr. Wilson's wide reputation as a superior surfman. Although it was the keeper's duty to himself conduct the enterprise, the incident establishes that the boat was in the best hands, and that the effort to reach the wreck, which completely failed, did so only because the passage at that time was impossible.

The surf-boat crew, upon being driven back upon the shore, which was between five and six o'clock in the evening, found there Keeper W. W. Eldridge, of Station No. 28, who had assembled a crew, four of them station men, and brought the wreck-gun and apparatus to the beach. A vast concourse of people, composed of residents and summer visitors, men, women, and children, numbering from six to seven thousand, had also gathered, and were in a state of terrible excitement, clamoring for action on the part of the men who represented the Life-Saving Service. The effort already made, however, and the evidence of the best surfmen present, show decidedly that boat-service at that time was impossible, owing to the fury of the surf. It was plain also that it was equally impossible, the schooner being half a mile away, to reach her with the wreck-gun. There was, therefore, nothing for the life-saving crew to do but wait. Nevertheless, the keeper of Station No. 28 was induced to discharge the wreck-gun. He did this, he deposes, to satisfy the clamor of the crowd, who were accusing the crew of doing nothing. The shot, of course, fell half-way, as any line-carrying shot must have done at such a distance, even under more favorable circumstances. At length, amidst the greatest excitement and confusion, which must have made it difficult for any one to even think, a conference was held by the two keepers and the most experienced surfmen present, and it was decided that the passage of the surf would not be practicable until near the time of low water, at two o'clock, when the surf would be abated, and it was settled that the attempt should be made at about that hour. This conclusion appears perfectly valid. It rests on the common conviction of the ablest surfmen present, and it is supported by the fact that the prior effort to pass the surf had been baffled. To encourage the sailors in the interim, large fires were kindled on the beach. The vessel had all the while been steadily working toward the shore, and ultimately came within about 400 yards. An uproar of denunciation continued around the sullen crews, which increased as the vessel drew nearer to the land, and the clamorous demand for action at length became so imperative, that half an hour after midnight, as the tide was falling, a brave volunteer, Michael Bradford, aided by two men named Owens and Behm, undertook to carry out a half-inch line to the wreck. A small surf-boat was procured and the three men set out upon their perilous and gallant enterprise. The boat was skillfully managed and succeeded in getting through the breakers, but was swamped when within a few feet of the wreck.

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Bradford, however, fortunately got hold of the foot-ropes upon the schooner's main boom, which, quite as fortunately, happened to project over the side in the direction of the boat, and, with great presence of mind, keeping hold of the boat's painter, swung himself on board, hauled his boat up, and enabled his comrades to gain the deck. He then, according to preconcerted arrangement, jerked upon the half-inch line he had brought out, the other end of which was held on shore, and thus announced his safe arrival upon the vessel.

A short time previously, or about midnight, Keeper Eldridge had gone home to get something to eat. He avers in his evidence that he did this in order to prepare himself for the work of rescue, which had been set for two o'clock. The immediate consequence of his error in leaving the beach at all was that now when a line had been run from the shore to the vessel, and the hawser was needed to be bent on to it to be hauled on board, the men in charge of the latter, obeying orders, refused to allow it to be meddled with until the absent keeper returned. The matter ended in the excited crowd making a rush upon the cart and seizing the hawser, which, in a few minutes, they got so badly snarled that they could do nothing with it. In the mean time the main peak halyards were unrove and bent on aboard the schooner and were soon hauled by the crowd to the shore. They just scantly reached the beach. It is not known whether they were long enough to have been used, but half past one having arrived and the fast ebbing tide having reduced the surf considerably, Keeper Purnell Bowen and his men, Keeper Eldridge not having yet returned, agreed that the time had come for the predetermined launch of the surf-boat. On this occasion Keeper Bowen, again deferring to ability superior to his own, surrendered the steering oar to William Arthur. In a short time the wreck was reached by the life-saving crew and the four sailors, together with Bradford and his two comrades, were taken into the surf-boat and safely landed.

The life-saving men, after all, accomplished the rescue. It was followed, however, by the dismissal of Keeper Bowen, a step which his mediocrity as a surfman had previously caused the officers in charge of the service to resolve upon, and which had only been delayed by the difficulty of securing a suitable successor for the compensation allowed. Keeper Eldridge was also discharged, his temporary departure from the beach during a scene of shipwreck being considered unpardonable.

The station service at this rescue does not appear in other respects blamable. The storm was a very bad one, and it is probable that assistance was rendered to the unfortunate sailors on the wreck by the surf-boat about as soon as it could have been. The captain of the vessel, who testified that he had been a surfman all his life, stated that the vessel could not have been boarded before twelve.

August 18.—The schooner *Mary Ann*, of Philadelphia, bound from Philadelphia to Five Fathom Banks, fishing, with a crew of three men, while at anchor in a heavy gale, about one mile west of Station No. 40, Fourth District, New Jersey, was discovered at 5 p. m. to be in a precarious position, the sea breaking over her, and apparently endangering the lives of those on board. The keeper and crew of the station proceeded to the beach abreast of the schooner, with the mortar apparatus, the surf being too heavy to permit the use of a boat. A line was shot to the vessel, and the apparatus rigged with the purpose of landing her people, but the captain of the schooner finding it was moving his vessel inshore cast it off. Night had now set in, and as it was impossible to board the schooner, nothing further could be done. The life-saving crew, however, remained on the beach all night, and at four

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o'clock the next morning, the sea having moderated somewhat, launched the surf-boat and boarded the vessel. She was found to have safely weathered the storm, and required no assistance.

August 18.—The British bark *North Carolina*, of Liverpool, bound from Smithville, North Carolina, to Baltimore, in ballast, with a crew of seventeen men, stranded in a northeast gale and high sea at 9.45 a. m. about half a mile north of Station No. 4, Sixth District, Virginia. The vessel being light, and having grounded at high-water, went high up on the beach, which enabled her crew to land without difficulty. The station was not manned at this season, and no assistance was rendered by the life-saving service, except to give shelter to the crew. The bark was saved by the Coast Wrecking Company.

August 18.—The schooner *Ida B. Silsbee*, of Patchogue, New York, bound from Pall's Point, North Carolina, to Portland, Maine, with a cargo of watermelons and a crew of three men, foundered at her anchors during a southeast gale, in Pamlico Sound, about one mile northwest of Hatteras Bar, her crew taking to the rigging. The stations not being manned at this season of the year, the keeper of the nearest station, No. 23, Sixth District, North Carolina, did not learn of the disaster until some hours after it occurred, but as soon as he heard of it he mustered three of his crew, procured a boat at the village of Hatteras, on the sound, a mile distant from his station, and with the aid of volunteers from the town, boarded the wreck, took off her crew, and gave them shelter at the station for several days. The vessel was lost.

August 18.—After their return from the wreck of the *Ida B. Silsbee*, the same crew boarded the schooner *Water Lily*, of New Berne, North Carolina, bound from Norfolk, Virginia, to Hatteras, North Carolina, with a cargo of flour and watermelons and a crew of two men, and brought ashore the men. The vessel while at anchor during the gale had parted her chains, and to prevent capsizing her masts had been cut away, but she drove ashore on the inner point of Hatteras Inlet, and about two miles north of the bar, where she was when found by the life-saving crew. The vessel was saved.

August 22.—The keeper of Station No. 2, Tenth District, Lake Huron, saw a steamer with five barges in tow heading for a dangerous ledge in that locality, and, by displaying the proper flag from the signal code, succeeded in making her captain alter his course and avoid the danger.

August 22.—The crew of Station No. 17 (Two Rivers, Wisconsin), Eleventh District, Lake Michigan, turned out to assist in saving a raft of timber which had been brought by the government to Two Rivers, Wisconsin, for harbor improvements, and had broken adrift.

August 23.—A yacht from Grand Haven, Michigan, with a party of ladies and gentlemen sailing for pleasure, during a strong northwest wind and heavy sea, broke her rudder and was stranded about two miles from the harbor. The crew of Station No. 9 (Grand Haven, Michigan), Eleventh District, who were out drilling on the lake in the immediate vicinity, went at once to the rescue, but experienced great difficulty in the attempt to get alongside the yacht, the heavy sea rendering it almost impossible. After repeated efforts, they succeeded in reaching the yacht and taking her and the three women and two men on board safely into port.

August 24.—Two men and a woman in a sail-boat upon Lake Ontario, being in imminent danger by the boat becoming unmanageable, were rescued by two surfmen of Station No. 3 (Oswego, New York), Ninth District, who went out to their relief and towed them to a place of safety.

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August 24.—The screw steamer *Bret Harte*, of Chicago, Illinois, with a crew of three men and nine passengers, got on the bar near the pier at Lincoln Park, Illinois. The strong northeast wind and heavy sea prevailing had caused an unusual accumulation of sand on the bar, and the vessel was in danger of becoming a total wreck, her safety depending upon a line being run out to her from a tug, which the state of the wind and sea prevented the latter from getting near enough to do. In this exigency, the crew of Station No. 11, Eleventh District, went out to the steamer in the surf-boat, an ordinary boat not being fitted for the task, and succeeded with difficulty in getting to her the required line, thus enabling the tug to pull her off the bar, and preventing her from being destroyed.

August 25.—The schooner *Brilliant*, of Castine, Maine, bound from Bangor to Boston, with lumber, and having a crew of three men, stranded in consequence of thick weather, at 8 p. m., on Monroe Island, near Owl's Head, Maine. A messenger from the island informed the keeper of Station No. 5, First District, Maine, of the disaster at about 11 a. m. the following day, and as soon as the crew could be gathered the boat was launched and proceeded to the stranded vessel, arriving at 3 p. m. She was found with her bows on the rocks, and her stern under water. The revenue steamer McCulloch had already engaged to pull her off at flood-tide, which was accomplished, the life-saving crew assisting.

August 26.—During a northwest gale and heavy sea the brig *L. M. Merritt*, of New York, parted her chains, and drove ashore near the town of Lewes, Delaware. The keeper of Station No. 1, Fifth District, Cape Henlopen, Delaware, being present, mustered a volunteer crew and boarded the vessel in a private boat. The master of the brig, his crew and eight passengers, fifteen in all, were safely landed. The vessel was subsequently saved.

August 26.—The keeper of Station No. 1, Fifth District, having, with a volunteer crew, landed the people from the brig *L. M. Merritt* on this afternoon, got the station crew together, fearing that other vessels in the anchorage might drive ashore in the gale. When night set in he caused a fire to be lighted on the shore, and with his crew kept watch all night. At daylight a vessel was discovered on the bar with a signal set in her rigging. The private boat used on the day before was launched and the vessel boarded. She proved to be the schooner *Adaliza*, bound from Pensacola, Florida, to New York, lumber-laden, with six persons on board. She had parted her chains and driven ashore, but was otherwise in no danger. The keeper brought the captain ashore. The vessel was saved.

August 26.—At seven o'clock in the evening the lookout at Station No. 8 (Cleveland, Ohio), Ninth District, Lake Erie, saw that the water-works crib at Cleveland was on fire and gave the alarm at the station. The life-saving crew at once launched the surf-boat, reached the crib, and with buckets of water passed from hand to hand kept down the fire until the arrival of a tug, with the hose of which they extinguished the flames.

August 27.—The steam yacht *Belle*, of Ottawa, Ontario, having on board eight persons, was crossing from Stoney Island to Oswego, when her steering gear was carried away, and the keeper of Station No. 1, Ninth District, Lake Ontario, hearing her whistle blown for assistance five miles from the station, rowed out in a small boat with two men, brought in the yacht, and fixed her steering gear.

August 28.—The tug *N. P. Sprague*, of Tonawanda, New York, while abreast of Station No. 4 (Ottawa Point (Tawas), Michigan), Tenth Dis-

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trict, Lake Huron, and about a mile and a half from shore, blew a signal of distress. The surf-boat at once went out to her, found she was in need of assistance in getting a raft of lumber she had in tow into the bay, the wind and sea being too heavy to accomplish it without aid, and, at the request of her captain, procured from Tawas another tug for the purpose.

August 30.—The schooner *Volunteer*, of Big Sandy Creek, New York, laden with lumber, and having three men on board, stranded on the bar at the mouth of Big Sandy Creek, Lake Ontario, and the crew of Station No. 1, Ninth District, went out to her, caused her to be lightened by throwing off a quantity of her load of lumber, ran out a line, and hove her inside.

August 30.—The schooner *Kate Richmond*, of Port Huron, Michigan, laden with lumber, and having a crew of six men and two passengers, missed the channel and stranded on a reef off Alcona, Michigan, about four miles north of Station No. 5 (Sturgeon Point, Michigan), Tenth District, Lake Huron. The accident was reported at the station by the patrol north at 2 a. m., and shortly after the station crew reached her in the surf-boat. The vessel was found lying head on upon the reef, and the life-saving crew at once set to work shifting her deck-load of lumber from forward to aft, which so lightened her that they were enabled, by means of the windlass, to heave her off into deep water. They then helped to rearrange the deck-load and make sail, remaining on board and piloting the schooner until she was beyond danger. The vessel sustained no damage.

September 2.—In the evening the keeper of Station No. 4, Ninth District, Lake Ontario, learned that a vessel was out on the lake, waterlogged, about eight miles distant. He and his crew started at once with the surf-boat in tow of a tug, in search of her, but the night being very dark their search was in vain, and they returned to the station at midnight. At daybreak the following morning they went out again and found the vessel, which proved to be the sloop *Cora*, of Oswego, New York, stranded, with two men on board, three and a half miles west of the station. After throwing off part of her deck-load of lumber, they succeeded in relieving her, and took her safely to Charlotte.

September 3.—At 11.30 p. m. the *Halcyon*, an American bark, of 620 tons burden, hailing from Bath, Maine, bound from Boston, Massachusetts, to Perth Amboy, New Jersey, went aground in a southeast gale about half way between Stations Nos. 32 and 33, Third District, Long Island. As soon as the breakers were discovered both anchors were let go, and at the same moment danger-signals were seen made from shore. The east and west patrol of the two stations were just separating, when they observed a vessel's starboard side-light, and an instant later discerned the vessel herself through the fog. They immediately burned their Coston lights and started for their respective stations. The wreck was reported to the keeper of No. 32 at 11.55 p. m, and to the keeper of No. 33 at 11.45 p. m. The crew of No. 33 arrived first at the scene of the wreck and boarded her at once. The vessel was difficult to approach, as she was held by her anchors head off shore. They were about to cast a line from the ship to the surf-boat when a heavy sea filled the boat, and the crew were obliged to land and free their boat of water. At this time the keeper of No. 32 arrived with his crew, and launched their surf-boat. Meanwhile the ship had parted both chains and had swung around broadside to the beach, so there was less difficulty in reaching her, and afterwards safely landing the captain, his wife and child, and the first officer. The lady and child were taken to Station

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No. 32 and comfortably accommodated for two days. The keeper of No. 33 relaunched his boat, and in two trips took ashore the remainder of the crew, eight in number, and succored them at his station. The stations not being provided with horses, and none being in the vicinity, the boats had to be hauled on their wagons to the scene of disaster by hand, a most difficult task, through the yielding sand. The keeper states that the men were much overcome by weariness and heat, and that as they proceeded on their way they had nearly stripped themselves of their clothing. Captain Dickinson, of the *Halcyon*, was profuse in his praise of the promptness and ability exhibited by the life-saving crews in rescuing the imperiled lives, and of the kind treatment received at the stations.

September 3.—The screw steamer *J. Bertschey*, of Detroit, Michigan, commanded by Capt. G. W. McGregor, bound from Saginaw, Michigan, to Cleveland, Ohio, heavily laden, with 1,400,000 shingles and having on board nineteen passengers and a crew of thirty-two persons, was lying on the 3d of September at Port Austin, Michigan, weather-bound by an easterly gale. The wind suddenly changed to the north and blew violently, and the steamer began to pound on the bottom, so that the captain was obliged to weigh anchor and take to the open water. The vessel had got clear of the dangerous reef in that locality, and was steaming down the lake apparently all right, when she sprung a leak which increased rapidly, and her steam siphon pump became choked and useless, when, to prevent her foundering, she was headed for the land, the captain hoping to beach her between the docks at Grindstone City, where the passengers could be easily landed, but the vessel got close to the shore before exact bearings could be got in the darkness, by which time the fires were extinguished by the water, and she struck about ten o'clock at night, a quarter of a mile from shore, and 300 yards southeast from Grindstone City dock. The nearest life-saving station was that at Point aux Barques (Station No. 2, Tenth District, Lake Huron), seven miles distant, and with the view of getting the assistance of the life-saving crew, a boat containing both mates and four men, was lowered from the steamer soon after she struck, and attempted to gain the land, but capsized almost immediately. The men clung to her, and fortunately were washed ashore, though only upon some shelving rocks at the foot of a perpendicular bluff, forty feet high, which they were unable to scale, and where they remained clinging to the rocks in the rain and darkness, drenched and hungry, some of them having sustained bruises in landing, until seven o'clock the next morning when they were discovered by some citizens of Grindstone City, who hauled them up the bluff with ropes. Another attempt was made by the steamer's company about midnight to gain the shore by means of a boat, which, however, broke adrift when but one man was in it, who was washed ashore, and joined his companions at the foot of the bluff, remaining with them until morning.

The thick weather and the darkness of the night, as well as the distance of the wreck from the station, it being four and a half miles beyond the limit of the patrol, prevented any knowledge of the disaster from reaching the life-saving crew at Point aux Barques until after seven o'clock in the morning of September 4, when information was brought them by a mounted courier from Grindstone City, where the wreck had been discovered at daybreak. The keeper at once sent or a team, and in a few minutes had it hitched to the boat-wagon, upon which were the surf-boat and oars, the cork-jackets of the crew, the grapnel and heaving line, and the men themselves. The horses were young and spirited, and it was an incident of the start, that they ap-

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peared to be scared at their novel load, and came very near running away. The burden, however, and the difficulty of the road, soon told upon them. Two miles on the way another team was met racing toward the station, having been sent for the assistance of the crew, and the keeper immediately dispatched it under charge of one of the surfmen, with instructions to follow after as fast as possible, with the Lyle gun and its appurtenances.

The team with the boat-wagon, although urged to its utmost over the rough and sandy road, could not arrive abreast of the wreck until half past nine o'clock, the journey of seven miles consuming two hours. Without a moment's delay the launch was ordered. The pier at Grindstone City, upon which five hundred people had now gathered, projects into the lake in a northeasterly direction. About southeast from the outer end of the pier, at the distance of a quarter of a mile, seen through the driving rain, lay the wrecked steamer, heeled over to starboard, with the water at intervals flying in great sheets over her. She was already breaking up, and her miserable passengers and crew, almost hopeless of relief, were grouped upon her upper deck, lashed to the bulwarks, where they had been for hours, drenched by the flooding breakers. The gale was from the north, and between the vessel and the pier was the breadth of a terrible sea, running from the north-northeast in heavy furrows. This threatening expanse the surf-boat had to traverse in the desperate endeavor for the rescue, without, as the relative positions of the steamer and the pier make evident, the least shelter to her crew from the gale and sea beyond what the immediate lee of the dock afforded.

At the moment of launching, a crew of volunteers attempted to go out to the wreck in a fish-boat, but as soon as they got beyond the lee of the pier and felt the sea they put back. The life-saving crew were meanwhile on their perilous way. Many times, to the spectators on the shore and the wretched group on the wreck, they seemed to have gone down, as their boat sank from sight into the troughs of the sea; but on each occasion the boat rose on the summit of the waves, with her bows steadily headed to the stranded steamer, and her crew working together with all their might at the oars. The energy of the men is told by the fact that against all obstacles they came up alongside and flung their line by its heaving-stick aboard the wreck within ten minutes from the time they left the shore. The line was caught by willing hands upon the vessel and made fast. In operations for rescue of this nature, the surf-boat is loosely held to the wreck by the connecting line, advancing and receding by her oars as the action of the sea allows, and, at the proper moment, sheering up and snatching away, as it were, the people to be rescued. Upon this occasion no sooner was the boat secured to the vessel than two of her men flung themselves into the water, and, by the aid of ropes, worked themselves, with great exertion, up and on to the steamer's deck, where they could aid and direct the labor of transferring those on board to the surf-boat. This transfer was difficult and dangerous. The position of the steamer afforded no sheltering lee to the surf-boat; and the seas washed through between decks and came curling around her bows, constantly threatening to dash the boat to pieces against the hull of the wreck. By good fortune, as well as by the skill of the life-saving crew, this work was throughout conducted successfully, none of the people on the vessel being hurt in any way, and the boat escaping the occasional concussions with but slight damage. The first people lowered over the bulwarks were the eleven ladies on board and a little boy, and with this load the surf-boat shoved

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off and in a few minutes safely gained the pier. Without a moment's delay, the life-saving crew rowed back again to the wreck. They were now put to their mettle by the conviction that the steamer was fast breaking up, and within an hour they accomplished four trips and saved forty-four persons, being every soul on board. "I cannot," says the keeper in his official report, "speak in too high praise of my crew. On leaving the wreck with my first load I told them that it would not be long before she went to pieces by the way her stanchions were cracking and her cabins settling. They responded by bending to their oars with a will and in making the four trips inside of an hour."

The team with the Lyle gun and apparatus arrived upon the dock just as the last boat-load of people from the wreck was landed. The gun and other appliances, together with the surf-boat, were sent back to the station, but the crew remained, and, at six o'clock in the evening, the wind and sea having abated, they went out to the wreck in a fish-boat and brought back the luggage of the passengers and crew, and a part of the cabin and stateroom furniture, which they stored in a shanty on the dock. The night was spent by the men in two-hour watches on the dock, organized to watch the property brought ashore and that still remaining on the steamer. Early the next morning (September 5) they again visited the wreck in a fish-boat and helped to bring away another load of the vessel's furniture. At half past eleven o'clock of that day, their duty being fully accomplished, they returned to the station.

September 3.—At six o'clock in the morning the patrol of Station No. 5, Tenth District, Lake Huron, reported a vessel aground on a reef off Black River Island, nine miles north of the station, which proved to be the schooner *W. H. Rounds*, of Buffalo, laden with coal and having a crew of eight men. The surf-boat was at once launched and rowed against a heavy head gale and sea to the stranded vessel, which was reached after a hard pull by eleven o'clock in the forenoon, but was found in need of no assistance from the life-saving crew, her mate having gone ashore to procure a tug to pull her off.

September 3.—The schooner *Clara*, of Chicago, Illinois, laden with lumber, lost part of her deck-load in coming through the breakers at Saint Joseph, Michigan. The crew of Station No. 10, Eleventh District, picked up the lumber and saved it.

September 3.—The bark *Lewis Day*, of Waukegan, Illinois, with a cargo of cedar posts and telegraph poles, a crew of nine men being on board, having labored heavily in a high sea, sprung a leak, and was in a sinking condition about three miles east of Chicago Harbor. She was seen from Station No. 11, Eleventh District, early in the morning signaling for a tug. Receiving no response, she hauled down her flag and hoisted a signal of distress. The keeper of the station went immediately with the sail-boat and five men to the rescue. It was blowing a living gale, and the boat was with much difficulty kept from swamping. Arriving at the distressed vessel the life-saving crew found her sinking, her steering-gear carried away, and her nine men exhausted with pumping, having been at it all night. With considerable difficulty a line from the boat was made fast to the stern of the vessel, but the heavy sea made it impossible for the boat to get alongside. Finally, a line was hove from the vessel, which one of the life-saving crew tied around his body; then jumping into the sea, he was hauled upon deck. Another of the crew was hauled on board in the same way, and the two men at once fell to work heaving the anchor, which had been dragging, letting the vessel swing broadside to, in imminent danger of foundering. Meanwhile a tug came up and held the vessel while the anchor was being raised.

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The vessel was then towed into harbor, the two surfmen working steadily at the pumps all the way, to the great relief of the crew. She had four feet of water in her hold when she arrived in port. The service rendered her by the life-saving crew occupied two hours.

September 8.—The schooner *Three Brothers*, bound from Cleveland, Ohio, to Milwaukee, Wisconsin, laden with coal and having on board a crew of eight men, stranded at 2 a. m., during a gale in thick weather, outside of North Point Reef, Thunder Bay Island, Lake Huron, four miles from Station No. 6 (Thunder Bay Island, Michigan), Tenth District. She was seen by the lookout of Station No. 6 at 6 a. m., and the life-boat crew immediately went to her. They found her in great danger, and returned at once to shore at Alpena, taking her captain with them to obtain a tug. As soon as one was engaged they returned to the vessel and assisted in throwing overboard about 200 tons of coal, and so lightening her that on the morning of the 9th she was pulled off in safety.

September 10.—A small sloop, having on board two men, bound from Miller's Station to Chicago, capsized at the entrance of the harbor, at four o'clock in the afternoon. The accident was seen by the lookout of Station No. 11, Eleventh District, and the crew at once went in the surf-boat to their assistance. When they were about fifty yards from the sloop, a tug came up, took the two men from the water and returned with them to the shore, landing them at the station. In the mean time the life-saving men righted the sloop and saved a part of her cargo of rags, which was afloat. Reaching the station, the keeper finding there the rescued men cold, wet, and exhausted, gave them some hot brandy from the medicine chest and provided them with dry clothes. The men were succored at the station for a day and a half, when they were well enough to leave for home.

September 11.—The schooner *Cybele*, of Perth Amboy, New Jersey, bound from Prince's Bay, New York, to Tom's River, New Jersey, with a crew of two men, stranded on the shoals of Squan Inlet, near Station No. 9, Fourth District, New Jersey. The keeper and crew of the station assisted in running the vessel's anchors, and in heaving her afloat, and taking her to a safe anchorage.

September 13.—The steam scow *Josephine*, of Milwaukee, Wisconsin, with a cargo of sand and having on board five sailors, bound from Milwaukee, Wisconsin, to South Point, Wisconsin, became unmanageable on account of some injury to her machinery, and dragged ashore, where her stern pounded, there being no hold for her anchor. The crew of Station No. 15, Eleventh District, went to her assistance with the surf-boat, and carried her hawser to a tug, which pulled her off and towed her into harbor.

September 18.—The schooner-propeller *G. P. Heath*, of Saugatuck, Michigan, loaded with lumber, stranded about thirty rods from the beach at Saint Joseph, Lake Michigan. The accident occurred at 1 o'clock a. m., and in a short time the crew of Station No. 10, Eleventh District, came alongside in the surf-boat. The heavy sea and the darkness of the night made the crew of the propeller (five men) refuse to venture their lives in the surf-boat, which consequently returned with only its own crew to the shore. After beaching the boat the station men occupied themselves with pulling in and piling up lumber that washed ashore from the wrecked schooner until 7 a. m., when the sailors on board the wreck signaled them to return to their rescue. Four of the life-saving crew and one volunteer launched the boat again, pulled through the surf, and brought the five men safe to land.

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September 20.—The crew of Station No. 1, First District, Maine, were called upon by the customs officers to assist in capturing two small smuggling vessels. The surf-boat was manned and taken out about four miles off Quoddy Light, where it overhauled the sloop *Bee*, of Gloucester, Mass. Upon searching her illicit liquors were found, and she was taken in tow to the cove abreast the station. Having placed keepers aboard of her, the life-saving crew again went out in search of the other craft. The master of this vessel had learned that government officers were after him, and, taking advantage of a light breeze, had started for the island of Grand Manan, and would have got clear had not the revenue steamer *Levi Woodbury* appeared opportunely to receive information from the life-saving crew and give chase. She was soon overtaken and captured.

September 21.—At 12.20 a. m. the south patrol of Station No. 3, Fifth District, Delaware, discovered a vessel's light off shore, and in a short time found it to be a steamer coming in close upon the breakers. He at once burned his Coston light, the signal was answered, and the steamer changed her course.

September 21.—The Norwegian bark *Stanley*, from Honfleur, France, to Baltimore, with a cargo of grain bags and a crew of eleven men, stranded in a northeast storm, half a mile north of Station No. 7, Sixth District, North Carolina. The patrol at 2 p. m., saw the bark under full sail coming toward shore just outside the outer reef, and hurried to the station with the alarm. By the time he arrived the vessel had grounded and was laboring hard, the seas breaking over her. The life-saving crew lost no time in getting under way with the apparatus, but before they got abreast of the vessel her main and mizzen masts went by the board. When opposite the wreck they hastened to rig the apparatus, but before the shot was fired the captain of the *Stanley* and four men got into one of the boats and started for the shore. The life-saving crew rushed into the breakers and helped to haul the boat ashore and land the men in safety. The ship's men had brought with them a line from the vessel with which the apparatus was set up, and the remaining six men were taken safely ashore. They were lodged and fed at the station until the evening of the 23d. The crew of No. 7, were assisted by the crew of No. 6, who went on foot to their help, and after rendering service returned to their own station at 6 p. m., having traveled eleven miles in the storm.

September 21.—The schooner *Blue Bell*, of Manitowoc, Wisconsin, having on board a crew of six men and one passenger, missed the channel and ran aground at 6.30 p. m. on the bar at the entrance of the harbor at Two Rivers, Wisconsin. The keeper of Station No. 17, Eleventh District, Lake Michigan, went to secure the services of a tug, and finding the captain ill, induced the engineer to take command, and sent one of his own men to run the engine. The surf-boat was then launched, and for over two hours ran hawsers from the schooner to the pier in aid of the operations of the tug, which at length resulted in getting the vessel off and into the harbor.

September 24.—An open boat having two persons in it, sailing for pleasure capsized near Station No. 27, Fourth District, New Jersey. One of the crew of the station who happened to be fishing from his boat near the scene of the accident, went to the rescue of the men, got them into his boat and landed them safely. The station crew then secured the capsized boat and hauled it up on the shore.

September 25.—The schooner *Woodruff Sims*, of New York, bound from Chickahominy, Virginia, to New York, with a cargo of pine wood

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and lumber, and a crew of six men, sprung a leak in a northeast gale on the night of the 24th, off the coast of Virginia; filled in a few minutes, and was abandoned by her crew. The vessel drifted ashore the next morning about a mile south of Station No. 2, Sixth District, Virginia, where she was discovered by the crews of Stations Nos. 2 and 3, and boarded by the surf-boat, but no one found on board. Her crew of six persons were picked up by a passing vessel and landed on the same day at Cape Henry, where they were sheltered several days at Station No. 2. The vessel was a total loss.

September 29.—A surfman belonging to Station No. 15, Eleventh District, saw a horse hitched to a lumber wagon, containing five boys, back off the wharf into the Milwaukee River opposite the station. He at once gave the alarm, and put off in a skiff with another surfman to the rescue. In a few minutes the men arrived alongside of the floundering horse and half submerged vehicle. Two of the boys had managed to regain the wharf, two were clinging to the wagon, and one, holding on underneath, was momentarily immersed, owing to the struggles of the horse, and would have been soon drowned had he not been dragged into the boat together with the other two boys. The traces were then cut, freeing the horse from the wagon, and the animal's head, by means of the bridle, was rested on the gunwale of the boat, which was rowed as swiftly as possible to a landing place easy of access on the opposite shore. The vehicle was afterwards recovered by the same surfman.

October 2.—The barge *J. W. Hanaford*, of Marquette, Michigan, bound from Bay City to Chicago, with 400,000 feet of lumber, parted her towline from the steam barge Algona, about five miles south of Sheboygan, Wisconsin, and let go her anchor, but the chain parted and she drifted ashore at 9 a. m., five miles south of Station No. 16 (Sheboygan, Wisconsin), Eleventh District, Lake Michigan. The wreck was discovered through the fog by the station patrol, and the crew put out at once in the life-boat against a fresh southeast wind and high sea. They arrived alongside the barge at one o'clock in the afternoon, after a hard pull, and assisted to lighten her of about 60,000 feet of lumber, after which a tug pulled her off without further damage than she had already sustained in the loss of her anchor.

October 3.—The schooner *John Anna*, of Somers' Point, New Jersey, with a cargo of oysters and a crew of four men, stranded on Anchorage Island, New Jersey, in a gale at high tide. The crew of Station No. 23, Fourth District, went with the surf-boat to her assistance, run out her anchor and worked the vessel off without damage, thereby saving the vessel and cargo.

October 4.—The schooner *Ida B. Gibson*, of Tuckerton, New Jersey, was seen from Station No. 16, Fourth District, with signals of distress. The keeper launched the surf-boat and went to the schooner, taking with him the medicine chest and restoratives. He found the first mate of the vessel ill and the captain desirous of landing him as near as possible to his home at Wareton, New Jersey. The sick man was taken ashore in the surf-boat, and thence over the beach in a wagon, under care of a surfman, to the mainland.

October 5.—At 7.30 a. m., the schooner *Mary Lyons*, of Rochester, New York, bound from Cleveland, Ohio, to Milwaukee, Wisconsin, being in tow of the harbor tug, was run, owing to the thick weather, onto the North Point Reef, about five miles from Station No. 15, Eleventh District, Lake Michigan. At 10 a. m. word of the disaster was received at the station, and the surf-boat in tow of a tug, and accompanied by a lighter and twenty men beside the life-saving crew, proceeded to the

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schooner. The life-saving crew ran out lines to the schooner and assisted in transferring her cargo of coal to the lighter. In less than two hours fifty tons were lightered and the vessel floated. The service was rendered none too soon, for within an hour a heavy southeast surf set in which would have battered the schooner to pieces.

October 9.—On the morning of this date a steam-whistle was heard sounding a signal of distress directly off Station No. 2, Tenth District, Lake Huron. A dense fog was prevailing, and the life-saving crew, having launched the surf-boat, soon lost sight of land, but following the sound of the whistle made their way to the vessel, which proved to be a large steamer, the *Roanoke*, of Buffalo, New York, with a cargo of 31,000 bushels of wheat and 500 barrels of flour. She had grounded on the outer reef, two miles from land, in 11 feet of water. After learning the situation, hearing a whistle outside answering that of the *Roanoke*, the life-saving crew rowed in that direction, hoping to obtain help for the stranded vessel. Two tugs were found, and successively piloted to the steamer, but their united efforts could not pull her off the reef. The crews of the station and vessels then went to work and threw overboard all her flour, 5,000 bushels of wheat, and 20 tons of coal, laboring steadily until 4 a. m. of the next day, when the vessel was relieved and went on her way.

The day after, the station crew recovered 13 barrels of the flour and shortly after turned them over to the owner.

October 10.—At 10 p. m., the weather thick and a strong westward current, but smooth sea, the schooner *Samuel Wackrill*, of Boston, Massachusetts, with a cargo of logwood, from Hayti for Boston, stranded on the north end of Third Cliff, Scituate, Massachusetts. In the morning, at seven o'clock, the keeper of the new station, No. 3, Second District, discovered the vessel, which had drifted farther up the beach. The wind had freshened during the night, and quite a sea was running. The keeper gathered a crew, the station not being manned or equipped at the time, and hastened to the scene of disaster. They found the vessel bilged, and lying about thirty yards from the shore, with her small boat alongside full of water, and the oars washed away. The life-saving crew threw a fish-line, with a stone on the end, across the jib-boom of the *Wackrill*. One of the ship's crew bent the fish-line on to the boat's painter, and the life-saving crew hauled the boat ashore, turned the water out, when she hauled back to the ship by another line, which the vessel's crew had attached to her, and brought safely to land, in three trips, the crew of seven, and three passengers, including a woman and child.

October 10.—The schooner *William Thompson*, of South Dennis, Massachusetts, bound from Carthagena, South America, to New York, with a cargo of cocoa-nuts, and a crew of six men, stranded at 1.30 a. m., one mile east of Station No. 17, Fourth District, New Jersey. At 2.15 a. m. the life-saving crew reached her with the surf-boat. They ran out anchors, discharged 25 tons of cargo, and worked the vessel to the inside channel. After this they made full sail upon her, and piloted her safely out to sea, returning to the station at 6 p. m.

October 11.—At 2 a. m. the Italian bark *Antoinette Costa*, from Genoa, Italy, to Baltimore, in ballast, with a crew of fourteen persons, stranded on Brigantine Beach, two miles south of Station No. 25, Fourth District, New Jersey. She was discovered by the patrol of the above station half an hour after the disaster, and as soon as the surf-boat could be brought up the life-saving crew boarded her. At 7 a. m. the crew of Station No. 27 also arrived, but assistance was declined by the master of the *Costa*. On the 12th, the crew of No. 25 again proffered help, which

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was refused, but at night, as there was a heavy sea and the stranded vessel had sprung a leak, the keeper thought it prudent to remain with his crew near by all night. The next day, October 13, they landed the crew and a part of their effects. On the 14th they occupied the whole day in taking ashore the remainder of the personal property of the seamen, and on the 15th the *Costa* was given in charge of the Coast Wrecking Company.

October 12.—The keeper of Station No. 23, Sixth District, North Carolina, discerned the schooner *Charles C. Warren*, of New York, at anchor in Hatteras Inlet, displaying signal of distress. He at once went out with two men, to render necessary assistance, and found the captain of the schooner dead. The life-saving crew took charge of the body, coffined, and interred it.

October 12.—At 4 o'clock p. m. the schooner *Racine*, of Chicago, Illinois, bound from Muskegon, Michigan, to Chicago, having a cargo of lumber and a crew of six men, ran ashore in a dense fog seven miles north of Chicago. The first mate got ashore in a boat and went to Chicago to procure the services of a tug, at the same time notifying the life-saving crew of Station No. 11, Eleventh District, of the disaster. The surf-boat was at once prepared and launched ready for the tug; but, after waiting an hour, the discovery was made that the tug's captain refused to venture out on account of the threatening storm. The surf-boat was then beached, a team hired, and the boat taken on its carriage to the scene of the wreck, when it was again launched and the vessel reached by ten o'clock at night. She was found lying easy, and her crew refused to go ashore, as they were expecting a tug, which appeared at 12.30 a. m. the 13th. The life-saving crew had meanwhile returned to the beach and waited. All this time there had been a pouring rain, and the crew were wet through. On the arrival of the tug the surf-boat was relaunched, and, rowing out to the schooner, ran a line from her to the tug, which, after a part of the schooner's deck-load had been thrown overboard, pulled her off safely. The life-saving crew on the way to the *Racine* had descried another schooner, the *M. E. Collins*, ashore, but found that she was not in need of immediate assistance. After concluding their work with the *Racine* they rowed to the *Collins*, and finding that her crew had left her, went on to the station, arriving at 4.30 a. m.

October 12.—The schooner *Thomas Sims*, of Chicago, Illinois, bound from Menominee, Michigan, to Chicago, with lumber, and having on board a crew of five men, stranded during a dense fog at 5 p. m., about eight miles from Station No. 12, Eleventh District, Lake Michigan. By the first train the next morning word was taken to the station of the disaster. A team was at once procured and the boat on its trucks drawn to the shore, which was reached at 11.45 a. m. The fog was so heavy that nothing could be seen a distance of twenty-five yards, and at that portion of the shore the banks are 90 feet high, very nearly perpendicular, and scaled by a stairway. The boat had consequently to be lowered by means of lines, and was launched at 12 m., taking the direction indicated by a person on the shore who claimed to have seen the vessel. After three-quarters of an hour's search in the thick fog the schooner was discovered hard aground. The crew were found to be out of provisions, and preparing to cast off the deck-load. The life-saving men started immediately to look for a tug, a task dangerous as well as difficult, as a northeast storm was threatening. After two hours' search a tug was found two miles distant, which the life-boat piloted to the schooner. By this time the darkness and fog had so increased that it was deemed imprudent to return to the station, and the life-saving crew

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turned to and helped to transfer the vessel's load to the lighter. At 1 a. m. of the next day, the fog lifted and the life-boat returned to the station.

October 13.—During a high wind with heavy sea at night, the keeper of Station No. 9, Fifth District, Virginia, observed a steamer running too close in, and in danger of the bar. He caused a Coston light to be burned and a watch kept on the steamer's movements. She heeded the signal and hauled off out of danger.

October 14.—One of the patrolmen of Station No. 4, Third District, Block Island, at about 2 a. m. discovered the sail-boat *Blue Fish*, of New Shoreham, Rhode Island, in the surf. He procured help from the station, recovered her, and took her into the harbor.

October 15.—The schooner *Mist*, of Port Ontario, New York, bound from Oswego to Big Sandy, Lake Ontario, with a cargo of corn, shorts, and kerosene oil, stranded during a fog on the bar at the mouth of Big Sandy Creek, and the crew of Station No. 1, Ninth District, seeing her signal hoisted, pulled off to her in the supply-boat, and assisted in getting her in over the bar. To do this they were obliged to lighten her by throwing overboard the barrels of kerosene, which they afterwards hoisted again on deck, and helped the vessel to get under way.

October 15.—The lookout at Station No. 2 (Salmon Creek, New York), Ninth District, Lake Ontario, heard at 5.30 a. m. a steamer outside, and knowing at once that she must be out of her course, he called the crew, who launched the surf-boat in haste, and rowing out upon the lake found the steamer *Robb* towing the schooner *Bentley*, of Toronto, Canada, directly towards the shore. The vessels were not half a mile off, and in ten minutes would have been aground on the bar but for their timely warning. Owing to the smoky weather, they had missed Oswego, into which port they thought they were standing. The keeper gave them their course for Oswego, and returned to the station.

October 15.—At noon the steamer *B. F. Ferris*, of Put-in-Bay, Ohio, bound from Put-in-Bay to Sandusky, Ohio, lost her reckoning during thick weather, and stranded on the rocks half a mile northwest of Marblehead light, Lake Erie. The crew of Station No. 9, Ninth District, went immediately to her assistance with both life and surf boats, reaching her half an hour after the accident. Both boats were used in lightening her of part of her cargo of fruit and fish, and the balance being shifted the vessel was enabled to back off the rocks with her engine. She had a crew of eight persons besides eight passengers on board.

October 16.—The sloop *Ellen H. Webb*, of Bridgeton, New Jersey, having two men on board, bound from Philadelphia to Cape May, struck on the south bar of Cold Spring Inlet. The crew of Station No. 39, Fourth District, New Jersey, went with the surf-boat to her assistance and aided in getting her off.

October 17.—The schooner *Forest Queen*, of Belfast, Maine, bound from Bangor to Scituate, Massachusetts, with lumber, and a crew of three men, struck on Ash Island Point, Maine, but came off and got into Seal Harbor, where, in attempting to go on the flats, she got ashore on the rocks. She was seen by the patrolman of Station No. 5, First District, who reported her to the keeper. The keeper and two surfmen went to the stranded schooner in the station small-boat, hoisted her head-sail, swung her round and off the rocks, and then run her on the flats at the head of Seal Harbor. They then assisted in hauling down and furling her sails, pumped her out, and returned to the station.

October 17.—The Italian bark *Cutelin Dall'Orso*, of Genoa, bound from Marseilles, France, to New York, in ballast, with a crew of fourteen men,

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stranded at 8 p. m. a quarter of a mile from Station No. 28, Fourth District, New Jersey. She was very soon discovered by the patrol of the above station, who, after firing his Coston signal, which was answered by the vessel, gave notice of the disaster at his station. The boat was at once run out and the vessel boarded at 9.30 p. m. The captain declined assistance, but the weather was so indicative of storm that the keeper deemed it expedient to stand by the bark until morning with his crew ready for emergency. The vessel was floated off on the 22d by the steam-tug *Relief*, and towed to New York. The crew of Station No. 28 rendered assistance with the surf-boat, carrying dispatches and conveying the officers back and forth, making in all seven trips.

October 18.—The schooner *E. G. Buxton*, of Boston, bound for Bucksport, Maine, was wrecked on Old Cilley Ledge, about ten miles from Station No. 5, First District, Maine. Her plight was discovered through the glass by the lookout of the station, and the life-boat with the life-saving crew went immediately to render assistance. This was no easy task, as the crew were obliged to row and beat against a strong head wind and tide. The vessel was found full of water, with the sea breaking around her, and had already been given into the hands of the wreckers. The life-saving crew took the clothing, bedding, and other effects of the *Buxton's* crew into the life-boat, and delivered them to the captain's agent at Herring Gut.

October 20.—The schooner *Gertie E. Merrow*, of Bath, Maine, with eight persons on board, stranded on Sinepuxent Beach, Maryland, five and a half miles south-southwest of Station No. 4, Fifth District, Maryland, where she was discovered at 5.30 a. m. by the patrolman. The wind was west-northwest, weather cloudy, and surf high. The keeper endeavored to obtain a team to convey the surf-boat to a point on the beach abreast of the vessel, but was unable to do so. The boat was accordingly launched in front of the station, and after a hard pull of nearly two hours boarded the vessel, where her steward and one passenger were found to be all who were on board. These were taken in the boat and landed on the beach, where the master of the vessel, three seamen, and two passengers had previously landed in the ship's boat, which was swamped in going ashore. The keeper finding that he could be of no further service returned with his crew to the station. The schooner was hauled off the beach by a wrecking steamer the day after stranding.

October 20.—The schooner *Ellie Bodine*, of Tuckerton, New Jersey, bound from New York for York River, Virginia, in ballast, with a crew of six persons on board, stranded on Isaac Shoals, four and a half miles south of Station No. 11, District No. 5, Virginia, at 12.15 a. m. The wind was north-northwest, clear weather, and a heavy sea running. The surf-boat was launched as soon as practicable after the vessel was discovered, and the schooner boarded. The captain refused to leave his vessel, but requested the keeper to return for him in the evening if he did not get off in the mean time. Accordingly the keeper finding that no assistance could be rendered, returned to the station. At 2 p. m. the vessel was again boarded, and the captain and crew taken off. The vessel was subsequently got off.

October 21.—The schooner *Nathan Clifford*, of Belfast, Maine, bound from Bangor to New Haven, Connecticut, with lumber, and having four men in the crew, and two passengers, misstayed and stranded on Lower Gangway Ledge, near Station No. 5, First District, Maine. The occurrence was witnessed by the crew of the station, who had been watching her as she beat down the channel. They immediately launched the boat and went out to her. They found her lying easily on the rock, and

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trimmed her sails so as to hold her steady and prevent her chafing. They then waited until the flood tide took her off, when they beat her into Seal Harbor, anchored her, furled her sails, and returned to the station.

October 21.—The schooner *Lena Sooy*, of Chincoteague, Virginia, bound from Philadelphia to Chincoteague, in ballast, with five persons on board, stranded on the south point of Indian River Inlet, near Station No. 3, Fifth District, Delaware. The wind was south-southeast, weather stormy, and a moderate surf running. The surf-boat was launched, and the schooner boarded, her anchor run, cable hove taut, all made secure, and her crew landed at the station. On the following morning, at eight o'clock, the life-saving crew returned to the schooner, ran another anchor, and at 12 m. hove the vessel afloat and took her to a safe anchorage in the river.

October 21.—The schooner *Volunteer*, of Oswego, New York, bound from Bay of Quinte to Port Ontario with a cargo of lumber, and having a crew of three men, struck at seven o'clock in the morning on the sand beach at the mouth of Big Salmon River (Port Ontario). The lookout at Station No. 2, Ninth District, five miles away, saw the stranding, and at once reported it to the keeper. The crew, with the surf-boat laden with proper appliances, immediately got under way, and reached the scene of the disaster at eight o'clock. After nearly three days' labor the life-saving crew, with the aid of the three men on board, succeeded in getting the vessel and cargo off and taking them into port.

October 21.—The fishing-schooner *Winnie Iona*, of Fairport, Ohio, was dismasted while out on the lake, four men being on board engaged in examining their nets. The accident occurred about a mile west of Station No. 7, Ninth District, Lake Erie, and in twenty minutes afterward the life-saving crew were on the way to the rescue, and soon brought the men and their craft safe to harbor.

October 21.—The schooner *Vampyre*, of Ashtabula, Ohio, with a crew of seven men, stranded upon a shoal about one and a quarter miles south of Station No. 4, Tenth District, Lake Huron. The life-saving crew reached her at six o'clock in the morning, ran out her anchor into deep water, and spent the remainder of the day in endeavoring to work her off the shoal, a task finally accomplished with the assistance of two tugs which arrived in the afternoon.

October 22.—At eleven o'clock at night, the schooner *Cora*, from Muskegon, Michigan, laden with lumber and having four men on board, in attempting to enter the harbor of Saint Joseph, Michigan, was misled by the range of lights, and struck the pier. The crew of Station No. 10, Eleventh District, Lake Michigan, went at once to the rescue, landed the four men on the pier by means of lines, and gave them shelter at the station. An attempt was made to hold the schooner to the pier by a hawser, but it parted, and the vessel stranded. The captain and owners published a card, thanking the crew for saving their lives.

October 23.—The schooner *Eliza Gerlach*, of Cleveland, Ohio, while being towed into harbor at Buffalo, New York, parted her hawser and drifted onto the old breakwater. The life-saving crew of Station No. 5, Ninth District, Lake Erie, went out in the surf-boat at once to her relief, but before their arrival the captain had scuttled her, to save her from greater injury. They remained by until vessel and crew were out of danger.

October 23.—The schooner-barge *Roscius*, of Buffalo, N. Y., with a cargo of lumber and crew of six men, in tow of the steam-barge *Missouri*, arriving at the new breakwater at Buffalo, let go her line for a small tug

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to tow her into port, but the tug not coming up she drifted on the reef outside the piers and stranded. The accident occurred at 5 a. m., and was seen by the lookout of Station No. 5, Ninth District, Lake Erie. The life-saving crew went out to her immediately in the surf-boat, but their assistance was not needed.

October 23.—On the same day and hour, the barge *L. J. Farwell*, of Buffalo, New York, also in tow of the *Missouri*, let go her line and drifted off, stranding on the reef. The crew of Station No. 5 also went to her, but their assistance was not required.

October 23.—A fishing-boat laden with salt and fish barrels, and having two men on board, was dismasted about eleven o'clock in the forenoon, during a heavy snow-squall, about two miles from Station No. 4, Tenth District, Lake Huron, and, having no anchor and only one oar, was rapidly drifting out upon the lake in a helpless condition, in danger every moment of being swamped in the increasing sea. The keeper was on the beach at the time, at some distance from the station, and fearing that if he waited to get the assistance of his crew the men on board the boat would be lost, he started after them alone in the station supply-boat, under sail—this being near at hand—overhauled them, took their boat in tow, and brought them safe to land near the station.

October 24.—At 6 a. m. the schooner *E. M. Fox*, of Sag Harbor, New York, bound from Fire Island, New York, to Philadelphia, with a crew of six men, grounded on the north point of Cold Spring Bay. The crew of Station No. 38, Fourth District, New Jersey, went out to her immediately in the surf-boat, and boarded her at 6.45 a. m. They assisted in furling sails and getting things in favorable order for floating her off at flood tide. When the tide served she got under way without damage.

October 24.—The Canadian brigantine *H. Roney*, from Kingston, Ontario, sprung a leak and foundered three miles east of Station No. 4, Ninth District, Lake Ontario. At 7.35 a. m. report was brought to the station, and the crew were soon on the way with their boat, in tow of a tug, to the scene of disaster. On arriving, they found that the captain and crew (eight men) had gone ashore in the yawl-boat without warning the cook, a woman, who was asleep and was drowned in her berth. (See page 18.)

October 25.—The crew of Station No. 2, First District, Maine, launched the surf-boat and went to the assistance of a boat which, with two men in her, had run ashore on a ledge. They got her off and took her safe into harbor.

October 25.—The keeper of Station No. 22, Sixth District, North Carolina, observed a vessel northeast of Hatteras Shoals running before the wind with double-reefed foresail and flying signal of distress. The surf-boat was immediately launched, and in about an hour reached the distressed vessel, nearly four miles out at sea. She proved to be the schooner *Irene*, of Millville, New Jersey, bound from Snow Hill, Maryland, to Millville, with a cargo of yellow pine, and a crew of three men. Part of her deckload had been washed overboard, and her mainsail blown away. The life-saving crew brought the vessel in under the beach and anchored her, and then sent for a pilot to take her to Hatteras for repairs.

October 26.—The schooner *John Mayo*, of Linconville, Maine, bound from Lincolnville to Mystic, Connecticut, with a cargo of lime and a crew of three men, was discovered at 5.45 a. m. by the patrol of Station No. 3, Third District, Rhode Island, on Watch Hill Reef. The life-saving crew immediately launched the surf-boat and boarded her. Finding she had no hawser on board, they returned to the station, procured

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one and returned to the vessel, which, after throwing overboard 250 barrels of lime, they succeeded, by use of the hawser, in floating at high water.

October 26.—The schooner *F. B. Gardner*, of Chicago, Illinois, stranded on the rocks on the Canada shore, about five miles west of Buffalo, New York. The disaster occurred at five o'clock in the morning, but no distress-signal was made until three hours after, when it was seen by the look-out from Station No. 5, Ninth District, Lake Erie, and the surf-boat was launched and went out to the vessel. A tug was already at the scene of disaster, but could not get near enough to the schooner to afford assistance, and the surf-boat was of service in running out the hawser from the stranded vessel to the tug, and when it broke under the strain, in performing the service again. The life-saving crew then pumped out the schooner, thus enabling her to be pulled off the rocks more easily, and having seen this done, and the vessel and crew out of danger, they returned to the station, which they reached by six in the afternoon.

October 27.—At 11 p. m. the patrol of Station No. 6, Tenth District, Lake Huron, reported a fish-boat stranded on a reef at the north end of Thunder Bay Island. The crew went immediately to the place and found a fish-boat, owned by F. R. Merrill, of Detroit, ashore. She was laden with 2,000 pounds of fish, and lay close in, so that the life-saving crew waded out to her. After working about an hour in the water, which was very cold, they got her off and took her to Sugar Island for harbor. The captain said his rudder had unshipped in the heavy sea, and the boat, becoming unmanageable, had drifted ashore.

October 28.—The wreck of the *Amazon* of Detroit, Michigan, was the most notable of the season. She was a large and staunch four-masted twin-screw steamer, of 1,406 tons, 245 feet in length, and 40 feet beam, belonging to the Northwestern Transportation Company, and plying upon Lake Michigan, between Grand Haven, Michigan, and Milwaukee, Wisconsin, under the command of Capt. James Fraser. On October 27, at eleven o'clock at night, laden with about 900 tons of flour, pork, and sundries, and having sixty-eight persons on board, her officers and crew being thirty-two in number and the remaining thirty-six being passengers, she left Milwaukee on her regular trip in a northwest blow, which was not, however, violent until toward morning, when the wind increased to a fierce gale, raising a very heavy sea and surf. The steamer arrived opposite Grand Haven at about eight o'clock in the morning, and attempted the passage between the piers which make out into the lake from the river at that place, forming the entrance to the harbor. The wind and sea were furiously driving in an oblique direction toward the end of the piers, over which the great waves were curling, and, despite the best calculation, they swept the steamer aside from the entrance and carried her about 800 feet to leeward of the south pier and almost onto the bar. For a moment it seemed as if she were lost, but suddenly, to the astonishment of the spectators on the beach and piers, she backed, and with her powerful double engines and wheels tore her way out of the breakers. Fairly out in the lake again, she steamed away to the north for more than a mile, turned and again bore down upon the piers, laboring heavily through the water, the activity of her steam-pumps indicating the leak that was already gaining upon her. The aim was to make in by hugging the north pier, and it was so well directed that she nearly effected the entrance, but, at the very mouth of the piers, while she hung surging and staggering in the struggle to get in, the gale and the tremendous undertow slowly but irresistibly bore her past the southern pier-head and on to the bar below. From that moment all was over

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with her. She had struck the bar with her bow, and gradually her stern swung around to the south, giving her broadside to the breakers, which now broke upon her whole length, streaming over her hurricane deck, while the spray flew in columns as high as her cross-trees. Although much enfeebled through the racking and straining to which her frame was subjected, her engines continued to work in the desperate effort to get her beyond the masses of water incessantly flung upon her, and which were battering her into a ruin, and by ten o'clock she had gradually worked up nearer to the south pier, without, however, getting beyond the destructive action of the breakers.

While this lamentable scene was going on, the crew of Life-Saving Station No. 9, Eleventh District, were not idle. The keeper being absent through illness, Mr. Louttit, the superintendent of the district, had had the surf-boat brought across the river from the station on the north side, and had assembled the men upon the piers, and endeavored to throw lines to the steamer upon her successive attempts to make the harbor, with the view of aiding the entrance by holding her to the dock. These endeavors failing on account of the steamer not getting on either occasion sufficiently near, the crew, with the intention of setting up the hawser and hauling lines for rescue by the life-car, embarked from the beach in the surf-boat, carrying out a line, the slack of which was paid from the pier by a group of sailors. This dangerous expedition (which was undertaken because the wave-swept condition of the piers made it impracticable to employ the wreck-gun) was finally so embarrassed by the line that the latter had to be cut, the boat being in danger of swamping and unable to make her way through the heavy seas. The crew, however, finally contrived to bring their boat alongside of the steamer, their object being to run back a line from the vessel to the shore, but it was found that unfortunately there was no line on board long enough for the purpose. The passengers, huddled together under the bulwarks and pilot-house to escape the seas incessantly breaking over the decks, shrank from the solicitations of the life-saving crew, who wished to take back a boat-load of them, and only three of the whole number who saw the daring surf-boat half filled with water, which the men were bailing, could be persuaded to risk the return passage through the terrible seas. These three the boat soon landed on the beach in safety, though well drenched. Meanwhile, a lot of freight was discharged into the sea from the leeward gangway, somewhat lightening the vessel, which continued to work slowly under the stubborn though failing action of the machinery, until she was within about fifty yards of the pier, when by a bold cast of the heaving-stick a line was thrown on board the wreck. By this the hawser and the hauling-lines for the employment of the life-car were now run out.

Meanwhile the breaking up of the vessel continued with increasing rapidity. A little after ten o'clock the first fragments of the hurricane deck had begun to strew the water. The hull was so heavily freighted and so imbedded in the sand that it did not pound much, but the gale and sea were smashing and splintering everything. The stanchions of the deck were giving way, and the boats hanging on the windward side of the bulwarks were beating to pieces against the hull; one of them especially got loose and battered against the cabin with such force as to breach its walls. Captain Fraser, at the peril of his life, got over the deck with an ax, and, although several times actually buried in the flooding seas, succeeded in cutting the boat loose. The sea, however, still continued the destruction of the cabin, wrenching off piece after piece, until soon there was a large hole in the west side, through which

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the water swept without impediment. At the same time it was noticed from the shore that the ends of the steamer were lower than the middle, indicating that the vessel was broken in two and her wreck accomplished.

It was at this hour (eleven o'clock) that the life-car made its first passage out to the steamer, the hawser and hauling-lines having been set up to the foremast with their shore ends made fast to a timber of the pier. One of the life-saving crew, John Vissel, went out in the life-car to superintend operations, and from the moment that he was seen from the shore standing on the deck of the Amazon, it was generally felt that the people on board were safe. This confidence was not without warrant, for in an hour and a quarter every one on board was landed, being sixty-five persons, exclusive of the three persons landed by the boat. The first trip of the car brought ashore four ladies and a little girl; after which the hawser was doubled to prevent possible accident and the lines carried ten feet higher up the mast above the pilot-house, so as to keep the car well away from the sea. The remaining six ladies on board came in the next car, followed in successive trips by the male passengers and the crew, the captain being the last to leave the vessel. The life-car made fourteen trips in all, the last two or three being devoted to bringing ashore the United States mails and the baggage of the passengers. A dog was also brought ashore. The vessel was a total wreck.

October 28.—During a violent gale the crew of Station No. 17, Eleventh District, Lake Michigan, discovered a dismasted schooner on the lake, southeast of the station. They launched their boat, procured a tug to assist, went out to her a distance of eight miles, assisted to get her in tow, and lay by her until they saw her safely under way. She proved to be the schooner *Nelly Wilder*, of Sackett's Harbor, New York, with a cargo of coal, bound for Milwaukee. There were nine persons on board.

October 29.—The steam-barge *William Edwards*, of Huron, Ohio, with a cargo of coal and sixteen persons on board, brought up on the bar at the entrance of the piers at Cleveland, close to the east one. The crew of Station No. 8, Ninth District, Lake Erie, close at hand, saw the occurrence, launched the life-boat at once, and in ten minutes had boarded the barge, and by means of a hawser run from the starboard quarter of the vessel to the end of the west pier, kept her from pounding on the pier next which she lay, while two steam-tugs engaged in getting her off, which they succeeded in doing with but comparatively little damage to the vessel.

October 30.—At 8.40 p. m. the patrol of Station No. 9, Fifth District, Virginia, saw a vessel approaching the shore, apparently steering directly for the beach. He burned his Coston light, and the vessel, heeding the warning, kept off.

October 30.—The Canadian scow *Mary Lydia*, bound from Kingsville, Canada, to Sandusky, Ohio, sprung a leak during heavy weather, and capsized, at three o'clock in the morning, about three miles north of Station No. 9, Ninth District, Lake Erie. She was discovered by the station patrol with her crew of five men clinging to her, and in ten minutes the life-boat was on the way to the rescue. Meanwhile, however, the steam-barge *Bay City*, which was not more than half a mile distant from the capsized scow, started for the men, picked them up, and took them on board of a tow-barge in her wake. The life-saving crew boarded the barge and found that the rescued men had been cared for as well as possible, but were nearly perished with wet and cold. They gave them restoratives from the station medicine-chest, got them as warm as possible

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and took them in their boat to Sandusky, in order that one of the men, whose hands were badly wounded, might have surgical attention, and where the captain wished to procure a tug to endeavor to save the scow.

October 31.—Two men out in a dory, shooting sea-fowl, ventured too far from land, and, not understanding the management of the craft, were being fast driven out on the bay. Their plight was observed by the crew of Station No. 5, Second District, Massachusetts, and a dory pulling six oars being at the water's edge, they proceeded at once to the rescue in it. On reaching the distressed boat they put one of the station crew in her, and taking her in tow brought her to land. The rescued men were wet and exhausted, and had it not been for the assistance of the life-saving crew must have been lost, for it is hardly possible that the boat could have lived to cross Cape Cod Bay in the wind and sea which prevailed.

November 2.—The schooner *Telegraph*, of Ellsworth, Maine, with a crew of two men and a woman passenger, lost her boat and had her sails split during a gale. The disabled vessel made signal of distress, which was seen by the patrolman of Station No. 1, First District, Maine, at 6 a. m., who reported it to the keeper. At 7.30 a. m. the surf-boat and crew arrived at the scene of disaster, and took the captain of the *Telegraph* into the boat and rowed him to Lubec to obtain a tug to tow the vessel into harbor. Obtaining one, the schooner's captain boarded it to return to his vessel, but when about half way to her the captain of the tug refused to go near the schooner on account of the heavy sea, and turned back. The surf-boat then again took the schooner's captain and returned him to his craft. The keeper then went back to the station and procuring needles, twine, etc., went out again to the schooner and repaired her sails sufficiently to work the vessel, and sailed her into Lubec for repairs.

November 2.—The German ship *Hansa*, from Bremen to Baltimore, in ballast, and with a crew of twenty-one men, went ashore a quarter of a mile north of Station No. 1, Sixth District, Virginia, at 12.10 at night. Ten minutes later the life-saving crew launched their boat and went out to her and offered assistance, which was accepted only to send a telegram to Norfolk for a wrecking tug. At 6 a. m. the crews of Nos. 1 and 2 both went out and offered their assistance, but it was not needed. The vessel was got off by the Coast Wrecking Company.

November 2.—A new schooner, not yet named, having on board three men, was in tow of a tug from Oswego, New York, to Big Sandy, New York, where she was to be fitted out, and near the latter place was caught in a severe storm. The tug, owing to the heavy sea, dared not venture into port with her, and the life-saving crew of Station No. 1, Ninth District, Lake Ontario, launched the surf-boat, pulled out to her, took her line, and towed her inside.

November 2.—At three o'clock in the afternoon the schooner *Helena*, of Cleveland, Ohio, laden with iron-ore, and having a crew of nine men, lost her foremast and main-topmast during heavy weather, about twenty miles from Cleveland, Ohio. Two of the crew were badly injured, one having his leg and another his arm broken by the falling spars. The following morning, November 3, at sunrise, the vessel was seen by the keeper of Station No. 8, Ninth District, Lake Erie, four miles northwest of Cleveland, and he immediately secured a tug, which took the life-boat in tow and conveyed it alongside the *Helena*. After some difficulty, owing to the very heavy sea, the life-saving crew boarded her. They found her leaking badly, and her crew exhausted from long working at the pumps. The life-saving crew at once relieved them, manned the pumps, and worked steadily until eight o'clock in the evening, when the sailors

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took hold until midnight, at which time they were again relieved by the life-saving men, who pumped until four o'clock in the morning of the 4th. By six o'clock the weather had so moderated that they were able to heave her anchor short and put her in tow of the tug, the life-saving crew remaining at the pumps until nine o'clock, when they arrived at the dock. Here they assisted in clearing up the deck, topping up the main-boom, and helping in other matters until they were no longer needed.

November 2.—During a fearful snow-storm the schooner *Ithaca*, of Chicago, Illinois, laden with pine lumber, and having a crew of six, with one passenger, struck on the bar ten rods from the north pier at Saint Joseph, Michigan, and was totally wrecked a little after midday. The crew of Station No. 10, Eleventh District, on their way to dinner saw the vessel in distress, and at once put the surf-boat on a wagon, and, with the assistance of a number of volunteers, dragged it through the heavy and unbroken snow to the lake, launched, and pulled out, and brought ashore the seven men, whom they succored at the station. The rescued men published a card the next day in the local papers, stating that they owed their lives to the station crew for delivering them while their vessel was going to pieces.

November 2.—The steamer *Menominee*, of Kenosha, Wisconsin, with a heavy cargo, and having twelve passengers, and a crew of twenty-five men, stranded, during a thick snow-storm, the wind being fresh, with a heavy surf, in White Fish Bay, about eight miles north of Station No. 15, Eleventh District, Lake Michigan. The place of disaster was four miles beyond the beat of the station patrol, being, moreover, hidden by the curvature of the coast, and, as the casualty took place late at night, it was not reported to the life-saving crew until after 10 o'clock the following morning, when information was brought to the station by the master of the tug *Hagerman*. The surf-boat, equipped with a hawser, was immediately manned, and proceeded in tow of the tug to the vessel, alongside of which it came a little before noon, and took on board three male passengers and the purser of the steamer, whom it transferred to the tug *Sullivan*, which was lying off and on a mile to windward, the surf being too rough for the tugs to venture farther in. The surf-boat then made a second trip, bringing off four women and two children, and also one male passenger. The remainder of the passengers, one of them an elderly lady, were too timid to trust themselves in the surf-boat, and remained on board the steamer. The weather was bitterly cold, and the life-saving crew, being much exhausted by these labors and their exposure, returned to the station in tow of the tug *Sullivan*, and ate a hasty meal, after which they exchanged their hawser for a handier running line, and returned in tow of the tug to the vessel, which they reached by four o'clock in the afternoon. From this time until half past two o'clock the next morning the crew were occupied in running lines between the steamer and the tugs or carrying messages between them, never leaving their boat for this period. A stout hawser was finally run from the steamer to the tug *Welcome*, and she was hauled off, and subsequently got into dock at Milwaukee, having sustained little damage. The life-saving crew suffered a great deal from cold and exposure during their long and arduous labor, their boat being all iced up, and they themselves covered with frozen spray. They received great praise from the master and owners of the steamer, who credited them with saving the vessel and cargo and the lives of the passengers, since without their aid the tugs could probably have rendered no assistance.

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November 3.—The keeper of Station No. 4, First District, Maine, with a volunteer crew, which he raised for the occasion, the station being a new one not yet manned, went to the assistance of the stranded schooner *Presto*, of Machias, Maine, in their boat through a blinding snow-storm, but found that her crew of four were able to get from the vessel to the shore dry-footed, as the tide was out and the vessel lying nearly upright and apparently not hurt.

November 3.—Before leaving the *Presto*, the same life-saving crew discovered the schooner *Emma G.*, of St. John, New Brunswick, ashore on the southeast point of Little Cranberry Island and went to her. They found that her company, four in number, had landed in their own boat on Baker's Island, and had gone to the light-keeper's house. The light-keeper accompanied them across the bar (it being low tide), back to their vessel. The keeper opened the station and stored the personal property of the *Emma G.'s* crew, clothing, charts, &c., and there being nothing more to do discharged his volunteers. The next day the vessel was taken off, after lightering her deck-load, and taken to Hadlock's Wharf, Cranberry Isle. The keeper assisted in getting the vessel off, and taking the lumber to the wharf, where he took charge of it until it was reshipped in another vessel. The vessel abandoned the voyage and was taken back by a tug to St. John, New Brunswick, after receiving some repairs.

November 3.—The British bark *W. E. Heard*, of Yarmouth, Nova Scotia, in ballast, from Newry, Ireland, to Baltimore, with a crew of thirteen men, grounded abreast of Station No. 1, Sixth District, Virginia, and was boarded by the crew of the station. Their offer of assistance, however, was not accepted, as she wanted but one foot of water to float, and at flood tide, the wind being favorable, she went off without damage.

November 3.—The schooner *Addie*, of Benton Harbor, Michigan, was discovered by the keeper of Station No. 10, Eleventh District, Lake Michigan, with her colors at half-mast, two and a half miles from the shore. It was snowing hard and freezing, and the wind and sea were heavy. The life-boat was at once launched and the services of a tug were secured, but her draught proved too great for the water on the bar. A smaller tug was then obtained, and the life-boat taken out in its tow to the schooner, which was found badly iced up and her crew of three men utterly unable to manage her and in much suffering from the fearful cold. The life-saving crew at once went to work and in an hour the vessel was towed safely into harbor.

November 3.—The schooner *Reindeer*, of Milwaukee, Wisconsin, laden with lumber and having two men on board, was cast, during a heavy snow-storm, with the sea running high, on the beach near Lincoln Park, above Chicago, Illinois. She was discovered early in the morning by the patrolman of Station No. 11, Eleventh District, Lake Michigan, who, on his way to the station, took the precaution to hire a team to draw the boat-carriage. Matters thus expedited, the boat was launched in an hour and a half from the discovery of the wreck. The life-saving crew found the schooner covered with ice, and had much difficulty in getting and keeping the surf-boat close alongside while rescuing the men, the current being so strong as to force the boat broadside to the sea, and also causing her to ship considerable water, which kept one man bailing as actively as possible while the boat was backed into the shore. The rescued men were wet to the skin and their clothing frozen stiff. As soon as they were landed they were put in a wagon, being unable to walk, and taken to the nearest house and left with its occupants for proper

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care, one of the surfmen remaining to assist. The surf-boat was considerably injured in the undertaking, having one of her planks stove in. The *Reindeer* was an entire loss, but a portion of her cargo of lumber was saved.

November 4.—As the keeper of Station No. 4, Second District, Massachusetts, was returning from Plymouth at 4 p. m., he observed a schooner aground on Brown's Island shoals. Going to her he found her to be the schooner *Fannie Barney*, of Rockland, Maine, bound from Bangor, to Duxbury, Massachusetts, with a cargo of lumber and a crew of three men. The captain informed him that, being unacquainted with the harbor and unable to procure a pilot, he had got on the shoal, at 3.15 p. m., it being then an hour to ebb-tide. The keeper hurried to the station, manned and launched the surf-boat and went to the schooner, taking along a 4-inch hawser. They found on boarding her that she had only a small kedge anchor, weighing fifty or sixty pounds. The life-saving men returned in the surf-boat to the beach and procured a large rock which they took out to the vessel with which to back the kedge, and after the schooner began to right they ran it out with seventy-five fathoms of hawser. They then found two feet of water in the vessel's hold and pumped her out. It being a fair wind, they made all sail on the vessel, manned the windlass, and at about half an hour before high tide hove her off the shoal. At midnight a pilot from Duxbury came aboard, and the life-saving crew assisted him in getting the schooner to a good anchorage, after which they furled the sails and left for the station at 2.40 a. m., having been constantly and hard at work all night.

November 5.—At 10 a. m. the schooner *Nellie Brown*, of Boston, from Gardiner, Maine, to Philadelphia, with a cargo of ice, a crew of six men, and one passenger, struck on the south end of Little Egg Harbor Bar. The crew of Station No. 24, Fourth District, New Jersey, boarded her at 11 a. m., and shortly after the crew of No. 23 arrived. The two crews worked until 1 p. m. throwing cargo overboard. The crew of No. 24 then returned to their station, that of No. 23 remaining on the schooner. In the afternoon No. 24 again went out to the vessel and remained until midnight, doing whatever could be done to lighten and ease her. At midnight the wind blew from the southeast, threatening a storm, and as the schooner was making water faster than it could be pumped out, it was decided to leave her. The captain, steward, and passenger went ashore with their luggage in the boat of Station No. 23 and were kept at the station five days. The mate, the remaining three men, and their baggage were taken to No. 24. The vessel was lost.

November 6.—The schooner *Gold Hunter*, of Cleveland, Ohio, loaded with iron, while scudding before the wind during a heavy gale accompanied with sleet and snow, ran ashore on the southeast bar of Black River Island, ten miles north of Station No. 5, Tenth District, Lake Huron. The disaster occurred at 5 o'clock p. m., and the crew, eight in number, landed in their own boat. No signal of distress being made, and the weather being very thick, the life-saving crew did not become aware of the disaster until the morning of November 8, when they at once proceeded to the schooner in their surf-boat and offered their services, but as a tug and steam-pump had been applied for, their offer was declined. Directing the schooner's captain to display a flag at half-mast should there be subsequent need of their services, the life-saving crew returned to the station at 2.30 p. m., having been absent six and a half hours and having rowed twenty miles through the bitter cold.

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November 7.—The keeper of Station No. 4, Second District, Massachusetts, discovered off his station the three-masted schooner *John W. Hall, Jr.*, of Wilmington, Delaware, with a crew of seven men, bound from Baltimore to Plymouth, Massachusetts, with signal set for a pilot. As the weather was thick and stormy, with a strong wind and rough sea, the keeper feared the vessel might get into trouble, knowing that the pilots from town (Plymouth), could not see her. He and three of his crew manned the station dory and pulled out to her. The boarding was effected with difficulty, although the captain put his vessel in stays at the request of the keeper to aid him, and the dory was nearly swamped. After having the dory hoisted out of water, as it was too rough to tow her astern, the keeper piloted the vessel as far as Saquish Cove, into smooth water, when, meeting a pilot from town, the life-saving crew left the schooner and returned to the station.

November 8.—The keeper of Station No. 2, Third District, Rhode Island, discovered a bark about one mile off his station burning torch-lights, and supposing she needed assistance he answered by sending up a red rocket, followed by a Coston signal, signifying immediate help. The surf-boat was then launched and in half an hour the vessel was boarded. She proved to be the British bark *Hesse Darmstadt*, from London, England, to Providence, Rhode Island, with a cargo of scrap-iron. She had signaled for a pilot. The keeper loaned him a chart of Narragansett Bay, which was all the assistance needed.

November 8.—The patrolman on his northern beat from Station No. 1, Cape Henlopen, Fifth District, Delaware, between the hours of 9 and 10 p. m., discovered a vessel heading inshore. He burned two Coston lights, but before the second one was consumed the vessel struck the beach on the point of the cape. The patrolman hurried back to the station, arriving there at about 10 p. m., as the watch from the southern beat was returning. The surf-boat was launched at once, and proceeded to the stranded vessel, reaching her at 10.40. She proved to be the British ship *Livingstone*, from Galway, Ireland, to Delaware Breakwater, for orders, with a ship's company of seventeen, all told. The wind was moderate from the south, with a heavy ground swell on the beach. The keeper found the vessel pounding heavily. He offered his services to the captain of the ship, which being accepted, he started immediately with his boat and crew into the harbor (Delaware Breakwater) to bring a tug to the relief of the ship. He returned at 2 a. m. in tow of the wrecking steamer *North America*. From this hour until 5.30 a. m. the life-saving crew were busily engaged in running lines from the ship to the steamer, and in getting everything ready for the tug, preparatory to an attempt to haul the vessel off. Having perfected these arrangements, he beached his boat, and soon had the satisfaction of seeing the ship towed afloat and on her course to destination. The crew reached the station at 8 a. m., having been at work from 10 p. m. the night before.

November 11.—The Tug Company at Milwaukee, Wisconsin, received a dispatch calling for a tug and boat to go to the assistance of the schooner *Spy*, of Oak Creek, Wisconsin, which had stranded just after leaving her pier at Oak Creek, Lake Michigan, with a crew of four men and a cargo of brick. The master of the tug *Coe* brought word to Station No. 15, Eleventh District, and the surf-boat was immediately launched, taking a three and a half inch hawser, and in tow of the tug started for the wreck. There was a heavy sea and pouring rain, with a fog so dense that, after a vain search for the schooner, the tug refused to risk going farther, and the life-saving crew were obliged to return to the station,

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which they only reached after groping about in the sea for four hours. The schooner was subsequently got off.

November 13.—At noon word was received at Station No. 2, Second District, Massachusetts, that a vessel was drifting ashore at Rockport, four miles from the station, with her crew in the rigging, and that the weather was too rough to allow the neighboring dories to get out to her. The keeper at once procured two teams for conveyance, and went with mortar apparatus, etc., to the place indicated, arriving just one hour after receiving the message. They found the wreck about two miles off shore and slowly drifting in. The storm had by this time moderated, and three fishermen's dories, manned by three men each, had gone out to her. She proved to be an abandoned schooner, the *Bay Queen*, of Cohasset, Massachusetts; her hull badly damaged, her mainmast gone, and her sails in tatters, the fluttering of which gave the appearance of people in the rigging. She came ashore the same evening, and soon broke up.

November 13.—The schooner *Belle*, of Scituate, Massachusetts, was disabled during a high wind, with heavy sea, off Tilden's Point, near Scituate. Station No. 3, Second District, not yet being equipped, the keeper took the boat No. 33 of the Massachusetts Humane Society, which was near, with the life-saving crew and five others, and went out to the *Belle*, boarded her, reefed her sails, slipped her chains, which her crew, disabled by fatigue, could not do, and took her, with the four persons on board (two of them passengers), safely into Scituate Harbor.

November 13.—At 7.30 p. m. the north patrol from Station No. 3, Fifth District, Delaware, discovered a vessel standing inshore. As she came in he waved his light, and seeing no notice taken of it, then burned a Coston signal, which was answered, and the vessel immediately tacked off shore. She was in imminent peril, being so near shore that her people were heard talking.

November 13.—At 7 o'clock a. m. the keeper of Station No. 11, Fifth District, Virginia, discovered a three-masted schooner lying about eight miles south of the station, with all sails set, but apparently becalmed. At 10.30 a. m. the captain came to the station in his boat, and reported that his vessel, the *James Ford*, of Fall River, Massachusetts, was ashore, and that he wished to telegraph to Norfolk for assistance. The keeper at once launched the surf-boat and went to the relief of the vessel, which was laden with coal, and bound from Baltimore to Hoboken, New Jersey, and had a crew of nine men. As nothing could be done for the immediate relief of the vessel, and she was making water rapidly, her crew were taken in the surf-boat, and their luggage in tow in the schooner's boat, to shore, and kept at the station three days. On the 14th it was seen from the station tower that the vessel had floated during the night, and struck again ten miles west-northwest of the station. At 7 a. m. the life-saving crew launched their boat and went out to he . They made sail and endeavored to get her off, without success, and returned to the station in the afternoon. Subsequently, however, the worked her off, and she was towed into port by a tug.

November 15.—An intoxicated man attempting to cross the river in a skiff at Charlotte, New York, capsized his boat and fell overboard. A surfman of Station No. 4, Ninth District, Lake Ontario, saw the accident, which occurred about eight hundred yards from the station, went to his assistance, and rescued him.

November 16.—The British schooner *Gipsey*, of St. John, New Brunswick, bound from Salem, Massachusetts, to her hailing port, with a crew of five men, while at anchor during a squall was run into by an unknown

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schooner at about 10 p.m. Her bowsprit and both masts were carried away, and her windlass broken. She lay so that she could not be seen by the patrol of the station (No. 5, First District, Maine) until daylight. At 6 a. m. the boat was launched and manned, and the life-saving crew went to the assistance of the disabled vessel. The mate, who was on deck, gladly accepted their services, and they at once commenced clearing away the wreck, but the master of the vessel, who was below, learning that strangers were on board, came up and ordered them not to proceed. He asserted that he knew nothing of the Life-Saving Service, and was evidently fearful that a snare had been set to obtain salvage on the vessel. The representations of the keeper failed to convince him, and he refused to allow anything to be done until he could communicate with his owners. The keeper gave him all information possible as to the best method of communicating with the owners, and returned to the station. The vessel was subsequently towed away.

November 16.—The sloop *Mist*, of Cape May, New Jersey, from Philadelphia to Mayville, New Jersey, with a cargo of lumber and apples, and a crew of three men, struck on the north bar of Hereford Inlet and partly filled with water. The vessel was discovered almost immediately by the crew of Station No. 36, Fourth District, New Jersey, and the surf-boat was launched. At 1 p. m. they boarded her, found her leaking badly, and at once manned the pumps and kept her free until flood-tide, when they worked her off and took her into the inlet, remaining aboard of her all night and working at the pumps. Without the aid of the life-saving crew she would have been a total loss.

November 16.—The schooner *Hattie Howard*, of Oswego, New York, with a cargo of lumber and a crew of seven men, broached to in getting into harbor at Oswego, and was driven ashore against the west pier, one hundred and fifty feet from the light-house. The crew of Station No. 3, Ninth District, Lake Ontario, immediately launched the surf-boat and went to the scene of disaster. They found the vessel lying about fifty feet from the pier, rolling heavily, and fast becoming a total wreck. They threw a heaving line aboard of her, which was passed around the main boom and back again to shore, thus converting it into a whip-line, by means of which the crew were safely landed. The vessel was lost.

November 17.—The schooner *Sasco*, of Buffalo, N. Y., bound from Erie, Pennsylvania, in trying to make the harbor at Fairport, Ohio, during a blinding storm of rain and sleet, and northeast gale, missed the piers and was driven ashore to westward of the harbor, and about half a mile from Station No. 7, Ninth District, Lake Erie. The disaster occurred at ten o'clock at night. The keeper and crew of the station placed the surf-boat on its wagon and dragged it to the beach opposite the wreck, launched it, and pulled off through the raging surf to the wreck. Only one of the schooner's six men could be persuaded to venture his life in the turbulent sea. When he was safely landed, two men were left to watch on the beach, and the keeper and remainder of the crew returned to the station for the mortar and beach apparatus. On their way back to the wreck with the apparatus they were met by the watch, who reported that the vessel had swung around over the outer bar, driven close in to the beach broadside on, and that the crew were calling for help. They immediately lightened the cart of gun and shot and ran at full speed over logs and sand through the darkness with the remainder of the apparatus to the wreck. A heaving-line was thrown to the vessel, the whip-line hauled off, the hawser rigged and set up, and the five frightened men were brought safely to shore in the breeches-buoy. They were accommodated at the station with beds and food, and the next day measures were taken to

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obtain for them free passes by railway to Erie, as they were destitute of money.

November 18.—At 7 a. m., the keeper of Station No. 1, Second District, Massachusetts, discovered from the lookout on the top of the station a schooner on the point of Plum Island. Accompanied by two surfmen, he went at once to the scene of disaster, arriving at 9.30 a. m. The vessel proved to be the schooner *Greyhound*, of Newburyport, Massachusetts, out on a fishing cruise. She was lying with her stern high and dry on the point shoal, and her bow in deep water. The captain and two of the crew were on shore, the remaining five being shut up in her cabin. The keeper, on consultation with the captain, sent one of the surfmen back to the station for the remainder of the life-saving crew, the hope being with this re-enforcement, as the tide rose, to float the schooner into deep water. The men arrived at 12 m., and the tide being at half-flood, the *Greyhound's* mainsail was set on the starboard side to force her ahead off the shoal, and with help of the tide, which was setting strong against her port or inshore quarter, to swing her stern off the shore. They had succeeded in this way in forging her ahead about half her length, and expected that at flood tide she would surely float, when suddenly, just before high tide, the wind canted to northeast, blowing a heavy gale. The mainsail had to be taken in and stowed with all possible speed. The sea ran high, breaking over her, filling the six dories on her deck, washing adrift whatever was movable, and rendering stay on deck not only uncomfortable, but unsafe. The life-saving crew now went ashore and hauled in the dories and fishing-gear, landing them high up out of the way of the surf, and returned and assisted in double-reefing the foresail, and setting it with the sheet hauled aft to leeward to keep the vessel from listing off shore. There now remained nothing to be done for the present, and the men being wet, tired, and exhausted with hunger—having fasted since early morning—the life-saving crew, with four of the *Greyhound's* men, returned to the station, where they arrived at 5 p. m. After dinner the sailors returned to the schooner, and at 6 o'clock two surfmen started for the wreck, arriving at eight. She was listed off shore and no person to be seen. One of the life-saving men boarded her over the bow, and found her closed up, with no one on board. The morning watch found her in deep water with only half her masts above the surface. She was a total loss.

November 18.—The schooner *Memento*, of Yarmouth, Massachusetts, bound from Perth Amboy, New Jersey, to New Bedford, Massachusetts, with a crew of four men, was seen making signals of distress by the patrolmen of Station No. 3, Third District, Rhode Island, at 8 p. m., as they were returning from their watch. They burned a Coston light in answer to the signals, and as soon as possible mustered the life-saving crew and went out to the schooner in the surf-boat. Falling snow, a fresh wind, and chop sea made approach to the vessel difficult, and when they reached her she was riding at anchor, leaking badly, sails blown away, her small boat stove in so as to be useless. She had been making water all day, and the captain had attempted to reach Stonington Harbor, but found himself going on the reef at Watch Hill, and let go the anchors just in time to swing clear of the rocks. The crew of No. 3 took the four men ashore and gave them supper, lodging, and breakfast. The next morning the life-saving crew again boarded the *Memento*, assisted in pumping her out, the water being up to the cabin floor, and then remained by her until she was taken in charge by a tug to be towed away.

November 19.—At eleven o'clock at night the patrol of Station No. 8,

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Ninth District, Lake Erie, reported that a large three-masted schooner was dragging on the old Lake Shore Depot pier. The river and pier being between the station and point of disaster, and the railroad bridge being swung away so that the life-saving crew could not cross by it, they launched their boat, crossed the river, and carried the boat over the pier abreast of the schooner. They now found it impossible, on account of obstructions, to launch the boat. They therefore pulled back to the station, got out the beach apparatus, and sent word to the bridge-keeper that they wished to cross. When they were ready to start, the bridge was still swung away, and they had to drag the hand-cart and apparatus a mile around to the Lake Shore and Michigan Southern Railroad yard. To get across this they had to clear away obstructions, and finally, before they could get a favorable place to plant the gun, were obliged to move four sleeping-cars with tackles. When this task was accomplished, and the mortar placed, one shot took the line over the vessel, and the whip-line and hawser were sent aboard. One man had been landed by this means, when the schooner, which proved to be the *Sumatra*, of Cleveland, Ohio, bound from Marquette to Cleveland, Ohio, with a cargo of iron ore and a crew of nine men, parted her chains and drove stern on into the old pier and depot, smashing and staving in the pile dock and carrying such swift destruction before it that it was with great difficulty that the Lyle gun was saved, which was only done by the presence of mind of one of the men, who seized the piece when the dock began to go and hauled it away up the pier. A number of the appurtenances of the gun were lost in the sudden destruction of the dock, and several sleeping-cars were only saved from going into the lake by the men seizing and hauling them away up the pier. The hawser, meanwhile, remained fast to the *Sumatra*, and by means of this to steady themselves by, and the whip-line to draw them in, the six remaining men were safely landed, the rescue being effected in the most rugged and ugly place to work in conceivable, and under strangely untoward circumstances.

November 19.—The scow *C. Rich*, of Detroit, Michigan, bound, with a crew of three men, from Sandusky, Ohio, to Port Huron, Michigan, broke her chains during a heavy northwest gale and snow-storm, and was discovered by the patrol of Station No. 9, Ninth District, Lake Erie, at midnight, fast drifting on to the shore. The life-saving crew went immediately to her assistance. The gale was so strong that she beached before anything could be done to save her; but, by means of a line thrown from the vessel and made fast on shore, the crew were landed in safety. They were taken to the station, made comfortable, and sheltered for the night.

November 19.—Just after the rescue of the men from the scow *C. Rich*, the schooner *New Hampshire*, of Detroit, Michigan, bound from Sandusky, Ohio, to Detroit, with a crew of four men, was seen coming ashore, and her captain, who attempted to land in a small boat, was in imminent danger of being drowned, and was only saved by three of the crew of No. 9 wading into the breakers and taking him out of the boat by main strength to the land. The boat was also dragged ashore by the crew. A line was then thrown from the schooner and made fast on shore by the life-saving men, by which means the sailors were helped ashore.

November 19.—Before the crew of Station No. 9 had left the beach, the scow *J. A. Saunders*, of Port Huron, Michigan, bound from Huron, Ohio, to Port Huron, with four men on board, dragged her anchor and was stranded near the other two vessels, driving high up on the beach.

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The life-saving crew assisted in grappling for and recovering her anchor and placing it to hold her until the water should rise so that her crew could heave her off.

November 19.—The schooner *Maple Leaf*, of Milwaukee, Wisconsin, from White Hall, Michigan, to Milwaukee, with a cargo of lumber and a crew of four men, encountered a heavy southwest storm and struck on the sunken cribs of the north pier at Grand Haven, Michigan. The accident occurred at midnight, and was seen by the patrol of Station No. 9, Eleventh District. A line was thrown from the vessel to the pier, and after securing it the patrol hastened to give the alarm at the station. The keeper and crew went immediately to the wreck, which they found already full of water, lying with her jib-boom over the pier, and the sea, which was very boisterous, breaking over her aft. The keeper and two of his men boarded her by the jib-boom, and assisted the crew to secure the sails and rigging, and also to gather their personal effects and get them ashore. This done, they took them to the station and made them comfortable for the night. The life-saving crew would have been able to save the schooner, but the schooner *J. A. Holmes*, which stranded at the same place a few hours later, unfortunately ran into her, dismasting and almost cutting her in two, so that she became a total wreck.

November 19.—Three hours later (3 o'clock a. m.), while the keeper of the station (No. 9) was still on the pier after the disaster to the *Maple Leaf*, endeavoring to take measures for saving her, the schooner *J. A. Holmes*, of Chicago, Illinois, as above stated, crashed into her. As both vessels were being pounded to pieces by the furious collisions, the keeper directed the captain of the *J. A. Holmes* to scuttle her, which was done. The two vessels now lay so as to form a breakwater, and rendered it practicable for the keeper to get a boat to the *J. A. Holmes*, and rescue the six men on board, who were taken to the station and housed with those before rescued.

November 19.—The keeper and crew of Station No. 9 had their hands full on this night of storm and disaster. An hour after the stranding of the *J. A. Holmes* (4 o'clock a. m.), the schooner *Margaret Dall*, of Chicago, came ashore, and stranded about two hundred feet north of the north pier, where she was at once scuttled to prevent her from pounding to pieces. The life-saving crew made two trips to her in a boat, and brought off her crew of seven persons and their effects, and took them to the station, where they remained until 8 a. m.

November 19.—Almost at the same moment that the *Margaret Dall* stranded, the barge *C. O. D.*, of Grand Haven, which had been cut away from her tug on account of the violence of the wind and sea, was flung high upon the strand about two hundred feet from the *Margaret Dall*. The life-saving crew, after landing the men from the latter, went to the *C. O. D.*, but her crew refused to leave her.

November 19.—While the crew of No. 9 were still on duty at the scene of these disasters, the steam-tug *General H. E. Paine*, of Grand Haven, Mich., struck on the bar and began to leak. She went about a hundred feet farther, and struck again on the end of the north pier and sank immediately. The life-saving crew went to her at once with the boat, and in two trips brought off her two passengers and crew of thirteen persons. In thirty minutes from the time the vessel struck the pier she was in pieces and out of sight.

November 19.—In the mean time, at 7.30 in the morning, the schoone *Mystic*, of Grand Haven, Mich., from Racine, Wisconsin, with a crew of three men, when near the mouth of Grand Haven Harbor, broke her tiller, drifted to the lee shore, and stranded high and dry. The crew of

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No. 9 went to her, but found that her men had walked ashore. Nothing was required to be done in the case of this vessel until December 10 following (which date see).

November 19.—At seven o'clock in the evening the crew of Station No. 11, Eleventh District, observed a schooner making for the harbor of Chicago. The wind at the time was blowing a heavy gale, and when the vessel was at the entrance of the harbor headed her off and threw her against the breakwater. The surf-boat was immediately launched and taken to the scene of disaster. On arriving, it was found that the schooner was the *Clara Parker*, of Chicago, and that her crew had jumped to the breakwater and made her fast with lines. The keeper having offered his assistance, the captain begged him to return to Chicago and procure a tug. The life-saving crew at once set out on the errand, but the wind blew with such fearful force that they could not row against it, and they were obliged to walk back along the breakwater, towing the boat. In so doing a hole was stove in the boat by a sunken crib. The keeper again manned her, took to the oars, setting one man to bailing, and at length reached the station, the boat being then half filled with water, and it and the men covered thickly with ice. The effort to get a tug was unavailing, none being willing to venture out. As it was known that, having lost her anchors, and as the ice was increasing, the schooner could not long remain lashed to the breakwater, but must be driven on the beach, a patrol of three men was kept on the watch all night. At 2.30 a. m. of the 20th, the vessel had drifted to a point four miles from the station, and fetched up at a pier, where she lay easy, and in such a position that her crew could walk off without help. Ten days later, on November 29, the crew of the station launched their surf-boat, went to her, and ran a line from her to a tug, which was to haul her off, the heavy sea having swamped her yawl-boat when attempting to carry the line. The surf-boat, by watching the lulls and taking advantage of opportunity, succeeded in getting between the heavy breakers and taking the line aboard.

November 20.—The schooner *L. V. Ostrum*, of Patchogue, Long Island, with a crew of three men, left Fire Island, in ballast, for New York. At Rockaway Shoals she encountered a gale from the northwest, with snow-squalls, and was obliged to scud. When abreast of the inlet, south of Station No. 31, Third District, Long Island, the captain attempted to get inside for a harbor, but the vessel misstayed, the jib blew out, and she went ashore about half a mile south of the station. The keeper saw the disaster, ran down the beach to her, and climbed aboard to see what assistance could be rendered. The captain asked the loan of a line and that the keeper would run it for him. This request was complied with, the keeper returning to the station for a 2½-inch hauling-line, which he took to the vessel, but was prevented by the severity of the storm from running out the anchor. On the 21st the life-saving crew laid cables and anchors, and on the 22d, after obtaining help from the adjacent stations, as the one crew was insufficient to attend to both the *Ostrum* and the *Hector*, which had stranded in the mean time, the crew of No. 32 was placed on board the *Ostrum*, while those of Nos. 30 and 31 went to the *Hector*. The crew of No. 32 succeeded in hauling off the *Ostrum* with the lines and anchors laid by No. 31 the previous day.

November 20.—The schooner *Mary Chilton*, of New York, bound from New York to Ciudad, South America, with a general cargo, and a crew of five men, anchored during a heavy northwest gale under lee of Staten Island, and dragging her anchor went ashore on West Beach, half a mile south of the main light at Sandy Hook. She was discovered by

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the patrol of Station No. 1, Fourth District, New Jersey, at 8.30 p. m., who went at once to ascertain her condition. He found that the crew had come on shore in their own boat, it being nearly full of water. He assisted them in getting the few things they had brought ashore up the bluff out of the wash of the sea, and then conducted them to the station, where, as they were wet, exhausted, and suffering with cold, they were given restoratives, and fed and lodged for two days, at the end of which time the schooner was pulled off by the Coast Wrecking Company, and taken to New York, her crew accompanying.

November 20.—At midnight the sloop *J. G. W. Havens*, of Kettle Creek, New Jersey, dragged her anchors during a heavy northwest gale, and was driven ashore near Station No. 23, Fourth District, New Jersey, where she lay beaten by the sea, which constantly swept over her. The two men who sailed her leaped ashore and went to the station, where they were fed and lodged. The following day the life-saving crew worked the sloop off the beach, and she proceeded on her way without material damage.

November 20.—At 3 a. m. the patrol of Station No. 14, Sixth District, North Carolina, saw a schooner in the breakers near shore, a short way beyond the patrol beat. He at once burned his Coston signal, which was answered by a fog-horn from the schooner, which lowered her mainsail and headed off.

November 20.—The schooner *Wacousta*, of Montreal, Canada, bound from Buckhorn, Canada, to Buffalo, New York, with a cargo of stave-bolts, and a crew of eight men, became unmanageable and water-logged during a gale of wind, and sunk at 8 o'clock p. m., about a quarter of a mile east of Station No. 6, Ninth District, Lake Erie. The occurrence was seen from the station, the surf-boat immediately launched, and in twenty minutes after she struck, the schooner's crew were being taken into the surf-boat. They were in a very exhausted condition, from forty-eight hours' working at the pumps, and were taken to the station and cared for by the keeper's wife, while the life-saving crew went with their boat to Erie for a tug to haul the schooner off. The lives of all the crew, the schooner, and the greater portion of her cargo were saved.

November 20.—On Tuesday, November 18, the three masted schooner *Mercury*, of Grand Haven, Mich., laden with 251,000 feet of pine planking, left the harbor of Ludington, Michigan, at noon, bound for Chicago. She was commanded by Capt. Louis Sterling, and had a crew of seven men, including a man cook. Off Little Point au Sauble, the wind shifted to the southwest and blew a gale, compelling the vessel to sail off her course and make for the Manitous. By ten o'clock in the forenoon of Wednesday, November 19, she reached Point Betsey, and by noon the wind hauled to the northwest, blowing with fearful violence, and accompanied by a blinding snow-storm, and the vessel lost a part of her canvas, her yawl-boat, a portion of her cargo, shipped several heavy seas, and became water-logged. Her captain handled her with the foresail as well as possible, but could not prevent her from often falling into the trough of the sea and taking in floods of water. An attempt to run her under Grand Point au Sauble failed, and finally, about nine o'clock on Thursday morning, November 20, she drifted ashore two miles south of Pentwater. Her condition was then dreadful. She was covered with ice, already beginning to go to pieces, and the furious seas so constantly broke over her that her crew were unable to keep on deck, and took refuge in the cabin. Here the water was over knee-deep, and the wretched men, in momentary expectation of their doom and unable to make any effort to reach the shore, were in danger of perishing from

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the cold before the breaking up of the vessel. They finally succeeded in getting the stove up on the cabin table and lighting a fire in it, up around which they huddled, thereby keeping themselves from freezing. They were almost famished, and their condition could hardly have been more deplorable. Several futile attempts for their rescue were meanwhile made by persons residing near Pentwater, the final effort being the launch of a yawl by three volunteers, which resulted in the boat being capsized in the breakers, and one of the noble fellows, a man named Hawkins, being drowned. The nearest life-boat station was at Ludington, nearly fifteen miles distant, but the wires between that place and Pentwater were down, and it was not until seven o'clock that evening that a dispatch was got to Capt. Joshua J. Brown, the keeper, that the *Mercury* was ashore and her crew perishing.

The station (No. 7, Ludington, Michigan, Eleventh District) was then in process of erection, and not, of course, ready for service. No crew had been enrolled, but fortunately a portion of the appliances, including the life-boat, had been sent on and were in store. The scene of the wreck was far beyond the sphere of the operations of the station, but the keeper, without a moment's hesitation, ran to collect a crew. It went like fire through the community that Captain Sterling had many times faced danger on Lake Michigan to save the lives of others, and there was a general desire that no effort should be spared to rescue him and his men. Nevertheless, the sea and the storm were so terrible that when it became known that the services of a tug were necessary to tow out the life-boat, as without such aid the boat could not have got even out of the harbor, the regular tugs all refused to go, their owners knowing that the enterprise involved the probable destruction of their vessels. Finally the keeper applied to Captain Smith, of the little steamer *Magnet*, and this gallant man instantly accepted the hazard, started for the steamer, and in half an hour had her fires up and steam on.

Keeper Brown meanwhile had to rush up town and find the owner of the warehouse, where the oars and other appliances were under lock and key, then hurry to the boom which temporarily held the self-righting and self-bailing life-boat, and get the latter equipped for service. These preparations, including the muster of a crew, though made in desperate haste, consumed time, but by nine o'clock all was accomplished, and the little steamer, with the life-boat in tow behind her, ploughed out into the darkness on her perilous voyage. The dangers and the terrors of this expedition, like the daring of the men who undertook it, are unreportable. The official statements show that in assuming the task of convoy, Captain Smith took into account the probable foundering of his steamer, and only ran the risk on the consideration that he would have a life-boat in tow, which, in the event of his vessel being overwhelmed, might give him and his men a chance for their lives. The distance from Ludington piers to the wreck was, as previously stated, nearly fifteen miles, and all the way the sea flew incessantly over the steamer, and lashed her decks as she waded and staggered on her course, each sea making her captain question whether she would stand the next. Those who peered across her stern through the darkness and spray could only at times see the life-boat, which the seas appeared to cover entirely, and whose safety was only assured to the anxious gazers at intervals when she arose from the burying waters.

For five miles of the distance between Ludington and Pentwater the lake shore is composed of precipitous clay banks, against which in storms the surf directly beats, making landing or refuge alike impossible. If, by any accident, the tow-line had parted anywhere along this extent, the

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life-boat, which could hardly have been sufficiently controlled by her oars in such a storm, would undoubtedly have been hurled upon this inaccessable wall of clay and dashed to pieces, while all on board would as surely have perished. The steamer, however, survived the ordeal, weathering every danger, and after two terrible hours of her rough combat she arrived a mile to windward of the locality where the *Mercury* was supposed to be and let slip the life-boat.

The boat was at once pulled towards the land. Two large fires struggling in the wind on the shore disclosed, as they approached, the broken and ice-clad wreck. There was no sight nor sound of life on board as the life-saving crew rowed up under the little lee her stern afforded, and there was no response to their shouts and calls. After a few minutes' laborious efforts to hold the boat in contiguity to the wreck, which was stranded in ten feet of water, the heavy wind and sea, and the overmastering undertow, swept her away. The crew bent to their oars and soon brought the boat back under the lee of the stern, and renewed their hails. They were again carried from the wreck, and it was not until the fourth attempt that faint cries were heard responding to their halloos, and a few dark figures appeared on the deck. The men had been huddled together, half insensible, on their perch in the cabin, and had only now been aroused to the consciousness that other human beings were near them. The astounding sight of the life-boat alongside of them in the dead of the night and in the height of the storm seemed to put new life into their famished and half-frozen frames; the heaving-line cast by the life-saving crew was at once made fast to the mizzen rigging, and in a few minutes they had thrown their baggage into the boat. In their eagerness to follow, the first man missed the boat and fell overboard, but was fortunately caught by some of the life-boat men and dragged in. The transfer of others from the wreck then proceeded with more caution, and in a short time all were taken off without further accident, and the life-boat let go her line.

The saved men were pitiably weak, but the gale and the sea were so violent, and the difficulty and danger of the return trip to the steamer so great, that the keeper made every man who could pull a pound take hold of an oar, and after a hard row to windward of about a mile the life-boat reached the *Magnet*. An attempt was now made to get the rescued men on board the steamer, but owing to their exhausted condition and the fury of the sea it failed, and, to prevent them from freezing, the life-boat was headed for Pentwater, where it arrived together with the steamer a little after midnight. In the excitement and activity of the hour consumed in the direct rescue, the state of the men taken from the wreck was not fully apprehended, and it was not until the arrival at Pentwater that the keeper and his crew realized how nearly perished they were. The little help they gave at the oars had expended the feeble remnant of their strength, and upon landing they had to be lifted into the wagons which conveyed them to a neighboring hotel, where they were soon made as comfortable as their miserable condition permitted. They were all badly frozen, and it is plain could not have survived their sufferings much beyond the hour at which the life-boat came to their rescue.

The life-boat, upon examination, was found to have passed through the ordeal of the daring enterprise with some damage—not, however, material.

November 21.—At 10.45 p. m. the schooner *Hector*, of Boston, bound from Philadelphia to Boston with coal and a crew of eight men, went on to the outer point of Jones' Inlet Bar, and was wrecked. At eleven

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o'clock the patrol reported her to Station No. 30, Third District, Long Island, and at the same time signal was made for assistance from Station No. 31. At 11.45 the crew of No. 30, and ten minutes later that of No. 31, were alongside the *Hector*, and rendered all possible assistance in securing personal effects, sails, and other property, bringing them ashore in the schooner's yawl-boat and the surf-boat for safety, in the event that the schooner could not be gotten off. As Station No. 30 was undergoing repairs, the keeper of No. 31 took the captain and crew of the *Hector* to his station for the night, and the following day both crews returned to the wreck. All effort to relieve her proving unsuccessful, the surf-boat was loaded with whatever movables could be saved, and returned to the station. The vessel was a total loss.

November 21.—At 8 a. m. the crew of Station No. 2, Fifth District, Delaware, discovered the schooner *Enoch Turley* (pilot boat), of Philadelphia, about two miles off shore with union down. They launched the surf-boat, pulled out to her, and found her head-gear had been carried away and her tiller broken, which disabled her. The life-saving crew went to work immediately to repair the tiller, and with the assistance of another pilot-boat's crew put her in such order that she was able to sail to the breakwater that night.

November 22.—The *Shamrock*, of Madison Dock, Ohio, a small coasting schooner with but one man to sail her, became unmanageable during a high wind. Her master having taken in her canvas for a squall, could not make it again, and became frightened. When he neared Station No. 7, Ninth District, the life-saving crew saw that the vessel was in imminent danger, and launched the life-boat and went to the rescue. When they reached the schooner, an endeavor was made to get a line to her, in order to tow her into harbor, but the wind was so strong, and the sea so high, that the effort was unavailing. The life-saving crew then took her in hand, got canvas on her, and left one of their men to sail her into port, the surf-boat keeping close by, to be ready in case of accident.

November 23.—About nine o'clock in the morning the three-masted schooner *Carlingford*, of Huron, Ohio, laden with lumber, and bound, with a crew of eight men and a woman (the cook), from Au Sable to Tonawanda, was being towed into Buffalo by a tug, when a heavy squall struck them nearly opposite the new breakwater, causing the tow-line to part, and the schooner drifted onto Horse-Shoe Reef. The accident took place during a southwest snow-storm, with a very heavy sea. The schooner's signal of distress was immediately seen at Station No. 5, Ninth District, Lake Erie, which had recently been supplied for experimental trial with the new self-righting surf-boat, devised by Superintendent Dobbins.

This boat was at once launched, and soon gave notable proof of her self-righting quality. In crossing the reef, where the surf was very heavy and a cross current prevailed, she was struck by a tremendous breaker, broached to, capsized, and instantly came right side up with all her crew in her, save one man who was thrown out, but quickly regained his position. The surf-boat was at once brought head to, dropped down under the lee of the wreck, where she was bailed out, and then took off six men and the woman cook (the captain and mate preferring to stay by the wreck), with whom she gained the shore by noon. The boat was somewhat stove by her encounter with the breaker. At four o'clock in the afternoon the signal of distress was again seen hoisted on the wreck, and the life-saving crew pulled out and brought off the captain and mate. The rescued people were all supplied with supper and beds and made comfortable at the station.

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November 24.—At 1 a. m. the patrol from Station No. 7, Fifth District, Virginia, discovered a small schooner ashore on Fishing Point, three-quarters of a mile south of the station, and reported the fact to the keeper as quickly as possible. From the report of the patrolman the keeper concluded the better way to assist the vessel would be to take his crew and go to her empty-handed with the view of floating her off on the tide, which was at about its highest stage, the vessel being well up toward the shore. He accordingly started with his men, and reaching the vessel, found her to be the schooner-rigged boat *Ellie*, of Chincoteague, Virginia, bound for Indian River, Delaware, with three persons on board. The men rushed into the breakers, and with great exertion succeeded in shoving her afloat and taking her to a safe anchorage. The keeper took the sailors to the station, sheltered them, and supplied them with provisions, and afterwards started them upon their journey. But for the prompt action of the keeper and crew of the station the boat would have been lost, and the crew probably have perished in the bitter cold.

November 24.—At 4.30 p. m. the schooner *Curlew*, of Port Huron, Michigan, on her way from Port Huron to Alcona, Michigan, in a heavy sea and strong wind, unshipped her rudder, broke her mainmast, and, her anchors not being heavy enough to hold her, stranded four miles north of Station No. 5, Tenth District, Lake Huron. She was discovered by a station patrolman, who took off his coat, waded into the water and ice up to his waist and caught a heaving line from the vessel, which he took ashore and made fast, the other end being secured to a mast of the schooner. He then helped her crew (five men) to slide down the rope to the land.

November 24.—At eight o'clock a. m. the propeller *City of New York*, of Grand Haven, Michigan, bound from Milwaukee, Wisconsin, to Ludington, Michigan, struck on a bar outside of Ludington Harbor, during a heavy storm, breaking her shoe, disabling her wheel, and bursting her steam-pipe. The keeper of Station No. 7, Eleventh District, Lake Michigan, was on the pier watching for occasion of service, as is his custom in stormy weather, and the moment the vessel struck he caught a heaving-line thrown from her, drew in her hawser and made it fast to the pier, thus holding her bow up and keeping her from sinking until she got within eight feet of the pier, where she went down, but so near the dock that her people, twenty-one persons, were enabled to get on shore without assistance. There being a heavy current to the north, this timely help of the keeper prevented the steamer from going to leeward, where she must have gone to pieces, doubtless with heavy loss of life.

The captain of the steamer wrote a letter stating that the prompt assistance rendered saved the vessel and the lives of those on board.

November 25.—At 11.30 p. m. the patrol on the south beat from Station No. 3, Fifth District, Delaware, discovered a small vessel ashore on the south side of the inlet, and at once started for the station to give the alarm. The surf-boat was launched at 12.20 a. m. and after about an hour's pull reached the stranded vessel, which proved to be the schooner *Ellie* which had been assisted the day before by the crew of Station No. 7. The keeper set to work with his crew immediately to release the vessel. An anchor was run, and the cable hove well taut, and high water awaited. The tide was full at 5 a. m., at which time the vessel was hove off by the life-saving crew, and taken to a safe anchorage in Indian River.

November 25.—The schooner *Charles J. Smith*, of South Haven, Mich-

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igan, laden with lumber and having a crew of five men, went ashore a mile south of Station No. 6 (Grand Point Au Sable, Michigan,) Eleventh District, Lake Michigan. The life-saving crew went at once in the surf-boat to their assistance and took out two anchors to heave off the vessel. They also sent a man to Ludington for a tug, and on its arrival ran a hawser from it to the schooner, and helped throw overboard a portion of her cargo to lighten her. They then hove up the anchors, set her sails, and the vessel was got afloat and went on her way.

November 26.—The Norwegian bark *Jason*, bound from Swansea, Wales, to Baltimore, with a cargo of railroad iron and a crew of twelve men, stranded on the outer bar about one mile and a half southeast of Station No. 9, Fifth District, Virginia, and was seen as she came on by the patrolman from the station, who endeavored to warn her off by swinging his lantern and burning a Coston light, but without success. The patrolman then hurried to the station and reported the disaster. The vessel was discovered at about 5 a. m., the wind at the time being moderate from northeast and a medium surf running. The surf-boat was launched immediately and the vessel boarded by 6 o'clock. The ship was working shoreward with every sea, and pounding heavily. The keeper at once set to work with his crew, assisted by that of Station No. 10, which had meanwhile arrived, to run anchors to hold her off, and there being nothing further that they could do then, left the vessel at 2 p. m. They boarded her again on the same day and found the Baker Wrecking Company in charge. On the 27th the vessel was again boarded by the life-saving crew, who again found they could be of no service. The keeper told the captain of the ship to set a signal if in need of assistance, and left. On the 28th the wind fresh from southeast and a storm threatening, a signal was discovered set on board the bark. The surf-boat was launched at once, and after a hard pull of an hour and a half the vessel was reached, which was found to be pounding very heavily, while the surf was growing and breaking a long distance off-shore. The captain's son was taken ashore, and all the baggage, the captain and crew remaining on board. The ship was working inshore constantly and now lay within 300 or 400 yards of the beach. From this time until the 2d of December the life-saving crew made frequent visits to the wreck, assisting in running anchors, &c. On that night the sea had increased, and the keeper caused a strict watch to be kept over the vessel. Before morning the wrecking crew found it necessary to cut her lines and let her work inshore. At 2 p. m. on the 3d a signal was again made from the ship. The life-saving crew at once boarded her. She had now worked in to within about 100 yards of the beach. The necessary lines were run from ship to shore, and the breeches-buoy apparatus set up so that the people on board could come off, if they should find it necessary. That night the situation became alarming, and they all came ashore and were taken to the station, where they were sheltered for several days. The wreckers continued to work on the vessel, day after day, until January 8th, when she broke in two and was abandoned, becoming a total loss.

November 29.—At 6 p. m. the sloop *Minnie B.*, of Duxbury, Massachusetts, which had been loading kelp from the outside beach, commenced to beat up the channel for Duxbury. The wind which had been southwest, and moderate during the afternoon, hauled to west-northwest and blew so heavily that her mainsail was double-reefed. The keeper and crew of Station No. 4, Second District, Massachusetts, had been watching her through the spy-glass in anticipation of her needing assistance, and seeing her at length running inshore and apparently

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unmanageable, they launched the station dory at 8 p. m., and leaving a watch with a lantern on the beach to guide them in case they should have to run the sloop ashore, went out to her. They found two men on board. Two large dories in tow of her had filled with water. The captain stated that the sloop would not tack. He had let go his heaviest anchor, and had lost the stock. He then let out the small anchor by the hawser, which had nearly chafed off, when the life-saving crew reached the vessel. On their arrival the master of the sloop gave her into the keeper's charge, who at once had the dories bailed out, and one of them towed ashore and left there. He then made a new stock for the anchor, shook a reef out of the mainsail, took in the anchors, and beat the vessel past Saquish Head, whence she could lay her course for Duxbury. Without his timely help the sloop would have been lost, for in two hours after the wind had increased to a gale. The service occupied two hours.

November 30.—The schooner *Lizzie*, of Beverly, Massachussets, broke from her moorings at Beverly, and went ashore on Long Ledge, a mile north of Station No. 3, Scituate, Massachusetts. Second District. One of the life-saving crew reported the matter to the keeper of the station, who at once went with his crew to the place of disaster. They found that the schooner, which was a small vessel, had run on the ledge, beaten over, and sunk. The keeper with two of his crew went out to her in a dory carrying a line which they made fast to her, and then returned with the other end to the shore. With the assistance of about forty persons who had arrived she was then hauled into shoaler water, and when the tide went out was relieved of her ballast, filled with empty casks to float her, and finally towed by the life-saving crew into Scituate Harbor.

November 30.—At 5 a. m. the schooner *M. and E. Henderson* of Philadelphia, bound from Bull River, South Carolina, for Baltimore, laden with phosphate rock, and having a crew of seven men, struck on the bar at the north point of New Inlet, North Carolina, and went to pieces within an hour. Three of her crew were saved. (See page 19.)

November 30.—The Schooner *Picton*, of Picton, Canada, bound from that place to Oswego, New York, with a cargo of barley, and having a crew of six men, was in danger of being cast ashore about eight miles from the latter port, during a heavy gale and snow-storm, and anchored about a mile from the beach at 6 p. m. The following day at 8 a. m. a report of her condition reached Station No. 3, Ninth District, Lake Ontario. The surf-boat was immediately launched and towed by a tug to the distressed schooner. She was found iced up heavily, with a distress signal flying. The life-saving crew assisted in heaving up her anchor and saw her towed safely into port.

December 1.—At 4.30 p. m. the crew of Station No. 14, Second District, Massachusetts, perceived a schooner which had struck on Shovelful Shoal, five miles southwest of the station, exhibiting signals of distress. Owing to a strong east tide on the sea side, and exceeding roughness on the bay side, the keeper and his crew were obliged to walk to the end of the Point, a distance of four miles. Here they launched a fisherman's boat, and arrived at the schooner, a mile distant, at 7 p. m. She proved to be the schooner *Carrie H. Spofford*, of Deer Isle, Maine, bound from Calais, Maine, to Providence, Rhode Island, with lumber. The keeper took the captain and the three men who composed his crew ashore, landing them at 8 p. m. They were given shelter at the lighthouse and the dwellings of fishermen, and the life-saving crew walked back to the station for the night. At seven o'clock the next morning they

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returned to the vessel in the station boat, and found the captain of the vessel, his crew, and three fishermen already on board of her. As there was a favorable prospect of getting the vessel off at high tide, the keeper left two of his crew on board to assist a crew of wreckers in throwing over her deck load, and at high tide she was relieved.

December 3.—At 11 p. m. the patrol of Station No. 1, Second District, Massachusetts, met four men coming down the beach from the north who informed them that they belonged to the fishing schooner *M. A. Baston*, of Gloucester, Massachusetts, and that she was ashore on the south breakers, at Plum Island. They stated that they had come ashore in a dory, leaving the captain and two men on board. The patrol re-returned immediately to the station, reporting there at 11.45 p. m. The surf-boat was at once taken to the beach, but the wind blowing strong from the northeast, and the sea running high the attempt to launch her proved unsuccessful, the surf breaking against her, throwing her broadside on the beach and filling her with water nearly to the thwarts. Having speedily bailed her out, the life-saving crew placed the boat on her truck and drew it across the island to the river where they launched her and pulled out round the island to the light-house, arriving at 2 p. m. At the light-keeper's house they found from one of the crew, who was sheltered there, where the vessel lay, and that to the best of his knowledge the captain and two men were still on board. The life-saving crew went out to the wreck in the boat and hailed several times to arouse whoever might be on board. Getting no answer they pulled up to the bow of the vessel, and one of the surfmen climbed up the bow-sprit but could get no farther, as the sea completely washed her from stern to stem, and she was full of water. Satisfied that no one alive was on board, the life-saving crew rowed round the point, landed, and patrolled the beach near the wreck until the fog lifted at 4 a. m. when they discovered a schooner at anchor in the river. They went alongside of her and inquired if any persons had been seen to pass in boats on the beach, and were informed that the captain and two men had been on board their craft during the night, but had left in their dory for Newburyport. Having spent the night in faithful though fruitless endeavor, the life-saving crew returned to the station at 5.45 a. m., thoroughly wet and cold.

December 6.—The schooner *Willie*, of Rockland, Maine, with a cargo of groceries and live-stock, bound from Rockland to Matinicus Island, stranded on Lark Ledges, near Ash Point. She was hidden from Station No. 5, First District, Maine, by intervening islands, but was discovered by one of the surfmen who was going to the mainland for provisions. He reported her at once, and the boat was launched and manned, and in an hour's time was alongside of her. Her crew of four men had left her about half an hour previously, and she was lying nearly on her beam ends, side to the sea and wind, and striking heavily on the rocks. The life-saving men boarded her, put on and barred down her hatches, ran out an anchor and line, and hove her round stern to the wind and sea. This having been done the vessel righted and lay easily on the rocks and when the tide rose the life-saving men hove her off. Her crew then returning, the life-saving crew helped to get her under way and beat her into Seal Harbor, where they left her.

December 7.—A patrolman of Station No. 1, First District, Maine, saw the schooner, *Miniola*, of Bear River, Nova Scotia, loaded with wood, break from her moorings in Eastport Bay, during a severe storm, and drift helplessly onto the Eastern Shoal. He immediately reported at the station, and the keeper procured a yoke of oxen to haul the boat across

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the beach, launched it, and with his crew went out to the schooner. He found her rolling heavily, leaking badly, and her crew of six men all working at the pumps. The life-saving crew put sail on the vessel to steady her, and then assisted at the pumps. In six hours, during which time the pumps were worked constantly, the tide rose so that the vessel beat over the shoal, though with four feet of water in her hold. The life-saving crew then ran her to Lubec and put her on the beach for examination and repairs.

December 10.—At about half-past eleven o'clock at night two men attempted to cross the river at Charlotte, Lake Ontario, in a skiff, and one of them, while changing position with the other, fell overboard, at the same time tipping the boat and causing it to partly fill with water. The man remaining in the boat was unable to assist the man in the water or to row the boat ashore, and both called loudly for help. Their cries were heard by one of the surfmen of Station No. 4, Ninth District, who at once put out in a boat and brought both men to land. But for his aid, one of them at least would have been lost.

December 10.—The captain and crew of the schooner *Mystic*, three in number, were engaged in attempting to heave her off the beach at Grand Haven, upon which she had been thrown on November 19, previous, as heretofore related. During the operation a violent storm arose, floated the vessel, and swept her away over 150 feet to the outer bar, where she began to pound so heavily that the men on board had to scuttle her to prevent her being battered to pieces. Having now to take to the rigging, and being in danger of their lives, they showed signals of distress to the crew of Station No. 9, Eleventh District, who, finding it impossible, on account of the violence of the sea, to get the life-boat out of the harbor, drew a smaller boat along the shore opposite the vessel, got out under her lee, and took off the three imperiled sailors.

December 11.—The night patrol of Station No. 1, Third District, Rhode Island, when between Gunning and Bass rocks, heard sounds of distress, and following them discovered, by the aid of his lantern, a man who had fallen into a stone hole about four feet deep, and so injured his knee that he could not get out. The patrolman assisted him out and conducted him to his home at Point Judith.

December 14.—The schooner *Artie Garwood*, of Bridgeton, New Jersey, bound from Philadelphia to Boston with a cargo of coal, and a crew of seven men, stranded in an easterly gale and high sea, on the coast of New Jersey, about two miles south of Station No. 4, Fourth District. The vessel was seen from the station in the southeast at 8 a. m. endeavoring to work up the coast, but having the appearance of being in distress, as she could not stay off shore, she was carefully watched from the station until a little after ten o'clock, when she grounded. The life-saving crew immediately repaired to the scene. The sea was breaking over the vessel, driving the crew into the fore and main rigging. The keeper found the sea so heavy that he could not board the vessel without imminent danger of having his boat stove and drowning his crew. He therefore brought the Lyle gun and apparatus into requisition. A line was shot to the vessel and the apparatus rigged. The men in the fore-rigging, four in number, were landed safely in the breeches-buoy. One of the life-saving crew was then sent off in the buoy to see if the men in the main-rigging could be transferred to the fore-rigging and landed from there. Upon his return he reported that the vessel's deck was breaking up and the men could not get forward. There was now nothing to be done but to attempt the rescue of the men in the main-rigging with the surf-boat. It was accordingly

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launched, and with great difficulty and danger the vessel was reached and the three men taken from the rigging and safely landed. The vessel was now rapidly breaking to pieces, but one of the surfmen volunteered to go aboard and cast off the lines of the apparatus. It was with some trouble that he was safely got back to the shore. The crew of Station No. 5 assisted at these operations.

December 16.—At 3.30 a. m., during a strong west wind and rough sea, the patrolman of Station No. 3, Third District, Rhode Island, discovered a vessel lying off-shore at Napatree Point, but on account of the distance was unable to discern whether she was at anchor or on the reef. He burned his Coston light, but received no answering signal. He then reported at the station, and the keeper reconnoitered from a point opposite the vessel and found her to be fast on the reef. As soon as possible he caused the surf-boat to be launched and went out to her. On boarding her she was found to be the schooner *Open Sea*, of Belfast, Maine, from Port Johnson, New Jersey, to Providence, Rhode Island, with coal and a crew of five men. The men and their baggage were taken ashore in the surf-boat and kept at the station a day and a half. Vessel and cargo were a total loss.

December 16.—A patrolman, while on his beat, from Station No. 5, Third District, Block Island, found an open boat on the surf-shore about two and three-quarter miles north of the station, and reported the fact on his return to the keeper, who took his crew and hauled the boat up to a place of safety. Afterwards the boat was conveyed to the station, and was advertised in the Newport, Rhode Island, papers. It was supposed that the boat had been lost from some passing fishing vessel.

December 20.—The patrol of Station No. 15, Sixth District, North Carolina, saw a vessel standing into danger on Inlet Point. He burned two red Coston lights, which failed to attract attention. He then burned a white light, which she saw, her crew waving a lantern in reply, and wore off.

December 20.—The second watch of Station No. 16, Sixth District, North Carolina, at 10 p. m., when two miles from the station, discovered a schooner standing into danger. He burned a red Coston light, and the vessel kept off.

December 20.—The schooner *Whitney Long*, of Saint George, Maine, bound from New York to Port Royal, laden with guano, sunk on Hatteras Shoals at 1 p. m. in five fathoms of water, the crew of seven men escaping in their boat. At 2.30 p. m. the crew of Station No. 22, Sixth District, North Carolina, reached the shipwrecked men with the surf-boat and took them and their boat ashore. They were succored at the station three days and nights. The vessel and cargo were totally lost.

December 21.—At 10 a. m. the British schooner *Trellis*, bound from Providence, Rhode Island, to St. John, New Brunswick, having collided the previous night with an unknown three-masted schooner and been disabled, went ashore about a mile north-northeast of Station No. 13, Second District, Massachusetts. The keeper of the station went at once to their relief, and took the crew of four men and their personal effects ashore. They were housed and subsisted at the station three days and then sent to Boston. The vessel was a total loss.

December 21.—At 12 m. in a fresh gale, accompanied by blinding snow-squalls, the three-masted schooner *J. H. De Wolf*, of Dennis, Massachusetts, bound from Georgetown, District of Columbia, to Boston, with coal, and having a crew of eight men, struck on a shoal two and a half miles east-northeast from Station No. 14, Second District, Massachusetts. She was seen from the station, and immediate preparations

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were made to launch the boat for the relief of her crew, but before it was accomplished they had left her in their own boat. The life-saving crew, perceiving this, ran to the shore, and by signals showed them a passable way through the breakers to the land, and received them as they came in. At 4 p. m. the schooner was boarded by a company of wreckers, who, with the assistance of the keeper and crew of Station No. 13, got her off. The crew of the vessel were sheltered for two days at Station No. 14.

December 21.—At nine o'clock in the evening the propeller *City of Toledo*, of Grand Haven, Michigan, bound from Milwaukee to Ludington, Michigan, with twenty-four persons aboard, struck about 300 yards from the shore in a gale and snow storm seven miles north of Station No. 7 and about six miles south of Station No. 6, Eleventh District, Lake Michigan. The former station was a new one and had not yet been manned, and the crew of No. 6 had retired for the season. The keeper of No. 7 heard of the disaster the forenoon of the following day, December 22, and went at once to the scene, arriving at 3 p. m. He found that the captain of the propeller and a portion of the crew had left the vessel immediately after she struck, and that in landing their boat had been stove in on the ice-banks, so that they were unable to return to the wreck. A wrecking tug had gone down during the night and had got a line to the wreck, at about seven o'clock a. m., but just as they had got a strain on the line, a squall, followed by a gale of wind from the west, sprung up and the tug was obliged to let go to save herself. The propeller was lying broadside to the shore, the sea making very fast and increasing the peril of her crew. Seeing the need of immediate help the keeper started at once for Station No. 6 to get aid and apparatus, and met a man coming from the station with the surf-boat, which they launched in Hamlin Harbor, having obtained a volunteer crew of six men, and undertook to pull out to the wreck. This it was found impossible to do, for the boat was swamped as soon as they attempted to pass out beyond the piers, the oars and thole-pins being so covered with ice that it was impossible to use them, and they returned to the shore. The keeper then got a team and went to the station for the Lyle gun, whip-line, and hawser. With one shot they succeeded in getting a line to the wreck, and soon had the hawser and breeches-buoy rigged, and by this means brought two men ashore. The sailors, on account of the ice, were unable to fasten the lines any higher than the hurricane deck, so the breeches-buoy could not be kept out of the surf, and the rescued men had to be dragged half the distance ashore through the freezing water. The work was also necessarily slow, as the life-saving men had great difficulty to contend with, their position being on a bank of ice covered with 15 inches of snow, and having to pull the hauling lines, which were frozen stiff and receiving accretions of ice whenever they came out of the water, against a current running alongshore at not less than five miles an hour. It was, therefore, concluded to again try the surf-boat. She was hauled abreast of the wreck, her painter passed over one reach of the whip-line, extending from shore to ship, in order to keep her from getting away, and then with the keeper and three men in her, she was shoved off the ice-bank and they hauled themselves by the whip to the wreck. They took twelve of the men into the surf-boat, worked their way back as near to the shore as they could in safety on account of the ice and then bade the men jump for the land, which they did, a large crowd being present to help them over the banks. Once more they returned and brought the remainder of the unfortunates, among whom was one woman, landing them in the same

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way, then, watching for a lull, the life-saving crew succeeded in getting their boat ashore in safety. The undertaking was one that not only involved very hard labor but great peril.

December 22.—The captain and mate of the schooner *T. J. Trafton*, of Portsmouth, New Hampshire, which was wrecked and sunk on the 21st, eight miles northeast of Manomet Point, were cared for at Station No. 5, Second District, Massachusetts, they and their crew having landed in their boat and come to the station. They were provided with dry clothing, supper, lodging, and breakfast.

December 22.—At 2.30 a. m. the patrol of Station No. 14, Second District, Massachusetts, discovered a vessel at anchor about a mile and a half east-northeast of the station, burning a torch as a signal of distress. He answered the signal and returned to the station for help. The life-saving crew on reaching the shore found it impossible to launch the boat through the breakers. The keeper then sent to Station No. 13 for assistance, and in the mean time went north abreast of the distressed vessel and showed signals to her and caused fires to be built to show her the deepest water in case her chains should part. The wind was blowing a strong gale with blinding snow-squalls, and a heavy sea was running. When the crew of No. 13 arrived it was evident that the vessel was dragging toward shore. The life-saving men now brought the mortar-cart with the Lyle gun and equipments abreast the vessel, which was now near the breakers. The first shot took the line across the head-stays, but the crew were so exhausted and benumbed that they were unable to get to it. The second shot laid the line over the fore-yard and was happily made fast. The breeches-buoy was then taken aboard, and in thirty minutes the entire crew, eight men, were landed in safety, though five of them were in such a helpless condition that they had to be assisted to the station, where they were furnished with hot drinks, dry clothing, and comfortable beds. The vessel was the brig *Black Swan*, of Boston, with a cargo of logwood from Hayti to her hailing port. The vessel was lost. The crew remained at the station two days.

December 22.—At 2 a. m. the schooner *Emma M. Fox*, of Sag Harbor, New York, bound from Wood's Hole, Massachusetts, to New York, with a crew of six men, encountered a heavy gale, with blinding snow and rough sea, and ran ashore about six miles from Station No. 38, Third District, New York, across Huntington Bay. The weather being exceedingly thick she was not sighted by the life-saving men until 1.30 p. m., when it lighted up. The surf-boat was at once launched and the life-saving crew went out to offer their help. They found that nothing could be done without a tug, and therefore took the captain to the station, kept him over night, and in the morning procured him conveyance to Northport, from whence he could telegraph to the city for suitable assistance.

December 24.—The patrol of Station No. 25, Third District, Long Island, discovered a schooner close to the beach. He burned his Coston light to give the crew warning of danger, and they at once hauled off shore.

December 25.—The schooner *Ellie Bodine*, of Tuckertown, New Jersey, with a crew of five men, stranded on a shoal one-quarter of a mile south of Station No. 7, Fifth District, Virginia, and about the same distance off shore. She was discovered there by the patrolman from the station at an early hour in the morning. The wind was strong from the south, and a thick fog prevailed. The patrol gave the alarm at the station as soon as practicable, and at 5.30 o'clock the surf-boat was launched and on her way to the stranded vessel. Boarding the schooner the keeper

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offered to take the crew off, but, finding that there was no immediate danger to life in remaining on board, they refused to leave. The keeper conveyed the captain ashore, and he succeeded in getting a wrecking steamer which hauled the schooner off.

December 26.—At 5 p. m. the schooner *Gaston T. Hubbard*, of New York, bound from James River, Virginia, to New York, with a cargo of pine wood and a crew of six men, stranded on Great Egg Harbor Bar, two miles east of Station No. 30, Fourth District, New Jersey. The crew of the station boarded her with the surf-boat at 5.45. They took the crew and their luggage off and to the station, arriving at 8.20 p. m., where the sailors were accommodated for the night. At 3 a. m. the next morning the life-saving crew, accompanied by the crew of Station No. 31 and the schooner's men, again went out to the vessel, and, after throwing overboard forty cords of wood, succeeded in getting her off the bar in good condition.

December 27.—The schooner *L. Edna*, of St. John, New Brunswick, with a crew of four men, misstayed and stranded on Hog Island Ledge, at the entrance of Seal Harbor, Maine. The occurrence was witnessed by the patrol of Station No. 5, First District, who at once reported, and the small boat was manned and alongside of her half an hour after the stranding. The schooner was found aground and in a bad position. The life-saving crew ran a line from her and hauled her head around, so as to bring her into such a position as would insure her safety at low water. They then waited until the tide rose, and as soon as she floated shoved her off with setting poles, then made sail and took her to a safe anchorage in the harbor, where, after furling her sails, they left her. Without this assistance she would probably have upset and filled.

December 29.—The patrolman of Station No. 5, First District, Maine, saw a small sloop-rigged sail-boat in a sinking condition on Chapel's Ledge, Seal Harbor. He at once reported at the station, and the keeper, with four of the crew, went in the small boat to the scene. The boat had already sunk in 15 feet of water, and her occupant had taken refuge in a wherry he had been towing. The life-saving crew took the man into the station-boat, and then, with two boats and a spar, rigged a Spanish windlass, and raising the sunken boat between the others, towed her to the shore and grounded her. They then bailed her out, reset her mast, arranged her outfit, stopped the leak, and turned her over to the owner, who was sheltered that night at the station.

January 3, 1880.—At 10.20 a. m. the sloop *Flash*, of Perth Amboy, New Jersey, with two men on board unacquainted with the channel, struck on a sand bar in Barnegat Inlet, half a mile northeast of Station No. 17, Fourth District, New Jersey, and filled with water. The crews of Stations Nos. 16 and 17 were out in their boats fishing, and that of No. 16, being the nearer to the sloop, reached her first and took the crew ashore, where they were taken in charge by the crew of No. 17, who followed them. Subsequently the crew of No. 17, with the two men from the *Flash*, went out to her, freed her of water, discharged her ballast, and got her off the bar. The two men were kept at Station No. 17 four days while their vessel was being put in sailing order.

January 8.—The schooner *A. H. Quinby*, of Wilmington, Delaware, with a crew of five men, attempted to heave from the wharf at Atlantic City, New Jersey, after discharging cargo, but dragged her anchor, and went ashore on the beach below. The schooner had not sufficient gear to enable her men to get her off, and the crew of Station No. 27, Fourth District, went to her assistance, bent their hawser to the schooner's anchor and hauled her off, after which they took her to a safe anchorag e

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January 8.—At daylight the patrol of Station No. 8, Fifth District, Virginia, discovered the masts of a brig over the beach on Paramore's Island, three miles and a half south of the station. He reported immediately, and the boat was launched at once for the rescue. As the wind blew a gale from the northeast, and the sea was heavily breaking on the shoals, it was impossible to pull to the distressed vessel through the inlet. The life-saving crew were therefore obliged to row out on the seaward side, three miles around the outer reef, and then down the coast four miles, reaching the vessel after a hard pull of an hour and a quarter. The wreck proved to be the brigantine *Alice Lea*, of Wilmington, Delaware, laden with lumber. She lay broadside to the sea, the sea breaking heavily over her and washing away her deck load. After skillful maneuvering to keep clear of the floating lumber, the surf-boat was brought under the lee of the wreck, and three of her nine men were taken off and landed safely on Paramore's Island. Launching twice again, and working their difficult way through the wreckage, the life-saving crew took off the remaining men, three at a time, and landed them by the others. It being hazardous to overload the boat for such a long trip as that back to the station, in the teeth of wind and sea, the life-saving crew returned by themselves, leaving the ship's crew to go up the island to a point opposite the station. The life-saving crew reached the station at 1 p. m., having been rowing almost constantly, and much of the time in face of the gale, since 7 a. m. They were much exhausted, and their hands were badly blistered, but, as soon as the boat could be relaunched, they rowed across the inlet and took the wrecked men over to the station, where they were cared for. One, whose hand was severely hurt, had it dressed and bandaged, and five of them were kept at the station three days. The vessel became a total loss, but most of the cargo was saved by wreckers, one of whom was drowned by the swamping of a boat, while at work alongside the wreck, on January 23.

January 8.—At 6 p. m., in misty weather, a bark making little headway, but that towards the beach, was descried just before dusk, from Station No. 7, Sixth District, North Carolina. As soon as it was sufficiently dark for the lights to show, a red Coston light was burned to warn the bark off. She seemed to bear off, but her movements were so slow and uncertain, and the danger of stranding so imminent, that three more lights were burned, and her change of course made certain.

January 9.—The patrolman of Station No. 1, First District, Maine, discovered a capsized schooner off Green Point, one mile west of Quoddy Light, which proved to be the *Madeira*, of St. John, New Brunswick, bound to New York, with a cargo of laths. The life-saving crew, with their surf-boat, went out to her immediately, and found her on her beam ends, her crew of five men clinging to her side, and the heavy seas threatening to wash them away. They were all taken safely off, and to the station, but in a state of great suffering and exhaustion. They were provided with dry clothing and such other comforts as the station afforded, and kept three days. Shortly after the schooner drifted ashore, and the life-saving crew going to her through the surf, saved her sails, part of her running rigging, and a portion of the personal effects of the crew.

January 10.—At 5 a. m. the keeper of Station No. 11, Eleventh District, Lake Michigan, discovered the tug *Prindeville*, of Chicago, adrift in the lake a little east of the station. With the assistance of two men he launched a skiff and went after the tug, catching up with her near the outlet of the harbor. There was no one on board. By means of lines run from her to the harbor pier, she was drawn as close as possible to

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it and made fast. The keeper then procured a tug, had the vessel towed inside, and afterwards notified the owner.

January 11.—At 6 p. m. the schooner *Ada M. Hallock*, of New York, was discovered by the patrolman of Station No. 9, Fifth District, Virginia, about one mile and a half southeast of the station, standing into danger, heading across Hog Island Shoals. There was a light easterly wind blowing, a very heavy sea running, and a storm threatening. The patrolman immediately burned his Coston light and swung his lantern, but as he did so, the vessel struck upon the shoal, became unmanageable, and began drifting toward shore. Meantime, the keeper joined the patrolman on the beach, and finding that the vessel was ashore, they hurriedly returned to the station, and soon had the surf-boat down. After great effort the life-saving crew succeeded in launching, but owing to the heavy surf, the strong westerly cut, and the fact that they nearly filled the boat three different times, they became so much exhausted by their endeavors to get off, they were obliged to return and beach the boat. By this time, the vessel had drifted to within 300 yards of the beach, while portions of her keel and upper works began to come ashore. The keeper and crew went to the station for the gun and apparatus, and when they returned with it, the current had slacked off, the tide being nearly full, so they determined to again try the surf-boat. This was done, the wreck was successfully boarded, and her people, four in all, were safely landed and conveyed to the station. During the night the vessel went to pieces.

January 13.—The schooner *Peacedale*, of Newport, Rhode Island, from South Amboy, New Jersey, to Narragansett Pier, Rhode Island, with coal, and a crew of four men, while endeavoring to beat into harbor during a gale and heavy snow storm struck the rocks at Dickens' Reef, and though she came off, was in a much damaged condition, having knocked away her rudder and sprung a leak. The weather was so thick that she was not discerned by the patrol, but a message was received at Station No. 1, Third District, and at 7 p. m. the surf-boat was launched and went to the scene of disaster, which was two miles northeast of the station. The vessel was found in a rapidly sinking condition, and her own crew unable to keep her free. The keeper put two of his men on board to assist at the pumps, and returned to the station for a relay of men, and to telegraph for a tug. He returned to the vessel at 11 p. m., put two more men on board to assist in pumping, and staid by her until the arrival of the tug at 2 a. m., when he returned to the station, leaving two of the life-saving crew on board to work at the pumps while she was being towed into harbor. Captain Caswell of the *Peacedale*, published a card thanking the life-saving crew for their prompt and faithful service.

January 16.—The three-masted schooner *Charles Morford*, of New York, bound from Nuevitas, Cuba, to New York, stranded on Assateague Beach, Virginia, two miles north of Station No. 5, Fifth District, at 6.45 p. m. The weather was thick and a light easterly air stirring, the surf moderate. The vessel was discovered a few minutes after she struck, by the patrolman from the station while on his beat north. He immediately burned his Coston light and started back to the station. The surf-boat, was got to the scene as soon as possible, where the vessel was found to be about 250 yards off shore. The boat was launched and the vessel boarded without delay. Nine persons, composing the ships company, together with five passengers, were landed and conveyed to the station. The vessel was subsequently hauled off the beach by a wrecking steamer.

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January 17.—At 3 a. m. the Norwegian bark *Thor*, from St. Nazaire, France, to New York, in ballast, with thirteen men on board, stranded on Hog Island Shoals, off Rockaway, Long Island, having lost her way in the dense fog. On account of the fog she was not discovered until the afternoon when the crew of Station No. 34, Third District, boarded her and a little later that of No. 33 also. The united crews hove the vessel off the shoal and, after getting her half a mile beyond and in safety, left her.

January 21.—The schooner *Frank Pierson*, of Rockland, Maine, bound from Richmond, Virginia, to New York, with a cargo of railroad ties and pig-iron, and a crew of four men, stranded on the coast of New Jersey, about one mile south of Station No. 14, Fourth District. The vessel was seen when she grounded at 6 a. m. by patrolmen from the station, and the fact at once reported to the keeper. The surf-boat was immediately launched, and the vessel boarded through a heavy surf, at seven o'clock. The keeper found the vessel lying aground, head to wind, which was blowing fresh from the northwest, and concluding that she could be hove afloat on the next tide, dispatched one of his crew with a team to the station for a hawser. After consultation it was deemed prudent to relieve the vessel of her deck-load, which was accordingly thrown overboard. Meantime the keeper and crew of Station No. 15, boarded the vessel to assist, and at about the same time the hawser arrived from No. 14. The life-saving crews at once set to work, making preparations to heave the vessel afloat upon the next tide. One of the vessels anchors was run and hove taut upon, and more of the cargo thrown overboard. At high water the vessel was got afloat without damage.

January 28.—At 8.30 a. m. as the schooner *May Montanye*, of Perth Amboy, New Jersey, with oysters, and a crew of four men, was passing out of Great Egg Harbor Inlet, during a high wind and heavy sea, her mainmast was carried away about 14 feet above the deck. She made her way under foresail to a point abreast of Station No. 28, Fourth District, New Jersey, coming to anchor at 10 a. m. At 10.45 the life-saving crew reached her with the surf-boat, boarded her, and rendered assistance by cutting away the stump of the mainmast and bending the mainsail on the foremast, after which they aided in getting her under way, and left her with the hearty thanks of her men.

January 29.—During a strong northerly gale and heavy sea, the schooner *Georgiana*, of Gloucester, Massachusetts, lost her rudder, and was otherwise damaged among the breakers off Petit Manan. Her crew of five men worked her forty miles along the coast, steering her with sails, searching for a safe anchorage. At 9 a. m. the patrolman of Station No. 1, First District, Maine, discovered her at anchor off Quoddy Light, with a signal of distress flying. The surf-boat was immediately launched for her assistance, and on reaching her the crew were found in an exhausted condition in consequence of their over-exertion in working the rudderless vessel through the storm. Upon consultation with the master it was decided that nothing could be done for her relief while the storm continued to rage so violently, and the life-saving crew returned to shore and sent a dispach to Eastport for a tug to tow the disabled schooner into harbor. The following morning, the wind having subsided, and no tug coming to the relief, the life-saving crew returned to the schooner, boarded her, took up her anchors, put two boats out ahead to help steer, and worked her up to Eastport for repairs.

February 1.—The sloop *Pandora*, of Perth Amboy, New Jersey, with two men on board, when off Cold Spring Bar, New Jersey, under a three-

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reefed mainsail, became unmanageable in the high wind that prevailed, and her captain let both anchors go, but found them insufficient to hold her in the gale. The vessel was leaking and drifting off shore, and her captain showed signal of distress, which was responded to by the keeper of Station No. 38, Fourth District, who boarded the sloop with the surf-boat at once, and found her in a critical condition. As there was great risk in remaining aboard, the two men left her to her anchors, and went ashore in the surf-boat. They remained at the station until next morning, when, the storm having abated, the life-saving crew launched the surf-boat and took the two men out to the vessel, which had lost one of her anchors and drifted about half a mile out. The life-saving men assisted in getting the sloop under way and towed her into Turtle Gut Inlet.

February 1.—The sloop *J. F. Knapp*, of Smith's Landing, New Jersey, stranded two and a half miles southwest of Station No. 7, Fifth District, Virginia, at about 3.45 p. m. The surf-boat was launched and the vessel boarded by the life-saving crew, as soon after being discovered, as possible. The wind was blowing strong from the westward, weather clear, and a moderate sea running. The keeper found the vessel lying easy, quartering to the sea; assisted the crew of the vessel in their attempt to heave her afloat, but they found that nothing could be done until flood-tide. The vessel being in no immediate danger, the keeper left with his crew and returned to the station. The sloop floated on the flood-tide and went on her way.

February 2.—An open boat with eight men in her, in attempting to cross Great South Bay, from Oak Island to Breslau, Long Island, got jammed in the ice and was unable to proceed. They had been observed in the afternoon from Station No. 27, Third District, to be making very slow progress, and fearing they would not be able to reach the mainland the crew went out after them. Upon reaching the men, at 4.30 p. m., they were found exhausted, with their hands badly frozen, and, in despair of getting out of the ice, they had given over all effort and hope. The life-saving crew got them to the station, where they were made comfortable and sheltered for two days. Had it not been for the help received these men would certainly have perished in the terrible snow-storm and severe cold which came on in the night. Their boat was lost in the ice.

February 2.—The life-saving crews of Stations Nos. 30, 31, and 32, Third District, Long Island, rendered assistance in getting off the schooner *Mary E. Nason*, of Provincetown, Massachusetts, bound from Virginia to Boston, with oysters, and a crew of six men, which had stranded on the southeast point of Jones' Inlet Bar. The vessel and cargo were saved without damage.

February 2.—The schooner *Samuel Warren*, of Wilmington, Delaware, from Millville, New Jersey, to New York, with plastering sand and a crew of four men, stranded on the south side of the south channel, not far from Station No. 23, Fourth District, New Jersey. The surf-boat was immediately launched, and reached the vessel at 1 p. m. They found the captain unaware of the danger of his position and unwilling to leave his vessel. It was snowing hard and the wind rising, and the keeper feeling sure they would be lost if they remained, persuaded the captain, after ineffectual efforts to heave the vessel off, to go ashore, and at 5.20 p. m. the life-saving crew, accompanied by the four men of the schooner, returned to the station. In the morning they found the vessel completely submurged and the sea breaking half way up her masts. The shipwrecked men were succored at the station four days and nights.

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February 3.—The schooner *Don Pedro*, of St. John, New Brunswick, with a crew of three men, stranded at 4 p. m. on Robinson's Beach, South West Harbor, Maine, about five and a half miles from Station No. 4, First District, Little Cranberry Island. The point of disaster was not within view of the patrol limits, and the report of it did not reach the life-saving station until the night of the 5th of February. Early on the morning of the 6th the surf-boat was launched, and the crew proceeded to the stranded vessel and offered their assistance, proposing, in order the more readily to release her, to lighten her cargo, but to this the captain objected, seeming to fear that some trap was being set for him by the government, notwithstanding the assurances of the keeper to the contrary, and all the surfmen were allowed to do was to run her anchor with a view to an effort to heave her off at high water, which having done they returned to the station. The vessel finally came off on the 10th.

February 3.—At 4.30 p. m., during a strong gale with heavy sea, the crew of Station No. 2, Second District, Massachusetts, saw the schooner *Abbie Bursley*, of Barnstable, Massachusetts, anchor about a mile east of the station, near Lanesville Breakwater. Deeming it impossible to reach her in the surf-boat from the station, the keeper sent a man for a team while the rest of the crew launched the boat, put on board the mortar apparatus, and landed it on the mainland, the site of the station being an island at high tide. Here it was met by a man with a sled and two horses and conveyed to a point opposite the vessel, where it arrived at 6 p. m. The vessel was riding at her anchors about 150 yards from the shore, and her crew of eight men had been taken off by Lanesville fishermen in dories. Seven of them were cared for in the neighborhood, and the captain was taken to the station, where he remained over night. The schooner parted her chains that evening and drifted ashore. The life-saving crew went with the crew of the vessel the next morning, and assisted in getting off their personal effects, and the keeper procured them free passes over the Eastern Railroad to Boston.

February 3.—At sunset the schooner *Carl D. Lothrop*, of Eastport, Maine, having a crew of eight men, got under way in Herring Cove, Cape Cod, where she had anchored during an easterly storm that prevailed during the day. The keeper of Station No. 6, Second District, fearing she might come ashore, kept watch on her until dark, and then directed the patrol to continue it. The eight o'clock watch found her ashore, having come on at high water. The tide soon left her so that the patrol walked out and boarded her. At midnight they returned to the station accompanied by the first mate and four men. The captain, second officer, and steward refused to leave the vessel, although urged to do so, as the wind had shifted and was rising rapidly. At 3 a. m. the keeper and two patrolmen went again to the wreck, as they knew she would soon be cut off from the land by the rising tide. On arrival they found the vessel filling with water and the seas breaking over her. They threw a line aboard, which was made fast, and steadying themselves by this while it was held taut by the surfmen, the three men were enabled to work themselves ashore, although the current was very strong. At the station they were provided with dry clothing and hot drinks, being badly chilled. The second mate's hands were also frost-bitten. The vessel was subsequently saved in a badly damaged condition.

February 3.—The severest tempest on the Atlantic coast during the year was that of this date. It resulted from the meeting of two storms, one from the northwest and one from the southwest, and extended from Maine to Louisiana, seeming to focus chiefly on the coasts of New York

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and New Jersey. The summer buildings at Coney Island were well smashed up by the sea and wind, but the heaviest damage appears to have been wrought at and around Long Branch. All the hotels at that place were more or less injured. The roofs of the Mansion House and United States Hotel were carried away. Many of the windows of the Ocean House were staved in. The flooring of the pier was torn up and swept away by the sea, while the gale also wrenched off the roof and stanchions of the pavilion on the pier, a building 350 feet long. Most of the summer cottages and villas suffered ravage. The telegraph wires were down in every direction. Between Jersey City and Long Branch all the meadow lands were inundated. For twelve hours from midnight the storm continued its devastation. It began with snow and sleet and ended with heavy rain. The sea was the highest known for many years, dashing against the bluffs at Long Branch in great volumes, and the wind, at times, reached the velocity of 84 miles an hour, being a veritable hurricane. It was a season of hardship and danger for the life-saving crews upon the Jersey coast, several of which rendered service so noble as to excite general enthusiasm. During the twelve hours the tempest lasted there were five wrecks within the field of four consecutive stations, while another engaged a station a few miles beyond.

The instance first in order is that of the three-masted schooner *Stephen Harding*, of Damariscotta, Maine, laden with hard-pine lumber, and bound from Cedar Keys, Florida, to New York. The crew numbered six persons, including the captain, Stephen Harding, whose wife was also on the vessel. In addition there was a young sailor, named William Ray, who had leaped over her bulwarks an hour before, from the schooner *Kate Newman*, which had collided in the gale with the *Stephen Harding*, six or seven miles from shore, staving in her starboard bows and knocking off her anchor, and then going down with all on board except this survivor. A vivid picture of this occurrence is given by Captain Harding: "We sighted the schooner dead ahead," he says; "she came right out of the darkness and stood on the top of a big wave, almost over our heads. The next instant we came together. The next we separated, and then she was out of sight in the darkness, leaving one of her men on our deck." The anchor which the collision carried from the starboard bows of the *Stephen Harding* hung by fifteen or twenty fathoms of chain over her side, and could not be cleared, causing her to fall off from her true course and drag to leeward, and finally sent her ashore, where she struck about a mile north of Station No. 2, Fourth District, New Jersey (Capt. J. W. Edwards, keeper), at two o'clock in the morning, in a thick snow-storm, a gale raging and rising, and a heavy sea. At this hour the patrol of Station No. 2 changed, and Charles Rex started out to the north on his beat. He had gone nearly a mile when he saw a light ahead. Confused in the darkness by the wind and the whirling snow, the patrolman did not know just where he was, nor how far he had gone, and at first thought the light he saw was the lantern of an advancing patrol from the station beyond. He hastened forward, and in a few minutes saw that it issued from the cabin skylight of a schooner stranded in the surf about 250 yards from shore. Coming abreast of the vessel, he saw the red light in her port rigging, and at once fired his Coston signal to let the sailors know their peril was seen, and then, running down into the surf as far as he dared, he shouted to them not to attempt to come ashore in their own boats, but await the help soon coming. A few minutes later his voice was heard outside the station, calling to those within to turn out, which was soon done, and the crew, with the exception of one man away on the south patrol, started for the wreck with the apparatus. The task of

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hauling was a severe one. The snow was thick upon the beach, the drifts more than knee-deep and fast accumulating, badly clogging the cart wheels; and the wind, steadily increasing, impeded the advance by its force, and blew the snow and sand together straight into the faces of the men as they tugged at their load. It was with the greatest effort and difficulty that they made their way, but by half-past three they were abreast of the wreck, and at once began operations. Despite the darkness and the blinding storm of snow and sand, the first shot from the Lyle gun laid the line across the almost invisible vessel, handy to the sailors, who seized it. The whip-line was soon bent on and hauled on board, followed by the hawser, but there being no lantern on deck, the respective tally-boards were thought to be bits of wreck-stuff which had got fastened into the lines, and their instructions for setting up the gear not being seen, the matter went by guess-work, and the hawser was fastened to the mast below the hauling lines, when it should have been above. The life-saving crew sent off the breeches-buoy three times in succession, hauling it back each time empty, and, not being able to see it when it reached the vessel's side on account of the darkness, only knew by its returning unoccupied and by the whip-line having a turn around the hawser, that something was wrong. Sending it out, however, a fourth time, it came ashore again with one of the crew, a German, who reported that the captain's wife was on board, and that the ship's people thought of remaining on the vessel until daylight. As the tide was then rising, and the condition of the sea growing more alarming, Surfman Wilson was sent off in the breeches-buoy to tell them to leave the vessel. As soon as he got on board he found what was the matter with the lines, and in about ten minutes rearranged them in good working order. It was fortunate for the people on the schooner that he came to hurry them off, for she was then beginning to thump on the bottom, and as the tide rose she was swept fore and aft, while, by daylight, the spray was flying 20 feet high in her rigging over the decks submerged in breakers. The first person Surfman Wilson sent to land in the breeches-buoy was one of the sailors. Mrs. Harding followed, and at once upon her arrival was sheltered behind the cart, which was the best that could then be done for her. One by one the men followed, each, upon landing, turning to with the life-saving crew at the hauling to keep themselves warm. When the last person was sent off, Surfman Wilson himself jumped into the breeches-buoy and was drawn ashore. Patrolman Ferry, who had come from his beat and joined the crew during their operations, at once set out again on his south patrol, while Patrolman Rex resumed his march to the north. The rest of the crew were left to get the gear back to the station, while the keeper, as the storm was raging more violently, fearing that the rescued might perish, as they were all soaked through, and getting very cold, started at once with them for the station a mile distant, where they remained storm-bound for several days. The captain of the vessel and his wife published the following letter in the local papers a few days after the wreck:

From Capt. Stephen Harding and wife to J. W. Edwards and crew of Life-Saving Station No. 2.

We wish to make a little acknowledgement of the benefit we have derived from the service, and a word of praise, which we consider due the members of the service in general, and of Life-Saving Station No. 2 particularly, for the very brave and efficient manner in which they in the storm of February 3 rendered such prompt and timely assistance to those on board the three-masted schooner Stephen Harding, of Damariscotta, Maine, on shore on the beach near the station, where she now lies, whereby the

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lives of all on board were saved; and we wish to thank the members of the station, one and all, for the kind, gentlemanly manner in which we were treated by them, even to their great discomfort, as no provision is made at the stations in the way of beds or bedding for any more than the members. A much-felt necessity is in the shape of some female clothing, enough for a change while those they have on are drying, or until more can be procured, as at present it is almost impossible to land without getting wet. This want is felt more especially at this station, as it is far from any assistance where clothing can be procured, and we think Captain Edwards deserves praise for the neatness and efficient manner in which the duties of the station are performed.

Respectfully, yours,

CAPTAIN AND MRS. STEPHEN HARDING,
Salem, Massachusetts.

FEBRUARY 16, 1880.

February 3.—At the same time the *Stephen Harding* stranded, the brig *Castalia*, of Bath, Maine, also struck the beach about three-fourths of a mile from Station No. 3, Fourth District, New Jersey. The vessel was bound from Galveston to New York with a cargo of cotton, and had on board a crew of ten men, including the captain, and one lady passenger, Mrs. W. C. Seymour, of Ohio. Half an hour after she struck, Patrolman Disbrow saw, by looking across the wind after he had gone by, it being impossible to look against the gale and the flying snow and sand, the dim gleam of her port light, and by going down to the water's edge was able to just trace her outline as she lay nearly broadside on, about 150 yards from shore. After burning the usual Coston signal for the encouragement of those on board, he ran for the station and aroused the crew. A note was left for a man then absent on the south patrol, bidding him join his comrades at the wreck when he returned, and the six men set out through the blinding snow-storm with the mortar-cart. The drag over the sand and through the snow-drifts, in the face of the gale, was severe, but within an hour the group, covered with snow and sleet, were abreast of the spot of light which was the only token of the stranded vessel, and the keeper, through his trumpet, hailed her sailors to look out for a line. A white Coston light was then burned, disclosing the position of the vessel, which was lying about a quarter to head on, her head pointing to northwest. The keeper (Capt. A. H. West) then proceeded to charge the Lyle gun and get his elevation and range, while one of the men held a rubber blanket to windward of his face to shield it from the driven sleet and sand. His object was to lay the line on deck that it might be readily found by those on board. In this difficult aim he succeeded admirably, the shot flying at the first fire between the fore-yard and fore-stay and leaving the line on the forecastle-deck, where the sailors at once seized it. The whip line and hawser were then successively hauled out and made fast on the vessel, and the work of setting them up on shore was entered on by the life-saving crew. In this, the drill with the apparatus, as arranged by the manual of the service, stood the crew in good stead, as it did all the crews who wrought that night at wrecks. The lanterns were of little use, thickly coated as they were with snow and sleet, and their light faintly glimmered in the darkness, but each man was at his post, with his own part assigned him, silently executing the task with which frequent practice had made him familiar, though in a light so feeble that the lines and implements he handled could not be seen, the independent operations combining in due time until the whole tackle was adjusted and the breeches-buoy was running out on the taut hawser to the vessel under the hands of the surfmen. Two men were first brought ashore in rapid succession, and then came the lady passenger, Mrs. Seymour. The vessel rolled so violently during the landing that despite the en-

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deavors to keep it taut by hauling on the tackle, the hawser would frequently slacken, dipping the breeches-buoy with its burden into the surf, whence the life-saving men, going in as far as possible, dragged the rescued people up on the beach. These efforts resulted in the speedy landing of the eleven persons on board, who then set out for the station. The captain was so exhausted that he had to be supported, and immediately upon arrival put to bed, when restoratives were administered to him. It was a quarter past six in the morning when the station was reached, the rescue having occupied only three and a half hours from the starting of the mortar cart on its toilsome way, to the return. The captain and sailors were kept and cared for at the station for two days, Mrs. Seymour being taken to the hospitable keeper's dwelling. The brig outrode the storm, being a staunch vessel, and was subsequently got off.

The lady passenger rescued, Mrs. Seymour, a few days after the wreck, published the following letter in the public journals:

SEABRIGHT, NEW JERSEY, *February* 7.

Being indebted for my preservation from what might have been a sure and sudden death, to the courage and daring of Captain West and his brave crew of Life-Saving Station No. 3, I take great pleasure in expressing to you that but for their prompt and energetic action we never could have been saved from our stranded vessel. The wind was blowing at a fearful rate of speed. The sea was raging almost mountain high, sweeping over the vessel's decks, threatening to engulf her at every onslaught. The night was in inky darkness, and the snow was blinding. Our boats would have been crushed to atoms, even if we could have succeeded in launching them, which was utterly impossible. We were seen by the patrol as soon as we struck, and in an incredibly short space of time (and in a scene like that, with death staring us in the face, the moments seemed like hours) the crew from Station No. 3, with their life-saving apparatus, were on the beach. They were successful in throwing a line to the ship, which was immediately made fast by the eager and willing hands on board, and then commenced the noble work those brave men were there to perform. I was the fourth to be placed in the breeches-buoy, and drawn rapidly and safely over the boiling, seething surf, landing without injury on the land, and escaping with only a slight wetting. I was not allowed to stand in the cold for five minutes; but wrapped in an oil-skin blanket, was taken immediately to the station, where every kindness and attention that was in their power to bestow was shown me. And here I will say that, when I had walked the distance between our vessel and the station, I was still more surprised at the short time which had elapsed from the time we were seen and the return of the life-saving crew. As far as I was able to judge the distance, it must have been nearly a mile. In coming to the vessel they had to face the piercing wind and blinding snow, dragging their heavy apparatus after them. Yet, before we really had time to expect them, they were there, doing the bravest, noblest work ever performed by man—that of saving human lives. What a grand institution is the Life-Saving Service! How it should be aided, and every effort made for its improvement and advancement by the government and the people of the United States. In fact, it should receive the hearty co-operation of all the world. How many valuable, precious lives would have been lost during that terrible storm but for the brave and earnest efforts of the men of the Life-Saving Service. I believe in every instance where it was possible to reach the vessels every life was saved. Is it not necessary, then, that those who are daily sacrificing their own welfare and health, separated from their families, exposing themselves fearlessly and nobly to the perils of land and sea, in their endeavors to save the lives of those whose only hope in such a supreme moment seems to rest upon them—is it not only necessary, but is it not just, that they should be provided with all that could contribute to their comfort? Is it not necessary that they should be afforded every means that would be conducive to facilitate such a glorious work? Some means should also be employed by which every man, woman, and child could be made acquainted with the advantages to be derived from the Life-Saving Service. In moments of great danger, like that which we experienced on the morning of the 3d, the thought that on the shore there are brave, earnest men working zealously for the rescue, inspires the shipwrecked with courage to do all they can to aid themselves, and, as a rule, has the effect of quieting all excitement and alarm. At least such was the case with myself; and when I was placed in the breeches-buoy, although fully realizing my danger, I was as calm and self-possessed as if I were going on a pleasure excursion instead of trying to be saved from a watery grave.

I sincerely trust that the occurrence of such a disastrous storm as that which swept

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our coast on the 3d will show the government the importance of still further aiding and facilitating the interest of the Life-Saving Service, and the brave men who are engaged in the perilous work connected with it. It seems to me much more might be done to alleviate the hardships they are compelled to encounter.

In conclusion, I cannot refrain from speaking of the subsequent courtesy and kindness extended to me by Captain West and his family. To them I am greatly indebted for their generous hospitality and pleasant hours passed in their happy home circle. The memory of the disinterested attention shown me, when as a stranger I was thrown upon their hospitality, will ever linger in grateful remembrance in my heart. May heaven's choicest blessings ever rest upon them, will always be the petition of her who owes so much to their kindness. Trusting that this rather lengthy epistle will meet with your approbation, I assure you I never performed a more pleasant duty than speaking in the highest praise of the prompt and efficient aid rendered us by the brave men of Life-Saving Station No. 3.

Respectfully,

MRS. W. C. SEYMOUR,
Passenger on the brig Castalia.

February 3.—A little earlier, or about an hour after midnight, the schooner *E. C. Babcock*, of Somers' Point, New Jersey, laden with cordwood and bound from Virginia to New York, driving near the shore in the storm, was come upon by Patrolman Van Brunt, of Station No. 4, Fourth District, New Jersey, who, by looking across the wind, direct vision being impossible, caught sight of her red port running light, and comprehending her danger, at once fired his Coston signal. The warning came late, however, the schooner having got too near the beach to wear or tack, and in ten minutes after, she struck within about a hundred yards of the shore. Patrolman Van Brunt immediately went running before the gale for the station, a quarter of a mile to the south, and roused the crew. The keeper, Charles H. Valentine, was quite sick at the time, but he and his men turned out with the loaded mortar-cart, and traveled for the wreck with all speed. Although at times the wheels so sank in the hollows of the beach where the snow and slush were deepest that they had to be lifted out, the hard journey was accomplished in a very short time. The position of the vessel was mainly determined by the dull red spot shed by her port lantern. With this to guide his aim, the keeper attempted the difficult feat of firing a shot-line across the deck of the schooner, beneath her rigging, in order that it might be quickly found by the sailors. The first attempt was baffled by the breaking of the line, which had become frozen stiff with snow and spray during the brief interval of its exposure in the line-box before firing. A second shot had better fortune, carrying the line between the fore-stay and jib halyards, where it was seized and hauled in by the men on board. A few minutes of disciplined labor in the darkness, which, as in the other instances, the frost-muffled lanterns could not illumine, sufficed to bend on the hauling-lines and hawser, which were soon dragged out to the vessel, and to set up the shore part of the apparatus. The first person that came ashore was a colored man, who told the crew that the captain's wife and two children were on board. The breeches-buoy went swiftly back and was quickly hauled ashore again, bearing in it the captain's wife. The next to come was the captain with his little daughter, six years old, in his arms. Following him, came the mate, holding fast the captain's other girl, ten years old. Then, one by one, three sailors were drawn to land, being all on board. Haste characterized this energetic rescue. Within one hour and fifty minutes after the vessel struck, a mile and a quarter from the station, and despite the great impediments of the night and the winter storm, the eight people on board the crumbling schooner were safe on land. They were taken at once, being pretty wet, to a summer cottage near by, where the custodian cared for them properly. The deserted vessel, which was beginning to break up while

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they were leaving her, went utterly to pieces by ten o'clock the next morning, her fragments and her cargo of cord-wood rolling and tumbling about in the surf as they slowly drifted southward.

February 3.—Their work at the wreck of the *E. C. Babcock* over, Captain Valentine and the crew of Station No. 4 reloaded the cart with the apparatus and such of the lines as were not attached to the wreck, and, dragging this burden, arrived at the station by five o'clock in the morning. After taking breakfast they fell to work, with the exception of two men who went out on patrol, at the task of cleaning and arranging the lines and getting the apparatus in order for service. At ten o'clock in the forenoon they were still busy in the boat-room at this labor, every one at work, when a patrolman bounded in with the startling news that a brig was coming dead for the shore. A momentary excitement seized the men, but the keeper held them at their tasks, simply commanding them to hurry. Indeed, nothing else could be done until the apparatus was in readiness. A few minutes after, the keeper went to the door and looked out over the swollen surf, tumbling uproariously upon the beach to the very sand-hills. The snow had ceased and, although it was raining, the air was clear and everything could be seen for a great distance. The gale was directly on shore, and running straight before it, under her split sails, with the tremendous sea and wind behind her, the keeper saw a brig rushing toward the station. It was the Spanish brig *Augustina*, bound from Havana to New York, with a cargo mainly of cedar wood and hides, and having eight men on board. Several of the crew could be seen on the pitching deck, huddled up against the house. There was a man at the wheel steering with apparent composure. As the vessel came racing on her course, a mass of water suddenly rose over her stern, and fell upon this man, completely covering him. It rolled off presently, disclosing him still standing at the wheel, and as it sheeted over the bulwarks and ran along the deck, it was observed that he gave the spokes one rapid twirl and again stood still. A moment afterward the vessel struck head on with a tremendous shock, and the next instant she swung around broadside to the sea, and heeled down upon her side, with the water scattering and flying all over her. A throng of men and women, finally numbering about two hundred persons, were gathering upon the sand-hills, before this spectacle, and in ten minutes after the vessel struck, the crew of the station were on the ground with the apparatus. The Lyle gun was hastily prepared and the shot fired, but the line, which had been some time in the station and was the only one then available, broke as it fled from the muzzle, and another shot had the same result. The brig, in the meantime, had been driven further in toward the shore, and Surfman Garrett H. White, by following a receding sea, running down into the surf as far as possible, and putting forth his utmost strength, succeeded in casting the heaving-stick and line on board just forward of the main rigging. The sailors seized the cord, and the whip-line, being bent on to its shore end by the crew, was speedily hauled on board. An ugly mishap now occurred. The sailors getting the tail-block on the end of the whip, pulled it about on deck but did not appear to know what to do with it, and paid no attention whatever to the tally-board appended to the lines and bearing instructions in two languages for setting them up on board. The *E. C. Babcock* meanwhile had gone to pieces a quarter of a mile up the beach, and presently, while the sailors were dallying with the whip-line, its slack became entangled with the drift-stuff, composed of the fragments of that vessel and of her cargo of cord-wood, which had floated down with the southerly set or current. This current was interrupted by the hull of the *Augustina*, which caused

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an eddying swirl that held the great mass of the wreckage between the beach and the vessel, where it was swept out by the undertow to be thrown in again and again with great force by the inrunning breakers. The whip-line thus fouled was carried by the eddy towards the bow of the brig, where it was caught and held by the port anchor. The life-saving men vainly endeavored to direct the sailors to properly arrange the line, but as the latter were acquainted with the Spanish language only, and failed even to comprehend the warning gestures of the men on the beach, they hurriedly used the line as they supposed it was intended they should, and undertook to come ashore by it, hand over hand. This would have been a hazardous venture in such a sea under the most favorable circumstances, but the drift-stuff before described, tossing about in inconceivable confusion, increased their peril to the point of apparently sure destruction, which would certainly have followed but for the helping hands of strong men at the risk of their own safety. The course the sailors took could only have been adopted in the temerity of extreme fear. The life-saving men tried to arrest the undertaking by shouts and vehement gesticulations, but vainly, for in a few moments one of the half-naked group was hanging to the line and pulling himself along through the sea. He had made about half the distance when the surf flung him over the whip-line. He held on, but as he came down, the two parts of the line, crossing as it turned, caught him by the neck and held him fast, at once arresting his progress and almost strangling him. Instantly Surfman Garrett H. White rushed waist deep into the breakers, holding to the line, and disentangled him. At that moment a rush of the drift-wood threw both men off their feet and they were swept from the line, but Surfman White, by a desperate effort, regained a foothold in the undertow, and still keeping his grip on the man, after a brief and violent scramble, succeeded in landing him. Meanwhile, two more of the sailors were swinging along the line. Surfman John Van Brunt plunged forward for the foremost, but before he got to him the drift-wood knocked him off his feet, and he was thrown into imminent peril, from which he was rescued by a number of fishermen on the beach who threw themselves into file with locked hands, and the end man getting hold of him he was hauled out. In the mean time Surfman White and an outsider had dragged in the sailor. The third sailor from the wreck was on his way when the sea suddenly tore him from his hold. For a few moments he was struggling in the water, then falling upon a clump of drift-wood, he lay sprawling, struggling to make the shore and beaten down by the surf as he strove to get up on his hands and knees. Surfman Potter sprang for him, but was thrown from his feet on to the drift-wood, falling upon his back, and was held down by the whip-line, which was suddenly tautened by the current across his breast. By an overmastering effort he managed to extricate himself from the line, and was washed out seaward, but got a spar on the next incoming breaker and made out to struggle to the beach. During these efforts Surfman Ferguson had reached the imperiled sailor and dragged him to the land. Surfman Lockwood went for the fourth sailor and was hurled from his feet into the surf like his comrades, but kept hold of his man and brought him in. In this way, by dauntless hand-to-hand grapples amidst the tumbling wreckage in the surf, man by man five sailors of the *Augustina* were saved. It is as wonderful as fortunate that the gallant rescue was accomplished without loss of life. The risks run by the life-saving crew, and those who aided them, were extreme. "Three of my men," Captain Valentine afterwards remarked, dwelling upon certain stages of the conflict, "I never expected to see again." The rescued

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men were all nearly naked. Every one was bareheaded and barefooted. One had on only a tattered shirt; another nothing but a pair of torn trousers. No one man had two garments. They were nearly frozen and utterly exhausted. Two of them had to be brought to by restoratives, being on the verge of perishing with cold. They were all cared for at the station to the extent of its means. None of these men could speak English, but it was presently learned through an interpreter that their captain, whose name is given as Aritz, was still on board the vessel, where two of the sailors also were.

After the tide had ebbed, a party of surfmen went on board the brig, where the captain was found lying in his berth, unconscious from a gunshot wound in his head. It appears that the brig's sails having split during the gale, she had become helpless, and there was nothing left but to allow her to drive on shore. The captain, realizing the loss which was about to befall him, being part owner of the vessel and cargo, and having no hope of escaping with his life, bade farewell to his men as the vessel was about to enter the outer breakers, and retiring to his cabin, deliberately shot himself. He was taken ashore and carried to the station, where his wound was dressed by a surgeon who happened to be among the spectators. He was conveyed to a hotel the next morning, from whence after a fortnight he was taken to a hospital in New York, and at the last accounts was recovering.

The *Augustina* later in the day broke in the middle, and was soon completely demolished by the sea. Her mainmast, which was about 120 feet long, was ultimately placed as a flag-staff on an elevation overlooking the ocean where she was destroyed.

The inspector who shortly after its occurrence visited the scene of disaster and ascertained the facts connected with it, closes his account with the following comment and recommendations:

> The services of the crew of Station 4 during the gale in successfully rescuing the crews of the two vessels, one of them in the darkness of night, and the other under the most unpromising circumstances for success, were of an extraordinary character, and their efforts deserve something more than honorable mention; for in addition to their prompt performance of the important duty for which they are employed, they displayed the most indomitable courage in braving the dangers to life and limb with which the lumber-laden surf was fraught, to rescue their fellow beings from almost certain destruction.
>
> In my opinion, no man could have undertaken to encounter the perils of a surf thick with cord-wood and floating spars and timbers without imminent risk of life and that these men nobly carried their lives in the hands which they extended to the imperiled Spanish sailors, is beyond all question.
>
> It is therefore recommended that Surfmen Garrett H. White, B. C. Potter, Nelson Lockwood, William H. Ferguson, and John Van Brunt be rewarded by medals of the first class, and that Keeper Charles H. Valentine be similarly rewarded for his gallant and conspicuous devotion to the service and the cause of humanity in his conduct of the operations of his station during the stirring events of the morning, as well as for actually venturing his life in exposing himself to the fury of such a storm while in impaired health.

February 3.—At about five o'clock in the morning Patrolman Daniel Ferns, of Station No. 5, Fourth District, New Jersey, on the south end of Long Branch, who had been out on the northern beat from two o'clock, saw when about a mile and a half from the station, at the same distance out to sea, a vessel anchored, which proved to be the schooner *Light-Boat*, of Rockland, Maine, bound from Norfolk to New York with a cargo of corn. He watched her lights until the breaking dawn enabled him to see that she was dragging her anchors and drifting in a southwesterly direction toward the beach, when he ran for the station, and notified Capt. W. S. Green, the keeper, who at once went out with two of his men, whom, with himself, he posted at picket distances to watch her and pass the

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word if action became necessary. The schooner, beaten by the northeast gale, continued to drag her anchors and slowly drift along until about nine o'clock, when she struck a mile north of the station and 200 yards from shore. Keeper Green foreseeing the event, had passed the word to his sentries, whose shouts in turn reached the waiting men at the station, and the mortar apparatus, drawn by two stout horses, which had been procured from the neighborhood, came hastening along the bluff and arrived a few minutes before the schooner grounded. She now lay with the seas sweeping entirely over her hull, and her crew of five lashed in the rigging. The Lyle gun was at once charged, and the line flew at the first fire over the main-topmast stays, where it was got by the sailors, who immediately began to haul it on board. To enable them to do this the keeper had to go down under the bank to the edge of the beach and take the shot-line along to the north, and such was the sea, that in performing this duty the surf broke over his head several times. The tail-block and whip-line were meanwhile bent on to the shot-line, and soon got on board, where they were made fast to the main-mast about seven feet above the deck-house, but when the hawser followed, the sailors, failing to observe the instructions sent with it, directing that it be detached from the whip-line and made fast above it, simply fastened the end of the hawser to the mast, without unbending it from the whip-line, and thus prevented the life-saving crew from running out the breeches-buoy to them, and sparing them the labor. Not apprehending the use of the whip-line, they began to haul on one of its parts, and the life-saving crew, seeing what they were at, could only help them by connecting the breeches-buoy with that part and slacking the line, thus enabling them to pull out the vehicle, into which the cook got, when the life-saving men, by using the same part, were able to haul him back. In this way, the sailors hauling out the buoy, and the life-saving crew hauling it in again, the five men were, one by one, delivered from their perilous position in the rigging. This stern labor, protracted by the action of the sailors with the life-lines, lasted about an hour, and was made severer by the heavy rolling of the vessel, which compelled a detachment of the life-saving crew to constantly haul and slack on the lines to the motion of the schooner. They found it impossible, however, to prevent the breeches-buoy, as it came shoreward with its living freight, from dipping into the sea and completely soaking the rescued men. The tension and friction upon the ropes were so great that upon their recovery from the wreck they were found to be badly chafed and in some places nearly parted. The rescued men were taken to a hotel near by, and afterwards came to the station, where two of them remained for two, and three for seven days. The vessel proved a total wreck, and her captain and crew testified that but for the aid given them from the life-saving station, they must all have perished.

February 3.—The wreck of this date on the New Jersey coast, which was attended with the most protracted suffering to those on board, and which involved loss of life, became the occasion on the part of the life-saving crews engaged, for a perseverance so noble and loyal under the most discouraging hardships and trials, as to reach by itself the high level of heroism, without taking into account the dauntless courage which accompanied it. The vessel was the *George Taulane*, of Camden, New Jersey, a schooner bound from Virginia to New York, with a cargo of cord-wood, and a crew, the captain included, of seven men. The evening before, the vessel was off the Highlands of Navesink, in 11 fathoms of water, with every prospect of soon reaching her destination, when the snow-storm began, and the thick weather so shut in around her that it became

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dangerous to attempt the run for Sandy Hook. The captain accordingly stood off shore, getting the vessel into 15 fathoms of water. Gradually the storm grew into a furious gale, in which the schooner labored heavily (under a two-reefed mainsail), and at two o'clock in the morning the deck-load started, and the perils of the men on board the plunging and staggering vessel in the uproar and confusion of the tempest were increased by the falling about the deck of big sticks of wood in the darkness. To make matters as bad as possible, the schooner was soon afterwards discovered to be on fire, communicated probably from the forecastle stove, and the flames spread to her deck-load and held with such tenacity that it was at one time thought she would have to be abandoned for the chances of an open boat in that terrible sea. At length, however, although all hands were constantly needed to manage the storm-tossed vessel, labor was spared to get the ignited portion of the deck-load overboard, and with great difficulty the fire was quenched. During all these troubles the run of the vessel was lost, and despite the steady effort to keep off shore, allowance had not been made for leeway, which the high deck-load had rendered great, and by eight o'clock the next morning, looking through the storm of sleet, the captain, to his despair, beheld the beach, to which the vessel was directly drifting. Hoping still to save her, the captain let go both anchors when about a mile from land. This step proved disastrous and made the rescue of those on board a task of stupendous difficulty. The anchors at first clawed the bottom and brought the vessel head to the wind; but immediately after, the strong current setting to the southward, and the force of the storm, made them drag without holding, and the vessel, broadside to the gale, swung helplessly in the trough of the tremendous sea, in which she lay drifting, rolling fearfully, the water making clean breaches over her, staving and rending, and sweeping everything off her deck, and not giving the men time to slip the cables, but only to scramble up aloft for their lives. In this plight, three of them in the fore rigging and four in the main, the violent swaying of the hull almost jerking them from their hold, they plowed slowly through the breakers, going along with the current, the sea running in torrents over the deck below, the beach very gradually drawing near, and the sense of doom in every heart, when they saw the life-saving crew of Station No. 11, Fourth District, New Jersey, following them along the shore with lines and heaving-sticks in their hands, the whole attitude and aspect of the group significant of the intention of assistance. The captain afterwards said that the very fact of seeing this determined squad gave new life to his then almost despairing men. The life-saving crew had seen the vessel nearing the beach, and when she had dropped her anchors and begun to drag along the coast, being then at a point something over two miles south of Station No. 11, they followed her, joined by a few fishermen who were upon the beach at the time.

They knew that no boat could get off from the beach in such a sea, and they took only the heaving-sticks and lines, because they wisely calculated upon the vessel grounding near Station No. 12, below, upon which they depended for apparatus. The patrolman of No. 12 had meanwhile seen the vessel something over a mile north of that station when she dropped her anchors, and hurrying back notified the keeper, Capt. Wm. P. Chadwick, who at once ordered out the mortar-cart with the apparatus and started for the wreck with the crew. In addition to the enormity of the surf, the tide was unusually full, being four feet higher on the beach than at ordinary high tides. The beach consequently was all covered with a frothing flood, and the only road to the wreck was across the skirting beach hills of sand. In a number of places these

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hills had been cloven by the battering sea, and sluices had formed in which the water rushed up each minute under the pressure of the surf, and poured back again with swift refluence as the flood fell away. In these rushing streams quantities of wreck débris, soon to be formidably increased, were already tossing hither and thither, menacing with at least bruises the adventurous crosser, whose hardships and perils would be further augmented by the quicksand character of the bottom of these rough courses. Hence it will be understood, the crews then journeying toward each other (in the case of that of No. 12, burdened with a cart-load of apparatus), besides generally slopping along through sand and water in the numerous hollows of the dwarf hills, had often to wade hip-deep and at times waist-deep across these ugly fords, where the bottom drew in the feet with a strong suction, and the water was full of pieces of fractured plank and joist, tumbling about to wound or maim whomsoever they chanced to get near. At the moment of starting, the crew of No. 12 were joined by a man from No. 11, who buckled to the cart with the rest. The conditions of travel over the inundated waste made hauling by hand necessary for at least portions of the distance, but a team of horses had been taken along by Keeper Chadwick, and followed the cart. It was half-past eight when the journey began. The wind was then blowing hard, and the sleet came down furiously. On the right of the expedition was the sea raging and roaring, with breakers extending further out from the beach than perhaps had ever been beheld before; on every other side was a dismal stretch of interflooded knolls of sand. The loaded cart thus plodded on for about a quarter of a mile. The horses were then hitched to and got it a half a mile further, when a deep sluiceway was reached where they refused to pull, and the men took hold and hauled the load across, waist-deep in water. The team was again used until another sluiceway intervened, through which the men once more dragged the mortar-cart. The horses were then put on again, but a lower portion of the coast being soon reached, the water got so deep and the sand cut away so fast under the wheels, that they could not draw, and the men took the burden in hand and tugged with it until they came abreast the wreck, which was between nine and ten o'clock. There they met and were re-enforced by Keeper Britton C. Miller and his crew of No. 11, who were still following the vessel down, accompanied by six brave volunteers. The rescuing party now numbered nineteen men.

A singular and memorable struggle was now entered upon. The vessel slowly drifted, fearfully rolling, her hull almost submerged in the foaming seas which fled across it. She was about 400 yards from shore. The seven men were in her rigging. One of them hung by his arms over a ratline, with one leg through below, and Keeper Chadwick at once remarked, "There is one man gone; we will never save him." Without delay the Lyle gun was planted on the summit of a sand-hill and fired, and the line leaped from the muzzle across the flying jib-stay. Here, unfortunately, it could not be used by the men on board, and had to be hauled back. The vessel continued to drag her anchors to the south, and the heroic march along her flank and through the floods and sluices was begun. The clefts in the hills embanking the beach had increased, and the way was freely trenched with tide-filled runnels of various depths and breadths, through which the men splashed and staggered with their load. With great labor and difficulty 200 yards were made, and a sand-top was reached, from which another shot was at once fired. The line being now heavier from the wet, and the point of unsubmerged ground the crew had gained further from the vessel, this

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shot fell short. The cart was reloaded, and the men, with severe toil, got on about 400 yards to another unflooded hillock, from whence a third shot was fired, but the line parted. The vessel was still reeling along shore in the southerly set of the current, with the seven wretched men in the rigging. The devoted crews again loaded up the cart and resumed their toilsome attendance upon her course. From first to last their difficulties and the perils which beset them never slackened a moment. The wheels of the cart, in coast phrase, "sanded down" so rapidly—that is, sank so quickly in the infiltrated soil—that the conveyance had to be constantly kept on the move lest it should be lost. Often the cart had to be partially unloaded and portions of the apparatus carried by the crews to lighten it sufficiently to make progress possible, and at other times the men would have to fling themselves upon the wheels and hold them with all their strength to prevent the cart from being capsized by the inequalities of the submerged ground, or the overwhelming inbursts of the sea rushing high over the axles. All the time, moreover, the ocean fury had been gradually tearing off and smashing the upper works of the vessel's hull, and scattering off the pieces, together with her deck-load of cord-wood, as she drifted along. This steadily continued, and the surf was full of these débris, which were constantly hurled up over the sand-hills right in the path of the advancing life-savers. The sluices, with their constant ebbs and flows, were full of splinters of wreck and cord-wood billets; and in fording, the men's attention was about equally divided between steadying and hauling through the cart-load of apparatus, and avoiding the onset of these drifting projectiles. On the less inundated ground the danger continued, the wreck stuff assuming here partly the character of missiles, a sudden overburst of the sea, half carrying on the water, half flinging through the air, great sticks of wood upon the crew. Several of the men were knocked down by these flying pieces. Others suffered bruises and contusions. Four months afterward, Keeper Chadwick's right arm was still lame from one of the blows. The escapes were numerous. It was with great difficulty that the men could keep their feet in this constant onslaught and pelting of drift-wood, which the vessel supplied the whole way with her every roll. But not a man fell away, or flinched from the work before him. The volunteers, like the crews, bore the racking labor with the same indomitable courage and composure, and the same disciplined obedience to the direction of the leader, every mind bent only upon the rescue. The care and patience observed by the men in their operations were no less remarkable than their noble hardihood. Not the least difficult of their tasks was that of keeping the lines, and especially the guns and powder, dry in the universal drench around them, and it is difficult to understand how they contrived it; for, aside from the number of actual firings, wherever a momentary pause of the vessel as she grazed bottom, or a slowing of her motion, seemed to offer an opportunity for action, at least a dozen times, and probably more, the cart was hurriedly unloaded on the nearest eminence, the gun planted and the shot-line arranged for the effort, when the wreck would suddenly roll away upon her course, and the men would have to reload the cart and toil on again after her. In this way, and with these interruptions, they worked down along the beach to No. 12, and a quarter of a mile beyond it, when a chance offered for another shot; but the line parted. The crew again moved stubbornly on. It was now noon, and suddenly the man so long seen hanging in the rigging, fell into the sea and was gone. The crew still followed the vessel with unslackened activity. Half an hour later, they saw another man drop lifeless from the ratlines. Laboring for-

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ward now for the rescue of the remaining five, they suffered a misfortune. In staggering and floundering through one of the worst sluiceways with the cart, the gun toppled off into the flood and was lost. A desperate search was at once made, and finally the gun was found in four or five feet of water, fished up and wiped dry, and carried thenceforth by the stout keeper on his shoulder. A man was despatched back to No. 12 for a dry shot-line, while the crew moved on to a point three-quarters of a mile below the station, where they got another chance to fire a shot, which, however, fell short, the tide having forced the firing party farther and farther back on the hills as they advanced, and the line, too, being weighted with moisture. The cart was again reloaded, and the march resumed. A mile below the station the man overtook them with the dry shot-line, and chance offering, the sixth shot was fired. This time it was a success. The line flew between the foremast and the jib-stay, and the cut sweeping the bight of the line in to the side of the vessel, the sailors got hold of it and fastened it to the fore and main rigging. As the schooner still continued to drift and roll, nothing could yet be done, but while the greater part of the force loaded up the cart and trudged on with it, three or four kept fast hold of the shore end of the shot-line, and kept pace with the wreck in leash. At the end of another quarter of a mile, the vessel suddenly struck the tide setting north, stopped, swung head off shore, and worked back to her anchors under the comb of the breaker. The time had come at last; and the whip-line, with its appurtenances, was bent on to the shot-line, hauled aboard, and made fast by the tail of the block to the mainmast head. The wreck now slued around broadside to the sea and rolled frightfully. The hawser followed the whip-line on board, and the breeches-buoy was rigged on, but the vessel rolled so that it was impossible to set the hawser up on shore in the usual manner, so it was rove through the bull's-eye in the sand-anchor, while several men held on to the end to give and take with each roll of the vessel. The work of hauling the sailors from the wreck was now begun with electric energy. After two men were landed the vessel took the ground, but the circumstance increased rather than diminished her rolling, and some conception of this powerful motion may be derived from the fact that in one instance the breeches-buoy with a man in it, swung in the off-shore roll, fully fifty feet in the air. The strain and friction upon the hawser were so great that the lignum-vitæ bull's-eye, through which it ran at the sand-anchor, despite the hardness of the wood, was worn fully half an inch deep during thirty minutes of use. Within those thirty minutes, however, the five men were safely landed, the last man getting out of the buoy at half-past two.

The distance the life-saving crews followed the vessel with the loaded cart, not counting in their previous travel, appears to have been over three miles, and the time occupied was not less than six hours. When the various conditions of the enterprise are considered, it is nothing less than marvelous that the heroic courage and the lofty endurance of these men were not fruitless but resulted in a successful issue. The most experienced beachman upon that part of the coast, gray with assistance at scenes of disaster, and who was one of the six volunteers present, said, in this connection, that he never saw a time when the chances of rescue seemed so improbable. That those chances were outweighed, is due to the noble pulses that beat so strongly that wild February day in the generous blood of nineteen men, of whom their coast and their country have reason to be proud. No commentary can add to the plain record of what they did and suffered for the five men they saved.

The names of the six gallant volunteers who wrought in this rescue

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are William L. Chadwick, Isaac Osborn, David B. Fisher, David B. Clayton, Abner R. Clayton, and Abner Herbert. The crews were, respectively, Keeper Britton C. Miller, and Surfmen William H. Brower, Louis Truex, Abram J. Jones, Charles W. Flemming, and Demerest T. Herbert, of No. 11; and Keeper William P. Chadwick and Surfmen Peter Sutfin, Benjamin Truex, Tyler C. Pearce, William Vannote, Charles Seaman, and John Flemming, of No. 12. The vessel was a total wreck.

February 4.—The schooner *Gussie*, of New York, bound from Canarsie, New York, to Jones' Inlet, with a crew of four men, dragged her anchors during an easterly gale, in Great South Bay, and drove ashore on the meadows three-quarters of a mile west of Station No. 31, Third District, Long Island. The life-saving crews of Stations Nos. 31 and 32, assisted by a number of fishermen, went to the vessel and succeeded in heaving her afloat the following day.

February 5.—At 6 a. m. the schooner *Estella*, of Stonington, Connecticut, with a crew of eight men bound on a fishing cruise, got ashore near Station No. 23, Fourth District, New Jersey. The life-saving crew immediately went to her with the surf-boat, ran her kedge, and with difficulty hove her off and took her into Little Egg Harbor.

February 6.—The schooner *Albert W. Smith*, of Providence, Rhode Island, from Matanzas, Cuba, for Boston, with a cargo of sugar, and having on board eleven persons, stranded three miles south of Station No. 10, Second District, Massachusetts, where she was discovered at about 3.15 a. m. by the patrolman, who reported at the station as soon as possible. The surf-boat was launched at four o'clock and the vessel boarded. She was found to be ashore on the inner edge of the bar. The life-saving crew ran an anchor, made sail on the vessel and hove her off. The keeper remained on board with his crew until the vessel was clear and safely on her way, then left her.

February 6.—The sloop *Pandora*, of Perth Amboy, New Jersey, with two men on board, stranded on the outer shoals of Squan Inlet, New Jersey. The life-saving crew of Station No. 9, Fourth District, went to her assistance and ran out her anchor, unloaded her ballast, and helped to heave her off.

February 7.—At 4.30 a. m. the patrolman of Station No. 7, Second District, Massachusetts, discovered the three-masted schooner *Maggie A. Fisk*, of Dennis, Massachusetts, almost as she struck the bar a mile west of the station. He burned his Coston signal and hastened at once to report at the station. The crew launched the surf-boat, and in twenty-five minutes they were on board to render assistance. The hawser and kedge anchor were taken out by the life-saving crew, and the capstan manned. By this means the schooner was moved about half her length ahead, when the kedge came home. The keeper then ordered the jibs hoisted and endeavored to force her over the bar, but to no avail. They then threw over cargo, and telegraphed for a steam-tug. At 4 p. m. the tug *C. M. Winch* arrived, and the life-saving crew assisted in taking the hawser aboard and secured it to the foremast. They remained on board the vessel until 6.15 p. m., when, having concluded that the vessel could not be pulled off, her crew were taken on board the tug, and the life-saving crew returned to the station. The vessel became a total wreck.

February 8.—At 12.30 p. m., the schooner *Potosi*, of Wilmington, Delaware, having on board a crew of seven men and one passenger, stranded on the south end of the Rips, off Cape May, New Jersey. At 12.45 the crew of Station No 40, Fourth District, launched their surf-boat, boarded the vessel and rendered assistance in getting her off and safely under way.

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February 11.—At 7.15 p. m. the sloop *Julia A. Reed*, of Absecom, New Jersey, having a crew of three men, mistook the buoys and anchored close in by the south bar of Hereford Inlet, New Jersey. The crew of Station No. 36, Fourth District, boarded her under the impression that she had stranded on the bar, but found her crew very glad to have their help in making sail and taking her safely into the inlet.

February 13.—The bark *Luxor*, of St. John, New Brunswick, bound from New York to St. John, having on board a crew of fourteen men and one woman, encountered thick weather with a heavy sea and was stranded about half a mile north of Station No. 3, First District, Maine. The fog being very dense, the first intimation of the disaster received at the station was by the report of a gun at 3.45 p. m. The surf-boat was immediately launched and went alongside the distressed vessel in a few minutes. The two chronometers belonging to the *Luxor* were taken for safety to the station, and the life-saving crew returned to the vessel, ran out the anchor and hawser to keep her from heaving upon the rocks, and as the tide rose hove her off the ledge. They then got her under sail, slipped her hawser, and at 11 p. m. anchored her southeast of the island and returned her chronometers, put her hawser and stream anchor on board, and left her ready to go to sea as soon as wind and tide favored.

February 13.—The schooner *Effie Sweet*, of Isaac's Harbor, Nova Scotia, bound from Cienfuegos, Cuba, to Boston, with a cargo of molasses and a crew of seven men, grounded in a thick fog on the bar, one mile and a half west of Station No. 8, Second District, Massachusetts, at 5 a. m., where she was discovered at that hour by the patrolman, who at once burned his Coston light and was answered by a signal from the vessel. He hurried to the station and gave the alarm. The surf-boat was immediately launched and boarded the schooner, through a rough sea. The life-saving crew ran a heavy anchor and hove taut on it. At high water the vessel was hove off and went on her way.

February 13.—At 2 p. m. the schooner *Leander A. Knowles*, of Barnstable, Massachusetts, stranded in a rough sea and thick fog on Handkerchief Shoals, nine miles southwest of Station No. 13, Second District, Massachusetts. Her crew, which consisted of seven men, remained on board until 11 a. m. on the 14th, when the fog lifted, and, as the vessel was leaking badly, they took to their boat and landed at the above station at 3 p. m. of the same day. It was Saturday, and the last train had passed. They were therefore kept at the station until Monday, the 16th, when they were sent to Boston by rail. Vessel and cargo were a total loss.

February 15.—The crew of Station No. 3, First District, Maine, went out to the assistance of the schooner *Berma*, of Parsboro', Nova Scotia, which had stranded in consequence of misstaying at the entrance of Head Harbor. They found that the vessel had struck a rock and gone over it, starting the oakum and causing her to leak, and that her captain had purposely beached her in order to calk her. No assistance being required, the life-saving crew returned to the station at 12 m., having been absent five hours.

February 16.—At 8 a. m. the sloop *John Roach*, of Greenport, New York, going out from Little Egg Harbor, New Jersey, to sea on a fishing cruise with a crew of seven men, stranded on the Salt Meadow at Point Creek, half a mile west of Station No. 23, Fourth District. At 9 a. m. the life-saving crew boarded her with the surf-boat and succeeded in getting her off without damage.

February 25.—At 5 p. m. the schooner *Deceiver*, of Somers' Point, New

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Jersey, with a crew of three men, stranded on Barnegat Shoals, one mile north of Station No. 17, Fourth District, New Jersey. The life-saving crew boarded her with the surf-boat and ran out her anchors, and with the assistance of the crew of No. 16 succeeded in heaving her off and getting her to safe anchorage before 8 p. m.

March 8.—At 9.30 p. m. the schooner *Challenge*, of Boothbay, Maine, with a crew of five men, sprung a leak and sunk twenty minutes after, about five miles south of Petit Manan light. The crew took to their boat, and after fifteen hours' rowing landed on Baker's Island, three-quarters of a mile from Station No. 4, First District, Maine. They saw the station, but were so exhausted and suffering, their hands and faces being badly frost-bitten, that they were unable to proceed thither, and were cared for by inhabitants of the neighborhood until the following morning, when the crew of Station No. 4, learning their condition, went to Baker's Island in the surf-boat and took them to the station, where they gave them such attention as their resources permitted, kept them over night, and on the 11th took them in the boat to Southwest Harbor, Mount Desert.

March 10.—At 7.30 a. m. the schooner *N. C. Price*, of Cape May, New Jersey, with a crew of three men, while endeavoring to make harbor, ran into Hugh's Jetty, in Delaware Bay, punched a hole through her bow and filled. At low tide the crew of Station No. 40, Fourth District, New Jersey, assisted in patching up the hole, pumped her out, and took her into harbor.

March 11.—The day patrol of Station No. 38, Third District, Long Island, discovered a schooner in apparent distress about six miles east of the station. The keeper obtained a team of horses to convey the boat overland to near the place indicated by the patrol, but found on arriving that the vessel had got out of trouble and sailed away.

March 11.—At 2 a. m. the schooner *Martha J. Granger*, of New York, with oysters, and a crew of five men, from Virginia to New York, went ashore one and a half miles north of Station No. 12, Fourth District, New Jersey. She was discovered by the 4 a. m. patrol north, who showed two red Coston lights, but received no answering signal, and then returned to the station with report. The keeper and crew went immediately to the scene by land, taking with them a heaving-lead, line, and small hawser. They found her lying with sails all set, head on shore. Her crew were in the cabin, which accounted for the patrolman's signal not having been answered, and it was with some difficulty, through the noise of the storm and sea, that they were made aware of their imminent danger and that help was at hand. As soon as this was accomplished the life-saving men threw the lead with heaving-line over the jib-boom, which, with the small hawser attached, was drawn aboard and made fast. The mate was landed first, and then the luggage of the crew, after which the remaining four men were safely brought ashore by the same means. They were all taken, with their baggage, to the station and kept three days. The vessel and cargo were lost. The anchors, sails, and rigging were saved with the assistance of the life-saving men, and sent by the captain to New York.

March 11.—The schooner *Osborn Curtis*, of Squan, New Jersey, struck on Williams Shoal, three miles south of Station No. 7, Fifth District, Virginia, and a half mile from land. She was discovered from the station at 9 a. m. The wind was northeast, accompanied with snow; a moderate sea was running. The surf-boat was at once launched and reached the vessel at 10.30 o'clock. The keeper and his crew joined forces with the crew of the vessel and tried to heave her afloat, but the

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tide was ebbing so fast that nothing could be done. Giving the master of the schooner instructions to set his red light in the rigging, if in need of assistance, the keeper and crew returned to the station. On the following flood tide the schooner floated and went on her way.

March 13.—The patrol of Station No. 3, Fourth District, New Jersey, on the evening watch saw a vessel standing head on the beach, evidently coming ashore. He burned his Coston light, its warning was recognized, and the vessel wore and stood off, and thus escaped stranding.

March 16.—The schooner *Five Sisters*, of Boston, bound from Porto Rico to New York, with a cargo of sugar and molasses, and a crew of six men, went ashore in a heavy northeast storm and bad sea about 500 yards north of Station No. 13, Fourth District, New Jersey, at 3.15 a. m. She was on the bar about 200 yards from the beach when discovered by the patrolman, who immediately burned a red Coston light to signify the approach of help, and hastened with the report to the station. The boat-wagon was speedily run out and up the beach opposite the vessel, but the violence of the storm and the dangerous surf rendered the use of the boat impracticable. The Lyle gun was sent for and a signal rocket thrown up to call help from the adjacent station, which was responded to at once by a light and soon after by the advent of the keeper and crew of Station No. 14. It was very dark, but the life-saving men soon had their apparatus arranged, and the first shot threw the line over the vessel's bow. Owing to the darkness, however, the line was not found by the ship's crew, who supposed the shot had failed, and expecting another shot, went into the cabin for safety. As the shot was not repeated they finally came out, and by the dawning daylight saw the line and with it drew in the whip-line and tail-block. The latter being made fast, the hawser was sent aboard and the breeches-buoy rigged. In attempting to send it off it was found that although the sand anchor was firm, the hawser slackened and could not be made taut. After repeated attempts to haul it taut the effort was abandoned, for the working of the vessel inshore made it impossible. With the assistance of the crew of No. 14, and the patrolmen of No. 12 who had arrived, the hawser was manned and the slack pulled in by hand, and while part of their number held the hawser taut, hauling and veering as the vessel rolled, the others sent the breeches-buoy off and on. After this only about 20 minutes were occupied in bringing the six men safely to shore. The vessel became a total wreck.

March 16.—The brig *Tropic*, of Port au Prince, from Marrigone, Hayti, to New York, with a cargo of logwood, and a crew of seven men, having encountered thick and stormy weather with strong northeast gales for six days, and been unable to get an observation, went ashore at 3.50 a. m. one mile north of Station No. 21, Fourth District, New Jersey. The patrolman discovered her soon after and reported her to the station. The crew turned out at once, ran out the boat-wagon and dragged it up the beach in the face of the storm. The pull was a hard one, and they were obliged often to rest, and when the surf-boat was launched at 5.30 a. m. they were well tired out. They reached the vessel at 5.50 and landed her crew and luggage, getting back to the station at 7. They were assisted by one of the crew of Station No. 20. The crew of the vessel remained at the station two days, being unable to reach the mainland before. The captain and mate remained four days to look after the wreck. The vessel was a total loss.

March 17.—At 4.30 p. m. the keeper of station No. 9, Fifth District, Virginia, discovered a bark standing to the southward and westward along the coast in close proximity to the shoals off the south end of

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Hog Island and the entrance to Great Machapongo Inlet. The keeper immediately hoisted flags of the code of international signals, warning the people on the bark that she was standing into danger. No notice being taken of the signals, and feeling confident that the vessel would strike the shoals, the keeper launched the surf-boat just as the vessel grounded, at 5 p. m., about one mile from the station. The vessel was boarded as soon as practicable, and proved to be the British bark *Sarah and Ellen*, of Maitland, Nova Scotia, bound from New York to Baltimore, in ballast, with a ship's company of fourteen persons on board. The keeper offered to land the master and crew of the vessel, but this was refused, the captain thinking there was no immediate danger. The life-saving crew then ran a kedge anchor to windward, and hove taut on it, to prevent the vessel driving further upon the shoals. Giving the master of the bark instructions to signal the station if further assistance should be required, the keeper left with his crew at 7 p. m., returned to the station, and set his patrol. The wind during the above operations was blowing fresh from northwest, a moderate surf running, and the weather clear and cold. At 10 p. m. a blue light was burned on board the bark as a signal to the station. The wind had hauled to northeast and the vessel was pounding on the shoals. The keeper immediately responded with his crew, launched the surf-boat, and boarded her, remaining on board until the following morning (the 18th) at 7 a. m., when they returned to the station for breakfast and rest. A lookout was kept from the station upon the vessel during the day, and many residents of the island were seen to go on board. At 6 p. m. signal was again made from the bark, and she was, in response, boarded a third time by the life-saving crew. This time eleven of the ship's crew and some of the islanders were conveyed ashore, the former to the station. The captain, mate, and one man of the vessel refused to land. On the following day (the 19th), a wrecking steamer attempted to float the vessel, but failing, cast off her lines and went to anchor in the inlet. The next day (20th) the steamer returned to the bark and commenced stripping her, finished at night, and stood into the inlet with the master and crew of the bark on board, leaving twenty-five islanders on the vessel. By this time the wreck was badly bilged and full of water. The men left on board soon became frightened and signaled the station for aid. The keeper boarded the wreck for the fourth time and landed the islanders safely, and then put the eleven men of the vessel's crew, who had been sheltered at the station from the 18th, on board the wrecking steamer. The bark became a total loss.

March 18.—The schooners *Achorn*, of Trenton, and *Maria and Elizabeth*, of Perth Amboy, New Jersey, collided at sea, nine miles from Absecom, at one o'clock a. m. The *Achorn* was sunk, taking down with her one of her crew of four men. The disaster was not within the field of the operations of the life-saving service, but the remaining sailors reached Hereford Inlet in their boat, where the crews of Stations 35 and 36, Fourth District, New Jersey, went to their assistance and conveyed them to the Cape May depot.

March 21.—The patrol of Station No. 16, Sixth District, North Carolina, saw a vessel standing into danger, and burned a red Coston signal to warn her off. This failing, a red rocket was sent up, and the vessel wore off.

March 28.—The schooner *Zicaro*, of Ellsworth, Maine, bound from Portland, Maine, to New York, with a cargo of lumber, and a crew of four men, encountered very thick weather, with rain, snow, a high wind, and raging sea. Her sails were so badly torn that she came to anchor two

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miles north of Station No. 3, Second District, Massachusetts. In the violence of the storm her chains parted and she beached head on at 4.30 a. m. She was reported by the patrol to the station, and the life-saving crew went immediately to her help, but found that the sailors had just landed themselves by means of a rope fastened to the jib-boom. They were taken to the station, provided with dry clothing, and kept three days, during which time they endeavored to save enough from the vessel to pay their way home. Most of their effects were lost, and the vessel became a total wreck.

March 30.—The schooner *Watchful*, of Providence, Rhode Island, bound from New Berne, North Carolina, to Philadelphia, with a cargo of lumber, and a crew of seven men, sunk on the bulk-head in Pamlico Sound, about seven miles northwest from Station No. 23, Sixth District, North Carolina. The crew landed in their own boat and proceeded to the station, where they were sheltered for several days. The vessel was raised by wreckers.

April 1.—At 11.30 a. m. the crew of Station No. 5, First District, Maine, discovered the schooner *William H. Boardman*, of Calais, Maine, with five men on board, on Allen's Rock, in Seal Harbor, near their station. They pulled immediately to her, ran out her kedge, hove her off the rocks, and hoisted her sails. They then got her anchor and left her safely standing out of harbor.

April 2.—At 10 p. m., while the patrol of Station No. 10, Eleventh District, Lake Michigan, was traversing the beach two miles north of the station, he discovered a fish-boat with three men in it near the shore. They had lost their way in the fog, and had no light by which to consult their compass. The surfmen boarded them and guided them back to the harbor.

April 3.—At 4.30 a. m., when the patrol of Station No. 2, Third District, Rhode Island, was about a mile and a quarter north of the station he discovered a schooner running with a free wind head on shore. He burned his Coston light and otherwise signaled to them by swinging his lantern. The vessel's crew, thus made aware of their danger, hauled off shore and evaded threatened disaster.

April 3.—The keeper of Station No. 12, Eleventh District, discovered a signal of distress flying from a schooner which had a similar craft in tow. He telegraphed immediately for a tug, and went out with the surf-boat to see if his assistance was required. He found on reaching the vessels, which were eight miles out, that the schooners *E. M. Stanton* and *R. B. King*, both of Chicago, had collided on the previous day, April 2, at 1 a. m., and the latter had been cut into, and filled immediately with water, but was kept afloat by her load of pine slabs. They both got into port.

April 4.—The English bark *Douglass*, bound from Santos to New York, with a cargo of old railroad iron and a crew of ten men, stranded and bilged at 3.40 a. m. on Peck's Beach, opposite Station No. 31, Fourth District, New Jersey, in very thick weather. The patrolmen found drift stuff on the strand, which led them to believe a vessel must be ashore, and after some search in the dense fog they discovered her and reported her at the station. The boat was at once run out, and though the wind was strong and the surf heavy they succeeded in pulling out to the wreck, and getting her crew all into the boat and safely to land. On arrival at the station the sailors were provided with dry clothing and kept for several days. Vessel and cargo were a total loss.

April 4.—The yacht *Nautilus*, of Perth Amboy, New Jersey, from Key West, Florida, to Perth Amboy, with four men on board, owing to fault

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of compass and thick fog, got on the south bar of Cold Spring Inlet. The crew of Station No. 39, Fourth District, New Jersey, went out to her in their boat, and assisted in getting her into the inlet.

April 4.—At 2 a. m. the crew of Station No. 7, Ninth District, Lake Erie, discovered a mud-scow called *No.* 5, of Cleveland, Ohio, which had broken from her moorings, and was drifting out on the lake under a fresh wind from shore. They put a kedge and line into the surf-boat, went out to her, and kedged her back to harbor, where they moored her securely.

April 5.—At 3 a. m. the schooner *Ralph Howes*, of Belfast, Maine, bound from Wilmington, North Carolina, to Boston, with naval stores and a crew of six men, stranded half a mile west of Station No. 11, Third District, Long Island. Although the night was so dark that objects could be discerned but a short distance, the odor of tar from the vessel blown to the land led to her discovery by the patrol, who reported her immediately. The sea ran so high that a boat could not be used, but the life-saving apparatus was taken to the shore opposite the wreck, which lay 200 feet off. By means of the Lyle gun a line was thrown over her, the breeches-buoy rigged and sent out, and at 4 a. m. all had been safely landed. The vessel and cargo were a total loss.

April 5.—The schooner *Enterprise*, of San Francisco, California, bound from Shoalwater Bay to San Francisco, with a cargo of lumber, and having on board nine persons, one a passenger, stranded on the bar in Shoalwater Bay, two and a half miles southwest of Station No. 2, Twelfth District, Washington Territory, and showed signal of distress. The surf-boat was launched as soon as possible, and the vessel boarded after a hard pull of five miles, the distance which it was necessary to make by water. She was found lying broadside to the tide, and the sea breaking around her. The crew were anxious to be taken ashore in the surf-boat, but the captain would not leave his vessel, and induced one of the sailors to stay with him. The passenger was afraid to go in the surf-boat, and preferred to take chances on the deck-load. Six of the crew were therefore landed. It was near sunset when the surf-boat left the vessel, and dark when the shore was reached. There was a strong northwest wind and a thick fog, but an hour after sunset it cleared up, and the wind went down, which circumstance, in the opinion of the keeper, saved the vessel and those on board. The schooner floated off as the tide rose, and drifted to within half a mile of where the schooner *H. L. Tiernan* lay at anchor, whose captain sent a boat and took the three persons off. The vessel was subsequently recovered and towed into Columbia River.

April 7.—At 10 a. m., as the patrolman of Station No. 3, Third District, Rhode Island, was watching the beach west of Napatree Point during a heavy northwest gale, with chop sea, he discovered a small boat trying to beat into Stonington Harbor. When just west of the Point she shipped a sea, became unmanageable, and drifted ashore. The patrolman assisted her two men to land and then helped them secure the boat, which was the sloop *Ocean Wave*, of Stonington, Connecticut, laden with lobsters. Subsequently five men came from Stonington with the view of helping them, and the entire party of seven had to be sheltered and subsisted at the station for a day and a night, on account of the raging storm which prevented their return to Stonington.

April 7.—The schooner *Goshawk*, of Cleveland, Ohio, left Chicago for Buffalo on the 6th of April with a cargo of corn. She had on board a crew of eight men, the captain's wife, who served as cook, and a boy passenger. While reefing sails in a squall that night one of her crew

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fell overboard, and four others jumped into the yawl boat to endeavor to save him. The snow-squall was so thick that they lost the schooner and made land about twenty miles south of Chicago. This left but three seamen on board the vessel, and as they were unable to manage her they set a signal of distress at 8 a. m. on the 7th, when about sixteen miles from shore. The signal was seen directly by the watchman of Station No. 11, Eleventh District, who notified the keeper, and the surf-boat was launched immediately and pulled out to her. They met her about eight miles out running under short canvas, and being managed with difficulty for lack of hands. The keeper with four of his crew boarded her, leaving the surf-boat with one man in tow of the schooner, and assisted in taking her into harbor.

April 8.—The schooner *Three Bells*, of Racine, Wisconsin, bound from Racine to Ludington, Michigan, loaded with hay, and having three men on board, at 10 p. m. missed the harbor pier and went ashore to windward. The man on watch at Station No. 7, Eleventh District, Lake Michigan, gave instant alarm at the station, and the life-saving crew went out at once in the surf-boat to her assistance. The sea was so heavy, however, that the tugs would not venture near her, and the life-saving men returned to the station leaving one of their number on board the vessel to assist in case of sudden need. The next morning the boat went out again, and the life-saving men assisted in running lines from the vessel to the tugs, after which she was towed into harbor.

April 10.—The schooner *J. L. Cotter*, of St. John, New Brunswick, bound from Guadeloupe to Philadelphia with a cargo of sugar and a crew of six men, stranded on the extreme point of Cape Henlopen, and was reported at Station No. 1, Fifth District, by the patrolman at 1.40 a. m. The tide was on the last of the ebb, a light southerly breeze was blowing, with a heavy roll of surf from the southeast. The surf-boat was launched at two o'clock and boarded the schooner as soon as possible. The keeper, finding that assistance to be effective must be rendered by a steamer, pulled in to the Delaware Breakwater to notify the wrecking steamer, but failed to secure her services. He then returned to the beach and hauled his boat up. The life saving crew remained here until high water, at which time the captain thought his vessel would float. As she did not, the surf-boat again boarded her at ebb tide and found wreckers had arrived. Deeming the vessel in safe hands, the wreckers having run anchors and otherwise prepared for emergencies, the keeper left with his crew and returned to the station, arriving there at about 10 o'clock a. m., having been on duty since 2 a. m. The vessel got off the beach at 10 p. m. the same day.

April 10.—During a furious gale the schooner-barge *Favorite*, of Buffalo, New York, with a crew of five men, and two lady passengers, parted her stern moorings from the end of the government pier at Buffalo, and swung out in the stream. The life-boat crew of Station No. 5, Ninth District, Lake Erie, with the aid of heaving-sticks and lines, got hawsers ashore from the vessel and then, with the assistance of a tug, hauled the vessel back to her berth and rescued her. The crew worked in water waist deep to effect the rescue.

April 10.—The scow *Mary Garret*, which had been loading salt at the New River dock, about four miles from Station No. 2, Tenth District, Lake Huron, could not get under way on account of a gale blowing on shore, and was in danger of wreck. At 12 m. a surfman from the station was sent to the dock to see if the life-saving crew could be of any assistance. He found her pounding hard against the dock and liable to serious damage. At his suggestion the crew of the scow and three men

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were taken ashore, and then the captain, assisted by the surfman, scuttled her, when she sank to the bottom in 10 feet of water, where she lay without further injury until she was raised.

April 10.—While the surfman above alluded to was absent, word was brought to Station No. 2, Tenth District, that the schooner *Home*, of Port Huron, Michigan, loading at Port Hope, Michigan, with salt for Toledo, was ashore and without means for her crew's escape. The keeper had already sent for a team to go to the stranded schooner *Montauk*, of Chicago, Illinois, which was also reported ashore four miles southeast of the station. At 4.25 p. m. the team arrived and was at once hitched to the boat-wagon, and the eight miles to the *Home* was accomplished before half-past six. While the keeper was fastening the cork jackets to his men, volunteers unloaded the boat from the wagon, and at 6.30 the life-saving crew shoved off to the rescue In spite of the heavy sea running they made the quarter of a mile to the wreck in about ten minutes, came to the leeward of her, and got the crew of six men aboard the surf-boat and landed them safely, amid the cheers of the bystanders.

April 10.—Immediately after volunteers hauled out the surf-boat, mounted it, and drew it on its wagon half a mile to the barn where the team was feeding, and immediately the life-saving crew, having in the meantime taken a hasty lunch, proceeded with their boat to the *Montauk*, laden with coal from Buffalo to Chicago, which, during the heavy gale and snow-storm that prevailed, had struck on the outside reef and commenced to leak, after which she was run inshore until she stranded. A fresh team was kindly provided on the way to expedite the journey by Mr. W. R. Stafford, of Port Hope, and at 8.45 p. m. they reached a small dock, the nearest point they could approach abreast the wreck, and the only place in the locality where the boat could be launched, and this was a mile and a half from the wreck. Before starting they sprinkled the boat with salt to cut the ice with which the thwarts, thole-pins, and oars were covered. At 9.15 they launched, and in the darkness headed for the place where they supposed the wreck to be, she showing no light. After getting clear of the dock they found a heavy sea running from the northeast with a gale from the northwest. The weather was bitter cold, and the spray froze to the crew as fast as it lighted on them. They pulled an hour without ever getting more than 150 feet to windward of their starting point, and meanwhile lost an oar. They then headed for the dock, and arrived wet, with clothing frozen and hands so benumbed with cold that it was with difficulty they could handle their oars. A small scow, the *Sunrise*, was lying at the dock, and her captain hospitably invited the suffering men to come on board and warm and dry themselves. As soon as this was done, in about an hour, two surfmen were provided with lanterns and patrolled the beach abreast the wreck. They were soon relieved by two others, as it was impossible to endure the intense cold long at a time. In this way the night was passed in a sharp look-out for anything that might come ashore, and a good oar, afterwards used in lieu of the one they had lost, was picked up.

At day-break, on the 11th, the vessel was discovered in good condition, and with no signs of breaking up. Captain William Cleary, of the scow, provided the life-saving crew with a good breakfast, and at sunrise they again took their places in the boat, determined, if possible, to reach the wreck. They worked with a will, but their progress was slow. The sea was heavy, and the intense cold formed ice on the oars and thole-pins so that the oars constantly unshipped and gave the seas such advantage that the boat broached to and took in water badly. In this way they worked two hours and a half and had reached within an

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eighth of a mile of the wreck. They could see no stir or indication of any person being on board. The breakers were exceedingly heavy, and sometimes took possession of the boat in spite of all the efforts of her men. At one time the crew lost two oars, but regained them before they drifted clear. Again the boat broached to and nearly capsized, throwing one of the surfmen out, and taking the three lee oars with him. The crew immediately doubled up on the two remaining oars and kept the boat headed for the surfman. The sea and wind were so heavy that it seemed almost impossible to reach him, but after twenty minutes' effort they were able to throw him the painter, which he caught and was drawn in. They then headed for the shore, but there were so many boulders and so much slush ice that they were compelled to jump into the water 100 feet from the beach and pull their boat through two and a half feet of water to the shore, a task accomplished with great difficulty. They landed about a quarter of a mile northwest from where they had launched at sunrise. The crew had now been without sleep for twenty-six hours, excepting such short forgetfulness as they may have had sitting on the stools or floor of the cabin of the scow *Sunrise*, during the night. Persons on the beach kindly provided them with dry clothing, and dispatched a messenger to look for the oars along the beach. At noon the wind moderated, and it grew warmer, and the sea was not quite so heavy. At this time three men started for the wreck in a yawl, and in three-quarters of an hour reached her. At 12.45 the messenger reported with the oars, and the life-saving crew made ready for another start to the wreck. Just as they were about to launch, the yawl was seen to leave the vessel with one more person than she had taken out, and they concluded to await her return. At 1 p. m. she came in with the captain of the vessel, who reported her lying hard and fast on the bottom and in no immediate danger of breaking up. He had not shown signals of distress because he had not considered the vessel in a dangerous condition, and did not wish any one to take risks when there was no need. The captain wished to go to Port Huron, and the keeper engaged to keep a lookout for the vessel's safety, and, if the gale should freshen, to go and bring the crew ashore. At 2 p. m. the station crew, with an ox-team and two stone-boats, drew the boat to a place where she could be loaded on her wagon, and returned to the station, arriving at 5 p. m., well worn out with their severe and continued exertion.

On the 12th, 13th, and 14th, the life-saving crew visited the wreck to ascertain her condition and afford help if needed. On the 14th they remained at the wreck all day, as the weather looked threatening, and at night left their cork jackets with the sailors in case of need. At 3 p. m. on the 15th, the wind suddenly canted to the northeast, blowing fresh, and, as the sea was making very fast, all hands were ordered into the surf-boat and in two hours were alongside the wreck. The second mate and two seamen were anxious to go ashore, but the remaining four, notwithstanding the urgent entreaties of the keeper, insisted on remaining on the schooner, promising if she showed signs of breaking up that they would signal for help. All hands took supper on shore, and afterwards the life-saving crew took turn about in watching the stranded schooner all night. At breakfast time next morning the men on the schooner had made no signal. At noon, though it blew a gale and a heavy sea was running, there was still no signal. Night set in with a heavy gale, and snow and rain, and a watch was again kept all night. At noon the next day, the 17th, all hands again manned the surf-boat and pulled out to the schooner with the two seamen, and as the mate felt secure for the vessel, it having so long withstood the storm, the men were left

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on board, and the boat returned to the station, arriving at 4.30 p. m. During the operations of the life-saving crew for the last four or five days, Mr. E. G. Johnston hospitably furnished them with meals. The vessel finally got off.

April 10.—The schooner *Ida Keith*, of Chicago, Illinois, with a crew of nine men, and a cargo of corn, bound from Chicago to Buffalo, during a strong northeast gale and snow-storm, stranded four and a half miles south of Station No. 2, Eleventh District, Lake Michigan. At 8 a. m. the life-saving crew went to the shore abreast of her to see what was needed, and afterwards took the surf-boat and other apparatus to the place. The captain of the vessel sent word ashore on a shingle that he did not wish to land, but desired a boat to be sent out to him. Two shots were fired, the second being successful, and the boat was pulled part way out by the line, when the latter parted and the boat drifted back to the shore. It was by this time too dark to fire another shot; the life-saving crew, therefore, built a fire and patroled the beach until morning. They then prepared to fire another shot, but a shingle message from the captain of the schooner requested them to await the going down of the sea. At 10 a. m. the storm lulled, and soon after the life-saving crew rowed out and landed the ship's crew. The vessel was subsequently got off.

April 10.—The schooner *G. H. Warmington*, of Cleveland, bound from Chicago to Buffalo with a cargo of corn, and a crew of nine men, when off Point au Bec Scies, Lake Michigan, at 4 a. m. encountered a gale which drove her into Manitowoc Bay for shelter, where she let go her anchor at 4 p. m. and hoisted a signal of distress. Her signal was seen at Station No. 17, Eleventh District, about eight miles north, and the surf boat immediately went out to her assistance, reaching her at 5 p. m. The sea was so heavy that the life-saving crew could not board her, but they held by her by means of a line from her stern, and found from her captain that she was in bad condition, her fore and main sails and her jib being blown away, and her main boom broken. The first and second mates were both disabled by bruises from timbers floating about in the seas that washed the deck during the storm. After getting the captain's directions, the life-saving crew went back to shore, and the next morning the keeper returned on a tug with one of his own crew, an extra seaman, and liniment for the bruised men. On arrival at the wreck the seaman, seeing the condition of the vessel, refused to ship. The captain went to Manitowoc for a mainsail and the keeper and surfman assisted in getting it aboard, after which, no further assistance being required, they returned to the station.

April 11.—A little before daylight the patrol of Station No. 7, Second District, Massachusetts, reported to the keeper a schooner aground on the bar near the relief station midway between Stations Nos. 7 and 8. About the same time she was also observed by the patrol of No. 8, who burned his Coston light to give notice of coming help, and immediately reported at the station. The crew of No. 7, with their surf-boat, arrived at the vessel's side at 4.40 a. m. and the crew of No.8 a few minutes later. The vessel proved to be the schooner *John L. Merrill*, of New York, from Porto Rico, for Boston, with sugar in hogsheads. The vessel was high on the bar, and the united efforts of both crews were needed to save her. As it was yet four hours to high water, the life-saving men opened the hatches and broke out cargo sufficient to trim the ship, and also to jettison, if it should be necessary, in order to float her. This done, the crew of No. 7 took the kedge and hawser and ran it out on the bar for the purpose of hauling out the ship's large

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anchor and chain. The vessel had no boat that would carry her anchor, and as the surf-boats were too small for the purpose the crew of No. 8 went for a larger boat which was on the beach about a mile away. In this they took a thirteen-hundred pound anchor and 30 fathoms of chain, hauling the boat by the hawser previously taken out, a task accomplished with difficulty owing to the height of wind and sea. This done, they hove the chain taut, and the vessel's head swung to seaward, though she was yet by no means afloat. They then hoisted all sail, shifted the cargo forward, and hove on the anchors, which, with the force of the wind and rising sea, jumped her over the bar, slipping her anchor chain and parting the hawser. Both crews remained on board, giving assistance and tacking on and off, until it was ascertained that the vessel did not leak. Three days after (April 14th) they took up the anchor and chain, and landed and delivered them to the underwriters' agent, who shipped them to Boston. Had not the vessel been thus opportunely relieved she must have been a total loss with her cargo. The captain made expression through the newspapers of his thanks for the service rendered.

April 11.—At 9 a. m., during a severe snow-storm with heavy wind, a report was received at Station No. 3, Ninth District, Lake Ontario, that a schooner was ashore six miles east of Oswego. At 9.15 the life-saving crew, with the surf-boat on its carriage and the mortar-cart loaded with the Lyle gun and apparatus, started for the scene of disaster. When within a mile of the wreck the axletree of the boat-carriage gave way, and abandoning it the crew proceeded with the cart and its load only, arriving opposite the wreck at 11 a. m. At the first shot the line was got aboard, the breeches-buoy was soon rigged, and the seven men on board the vessel were landed in safety and without getting wet. A surfman was then sent aboard for the captain's books and papers, the breeches-buoy making in all eight trips. The vessel was the schooner *David Andrews*, of Belleville, Canada, with a cargo of rye, and was a total loss.

April 11.—The British schooner *Twilight*, of Toronto, Canada, bound from Kingston to Toronto, with a cargo of stone, and a crew of seven men, was discovered close inshore and about four miles east of Station No. 4, Ninth District, Lake Ontario, flying a signal of distress. The keeper manned the surf-boat, and, in tow of a tug, boarded the vessel, where he learned that she had in the gale and snow-storm prevailing, carried away her forestay and main boom, and narrowly escaped going ashore, to avoid which both anchors had been let go and brought her up. The sea was running so high and the vessel lay so near the beach that the tug could not approach her near enough to assist her. The captain thought his vessel would ride out the storm until daylight. The keeper therefore returned with his crew to Charlotte, the men well covered with frozen spray and the boat with ice. On the following morning they went out again with surf-boat, cables, and tug, and the vessel was taken into harbor.

April 11.—At 1 p. m. the schooner *C. A. King*, of Chicago, lumber laden, on her way from Traverse Bay, Lake Michigan, to Racine, Wisconsin, in tow of the steam-tug *Henry S. Sill*, was trying to make harbor at Racine when the tow-line parted, and the schooner drifted ashore about 200 feet south of the south pier. The wind was blowing heavily from the northeast, and a high sea was running. The life-boat of Station No. 14, Eleventh District, with a full crew, went out immediately to her assistance. They found her pounding heavily, full of water, and her deck-load gradually being washed overboard. The tug was also in a helpless condition, drifting round with the parted tow-line tangled in

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her wheel. The life-saving crew took lines to both the tug and the schooner, and brought the captain of the latter ashore. The tug was hauled round the pier and pulled into harbor. After landing the captain the life-saving crew went twice to the schooner, but their services were not then needed. During the night the crew busied themselves in assisting to lighten the vessel, and at 11 a. m. of the 12th succeeded in getting her afloat, when the steam-tug pulled her safely into harbor.

April 12.—At 6 p. m. the schooner *James M. Hall*, of Philadelphia, bound from New York to Norfolk, with an assorted cargo and a crew of five men, was caught in a heavy head wind, and in endeavoring to gain shelter in Little Egg Harbor, New Jersey, got into trouble on the north shoals. The keeper of Station No. 23, Fourth District, discovering the vessel, procured a team of horses to draw the boat-wagon, and before dark had launched the surf-boat. It was quite dark when they came alongside the vessel, however, which they found lying between two shoals, with her anchors down and her stern within 20 feet of a shoal over which the sea was breaking heavily. She was laboring hard, and in danger of parting her chains or dragging anchors, which would throw her on the shoal and break her up. As nothing could be done for her safety, and it was at great risk of life for her crew to remain on board, the keeper proposed that they should return with him in the surf-boat to the station. The keeper and part of the life-saving crew then boarded the schooner, and assisted in stopping up her sails, while the remainder of the men kept the surf-boat off. When this was done the men all left the vessel, and though the gale was high and the night dark, rendering the task a difficult one, they were taken safely to shore, and the schooner's men were kept at the station until morning. During the night the wind abated, and the vessel fortunately had held to her place. At sunrise the surf-boat was again launched, and the crews went out to the vessel, hove up her anchors, cleared the shoal, and took her through a narrow channel into a safe anchorage.

April 12.—The crew of Station No. 2, Ninth District, Lake Ontario, went out three and a half miles in a heavy sea, in answer to a signal of distress, to the assistance of the barge *Grace Whitney*, of Detroit, which had broken her lines from the tug *Gardner*, drifted down the lake into Mexico Bay, and come to anchor, where she was being badly used by the storm. The gale and sea were so strong that it took the life-saving men more than two hours to pull out. They found the captain wished them to telegraph for a tug. They staid by the barge about ten minutes, and then returned to shore with the message, landing at 1.30 p. m., very much exhausted by their hard pull of about five hours. The barge was relieved by her own tug, and taken in safety to Oswego.

April 13.—At 11.45 a. m. the schooner *Charles H. Malleson*, of Perth Amboy, New Jersey, bound from Philadelphia for Norfolk, in ballast, grounded on Williams Shoal, about three and a half miles south of Station No. 7, Fifth District, Virginia, half a mile from shore. The wind at the time was blowing strong from the south, the weather clear, and a high sea running. The surf-boat was at once launched from the station, and after a hard pull of nearly two hours against wind and sea succeeded in boarding the vessel. The keeper determined, after arriving on board, that the schooner was in no immediate danger, and having told the master of the most available direction in which to run his anchors so as to be of service in floating the vessel on the flood tide, he left with his crew and returned to the station. The schooner floated on the flood tide and went into the harbor.

April 14.—At 3.10 a. m., ebb tide, as a patrolman of Station No. 1,

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Fourth District, New Jersey, was passing around Sandy Hook on return watch, he discovered a stranded schooner about 100 yards from the station. After burning a red Coston light to indicate approaching assistance, he hurried on to the station with the alarm. The crew immediately turned out, procured a team from the light-house, and conveyed the surf-boat to the beach. They boarded the vessel, which proved to be the *Xebec*, of Nova Scotia, bound from Porto Rico to New York, with molasses, and a crew of seven men. They found her lying easy and in no need of help, and returned to the station. At flood tide the vessel floated and was pulled into deep water by a tug.

April 14.—The schooner *Z. G. Simmons*, of Muskegon, Michigan, from Chicago to Manistee, Michigan, with a crew of six men, collided with a dump-scow at the entrance of Manistee Harbor. She was towed up the river abreast of Station No. 5, Eleventh District, where she sunk. The captain of the schooner and the men belonging to the tug worked all day to free her of water and failed. She was then given over to the keeper of the station, who, with his crew, assisted to clear up the wreck, put her in shape to pump, freed her of water, ran lines, and put her in such order that she left for Muskegon on the 17th.

April 14.—The schooner *W. H. Hawkins*, of Chicago, from White Lake, Michigan, to Chicago, with wood and a crew of six men, split her mainsail in a gale, which caused her to swing against the pier at Kenosha, Wisconsin, breaking her bulwarks, as she was making port. The life-saving crew of Station No. 13, Eleventh District, boarded her and got her up the river in safety.

April 15.—The schooner *George O. Hovey*, of Gloucester, Massachusetts, bound for the Fishing Banks, stranded at 1 p. m. on Round Shoal in Quoddy Bay, near Station No. 1, First District, Maine. The occurrence was seen by the keeper of the station, who sent a manned boat to assist in getting her afloat. The captain of the schooner, however, refused their help. The next morning the vessel lay in the same position, and as a thick fog prevailed and a heavy sea was beating in, the keeper went out to her with his boat and crew again at flood tide, when the captain accepted their services, by which the vessel was got afloat in two hours and taken to a safe anchorage, leaking badly.

April 15.—The schooner *Criss Grover*, of Loraine, Ohio, bound from Kelley's Island, Ohio, to Frankfort, Michigan, laden with limestone, struck a shoal in very stormy weather, at 9 p. m., and was wrecked about a mile south of the mouth of Au Sable River, in Lake Huron. Her boat had swamped and broken adrift, leaving no escape to the shore. The storm increased rapidly, blowing and snowing fiercely, and the crew, consisting of ten men and one woman, the cook, were driven to the top of the cabin under the lee of the mizzen boom and into the mizzen rigging. There is no life saving station at that locality, and the nearest one, No. 4, Tenth District, Lake Huron, is fourteen miles distant, at East Tawas. During the 16th every effort was made by persons in the vicinity to accompish the rescue of the wrecked people. Hundreds of men were on the beach. Two attempts to reach the vessel with a boat were made but failed, and a small cannon was fired to throw a weighted line over her. The cannon exploded, killing John W. Glennie, esq., the deputy collector of customs at Au Sable, and injuring two others. At 4.15 p. m. a messenger with a team to drag the boat-carriage arrived with word of the disaster at Station No. 4, and in fifteen minutes the crew were on their way to the rescue. It was midnight before they reached the beach opposite the vessel, the storm being so severe and the roads in such condition that they could not

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go faster than a walk. The life-saving crew walked nearly the entire distance. At a half-way house they found a fresh team awaiting them, where they also procured a change of hind wheels for the wagon, the hind axletree of the boat-carriage having given out and the boat having to be trailed for some distance. By the time the point of destination was reached the snow had ceased falling, but the night was intensely dark and the surf heavy. At 12.15 the boat was launched with the crew all in their seats. At the word "Give way," they bent to their oars, and after a sharp and uncertain struggle in the dark the first line of breakers was passed and soon the boat was under the lee of the vessel, which now lay 300 or more yards from the shore. The sea was breaking over the wreck, and drenching the crew on the cabin top and in the rigging at every wave. The woman was quite exhausted and helpless and would soon have perished had not help arrived. Others of the crew were so benumbed that they could not have held out until morning. They were taken into the boat as quickly as possible, an undertaking involving great risk, for the seas that washed the ship threatened to swamp them. When all were in the boat they pulled straight and steady for the shore. A great crowd watched for their coming, but it was so dark that the people could not see them until the boat's keel grated on the beach. Then they rushed into the surf with ready hands to draw the boat on land, and carry the rescued crew to the warm fires kindled for their comfort, and where stimulants and refreshments were provided for their recovery. The woman was speechless and apparently near dying. When the captain was set on shore his strength failed, and he became helpless. One sailor could with difficulty stand, and the mate and another man were nearly as badly off. All but the woman were revived and comfortable before the life-saving crew left on the morning of the 17th for the station. She was for some time under the care of a physician. The vessel was a total wreck.

April 16.—The British ship *Hannah Morris*, of Windsor, Nova Scotia, from Bremerhaven to Baltimore, laden with empty barrels and salt, and a crew of sixteen men, stranded at 3.30 a. m. about one mile north of Station No. 5, Sixth District, North Carolina. Within five minutes from the time the ship struck, the patrol from No. 5 discovered her and burned a Coston light, which he followed with two more, when the ship answering, he hastened to the station, arriving at 4 a. m. The keeper and crew immediately turned out, the keeper telephoned the adjacent Station, No. 4, and then with the crew proceeded in their surf-boat to the wreck. At 4.30 the keeper boarded her and offered assistance, which was gratefully accepted. It was decided to send a message by telegraph to Norfolk to the Coast Wrecking Company for a steamer's help, and one of the life-saving crew was dispatched with it to the station to send by telephone to the Cape Henry office. The keeper of No. 4, on receiving the telephonic announcement from No. 5, telephoned to Assistant Inspector Newcomb, who was at No. 3. The keeper of No. 4 arrived at the scene of disaster not long after No. 5, and at 7.30 a. m. Inspector Newcomb. As the vessel was working all the time, the wind off shore and the tide rising, it was thought possible to float her, and to this end the life-saving men ran a kedge out, while the crew of the ship threw over part of her cargo in order to lighten her. Every exertion was made during the day to get the vessel off until 2 p. m., when the tide commenced to fall, but the kedge failing to hold, the wind changing, and an adverse current setting up the beach, it was found possible only to keep the vessel in the same depth of water, and that by hard work on the part of both the crews. At 2.30 p. m. both life

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saving crews went on shore with orders to return before dark or sooner if the wind changed. At 3 p. m. the Coast Wrecking Company's steamer *Rescue* came alongside and prepared for an attempt to haul the vessel off. At 6 p. m. the station crews returned, and at the request of the captain transferred his private effects to the wrecking steamer. The weather was threatening, and at 7 p. m. it was decided to transfer the ship's crew to the steamer. While this was being done the ship came off, her crew was returned to her, and the life-saving men, very much exhausted with the labors of the day, returned to their stations and to their patrol duty, which, by order of Lieutenant Newcomb, had been performed by the crews of No. 3 and No. 6. Had the ship's anchor been heavy enough the life-saving crews would undoubtedly have been able to get the vessel off before the arrival of the wrecking steamer.

April 16.—The crew of Station No. 9, Ninth District, Lake Erie, was called to go to the assistance of the schooner *Reporter*, of Conneaut, Ohio, which, with a cargo of sand and a crew of three men, ran on the bar at Cedar Point, at the entrance of Sandusky Bay, and was lying in a dangerous position, the wind being fresh, north and east, and heavy seas breaking over her. Cedar Point is about five miles from Station No. 9, and before the life-boat crew could get to the vessel the wind had changed to the southwest, and she had pounded across the bar and come to anchor in the channel, and so did not need their help.

April 16.—The schooner *Evergreen*, of Racine, Wisconsin, bound from Muskegon, Michigan, to Racine, with a cargo of lumber and a crew of four men, was stranded about a mile south of Station No. 15, Eleventh District, Lake Michigan, about noon, while attempting to make the harbor at Milwaukee. There was a snow-storm from northeast and a heavy sea, and although the life-saving crew, who had been keeping a sharp look-out on the vessel, started at once, with their boat on its wagon, when they saw she had missed the piers, they were unable on account of the heavy draught on the wagon owing to the wash of the sea up the beach, to get to her before she struck. By means of a heaving-line thrown from the vessel, a crowd of persons on the shore had got to her a piece of old hawser, which happened to lie handy near by, and her crew came ashore by it, the last of them landing just as the life-saving crew came up. The whole thing took place in a few minutes, and it would have been impossible for the crew under circumstances more favorable to have reached them before this had been accomplished. The keeper at once tendered the services of himself and crew to do whatever might be desired by the captain, and in compliance with his request went aboard the vessel and threw over a part of her deck-load. The keeper then went below and got out a hawser, which he sent ashore. He then ordered some of his men to dig a trench, make the hawser fast to a timber, lay it in the trench and cover it with sand so as to make it serve the purpose of a sand anchor. They then took the loose end of the hawser to the windlass, and by its means the life-saving crew hove the vessel up fast on the beach. After this they secured the sails and rigging, and returned to the station. The next morning the surf-boat was launched in tow of the tug *Welcome* and went out with the intention of assisting her to run lines for pulling the vessel off, but they found her going to pieces, and the attempt was not made. The life-saving crew, however, assisted her own men to strip her, saving all the sails, running gear, rigging, spars, and personal effects.

April 17.—The schooner *Freddy Eaton*, of Calais, Maine, bound from Calais to Boston, with a cargo of lumber, having on board a crew of five men and one passenger, struck on Thompson's Ledge, near Cranberry

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Isles, in a snow-storm. She remained on about ten minutes and came off, when the captain run her for the narrow channel between Little and Great Cranberry Isles, and came to anchor abreast of Maple Point. Here she was seen by the crew of Station No. 4, First District, at about half past six in the morning. The storm having somewhat abated, the surf-boat was manned and taken directly to her assistance, but she was found so near taking the bottom that nothing could be done to relieve her until the next flood tide. The life-saving crew, however, put out a second anchor to hold her off a ragged ledge that was just astern of her, furled her sails, and drove down the rudder post that had been started up at low-water. When the tide began to flow they reefed fore and main sails and went forward to heave ahead. At this time one of the men in getting down off the deck-load took hold of the jib whip and it parted; the man jumped and landed on his feet, but the boom on the jib came down and struck another of the life-saving crew on the head, knocking him down and seriously injuring him. The vessel was got out of her dangerous position, and the life-saving crew took her into Cranberry Isle Harbor, somewhat damaged, and anchored her.

April 17.—The schooner *A. R. Woodward*, of Ellsworth, Maine, with a crew of four men, was discovered by one of the crew of Station No 6, First District, Maine, drifting toward the shoal ground of Wood Island Harbor. The wind was blowing hard from the northeast and the sea rough. Perceiving that she must before long run ashore, he hastened to the station and gave the alarm. The crew were immediately assembled, and at 7.45 a. m. the boat was launched, and arrived at the distressed vessel at 8.15. They found her drifted into shoal water and pounding on the bottom. As the tide was on the ebb, the life-saving crew could do nothing then to relieve the vessel. They therefore remained by her until flood tide, and then took her into a safe anchorage at Biddeford Pool.

April 17.—The schooner *New Dominion*, of Toronto, Canada, with a crew of six men, was disabled by loss of sails in a gale, and at 2 a. m. the vessel struck on the stone breakwater of the Erie Basin, at Buffalo, New York, and her crew took refuge on the breakwater wall. At 2.45 the crew of Station No. 5, Ninth District, went to their assistance with the surf-boat and lines. At the request of the captain they procured a powerful tug and hawser, made connection between the tug and the schooner, and then took the exhausted crew from the breakwater to the station, gave them a good hot breakfast, and made them as comfortable as possible. The tug in the meantime endeavored to haul off the vessel, but failed and gave up the attempt for the time being. She was subsequently got off, badly damaged.

April 18.—The open boat *Dolly Varden*, of Sayville, Long Island, with a party of ten persons on board, while pleasure-sailing in Moriches Bay, opposite Station No. 19, Third District, Long Island, was capsized in a squall, and the disaster being observed at the moment of its occurrence by the keeper of the station, he manned two skiffs, already on the shore, with his crew, and put off to the rescue. The life-saving crew succeeded in landing eight persons, women and children, from the sail-boat; the other two, being the crew of the boat, were assisted by the station crew to right and bail out the boat.

April 18.—At 8.30 a. m. the crew of Station No. 34, Fourth District, New Jersey, boarded the schooner *A. D. Scull*, of Great Egg Harbor, New Jersey, bound from Fall River, Massachusetts, to New Castle, Delaware, with a cargo of empty barrels, and a crew of seven men, which had stranded on the north bar of Townsend's Inlet, New Jersey. They

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helped to lay her anchors, handle her sails and hawsers, and with the assistance of the keeper of Station No. 33, who had arrived, succeeded in getting her afloat and to a safe anchorage.

April 18.—The same crew (No. 34) also boarded the stranded schooner *L. and A. Babcock*, of Absecom, New Jersey, bound from Gardiner, Maine, to Philadelphia, laden with ice and having a crew of seven men, but finding her anchors too heavy for their surf-boat, and a wrecking crew on hand to assist her, they left her in the hands of the latter and proceeded to attend to the wants of the *A. D. Scull*, as stated above.

April 18.—The crew of Station No. 7, Ninth District, Lake Erie, went out to the assistance of a steam pile-driver, with four men on board, about three miles west of the station, which had gone out early in the morning for the purpose of driving piles for fishing. A fresh wind had sprung up and the sea grown so heavy that the driver had not power enough to propel against it, and had set a signal of distress. In reply to the offer of assistance from the life-saving crew, her master requested them to send a tug to tow them back to harbor, which was done.

April 20.—At 4 a. m. the schooner *William H. Aspinwall*, of New York (pilot boat No. 21), with a crew of six men out cruising for vessels to pilot into New York Harbor, was caught in a thick fog and came on shore one mile west of Fire Island Light, all sails standing. Ten minutes later she was discovered by the patrolman of Station No. 25, Third District, Long Island, who burned his Coston signal and went at once to the station for help. The vessel was on the outer bar, and as the sea was high, the keeper had the mortar-cart taken to the beach opposite her, but on reaching there found that she had pounded over the bar and come in close to the beach. As her crew were unable to get her sails down, they had cut away her spars, and these had formed a breakwater which enabled them to launch their own boat between the masts, and they landed just as the life-saving crew reached the spot. The whole crew were taken to the station to breakfast, and afterwards the keeper procured a horse and cart and conveyed the station-boat to the wreck in order to save the effects of the men and as much as possible of the belongings of the vessel. After clearing the decks of everything of value, the keeper went below in a Merriman life-saving suit and worked several hours getting out whatever was worth saving. Three trips were made in the boat; the small stuff was taken to the station, and a watch was set over that which was too cumbersome to be transported, until the owner's arrival. The pilot crew were housed and sustained at the station four days. The vessel was a total loss.

April 20.—At about midnight the north patrol of Station No. 1, Fifth District, Delaware, reported a bark ashore on the point of Cape Henlopen. A heavy surf made it difficult to launch the boat, and the trouble was increased by the absence of one man, the patrol south, leaving the crew short-handed. They succeeded, however, in boarding her at 1 a. m. She proved to be the *Queen of Ceylon*, of Greenock, Scotland, with a cargo of sugar from Sagua la Grande, Cuba, to Delaware Breakwater, for orders. The keeper found she was badly aground. The life-saving men obtained a tug for her relief, and remained by her until she was got off and out of danger.

April 21.—The patrol of Station No. 11, Second District, Cape Cod, from midnight to 4 a. m., going south, discovered at 2 a. m., a mile and three-quarters from the station, a large vessel standing inshore and in danger of striking in a very few minutes on the outer bar. He burned his Coston light in warning, and the vessel immediately wore off.

April 21.—The steam-tug *M. A. Gagnon*, of Two Rivers, Wisconsin,

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going out from the harbor to the lake at Two Rivers, with a crew of four men, got on the bar at the outside end of the harbor piers, where she pounded heavily. She blew her whistle for help, and the crew of Station No. 17, Eleventh District, went out with their surf-boat to her assistance. They supplied her with lines and helped heave her off into deep water, where she could handle herself.

April 22.—At eight o'clock in the morning the schooner *Stampede*, of Sheboygan, Wisconsin, bound to that place from Alabaster, Michigan, with a cargo of plaster-rock, struck the outer bar off the harbor of Sheboygan, and stranded, broadside to the sea, about 300 yards south of the end of the lower pier. The wind was fresh from the northeast at the time, and the sea was high and heavy, with a strong current running past the ends of the piers to the southward. The keeper of Station No. 16, Eleventh District, seeing the trouble, at once put out with his crew to the aid of the schooner, in an old metallic surf-boat of a type not in use by the service, which had been stored at the station. The bar had been passed, and the boat turned, stern to the sea, and headed for the vessel, when a powerful surge struck and combed over the boat's stern, knocking the keeper off his feet. As the work of the steering oar was thus interrupted by this unfortunate accident, the boat broached to and capsized, spilling the crew into the water. The capsized boat, with one of the men under her, drifted by the vessel to leeward, and finally brought up among the broken piling of an old pier, some distance from the beach. Meanwhile, the master of the stranded vessel had observed the accident, and, launching his large yawl-boat, succeeded in picking up the keeper and the other five men. Immediately upon being landed, the keeper and these men, with some other assistance, launched another surf-boat and rowed out to the one capsized, which they vainly endeavored to right, it having become jammed between some of the piles, and were finally obliged to cut a large hole in the bottom of the boat, in order to liberate the man beneath. Having been imprisoned a long time, he was almost chilled to death by the icy water. Upon the capsizing of the boat, he had been somewhat stunned, probably by being struck on the head by something, and on recovering, found himself underneath the boat, holding on to a thwart. He drew himself up on the thwarts, getting clear of the water, all but his hands and knees, not venturing to attempt to get out from under the boat, lest it should strike him on the head, as it was tossing about violently in the rough sea. In this position he drifted to the old pier, by the time of his arrival at which he had become so benumbed as to be incapable of much further effort, and was fortunately liberated, as stated. The boat, besides the injury involved in cutting through her bottom, suffered some damage by the loss of thwarts and rowlocks.

April 27.—The schooner *A. H. Moss*, of Cleveland, Ohio, bound from Marblehead, Ohio, to Erie, Pennsylvania, with a cargo of stone and a crew of eight persons on board, stranded on the north side of Presque Isle, two miles from Station No. 6, Ninth District, Lake Erie, at 4 o'clock a. m. The disaster was reported at the station by the patrolman, when the surf-boat was immediately launched and the vessel boarded at 4.30 o'clock. The life-saving crew found the vessel lying easy, but nothing could be done without the assistance of a tug. The master of the vessel was therefore conveyed to Erie to get a steamer. A hawser having been procured from the revenue steamer *Perry*, it was put on board the tug, and on the following day the life-saving crew assisted the tug in getting the schooner afloat.

April 27.—At noon a small sail-boat in a strong wind and current capsized in the river within 300 feet of Station No. 17, Eleventh Dis-

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trict, Lake Michigan. The station watch observed the accident, and saw two men who had been sailing the boat crawl up on her keel. Three of the station crew immediately went out in a skiff and brought the men and boat safely to land. The men were benumbed with cold and must have been carried out into the lake by the strong current and washed off and drowned had not the surfmen taken advantage of the convenience of the little skiff instead of taking time to launch the surf-boat.

April 28.—The schooner *Swan*, of Machias, Me., bound from Cutler to Rockland, with a cargo of wood and a crew of two persons, drifted ashore while getting under way in Cross Island Narrows, near Station No. 2, First District, Maine. The life-saving crew immediately boarded the schooner in the surf-boat, ran her anchors, hove her afloat, and got her under way, when she proceeded on her voyage.

April 29.—At 1.30 p. m. the fishing steamer *Narragansett*, of Newport, Rhode Island, fishing off Long Island, struck the wreck of the *Circassian* off Bridgehampton, and began to leak badly. She kept afloat, however, until off East Hampton, between Stations Nos. 10 and 11, when her fires were put out just as she was run ashore to prevent sinking. The crews of the above stations went to the rescue. They found her full of water aft. A storm was coming on, which added to the peril, but the prompt and efficient aid given by the life-saving men to the vessel's crew assisted them in landing, and effected the removal of all the personal and fishing property to the land except a single boat and seine. The *Narragansett's* crew, fifteen men, were housed at the station for the night. The vessel became a total wreck.

April 29.—At midnight the life-saving patrol burned two Coston signals two and a half miles from Station No. 13, Sixth District, North Carolina, to warn a vessel which was standing into danger not more than 400 yards from shore. She heeded the second signal, tacked, and stood off in safety.

April 29.—The schooner *Venus*, of Cleveland, Ohio, from Kelly's Island, Lake Erie, with a cargo of limestone for Saint Joseph, Michigan, lost her reckoning and went ashore five miles south of Station No. 2, Eleventh District, Lake Michigan. She stranded at about 9 p. m., and was discovered the following morning at eight o'clock, by the station lookout, flying a signal of distress. Immediately the apparatus and boat were put on a wagon and taken to the beach abreast the vessel. A shot-line was sent over her, the whip-line attached, and the boat hauled off by it, and the crew of six men safely landed. The vessel sunk, but was finally raised and gotten off by a tug, badly damaged. The crew remained at the station nine days, while this was being accomplished.

April 30.—At 9.30 p. m. the German bark *Melchior*, bound from Bremen to New York, with a cargo of petroleum barrels, and salt, and a crew of eighteen men, stranded at Seabright, about a mile and a half south of Station No. 3, Fourth District, New Jersey. The active season on the sea-coast having closed, there was no patrol of the beach, but at 1 a. m. the next morning a member of the crew of the above station, who was out looking after the safety of his fishing-boats, which were exposed to the high tide and raging storm, saw one of the side lights of the vessel close in to shore, and hastened to give the alarm at the keeper's house near by. The keeper summoned his crew, procured a team, and as everything at the station was in order for instant service, was soon under way to the scene of disaster with the beach apparatus. The wind blew heavily from the southeast, the rain fell in torrents, and the darkness was so thick that upon arriving it was found difficult to get range for the gun. A Coston light, however, being ignited, enabled

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the position of the vessel to be determined, and the first shot carried the line across the main-yard. This was secured by the crew and the whip and tail-block were then sent aboard and properly placed, as also was the hawser; but when the arrangements were completed, and the breeches-buoy was sent aboard, it remained empty and was so hauled back to the shore. One of the life-saving men then went off in it and found that, although the crew desired to leave, the captain refused permission. Before long, however, the sea raged so tempestuously, breaking over the ship with increasing violence, that he gave consent, and all the crew except the first mate and himself were taken ashore. Later, however, these two also were landed. The keeper and part of the crew of Station No. 2 were at the scene of disaster and rendered assistance. The vessel was a total loss.

April 30.—A sail boat with three boys on board pleasure-sailing, in attempting to cross the bar opposite Station No. 12, Eleventh District, Lake Michigan, broached to in the surf and capsized, leaving the boys struggling in the water. The accident was seen from the station, and the alarm given. Prompt action was necessary to save the boys, and, there not being time to effect their rescue with the surf-boat, the keeper and crew plunged into the surf and swam to them, brought them ashore, and took them to the station, where they were stripped of their wet clothing, rubbed, and given restoratives. After about three hours they were fully recovered, and went home. The boat was also saved.

May 1.—An open boat called the *Silver Moon*, loaded with lumber, going from the West Pier at Cleveland, Ohio, to the Bath House, and manned by two men, her load making her top-heavy, capsized. The life-saving crew of Station No. 8, Ninth District, went out in the surf-boat to their assistance and rescued them. After both men were in the boat, some friends of one of them came alongside and took him into their boat. The other man was taken by the life-saving crew to the station, given dry clothes, and made comfortable.

May 1.—Two English tourists hired the row-boat *Horace W. Turner*, and attempted to row from the Round House to the Breakwater at Chicago. The water became too rough for the boat, and it filled and capsized, at nine o'clock in the evening, about 400 yards from Station No. 11, Eleventh District. The watch of the station heard their shouts for help and gave the alarm. The surf-boat was immediately launched and proceeded in the direction of the cries. The men were found clinging to the boat in a much exhausted condition, and were so drowsy after being taken into the surf-boat that three of the crew were obliged to rub them to keep their blood in circulation. They were taken to the station, stripped of their clothing, furnished with dry garments, and restoratives from the medicine chest, and soon recovered sufficiently to go away. The crew searched for the boat, found it, and returned it to its owner.

May 2.—Three young men rowing up the river from Charlotte, New York, to Rochester, in attempting to change positions in the boat, capsized it. A surfman of Station No. 4, Ninth District, Lake Ontario, hearing their cries, rowed out, rescued, and took them to his own house near by and gave them all necessary care.

May 5.—The brig *Rachel Coney*, of Bangor, Maine, bound from Beverly, Massachusets, to Bangor, in ballast, and having on board seven persons, stranded in a thick fog and heavy sea on Heron Point, White Head Island, near Station No. 5, First District, Maine. The life-saving crews were not on duty at this season, but the keeper collected a crew of surfmen and boarded the brig. It was found that it would be necessary to employ a steam-tug to save the vessel, and one was accordingly

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sent for. While awaiting her arrival the life-saving crew ran lines to the mastheads of the brig to keep her upright, and made other preparations to get her off. The tug arrived on the following day. The life-saving crew ran a hawser from the brig to the tug, and she was towed off and to a harbor, the station crew remaining by the vessel until she was at anchor.

May 7.—The keeper of Station No. 13, Second District, Massachusetts, at 7.30 a. m., observed the steam yacht *Alice M.*, of Wilmington, North Carolina, bound to Haverhill, Massachusetts, strike on the outer bar a quarter of a mile north of the station, near Chatham. The keeper secured sufficient volunteers (the station being closed for the season) and went to the rescue with a boat. On arriving they found the steamer leaking badly. They took off the crew of five men and conveyed them and their effects to the station, where they were sheltered twenty-four hours. The vessel immediately began to break up, and in a short time was drift-wood scattered along the beach.

May 7.—The schooner *Flying Cloud*, of Chicago, from Chicago to Menomonee, Wisconsin, with a crew of seven men, ran ashore at 3 a. m. one and a half miles southwest of Station No. 17, Eleventh District, Lake Michigan. The weather was dark and hazy, and the vessel could not be seen from the station lookout. The mate landed in the yawl-boat, and reported at the station at 4 a. m., requesting the assistance of the life-boat, anchor, and lines, with that of the tug *M. A. Gagnon*, to pull her off the beach. The life-saving crew, complying, ran lines from the schooner to the tug, which could approach only to within about two hundred yards. At 8 a. m. the tug succeeded in pulling the schooner out into deep water without damage, and at 8.30 the life-saving crew left her in sailing condition, the captain of the *Flying Cloud* thanking them warmly for their assistance.

May 9.—The British steamship *Swiftsure*, bound from Buenos Ayres to Baltimore, with a crew of twenty-five on board, grounded four miles southeast of Station No. 11, Smith's Island, Virginia, Fifth District, and was discovered there by the keeper of the station at 9.30 a. m. It was smoky weather, with a fresh southwest wind blowing, and a high sea running. The station crew went off duty on the 1st instant, and only two of them were at hand, but with these and four volunteers the keeper launched the surf-boat at 10 a. m., and reached the vessel an hour later. His offers of assistance were declined by the master of the ship, and he soon after left with his crew. The vessel was towed afloat at 5.30 p. m. by wrecking-tugs.

May 9.—A man out rowing for pleasure attempted to step from his boat to another, opposite Station No. 15, Eleventh District, Lake Michigan, and capsized. The crew of the station were quickly on hand, but the man had clambered into the other boat. The crew righted the capsized boat, took it ashore, and bailed it out.

May 10.—Two boys went down the river from Charlotte, New York, and out into the lake in a yawl-boat. The wind freshened with a squall, and they were driven out on the lake. Having but one oar they sculled with all their might, but soon became exhausted and helpless. A surfman from Station No. 4, Ninth District, Lake Ontario, discovered their situation, and with three others of the crew went to their rescue with a large double-oared skiff. When reached they were about three and a half miles out on the lake. One of the crew went aboard the yawl and used the sculling-oar, while the others pulled the skiff with the yawl in tow, and took it and its occupants safe to land.

May 10.—A young man rowing for pleasure on the lake at Milwaukee,

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when out about three-quarters of a mile encountered a fresh wind, and in the sea that arose could not manage his boat, and she half filled with water. The lookout of Station No. 15, Eleventh District, Lake Michigan, saw his distress and that he was fast drifting out on the lake. The surf-boat was immediately launched and the man and his boat brought safely in. Without this timely help he must have been lost.

May 13.—The evening watch of Station No. 17, Eleventh District, Lake Michigan, discovered a vessel standing inshore and made signals to her to keep off. The signals were not understood, and she stranded about 100 yards north of the harbor of Two Rivers, Wisconsin. In fifteen minutes the life-saving crew with the surf-boat were alongside. The vessel was the small schooner *Anna*, of Pentwater, Michigan, bound from Pentwater to Manitowoc, Wisconsin, with two men on board. They took her anchor and ran it out into deep water, then boarded her and commenced heaving her out. They had started her about 30 feet when a fluke of the anchor broke, and they were obliged to get another anchor and a hawser from the station. They succeeded in getting her off at 1 a. m. the next day, and piloted her up the river.

May 16.—Two men rowing up the river in a skiff at Charlotte, New York, in attempting to change positions capsized their boat. Two surfmen of Station No. 4, Ninth District, Lake Ontario, observed the accident and ran to their help with a heaving-line, with which they drew them out of the river. They then took them to the station, built a fire, warmed them, and gave them dry clothing.

May 22.—At about 10.30 a. m. the crew of Station No. 5, Tenth District, Lake Huron, discovered a vessel about eight miles southeast by south from the station showing a signal of distress. They launched the surf-boat immediately and reached her at 11.45 a. m. She proved to be the schooner *Emma C. Hutchinson*, of Cleveland, loaded with iron ore, and bound from Escanaba, Michigan, to Cleveland, with a crew of ten men. She had sprung a leak at the foot of Lake Michigan on the 20th, while in tow of a tug, and during the night of the 21st had cut loose from the tug on account of the heavy seas. When boarded by the life-saving crew she had 3 feet of water in her hold and her crew were exhausted with working at the pumps, having been constantly at work since the leak began. The water was gaining at the rate of about a foot an hour, when the life-saving men manned her pumps and soon had her free. This done, they helped make sail and put her on her course for Cleveland, and left her at 9 p. m. in good trim.

May 28.—At 6 a. m., the schooner *J. and C. Merritt*, of Somers' Point, New Jersey, with a cargo of cedar lumber, and a crew of three men, struck a sunken anchor in passing over the north bar at the entrance of Townsend's Inlet, New Jersey, and sunk. The crew of Station No. 34, Fourth District, launched the surf-boat, took a hawser out to the schooner, carried out her anchors, secured her sails, and threw over her deck-load, and otherwise assisted in getting her afloat. Afterwards, the life-saving crew picked up the lumber from the surf. Vessel and cargo were both saved.

May 30.—The Canadian schooner *Guelph*, of Saint Catharine's, Canada, from Kingston, Canada, to Fairport, Ohio, with a cargo of iron ore and nine persons on board, when endeavoring to make her harbor of destination, struck bottom, broached to, and went to windward of the piers, where she pounded heavily. The life-saving crew of Station No. 7, Ninth District, Lake Erie, were promptly on the spot, and with lines, by the help of the schooner's crew, hove her off and around between the piers; but before they could get her up to the dock she sunk in about

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14 feet of water. After doing everything they could to save her, they landed part of the crew and their clothing in the surf-boat, the remainder following in the schooner's boat. Their assistance saved the vessel from total loss. One person was kept at the station two days; the others remained but two hours.

May 30.—Early in the morning, the lookout of Station No. 4, Tenth District, Lake Huron, discovered the schooner *Mona*, of Detroit, riding at anchor, with foremast unstepped and her main-topmast broken off at the cap. She was entirely at the mercy of the sea, which, lashed by a furious gale, was rushing over her. She was about three-quarters of a mile from the station and 250 rods from shore. The life-saving crew went out at 4.20 a. m. in the surf-boat and rendered valuable assistance by running the vessel's hawser through the heavy sea to the tug *George N. Brady*, which arrived soon after they boarded the vessel, and in assisting to heave up her anchors. There were six persons on board.

May 30.—Three boys pleasuring in a yawl-boat near Racine, Wisconsin, were caught in a squall, with wind off shore, and, being unable to manage their boat, drifted out on the lake. When seen by the lookout of Station 14, Eleventh District, they were two and a half miles out on the lake. The life-saving crew took a sail-boat and hastened to their rescue. The lads were exhausted when reached, and but for the timely assistance received would probably have been lost.

May 31.—The schooner *C. S. Davis*, of White Lake, Michigan, bound from White Lake to Milwaukee, with a cargo of pine-wood blocks, and a crew of three men, sprung a leak and ran ashore on South Point, about eight miles south of Station No. 15, Eleventh District, Lake Michigan. The keeper manned the surf-boat and went to the schooner, where they arrived at 10 a. m., in tow of a tug, and assisted in running a hawser to the schooner and in throwing off her deck-load. The tug attempted to pull her off, but failed, and returned to Milwaukee with the surf-boat in tow. At 4 p. m. the life-saving crew returned to the wreck with their surf-boat in tow of the tug again, and assisted in running lines from the steamer, which made a second attempt to get the vessel off, and again failed. On the following day the life-saving crew went to the schooner a third time in tow of another tug and rendered similar service to that of the day before, and this time were successful in getting the vessel off.

June 4.—At 2.30 a. m. the schooner *Porter*, of Milwaukee, from Buffalo to Milwaukee, with coal, and a crew of eleven men, was dismasted in a squall at North Point, about eight miles northeast of Station No. 15, Eleventh District, Lake Michigan. The surfman on the lookout discovered her signal of distress shortly after daylight, and at 6.45 a. m. the surf-boat set sail. They reached the vessel at 8.30 a. m., went aboard, and assisted in weighing her anchor and clearing up the deck, preparatory to her being towed into harbor by the tugs.

June 5.—Three men pleasure-sailing in an open sail-boat, which became disabled by the breaking of the rudder, were seen by the lookout of Station No. 8, Ninth District, Lake Erie, two miles to the eastward, waving their hats for help, while the boat drifted fast out on the lake. The surf-boat was launched and went out to them; the heaving-line was thrown aboard, a line made fast, and the boat and occupants towed safely to harbor.

June 6.—At 11.40 a. m. the lookout of Station No. 3, Ninth District, Lake Ontario, during squally weather, saw a pleasure row-boat about a mile north of Oswego Harbor, with two boys in it, drifting out into the lake, the lads not being strong enough to row against the wind. The

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surf-boat was at once launched, went out to them, and towed the boat and boys to harbor.

June 6.—The sloop *Whip-poor-Will*, of Buffalo, New York, pleasure-sailing, with two persons on board, was struck by a squall, her sail split, and the main-boom carried away. Thus, becoming unmanageable, the vessel was fast drifting upon the stone breakwater. Discovering her condition, the keeper of Station No. 5, Ninth District, Lake Erie, with two of his crew, launched a small boat, put off, and brought the sloop with her crew into the harbor.

June 14.—The sloop *Harry*, with one man on board, broke from her mooring in the basin at Chicago, and drifted against the docks, where she was in imminent danger of pounding to pieces, when the life-saving crew of Station No. 11, Eleventh District, launched the surf-boat, went out to her, ran a line from the sloop to a tug, by which she was pulled off before she was badly damaged.

June 17.—Some young ladies were standing on the dock at Charlotte, New York, not far from Station No. 4, Ninth District, Lake Ontario, and one of them, Miss Lizzie Seiler, lost her balance and fell into the river. Surfman No. 1, of the above station, hearing cries for help, ran to the spot and found the girl sinking in 20 feet of water. He plunged in and went to the bottom after her. The keeper, who arrived just as the rescuer appeared above water with the girl, drew her out, and took her to an adjacent hotel, where she received all necessary attention.

June 18.—At 7.30 p. m. a report was received at Station No. 5, Buffalo, Ninth District, Lake Erie, that a boy, who was bathing near the wreck of the barge *Rocket*, had been sucked under the wreck and drowned. The keeper went with the dingy to the place and grappled for the body, which he finally recovered, and delivered to the coroner. The lad was Joseph May, aged 16, of Buffalo.

June 18.—A boy out in a row-boat, fishing in the lake, a quarter of a mile north of Station No. 15, Milwaukee, Eleventh District, threw his boat's painter over a spile, and it slipped down so far that he could not reach it. The crew of the above station went out and relieved the boy and brought him and his boat safely in.

June 22.—Report was taken to Station No. 5, Buffalo, Ninth District, that William Hackmeyer, aged 22, had just been drowned near the hulk of the barge *Rocket*. The keeper went with the small boat at once, and dived for the body, which was taken on shore and subjected to means for resuscitation. Finding life extinct, the keeper delivered the remains to the coroner.

June 23.—Two young men out in Sandusky Bay yachting for pleasure capsized. The accident was seen by a surfman of Station No. 9, Marblehead, Ohio, Ninth District, who notified the keeper, and the surf-boat was at once manned and went to the rescue. The young men were both taken into the surf-boat and conveyed ashore. Their boat also was taken in. One of the young men, who had been swimming and was not yet dressed when the yacht capsized, lost his clothes, and was rigged out with another suit. Their boat was also put in order by the life-saving crew.

June 23.—A boy took the *Little Lizzie*, a boat belonging to the crew of Station No. 11, Chicago, Eleventh District, with which the keeper had a little while before crossed the river, and went with it outside the harbor. The wind blowing fresh from the land, he was carried out on the lake. His plight was seen from the station, and the crew went out to his rescue in a sail-boat. They found him two miles out, the little

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boat half full of water, and the boy, who was crying, bailing it out with his hat. Boy and boat were taken ashore.

June 23.—At midnight it was reported at Station No. 14, Eleventh District (Racine, Wisconsin), that two young fellows, aged 13 and 19 years, respectively, had been drowned while bathing in the river. The life-boat crew immediately started for the spot, and, after two hours' dragging, succeeded in bringing to the surface the two dead bodies, which were clinched together.

June 24.—At 8 a. m. the lookout of Station No. 2, Ninth District, Lake Ontario, reported a yacht with flag at half-mast, under bare poles, and drifting out into the lake. The life-saving crew went at once to her rescue, taking out anchor and lines, and reached her at 10.20. She proved to be the schooner *Lottie Blair*, of Oswego, with two men on board, and had broken her rudder. The life-saving crew got a line to her and towed her into Little Salmon River.

June 28.—The yacht *Anne*, of Somers' Point, New Jersey, with three persons out pleasure-sailing in the vicinity of Station No. 27, Atlantic City, Fourth District, New Jersey, lost her mast in a high wind and heavy sea. She was seen from the station a mile away, and the keeper, who supposed the yacht had capsized, immediately launched the surf-boat, which was lying at the wharf, and with three surfmen and three volunteers pulled out to her. The life-saving men took charge of her, got her spars and sails on board, and with the assistance of the sloop *J. G. Mott* towed her into harbor.

June 28.—A man and woman were in a skiff on the lake, about 6 p. m., two and one-half miles east of Station No. 4, Ninth District, Lake Ontario, when they lost one of their oars and became helpless, and were rapidly drifting before a fresh southwest wind. The predicament of the boat was discovered by the steamer *City of Rochester* as she came into the harbor of Charlotte, New York, the captain of which notified the keeper of the station, and then started back to assist the boat. The surf-boat was at once launched, and after pulling two miles met the steamer returning with the man and woman on board and their boat in tow.

June 29.—At nine o'clock in the morning, a man, probably intending suicide, jumped into the lake at Chicago and was drowned. The life-saving crew of Station No. 11, Eleventh District, were called upon to drag for the body. Four of them went with hooks, and after nearly three hours' labor, the exact spot where the man sunk not being known, succeeded in recovering the body.

June 30.—At noon the sloop *Pinafore*, of Philadelphia, with three men on board, stranded in Delaware Bay, two miles north of Station No. 40, Fourth District, New Jersey. The life-saving crew visited her and succeeded in floating her off the following morning at 3 a. m.

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TABLE OF WRECKS

WITHIN THE FIELD OF OPERATIONS OF LIFE-SAVING SERVICE.

SEASON OF 1879-'80.

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LIFE-SAVING SERVICE.—TABLE

DISTRICT No. 1.—EMBRACING COASTS

Date.	Place.	No. of station.	Name of vessel.	Where owned.	Master.	Tonnage.
1879.						
Aug. 25	Monroe's Island, near Owl's Head.	5	Sc. Brilliant*	Castine, Me	Farnham	90
Oct. 17	Ash Island Point, Me	5	Sc. Forest Queen	Belfast, Me	Elwell	45
Oct. 17	Old Cilley Ledge, ten miles from station.	5	Sc. E. G. Buxton	Boston, Mass	Turner	81
Oct. 21	Lower Gangway Ledge, Muscle Ridge Channel.	5	Sc. Nathan Clifford	Belfast, Me	Coombs	90
Nov. 2	Four miles east of station, near Quoddy Head.	1	Sc. Telegraph	Ellsworth, Me	Remick	65
Nov. 3	Southeast Point of Great Cranberry Island.	4	Sc. Presto†	Machias, Me	Colby	85
Nov. 3	Southeast Point of Little Cranberry Island.	4	Sc. Emma G‡	St. John, N. B	Giggey	82
Nov. 5	Hadlock's Point, Southwest Harbor.	4	Sc. Democrat§	Ellsworth, Me	Smith	20
Nov. 16	Off Seal Harbor, near White Head Island, Me.	5	Sc. Gipsy	St. John, N. B	Martin	73
Dec. 6	Lark Ledges, near Ash Point	5	Sc. Willie	Rockland, Me	Snow	14
Dec. 7	Three miles northeast of station, near Quoddy Bay.	1	Sc. Mineola	Digby, N. S	Langley	127
Dec. 27	Hog Island Ledge	5	Sc. L. Edna	St. John, N. B	Rourke	67
Dec. 29	Chappel's Ledge	5	Sailboat	Saint George, Me	Allen	
1880.						
Jan. 9	Green Point, one mile west of Quoddy Light.	1	Sc. Madeira	St. John, N. B	Brown	114
Jan. 29	Petit Manan Island	1	Sc. Georgiana	Gloucester, Mass	Rowe	52
Feb. 3	Robinson's Beach	4	Sc. Don Pedro	St. John, N. B	Peck	61
Feb. 13	One-half mile north of station	3	Bark Luxor	....do	De Long	810
Mar. 8	Five miles south of Petit Manan Light.	4	Sc. Challenge	Booth Bay, Me	Wheeler	88
Apr. 1	Allen's Rock, Seal Harbor	5	Sc. Wm. H. Boardman.	Calais, Me	Richardson	150
Apr. 15	Round Shoal, Quoddy Bay	1	Sc. George O. Hovey	Gloucester, Mass	Lindsey	64
Apr. 17	Shoal Ground, Wood Island Harbor.	6	Sc. A. K. Woodward	Ellsworth, Me	Jordan	110
Apr. 19	Thompson's Ledge, Cranberry Isles.	4	Sc. Freddie Eaton	Calais, Me	Motz	89
Apr. 28	Point of main land, Cross Island Narrows.	2	Sc. Swan	Machias, Me	Hunington	32
May 5	Heron Point, White Head Island.	5	Sc. Rachel Coney	Bangor, Me	Coney	292
May 11	Near Gangway Ledge, Muscle Ridge Channel.	5	Sc. Daniel Pierson	Boston, Mass	Pierson	265
	Total					

DISTRICT No. 2.—EMBRACING

1879.						
Oct. 10	North end of Third Cliff, Scituate.	3	Sc. Samuel Wackrill	Boston, Mass	Dowling	157
Oct. 31	Off the station	5	Rowboat	Plymouth, Mass		
Nov. 4	West end of Brown's Island Shoals.	4	Sc. Fannie Barney	Rockland, Me	Quin	59
Nov. 7	Off Plymouth	4	Sc. John W. Hall, jr	Wilmington, Del	Sheen	193
Nov. 13	Halibut Point, Cape Ann	2	Sc. Bay Queen	Cohasset, Mass	Lincoln	65
Nov. 13	Off Tilden's Point, Scituate	3	Sc. Belle	Scituate, Mass	Smith	19
Nov. 18	Plum Island Point, two hundred yards northeast of Eastern Light.	1	Sc. Greyhound	Newburyport, Mass.	Kane	50

*Vessel got off by Revenue Steamer McCullough.
†No assistance required from Life-Saving Service.
‡Crew came ashore in their own boat.
§No assistance by Life-Saving crew.

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OF WRECKS, SEASON OF 1879–'80.

OF MAINE AND NEW HAMPSHIRE.

Where from.	Where bound.	Cargo.	Estimated value of vessel.	Estimated value of cargo.	Total.	Estimated amount saved.	Estimated amount lost.	No. of persons on board.	No. of persons saved.	No. of persons lost.	No. of persons sheltered at station.	No. of days' shelter afforded.
Bangor, Me	Boston, Mass...	Lumber...	$2,000	$1,400	$3,400	$3,050	$350	3	3	..	....	....
....do	Scituate, Mass .	....do	1,000	1,500	2,500	2,300	200	3	3	..	....	....
Boston, Mass ..	Bucksport, Me .	Assorted ..	1,000	4,000	5,000	1,500	3,500	4	4	..	....	....
Bangor, Me	New Haven, Conn.	Lumber...	3,000	800	3,800	3,750	50	6	6	..	....	....
Bar Harbor, Me	Ellsworth, Me..	.....	1,000	.....	1,000	800	200	3	3	..	....	....
Machias, Me ...	Boston, Mass...	Lumber...	1,500	1,200	2,700	2,600	100	4	4	..	....	....
Frederickton, N. B.	....do	....do	1,500	850	2,350	1,850	500	4	4	..	....	....
Eastport, Me ..	Ellsworth, Me..	Fish	300	800	1,100	500	600	2	2	..	....	....
Salem, Mass ...	St. John, N. B ..	.....	1,500	.....	1,500	800	700	5	5	..	....	....
Rockland, Me..	Matinicus Isl'd, Me.	Provisions	800	225	1,025	925	100	4	4	..	....	....
Bear River, N.S	Marblehead, Mass.	Wood	1,200	430	1,630	1,430	200	6	6	..	....	....
Boston, Mass ..	St. John, N. B ..	.....	3,500	.....	3,500	3,500	.....	4	4	..	....	....
Seal Harbor, Me	Wheeler's Bay, Me.	.....	35	.....	35	30	5	1	1	..	1	1
Point Wolfe, N. B.	New York City.	Laths	1,000	2,000	3,000	.....	3,000	5	5	..	5	15
Gloucester, Mass.	Eastport, Me...	.....	1,800	.....	1,800	1,600	200	5	5	..	....	....
Boston, Mass ..	St. John, N. B ..	General ...	1,000	5,000	6,000	5,900	100	3	3	..	....	....
New York City	....do	.....	40,000	.....	40,000	39,900	100	15	15	..	....	....
St. Andrews, N. B.	Boston, Mass ..	Scrap iron .	1,000	5,000	6,000	.....	6,000	5	5	..	5	5
Newburyport, Mass.	Calais, Me.....	.....	10,000	.....	10,000	10,000	.....	5	5	..	....	....
Gloucester, Mass.	The Banks, on fishing cruise.	.....	2,700	.....	2,700	2,525	175	11	11	..	....	....
Saco, Me.....	Ellsworth, Me..	.....	3,000	.....	3,000	3,000	.....	4	4	..	....	....
Calais, Me	Boston, Mass...	Lumber...	6,000	2,000	8,000	8,000	.....	6	6	..	....	....
Cutler, Me	Rockland, Me ..	Wood	400	100	500	490	10	2	2	..	....	....
Beverly, Mass .	Bangor, Me	.....	8,000	.....	8,000	7,700	300	7	7	..	....	....
Boston, Mass ..	Belfast, Me	.....	9,000	.....	9,000	8,970	30	6	6	..	....	....
.....	.....	.....	102,235	25,305	127,540	111,120	16,420	123	123	..	11	21

COAST OF MASSACHUSETTS.

Gonaives, Hayti	Boston, Mass ..	Logwood ..	15,000	3,800	18,800	16,000	2,800	10	10	..	....	....
Plymouth, Mass	.....	.....	.....	.....	.....	.....	.....	2	2	..	....	....
Bangor, Me	Duxbury, Mass.	Lumber...	800	180	980	930	50	3	3	..	....	....
Baltimore, Md	Plymouth, Mass	Coal.....	10,000	1,500	11,500	11,500	.....	7	7	..	....	....
Bangor, Me	Hingham, Mass	Lumber...	700	600	1,300	1,000	300	(*)	....	..	....	....
Rockport, Mass	Scituate, Mass .	Furniture .	800	500	1,300	1,200	100	4	4	..	....	....
Newburyport, Mass.	Fishing	.....	3,000	200	3,200	125	3,075	8	8	..	4	4

*No one on board, vessel abandoned at sea.

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DISTRICT No. 2.—EMBRACING

Date.	Place.	No. of station.	Name of vessel.	Where owned.	Master.	Tonnage.
1879.						
Nov. 29	Off station	4	Sl. Minnie B	Duxbury, Mass	Gool	9
Nov. 30	Long Ledge, one mile north of Scituate Light.	3	Sc. Lizzie	Beverly, Mass	Obear	4
Dec. 1	Shovelful Shoal	14	Sc. Carrie H. Spofford	Deer Isle, Me	Haskell	89
Dec. 3	One-quarter mile east of Plum Island Light.	1	Sc. M. A. Bastow	Gloucester, Mass	Blatchford	47
Dec. 21	Eight miles northeast of Manomet Point, Mass.	5	Sc. T. J. Trafton	Portsmouth, N. H	Eaton	217
Dec. 21	One mile north-northeast of station.	13	Sc. Trellis	St. John, N. B	Shaw	71
Dec. 21	Two and a half miles northeast by east from station.	14	Sc. J. H. De Wolf	Dennis, Mass	Rogers	489
Dec. 22	East-northeast, one and a half miles from station.	14	Brig Black Swan	Boston, Mass	Fleming	190
1880.						
Feb. 3	One mile east of station	2	Sc. Abbie Bursley	Barnstable, Mass	Parker	309
Feb. 3	One and a half miles south of Race Point Light.	6	Sc. Carl D. Lothrop	Eastport, Me	Mitchell	293
Feb. 6	Three miles south of station	10	Sc. Albert W. Smith	Providence, R. I	Loring	600
Feb. 7	One mile west of station	7	Sc. Maggie A. Fisk	South Dennis, Mass	Crowell	418
Feb. 13	One and a half miles west of station.	8	Sc. Effie Sweet	Isaac's Harbor, N. S.	McConnell	178
Feb. 13	Handkerchief Shoal, nine miles southwest of station.	13	Sc. Leander A. Knowles.	Barnstable, Mass	Bassett	464
Mar. 28	Between Second and Third Cliffs, Scituate.	3	Sc. Zicavo	Ellsworth, Me	Smith	99
Apr. 11	Three miles east of station	7	Sc. John L. Merrill	New York City	Miller	245
Apr. 13	Harding Beach Flats, two and a half miles west-northwest of station.	13	Bk. Georgina No. 2*	Cape Haytien, Hayti.	Eldridge	475
May 7	One-quarter mile north of station.	13	St. yacht Alice M	Newburyport, Mass.	Vatter	27
	Total					

DISTRICT No. 3.—EMBRACING COASTS

1879.						
Aug. 1	Half mile west of station	12	Str. Lizzie	Whitby, England	Gillings	940
Sept. 3	Between stations Nos. 32 and 33.	32 / 33	Bk. Halcyon	Bath, Me	Dickinson	624
Oct. 14	Near station	4	Sail-boat Blue Fish	New Shoreham, R. I.	Dodge	
Oct. 26	East end of Watch Hill Reef	3	Sc. John Mayo	Camden, Me	Bragg	53
Nov. 18	do	3	Sc. Memento	Yarmouth, Mass	White	144
Nov. 20	Half mile south of station	31	Sc. L. V. Ostrom	Patchogue, N. Y	Benjamin	33
Nov. 21	Outer point Jones' Inlet Bar.	30	Sc. Hector	Boston, Mass	Higgins	421
Dec. 16	Napatree Point	3	Sc. Open Sea	Belfast, Me	Wyman	175
Dec. 16	Harbor Neck Point, two and three-quarter miles north of station.	5	Open row-boat			
Dec. 22	Half mile from Point of Lloyd's Neck, Long Island.	38	Sc. Emma M. Fox	Sag Harbor, N. Y	Corson	221
1880.						
Jan. 13	Two miles northeast of station.	1	Sc. Peacedale	Newport, R. I	Caswell	200
Jan. 17	Hog Island Shoals, Long Island.	34	Bk. Thor	Oster-Risöer, Norway.	Tholvidson	642
Feb. 2	One and one-half miles north of station.	27	Sail-boat		Fingers	1

*No assistance rendered by the life-saving crew.

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COAST OF MASSACHUSETTS—Continued.

Where from.	Where bound.	Cargo.	Estimated value of vessel.	Estimated value of cargo.	Total.	Estimated amount saved.	Estimated amount lost.	No. of persons on board.	No. of persons saved.	No. of persons lost.	No. of persons sheltered at station.	No. of days' shelter afforded.
Gurnet Point, Mass.	Duxbury, Mass.	.....	$100	.....	$100	$100	.....	2	2	..	....	....
Beverly, Mass..	Broke from moorings.	.....	300	.....	300	200	$100	(*)	....	..	....	....
Calais, Me	Providence, R. I	Lumber...	600	$500	1,100	800	300	4	4	..	....	....
Gloucester, Mass.	Newburyport, Mass.	Fishing stores.	3,700	200	3,900	2,400	1,500	10	10	..	....	....
Hoboken, N. J .	Boston, Mass...	Coal.....	4,000	2,000	6,000	.....	6,000	6	6	..	2	2
Providence, R. I	St. John, N. B ..	.....	1,500	.....	1,500	.....	1,500	4	4	..	4	12
Georgetown, D. C.	Boston, Mass...	Coal.....	18,000	2,400	20,400	20,150	250	8	8	..	8	16
Miragoane, Hayti.	Boston, Mass...	Logwood..	4,500	6,000	10,500	3,000	7,500	8	8	..	8	16
Georgetown, Me	Philadelphia, Pa	Ice.....	7,000	450	7,450	4,500	2,950	8	8	..	1	1
New York City.	Boston, Mass...	Coal.....	7,000	1,500	8,500	3,700	4,800	8	8	..	7	14
Matanzas, Cuba	Boston, Mass...	Sugar	25,000	15,000	40,000	40,000	.....	11	11	..	....	....
Baltimore, Md .	Bath, Me	Coal.....	11,000	3,500	14,500	.....	14,500	7	7	..	....	....
Cienfuegos, Cuba.	Boston, Mass...	Molasses ..	9,000	28,000	37,000	37,000	.....	7	7	..	....	....
Booth Bay, Me .	Baltimore, Md..	Ice.....	18,000	500	18,500	.....	18,500	7	7	..	5	10
Portland, Me...	New York City.	Lumber...	2,000	1,500	3,500	1,200	2,300	4	4	..	4	12
Porto Rico, W.I.	Boston, Mass...	Sugar	11,000	34,000	45,000	45,000	.....	7	7	..	....	....
Boston, Mass ..	New York City	.....	20,000	.....	20,000	20,000	.....	9	9	..	....	....
Wilmington, N. C.	Haverhill, Mass	.....	4,500	.....	4,500	.....	4,500	5	5	..	5	5
.....	.....	.....	177,500	102,330	279,830	208,805	71,025	149	149	..	48	92

OF RHODE ISLAND AND LONG ISLAND.

New York City	London, Engl'nd	Wheat, cattle, & miscellaneous.	100,000	100,000	200,000	190,000	10,000	23	23	..	....	....
Boston, Mass ..	Perth Amboy, N. J.	.....	20,000	.....	20,000	16,000	4,000	12	12	..	12	28
.....	.....	.....	75	.....	75	70	5	....	....	..	....	....
Lincolnville, Me.	Mystic, Conn...	Lime	700	250	950	850	100	3	3	..	....	....
Perth Amboy, N. J.	New Bedford, Mass.	Coal	3,000	900	3,900	3,500	400	4	4	..	4	4
Patchogue, N.Y	New York City	.....	3,000	.....	3,000	3,000	.....	3	3	..	....	....
Philadelp'ia, Pa	Boston, Mass...	Coal	10,000	1,800	11,800	.....	11,800	8	8	..	....	....
Port Johnson, N. J.	Providence, R. I	...do	2,000	600	2,600	.....	2,600	5	5	..	4	8
.....	.....	.....	20	.....	20	15	5	(*)	....	..	....	....
Wood's Holl, Mass.	New York City.	.....	10,000	.....	10,000	9,800	200	6	6	..	1	1
South Amboy, N. J.	Narragansett Pier, R. I.	Coal	6,000	900	6,900	4,900	2,000	4	4	..	....	....
St. Nazaire, France.	New York City.	.....	30,000	.....	30,000	30,000	.....	13	13	..	....	....
Oak Island Beach.	Breslau, Long Island, N. Y.	.....	100	.....	100	.....	100	8	8	..	8	16

* No one on board.

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DISTRICT No. 3.—EMBRACING COASTS OF

Date.	Place.	No. of station.	Name of vessel.	Where owned.	Master.	Tonnage.
1880.						
Feb. 2	Southeast point, Jones' Inlet Bar.	31	Sc. Mary E. Nason	Boston, Mass	Murdock	108
Feb. 4	Three-quarters of a mile west of Station 31.	32	Sc. Gussie	New York City	Feith	11
Mar. 24	West of Napatree Point	3	Sl. Ocean Wave	Stonington, Conn	Stanburg	
Apr. 5	Half mile west of station	11	Sc. Ralph Howes	Belfast, Me	Getchell	143
Apr. 18	Opposite station in bay	19	Sail-boat Dolly Varden.	Sayville, N. Y		
Apr. 20	One mile west of Fire Island Light.	25	Sc. William Aspinwall.	New York City	Pennea	46
Apr. 29	Two miles east of station	11	Str. Narragansett	Newport, R. I	Church	97
May 29	Grove Point, Block Island	5	Sl. Wave*	New Bedford, Mass	Fish	6
June 11	Two miles west of station	2	Sc. Illinois†	New York City	Wilson	86
	Total					

DISTRICT No. 4.—EMBRACING

1879.						
July 8	Absecom Bar, one and one-half miles northeast of station.	27	Sc. Lydia B	Cape May, N. J	Spofford	30
July 27	Townsend's Inlet, north bar	34	Sc. Congress	Bridgeton, N. J	Leaming	37
Aug. 18	One mile north of station	21	Sc. Emma D. Blew	do	Moore	32
Aug. 18	Quarter of a mile north of station.	21	Sc. Emblem*	Beaufort, N. C	Harker	32
Aug. 19	Three-quarters of a mile northeast of station.	22	Sc. Minnie Aiken*	Bridgeton, N. J	Smith	36
Aug. 19	One and a half miles southwest of station.	27	Sc. Flora Curtis	Perth Amboy, N. J	Reaves	83
Sept. 11	Shoals off Squan Inlet	9	Sc. Cybele	South Amboy, N. J	Hyers	8
Sept. 24	Near station	27	Sail-boat	Atlantic City, N. J	Cook	
Oct. 3	Anchorage Island	23	Sc. John Anna	Somers Point, N. J.	Horton	29
Oct. 10	One mile east of station	17	Sc. William Thompson.	Harwich, Mass	Miller	92
Oct. 11	Brigantine Beach, two miles south of station.	25	Bk. Antonietta Costa	Genoa, Italy	Costa	618
Oct. 16	Cold Spring Inlet, south bar.	39	Sl. Ellen H. Webb	Bridgeton, N. J	Church	9
Oct. 17	Quarter mile from station	28	Bk. Cutelin Dall 'Orso.	Genoa, Italy	Questa	634
Nov. 5	Little Egg Harbor Shoals	24	Sc. Nellie Brown	Boston, Mass	Young	281
Nov. 16	Hereford Inlet, north bar	36	Sl. Mist	Cape May, N. J	Hall	20
Nov. 20	Sandy Hook, one-half mile south of main light.	1	Sc. Mary Chilton	New York City	Barstow	77
Nov. 20	West side of Long Beach	23	Sl. J. G. W. Havens	Kettle Creek, N. J.	Vannote	4
Dec. 14	Half mile south of Atlantic-ville.	4	Sc. Artie Garwood	Bridgeton, N. J	Stevens	264
Dec. 26	Great Egg Harbor Bar, two miles east of station.	30	Sc. Gaston F. Hubbard.	New York City	Loveland	193
1880.						
Jan. 3	Barnegat Inlet, half mile north of station.	17	Sl. Flash	Perth Amboy, N. J	Morton	9
Jan. 8	Half mile north-northwest of station.	27	Sc. A. H. Quinby	Wilmington, Del	Lloyd	68
Jan. 21	One mile south of station	14	Sc. Frank Pearsons	Rockland, Me	Cushman	83

*No assistance. Crew got ashore without help.
† No assistance required from Life-Saving Service.

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RHODE ISLAND AND LONG ISLAND—Continued.

Where from.	Where bound.	Cargo.	Estimated value of vessel.	Estimated value of cargo.	Total.	Estimated amount saved.	Estimated amount lost.	No. of persons on board.	No. of persons saved.	No. of persons lost.	No. of persons sheltered at station.	No. of days' shelter afforded.
Virginia	Boston, Mass	Oysters	$5,000	$800	$5,800	$5,800		6	6			
Canarsie, L. I	Jones' Inlet, L. I		1,000		1,000	1,000		4	4			
Stonington, Conn.		Lobsters	300	15	315	300	$15	2	2		*7	7
Wilmington, N. C.	Boston, Mass	Nav'l stores	8,000	4,000	12,000	2,500	9,500	6	6		6	12
Sayville, N. Y.	Moriches, N. Y.		400		400	400		10	10			
Pilot boat	Cruising		12,000		12,000	1,000	11,000	6	6		6	24
Fishing off	Long Island	Fish	15,000	100	15,100		15,100	15	15		15	15
Providence, R. I	Fishing		200		200		200	2	2			
Eddyville, N. Y	Fall River, Mass	Cement	3,000	1,500	4,500		4,500	4	4			
			229,795	110,865	340,660	269,135	71,525	144	144		63	115

COAST OF NEW JERSEY.

Allowaystown, N. J.	Atlantic City, N. J.	Flour and feed.	1,200	400	1,600	1,600		2	2			
Cape May, N. J.	Philadelphia, Pa	Wood	3,000	250	3,250	2,500	750	4	4		3	12
Dividing Creek, N. J.	New York City	Watermelons.	1,500	400	1,900		1,900	4	4			
Beaufort, N. C	do	do	1,500	400	1,900		1,900	5	5			
Morris River	do	Melons	3,000	350	3,350		3,350	3	3			
Old Point, Va	do	Wood	8,000	500	8,500		8,500	4	4			
Princess Bay, Staten Island.	Tom's River, N. J.		500		500	500		2	2			
Atlantic City, N. J.	Fishing		25		25	25		2	2			
Mulicas River, N. J.	Great Egg Harbor, N. J.	Oysters	2,000	500	2,500	2,500		4	4			
Carthagena, S. A.	New York City	Cocoanuts	5,000	4,000	9,000	7,700	1,300	6	6			
Genoa, Italy	Baltimore, Md		30,000		30,000	20,000	10,000	14	14			
Philadelp'ia, Pa	Cape May City, N. J.	Coal	700	50	750	750		2	2			
Marseilles, France.	New York City		20,000		20,000	15,000	5,000	14	14			
Gardiner, Me	Philadelphia, Pa	Ice	6,000	334	6,334		6,334	7	7		3	15
Philadelp'ia, Pa	Mayville, N. J	Lumber & apples.	1,000	450	1,450	1,400	50	3	3			
New York City	Ciudad Bolivar, S. A.	Flour, lard, oil, &c.	3,500	6,500	10,000	9,400	600	5	5		5	10
Kettle Creek, N. J.	Short Beach, N. J.		300		300	292	8	2	2		2	2
Philadelphia, Pa.	Boston, Mass	Coal	10,000	3,000	13,000		13,000	7	7			
James River, Va	New York City	Wood	5,000	1,650	6,650	6,250	400	6	6		6	6
Seabright, N. J.	Barnegat, N. J.		1,000		1,000	850	150	2	2		2	8
Atlantic City, N. J.	Smithville, N. C		7,000		7,000	7,000		5	5			
Richmond, Va	New York City	Railroad ties and pig-iron.	10,000	1,500	11,500	11,400	100	4	4			

* Including five men who came to assist.

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DISTRICT No. 4.—EMBRACING COAST

Date.	Place.	No. of station.	Name of vessel.	Where owned.	Master.	Tonnage.
1880.						
Jan. 28	Great Egg Harbor Bar	28	Sc. May Montanye ..	Perth Amboy, N. J	Seeley	28
Feb. 1	Between Cold Spring Inlet and Turtle Gut.	38	Sl. Pandora	.....do	Longstreet	24
Feb. 2	South side of South Channel.	23	Sc. Samuel Warren..	Wilmington, Del ..	Loper	88
Feb. 3	One mile north of station....	2	Sc. Stephen Harding.	Damariscotta, Me .	Harding ..	305
Feb. 3	Abreast of Highlands, three and a quarter miles north of station.	3	Brig Castalia.....	Bath, Me.....	Elmes.....	516
Feb. 3	Opposite station	4	Brig Augustina.....	Barcelona, Spain ..	Artiz	168
Feb. 3	One and a quarter miles north of station.	4	Sc. Emma C. Babcock.	Somers Point, N. J.	Treen.....	228
Feb. 3	One mile north of station ...	5	Sc. Light Boat	Rockland, Me	Tallman ..	114
Feb. 3	One and a half miles south of station.	12	Sc. George Taulane..	Camden, N. J	Adams	235
Feb. 5	Lower point of Long Beach.	23	Sc. Estella	Stonington, Conn..	Rodgers ..	75
Feb. 6	Squan Inlet, outer shoals ...	9	Sl. Pandora	Perth Amboy, N. J	Longstreet	24
Feb. 16	Point Creek, half mile west of station.	23	Sl. John Roach	Greenport, N. Y...	Foster	30
Feb. 25	Barnegat Shoals, one mile north of station.	17	Sc. Deceiver.....	Somers Point, N. J.	Frambus..	22
Mar. 10	Steamboat Landing, Cape May.	40	Sc. N. C. Price.....	Cape May, N. J....	Williams..	38
Mar. 11	Half mile north of station ..	12	Sc. Martha J. Granger	New York City....	Mott.....	60
Mar. 16	Near station	13	Sc. Five Sisters	Boston, Mass.....	Hutchings	146
Mar. 16	One mile north of station ...	21	Brig Tropic.....	Port-au-Prince, Hayti.	Potter	157
Apr. 4	Peck's Beach, opposite station.	31	Bark Douglas	North Shields, England.	Farrell....	311
Apr. 4	Cold Spring Inlet, south bar.	39	Sc. Nautilus.....	Perth Amboy, N. J	Force	35
Apr. 12	Little Egg Harbor, north shoals.	23	Sc. James M. Hall...	Philadelphia, Pa ..	Davis	87
Apr. 14	Near station	1	Sc. Xebec*	Bear River, N. S...	Dunham ..	400
Apr. 17	Townsend's Inlet, north bar.	34	Sc. A. D. Scull.....	Great Egg Harbor, N. J.	Frambus..	500
Apr. 18	.....do	34	Sc. L. & A. Babcock.	Absecom, N. J....	Smith	400
Apr. 30	Seabright, one and a half miles south of station.	3	Bark Melchior	Bremen, Germany.	Wierichs..	986
May 28	Townsend's Inlet, north bar.	34	Sc. J. & C. Merritt ..	Somers Point, N. J.	Booy	35
June 28	One mile north of station....	27	Yacht Annie.....	....do	Johnson ..	.....
June 30	Two miles north of station..	40	Sl. Pinafore	Philadelphia, Pa ..	Palmer....	6
	Total	..	.....	.....	.....	.....

DISTRICT No. 5.—EMBRACING COAST BE

1879.						
July 16	Two and one-fourth miles north of station.	5	Sc. John Rose.....	New York City ...	Petty	223
Aug. 18	One and three-fourths miles south of station.	2	Sc. Alice M. Ridgeway.†	Bridgeton, N. J ...	Cresse	26
Aug. 22	Five miles north of station ..	5	Sc. Henry Adelbert‡.	Gardiner, Me.....	Beatty	272
Aug. 26	Opposite Lewes, Del	1	Sc. Adeliza.....	New York City ...	Libbey....	185

* Vessel got off by steam-tug. † No assistance by life-saving crew.
‡ No assistance required from life-saving crew.

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NEW JERSEY—Continued.

Where from.	Where bound.	Cargo.	Estimated value of vessel.	Estimated value of cargo.	Total.	Estimated amount saved.	Estimated amount lost.	No. of persons on board.	No. of persons saved.	No. of persons lost.	No. of persons sheltered at station.	No. of days' shelter afforded.
Potomac River,	New York City.	Oysters ...	$3,500	$500	$4,000	$3,900	$100	4	4	..	....	....
Philadelphia, Pa.	....do	.....	2,800	.....	2,800	2,750	50	2	2	..	2	2
Millville, N. J..	....do	Plastering sand.	3,000	125	3,125	.....	3,125	4	4	..	4	20
Cedar Keys, Fla.	....do	Lumber...	13,000	5,000	18,000	5,000	13,000	8	8	..	8	32
Galveston, Tex	....do	Cotton	12,000	94,000	106,000	97,000	9,000	11	11	..	10	20
Havana, Cuba	....do	Cedar and hides.	3,000	5,100	8,100	.....	8,100	8	8	..	7	7
Virginia	....do	Wood	10,000	2,000	12,000	1,000	11,000	8	8	..	....	....
Norfolk, Va	....do	Corn	2,500	4,000	6,500	1,800	4,700	5	5	..	5	31
Virginia	....do	Wood	8,000	600	8,600	160	8,440	7	5	2	5	15
Little Egg Harbor, N. J.	Fishing	Fish	5,000	40	5,040	5,040	.....	8	8	..	....	....
Philadelphia, Pa.	New York City.	.....	2,800	.....	2,800	2,750	50	2	2	..	....	....
Little Egg Harbor, N. J.	Fishing	.....	2,000	.....	2,000	2,000	.....	7	7	..	....	....
New York City.	Atlantic City, N. J	.....	1,500	.....	1,500	1,500	.....	4	4	..	....	....
Philadelphia, Pa.	Cape May, N. J.	Lumber...	1,000	700	1,700	1,650	50	3	3	..	....	....
Virginia	New York City.	Oysters ...	3,000	1,000	4,000	.....	4,000	5	5	..	5	15
Porto Rico, W. I.	....do	Sugar and molasses.	3,000	8,000	11,000	5,334	5,666	6	6	..	6	27
Miragoane, Hayti.	....do	Logwood..	8,000	4,000	12,000	2,000	10,000	7	7	..	7	16
Santos, S. A....	....do	Old railroad iron.	8,000	17,000	25,000	.....	25,000	10	10	..	9	81
Key West, Fla.	Perth Amboy, N. J.	.....	4,000	.....	4,000	4,000	.....	4	4	..	....	....
New York City.	Norfolk, Va	Assorted ..	8,000	2,000	10,000	9,970	30	5	5	..	5	5
Porto Rico, W. I.	New York City.	Molasses ..	15,000	12,000	27,000	27,000	.....	7	7	..	....	....
Fall River, Mass.	New Castle, Del	Barrels....	8,000	1,000	9,000	8,500	500	7	7	..	....	....
Gardiner, Me ..	Philadelphia, Pa	Ice	5,000	400	5,400	5,000	400	7	7	..	....	....
Bremen, Germany.	New York City.	Barrels & salt.	13,000	2,000	15,000	.....	15,000	18	18	..	....	....
North Carolina	Townsend's Inlet, N. J.	Lumber...	1,500	1,200	2,700	2,200	500	3	3	..	2	8
Atlantic City, N. J.	Sailing excursion.	.....	500	.....	500	485	15	3	3	..	....	....
Philadelphia, Pa.	Atlantic City, N. J.	.....	600	.....	600	600	.....	3	3	..	....	....
.....	.....	.....	267,925	180,949	448,874	276,806	172,068	273	271	2	96	332

TWEEN CAPE HENLOPEN AND CAPE HENRY.

New York City.	St. George's Island, Bermudas.	General ...	8,000	10,000	18,000	2,000	16,000	7	7	..	....	....
Cape May, N. J.	Pleasure trip...	.....	1,500	.....	1,500	1,000	500	3	3	..	....	....
Bath, Me.....	Washington, D. C.	Ice.....	8,000	350	8,350	.....	8,350	7	7	..	....	....
Pensacola, Fla.	New York City	Lumber...	4,200	1,500	5,700	5,200	500	6	6	..	....	....

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DISTRICT No. 5.—EMBRACING COAST BETWEEN

Date.	Place.	No. of station.	Name of vessel.	Where owned.	Master.	Tonnage.
1879.						
Aug. 26	Opposite Lewes, Del	1	Bg. L. M. Merritt	Bucksport, Me	Bowden	337
Aug. 31	Hog Island Inlet, outer bar	9	Sc. Harry and Fred*	Machias, Me	Gardner	196
Oct. 13	New Inlet Bar, one-half mile north of station.	8	Open boat		Sturgis	
Oct. 20	Five and one-half miles south of station.	4	Sc. Gertie E. Merrow	Bath, Me	Dunning	197
Oct. 20	Isaac Shoals, four and one-half miles south of station.	11	Sc. Ellie Bodine	Tuckerton, N. J	Edwards	67
Oct. 21	Indian River Inlet, south point.	3	Sc. Lena Sooy	Chincoteague, Va	Conner	9
Nov. 8	Cape Henlopen, opposite Little Light.	1	Sp. Livingstone	Yarmouth, N. S	Crosby	812
Nov. 13	East end of Middle Ground, eight miles south of station.	11	Sc. James Ford	Fall River, Mass	Reynard	628
Nov. 21	Two and one-half miles north of station.	2	Sc. Enoch Turley	Philadelphia, Pa	Kelley	87
Nov. 24	Fishing Point, three-fourths mile south of station.	7	Sc. Ellie	Chincoteague, Va	Hickman	8
Nov. 25	Indian River Inlet, one hundred yards south of station.	3	....do	....do	...do	8
Nov. 25	One-half mile southeast of station.	9	Bk. Jason	Krageroe, Norway	Thorsen	486
Dec. 25	One-fourth mile south of station.	7	Sc. Ellie Bodine	Tuckerton, N. J	Edwards	67
1880.						
Jan. 8	Paramore's Island, three and one-half miles south of station.	8	Bg. Alice Lea	Wilmington, Del	Foster	297
Jan. 11	One and one-half miles south of station.	9	Sc. Ada M. Hallock	New York City	Pearsall	30
Jan. 16	Two miles north of station	5	Sc. Charles Morford	....do	Parsons	363
Feb. 1	New Inlet Bar, two and one-half miles south of station.	7	Sl. J. F. Knapp	Smith's Landing, N. J.	Taylor	16
Mar. 11	Williams Shoal, three and one-half miles south of station.	7	Sc. Osborn Curtis	Squan, N. J	Curtis	48
Mar. 17	Hog Island Inlet, outer bar	9	Bk. Sarah Ellen	Maitland, N. S	O'Brien	745
Mar. 21	.....do	9	...do	...do	...do	
Apr. 10	Cape Henlopen, point of	1	Sc. J. L. Cotter	St. John, N. B	Black	139
Apr. 13	Williams Shoal, three and one half miles south of station.	7	Sc. Charles H. Malleson.	Perth Amboy, N. J.	Williams	48
Apr. 19	Cape Henlopen, point of	1	Bk. Queen of Ceylon	Greenock, Scotland	Taylor	422
May 9	Four miles southeast of station.	11	St. Sp. Swiftsure	London, England	Gibson	601
	Total					

DISTRICT No. 6.—EMBRACING COAST

1879.						
Aug. 18	One-half mile north of station.	4	Bark North Carolina	Liverpool, England	Buchan	553
Aug. 18	Two miles north of Hatteras Bar.	23	Sc. Water Lily	New Berne, N. C	Peal	11
Aug. 18	One mile northwest of Hatteras Bar.	23	Sc. Ida B. Silsbee	Patchogue, N. Y	Jennings	45
Sept. 21	One-half mile north of station.	7	Bark Stanley	Arendal, Norway	Wrolsen	474

* No assistance by life-saving crew.

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CAPE HENLOPEN AND CAPE HENRY—Continued.

Where from.	Where bound.	Cargo.	Estimated value of vessel.	Estimated value of cargo.	Total.	Estimated amount saved.	Estimated amount lost.	No. of persons on board.	No. of persons saved.	No. of persons lost.	No. of persons sheltered at station.	No. of days' shelter afforded.
Guantanamo, Cuba.	Philadelphia, Pa.	Sugar	$3,000	$30,000	$33,000	$33,000	.....	15	15	..	....	....
Little River, Me	Richmond, Va..	Plaster	10,000	500	10,500	.....	$10,500	6	6	..	4	12
Powellton, Va..	Fishing	.....	15	.....	15	15	.....	3	1	2	1	1
New York City.	Jacksonville, Fla.	Brick and cement.	10,000	860	10,860	6,700	4,160	8	8	..	....	....
....do	York River, Va.	.....	4,000	.....	4,000	3,500	500	6	6	..	6	12
Philadelphia, Pa.	Chincoteague, Va.	Oysters	500	100	600	600	.....	5	5	..	5	5
Galway, Scotland.	Del'w're Breakwater, Del.	.....	25,000	.....	25,000	25,000	.....	18	18	..	....	....
Baltimore, Md.	Hoboken, N. J..	Coal	15,000	3,500	18,500	14,400	4,100	9	9	..	9	27
Pilot boat	Cruising	.....	16,000	.....	16,000	15,950	50	5	5	..	....	....
Chincoteague, Va.	Indian River, Del.	.....	150	.....	150	150	.....	3	3	..	....	....
....do	....do	Shells	150	10	160	110	50	3	3	..	....	....
Swansea, Wales	Baltimore, Md..	Railroad-iron.	25,000	6,000	31,000	4,000	27,000	12	12	..	12	48
York River, Va.	New York City.	Wood	3,500	350	3,850	3,600	250	5	5	..	1	1
Wilmington, N. C.	Philadelphia, Pa.	Lumber	5,000	2,000	7,000	2,000	5,000	9	9	..	5	15
New York City.	York River, Va.	.....	1,400	.....	1,400	.....	1,400	4	4	..	4	8
Nuevitas, Cuba	New York City.	Cedar, logwood, old iron and honey.	10,000	8,000	18,000	17,500	500	14	14	..	14	28
Philadelphia, Pa.	Chincoteague, Va.	.....	2,000	.....	2,000	2,000	.....	3	3	..	....	....
Chincoteague, Va.	New York City	Wood	2,000	200	2,200	2,200	.....	4	4	..	....	....
New York City	Baltimore, Md..	.....	35,000	.....	35,000	.....	35,000	14	14	..	11	11
....do	....do	.....	.....	.....	.....	.....	.....	25	†25	..	....	....
Guadaloupe, W. I.	Philadelphia, Pa.	Sugar	3,000	20,000	23,000	23,000	.....	6	6	..	....	....
Philadelphia, Pa.	Norfolk, Va	.....	2,000	.....	2,000	2,000	.....	3	3	..	....	....
Sagua la Gra'de, Cuba.	Delaw'e Breakwater.	Sugar	5,000	50,000	55,000	55,000	.....	11	11	..	....	....
Buenos Ayres, S. A.	Baltimore, Md..	Iron ore	175,000	125,000	300,000	300,000	.....	25	25	..	....	....
.....	.....	.....	374,415	258,370	632,785	518,925	113,860	239	237	2	72	168

BETWEEN CAPE HENRY AND CAPE FEAR.

Smithville, N. C.	Baltimore, Md..	.....	45,000	.....	45,000	45,000	.....	17	17	..	17	170
Norfolk, Va....	Hatteras, N. C..	Flour & watermelons.	500	$100	600	550	50	2	2	..	....	....
Poll's Point...	Portland, Me...	Watermelons.	2,000	400	2,400	.....	2,400	3	3	..	3	18
Honfleur, Fra'ce	Baltimore, Md..	Grain-bags	28,000	285	28,285	21,285	7,000	11	11	..	11	22

†Twenty-five wreckers taken ashore by life-saving crew.

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DISTRICT No. 6—EMBRACING COAST BETWEEN

Date.	Place.	No. of station.	Name of vessel.	Where owned.	Master.	Tonnage.
1879.						
Sept. 25	One mile south of station	2	Sc. Woodruff Sims	New York City	Bennett	206
Oct. 25	Four miles south of Smith's Island.	22	Sc. Irene	Millville, N. J	Johnson	37
Nov. 2	One-fourth mile north of station.	1	Sp. Hansa	Bremen, Germany	Kimme	1,382
Nov. 3	Abreast of station	1	Bark W. E. Heard*	Yarmouth, N. S	Robbins	587
Nov. 30	North point of New Inlet	17	Sc. M. and E. Henderson.	Philadelphia, Pa	Swain	387
Dec. 20	Outer Diamond Shoals	22	Sc. Whitney Long	Boston, Mass	Bickmore	254
1880.						
Mar. 12	South side of Hatteras Inlet	23	Sc. William P. Cox*	Washington, N. C	Burrus	187
Mar. 30	Three miles northwest of Hatteras Bar.	23	Sc. Watchful	Providence, R. I	Gill	139
Apr. 16	False Cape, one mile north of station.	5	Sp. Hannah Morris	Windsor, N. S	Dunbar	1,061
	Total					

DISTRICT No. 9—EMBRACING

1879.						
July 9	Two miles east of station	4	Yacht Dana	Charlotte, N. Y	Wooden	
July 11	Eight hundred yards from station.	4	Skiff (no name)			
July 11	One-half mile north of station.	6	Fish-boat (no name)	Erie, Pa	Slocum	
July 11	One-fourth mile southwest of station.	6	....do	....do	Nelson	
July 19	Head of Niagara River	5	Barge Northern Light.*	Bay City, Mich	Gowdey	494
July 26	Four miles south of station	1	Sl. Magic	Oswego, N. Y	Ames	4
Aug. 8	Two miles north of station	9	Yacht Favorite	Put-in Bay, Ohio	Foy	
Aug. 15	Mouth of Big Sandy	1	Sc. Volunteer	Oswego, N. Y	Kupkey	52
Aug. 27	Five miles off station	1	Steam-yacht Belle	Ottawa, Ont	Dailey	11
Aug. 30	Bar, mouth of Big Sandy	1	Sc. Volunteer	Oswego, N. Y	Kupkey	52
Sept. 3	Three and one-half miles west of station.	4	Sl. Cora	....do	Brown	50
Oct. 15	Mouth of Big Sandy	1	Sc. Mist	....do	Hemnon	28
Oct. 15	One-half mile northwest of Marblehead light.	9	Str. B. F. Ferris	Put-in Bay, Ohio	Freyenser	168
Oct. 21	Near mouth of Big Salmon River.	2	Sc. Volunteer	Chipenay Bay	Kupkey	52
Oct. 21	One mile west of station	7	Sc. Winnie Iona	Fairport, Ohio	Sharley	10
Oct. 23	On reef outside piers, Buffalo Harbor.	5	Sc. L. J. Farwell*	Buffalo, N. Y	Johnson	265
Oct. 23	North end of old breakwater.	5	Sc. Eliza Gerlach	Cleveland, Ohio	Delargie	271
Oct. 23	Reef outside of pier	5	Barge Roscius*	Buffalo, N. Y	Brown	250
Oct. 24	Three miles east of Charlotte.	4	Brigantine Henry Roney.†	Kingston, Ont	Redford	295
Oct. 26	Five miles west of Buffalo	5	Sc. F. B. Gardner	Chicago, Ill	Foster	402
Oct. 29	Entrance of piers	8	St. barge Wm. Edwards.	Huron, Ohio	Fagan	1,272
Oct. 30	Three miles north of station.	9	Scow Mary Lydia	Kingsville, Canada	Brown	101
Nov. 2	At Big Sandy	1	Sc. (no name)‡	Big Sandy, N. Y	Gilbert	80
Nov. 2	Twenty miles off Cleveland	8	Sc. Helena	Cleveland, Ohio	Butt	843
Nov. 15	Near station	9	Skiff (no name)			
Nov. 16	West pier	3	Sc. Hattie Howard	Oswego, N. Y	Becker	256
Nov. 17	Half mile west of station	7	Sc. Sasco	Buffalo, N. Y	Gilbert	281
Nov. 19	Near east pier, Cleveland, Ohio.	8	Sc. Sumatra	Cleveland, Ohio	Morse	845

* No assistance required from life-saving crew. †Crew came ashore in their own boat.
‡Subsequently named the William Gilbert.

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CAPE HENRY AND CAPE FEAR—Continued.

Where from.	Where bound.	Cargo.	Estimated value of vessel.	Estimated value of cargo.	Total.	Estimated amount saved.	Estimated amount lost.	No. of persons on board.	No. of persons saved.	No. of persons lost.	No. of persons sheltered at station.	No. of days' shelter afforded.
Chickahominy, Va.	New York City.	Wood and lumber.	$4,000	$1,800	$5,800	.....	$5,800	6	6	..	6	30
Snow Hill, Md..	Millville, N. J ..	Lumber...	2,000	850	2,850	$2,625	225	3	3	..	....	....
Bremen, Germany.	Baltimore, Md..	.....	125,000	.....	125,000	125,000	.....	21	21	..	....	....
Newry, Ireland.	....do	.....	85,000	.....	85,000	85,000	.....	13	13	..	....	....
Bull River, S. C.	....do	Phosphate rock.	8,000	4,000	12,000	.....	12,000	7	3	4	3	9
New York City.	Port Royal, S. C.	Guano	12,000	13,750	25,750	.....	25,750	7	7	..	7	28
Washington, N. C.	New York City.	Lumber...	6,000	3,000	9,000	6,000	3,000	8	8	..	....	....
New Berne, N.C.	Philadelphia, Pa.	....do	6,000	1,800	7,800	6,500	1,300	7	7	..	5	20
Bremerhaven, Germany.	Baltimore, Md..	Salt and barrels.	20,000	1,000	21,000	20,700	300	16	16	..	....	....
.....	.....	.....	343,500	26,985	370,485	312,660	57,825	121	117	4	52	297

LAKES ONTARIO AND ERIE.

Charlotte, N.Y.	Pleasure trip...	.....	500	.....	500	475	25	6	6	..	....	....
....do	Crossing river..	.....	35	.....	35	35	.....	2	2	..	....	....
Fishing-ground	Erie, Pa.....	Fish	200	25	225	215	10	2	2	..	....	....
....do	....do	....do	300	25	325	300	25	2	2	..	....	....
Bay City, Mich.	Tonawanda, N. Y.	Lumber...	2,500	15,000	17,500	13,100	4,400	7	7	..	....	....
Thousand Islands.	Oswego, N. Y...	.....	300	.....	300	300	.....	4	4	..	4	8
Lakeside	Put-in Bay, Ohio	.....	200	.....	200	200	.....	1	1	..	....	....
Oswego, N. Y..	Big Sandy, N. Y.	Fodder and coal.	1,000	500	1,500	1,500	.....	5	5	..	....	....
Ottawa, Ont ...	Oswego, N. Y...	.....	500	.....	500	500	.....	8	8	..	....	....
Trent, Ont	Big Sandy, N. Y.	Lumber...	1,000	750	1,750	1,750	.....	3	3	..	....	....
Port Hope, Ont.	Oswego, N. Y...	....do	800	850	1,650	1,000	650	2	2	..	2	2
Oswego, N. Y ..	Big Sandy, N. Y.	Fodder and oil.	1,000	345	1,345	1,345	.....	2	2	..	....	....
Put-in Bay, Ohio	Sandusky, Ohio.	Fish and fruit.	14,000	300	14,300	14,300	.....	16	16	..	....	....
Bay of Quinte, Ont.	Port Ontario, N. Y.	Lumber...	700	300	1,000	1,000	.....	3	3	..	....	....
Fishing trip ...	Fairport, Ohio..	.....	175	.....	175	175	.....	4	4	..	....	....
Bay City, Mich.	Buffalo, N. Y ...	Lumber...	2,500	5,400	7,900	7,800	100	6	6	..	....	....
Buffalo, N. Y...	Cleveland, Ohio.	Marble....	10,000	1,830	11,830	11,330	500	7	7	..	....	....
Bay City, Mich.	Buffalo, N. Y...	Lumber...	2,000	4,500	6,500	6,350	150	6	6	..	....	....
Kingston, Ont .	Charlotte, N. Y.	Limestone, &c.	5,000	1,500	6,500	1,500	5,000	9	8	1	....	....
Buffalo, N. Y ..	Chicago, Ill	.....	20,000	.....	20,000	5,000	15,000	8	8	..	....	....
Cleveland, Ohio.	....do	Coal	90,000	5,500	95,500	94,800	700	16	16	..	....	....
Kingsville, Can.	Sandusky, Ohio.	Heading bolts.	1,200	300	1,500	650	850	5	5	..	....	....
Oswego, N. Y .	Big Sandy, N.Y.	.....	2,000	.....	2,000	2,000	.....	3	3	..	....	....
Escanaba, Mich.	Ashtabula, Ohio	Iron ore...	30,000	12,000	42,000	39,000	3,000	9	9	..	....	....
Charlotte, N.Y.	Crossing river..	.....	35	.....	35	35	.....	1	1	..	....	....
Port Hope, Ont	Oswego, N. Y ..	Lumber...	3,000	4,800	7,800	200	7,600	7	7	..	....	....
Erie, Pa	Fairport, Ohio..	.....	3,000	.....	3,000	.....	3,000	6	6	..	6	6
Marquette, Mich.	Cleveland, Ohio.	Iron ore...	40,000	10,000	50,000	40,000	10,000	9	9	..	....	....

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DISTRICT No. 9.—EMBRACING LAKES

Date.	Place.	No. of station.	Name of vessel.	Where owned.	Master.	Tonnage.
1879.						
Nov. 19	Near station	9	Sc. C. Rich	Detroit, Mich	Desana	40
Nov. 19	do	9	Sc. New Hampshire	do	Bronty	94
Nov. 19	do	9	Sc J. A. Saunders	Port Huron, Mich.	McGreggor	67
Nov. 20	One-quarter mile east of station.	6	Sc. Waucousta	Montreal, Canada	Bostwick	181
Nov. 22	Off station	7	Sc. Shamrock	Not registered	Parks	20
Nov. 23	Horseshoe Reef	5	Sc. Carlingford	Huron, Ohio	Perry	470
Nov. 30	Eight miles east of Oswego, N. Y.	3	Sc. Picton	Picton, Canada	Ostrander	160
Dec. 10	Five hundred yards from station.	4	Open boat	Charlotte, N. Y		
1880.						
Apr. 4	Mouth of Grand River, Ohio, near station.	7	Scow, No. 5	Cleveland, Ohio	Simms	180
Apr. 10	Buffalo light-house, outer end of pier.	5	Sc. Favorite	Buffalo, N. Y	Fick	452
Apr. 11	Six miles east of Oswego	3	Sc. David Andrews	Belleville, Canada	McCrimmons.	
Apr. 11	Four miles east of Charlotte	4	Sc. Twilight	Toronto, Canada	Evart	210
Apr. 12	Three and a half miles off station.	2	Barge Grace Whitney.	Detroit, Mich		290
Apr. 17	Erie Basin Breakwater	5	Sc. New Dominion	Toronto, Canada	Malotte	154
Apr. 21	Big Sandy Creek, mouth of	1	Sc. William Gilbert	Big Sandy Creek, N. Y.	Gilbert	49
Apr. 27	Presque Isle, two miles from station.	6	Sc. A. H. Moss	Cleveland, Ohio	Backer	304
May 1	Three hundred feet from east pier, Cleveland.	8	Sl. Silver Moon	do	Metcalf	
May 2	One-quarter mile from station.	4	Open boat	Charlotte, N. Y	Brewer	
May 10	Three and a half miles northeast of Charlotte.	4	do	do		
May 16	Twelve hundred yards from station.	4	do	do	Bennett	
May 30	Fairport, Ohio, between the piers.	7	Sc. Guelph	Saint Catharine's, Canada.	Uglow	232
June 5	Two miles east of Cleveland	8	Open boat	Cleveland, Ohio	Henry	
June 6	Oswego, abreast of station	3	do	Oswego, N. Y	Post	
June 6	Buffalo, outside of breakwater.	5	Sl. Whippoorwill	Buffalo, N. Y	Johns	2
June 23	Two and a half miles east of station.	9	Yacht (no name)	Sandusky, Ohio	Edwards	
June 24	Off Nine-Mile Point	2	Sc. Lottie Blair	Oswego, N. Y	Vickery	7
June 28	Two and a half miles east of station.	4	Skiff*			
	Total					

DISTRICT No. 10.—EMBRACING

1879.						
Aug. 30	Off Alcona, Mich	5	Sc. Kate Richmond	Port Huron, Mich	Little	240
Sept. 3	Near Grindstone City dock	2	Str. J. Bertschey	Detroit, Mich	McGreggor	434
Sept. 3	Reef off Black River Island, 9 miles from station.	5	Sc. Wm. H. Rounds†	Buffalo, N. Y	Talbot	309
Sept. 8	Outside end North Point Reef.	6	Sc. Three Brothers	Black River, Ohio	Porter	800
Oct. 9	Reef two miles east of station.	2	Str. Roanoke	Buffalo, N. Y	Lundy	1,060

*Rescued by steamer before life-saving crew could reach her.
†Life-saving crew went to assistance, but not needed.

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ONTARIO AND ERIE—Continued.

Where from.	Where bound.	Cargo.	Estimated value of vessel.	Estimated value of cargo.	Total.	Estimated amount saved.	Estimated amount lost.	No. of persons on board.	No. of persons saved.	No. of persons lost.	No. of persons sheltered at station.	No. of days' shelter afforded.
Sandusky, Ohio.	Port Huron, Mich.	.....	$600	.....	$600	.....	$600	3	3	..	3	3
... do	Detroit, Mich ..	.....	1, 500	.....	1, 500	.....	1, 500	4	4	..	4	4
Huron, Ohio ...	Port Huron, Mich.	.....	800	.....	800	$600	200	4	4	..	.....	.....
Buckhorn, Can.	Buffalo, N. Y ...	Stave bolts	2, 200	$650	2, 850	1, 600	1, 250	8	8	..	8	24
Cleveland, Ohio.	Madison, Ohio..	Vegetables & lumber.	200	50	250	250	.....	1	1	..	1	1
Au Sable, Mich.	Tonawanda, N. Y.	Lumber ...	8, 000	4, 600	12, 600	11, 600	1, 000	9	9	..	9	9
Picton, Can ...	Oswego, N. Y ..	Barley	2, 500	7, 800	10, 300	10, 300	.....	6	6	..	.....	.....
Charlotte, N.Y.	Pleasure trip ..	.....	20	.....	20	20	.....	2	2	..	.....	.....
Fairport, Ohio .	Adrift	.....	1, 100	.....	1, 100	1, 100	.....	(*)	....	..	.....	.....
Buffalo, N. Y ..	Saginaw, Mich	.....	7, 000	.....	7, 000	6, 950	50	7	7	..	.....	.....
Napanee, Can .	Ontario, Can ...	Grain	5, 000	7, 890	12, 890	.....	12, 890	7	7	..	.....	.....
Kingston, Can.	Toronto, Can ...	Stone	10, 000	500	10, 500	10, 425	75	7	7	..	.....	.....
Ogdensburg, N. Y.	Detroit, Mich ..	.....	4, 000	.....	4, 000	4, 000	.....	7	7	..	.....	.....
Buffalo, N. Y ..	Wallaceburgh, Canada.	.....	5, 000	.....	5, 000	3, 000	2, 000	6	6	..	6	6
Oswego, N. Y ..	Big Sandy Cr'k, N. Y.	Miscellaneous.	4, 000	410	4, 410	4, 410	.....	4	4	..	.....	.....
Marblehead, Ohio.	Erie, Pa	Pier stone	6, 000	700	6, 700	6, 480	220	8	8	..	.....	.....
Cleveland, Ohio, west pier.	Bath-house, Cleveland, O.	Lumber ...	50	12	62	62	.....	2	2	..	.....	.....
Charlotte, N.Y.	Rochester, N.Y.	.....	30	.....	30	30	.....	3	3	..	.....	.....
....do	Pleasure trip...	.....	40	.....	40	40	.....	2	2	..	.....	.....
Rochester, N.Y	....do	.....	30	.....	30	30	.....	2	2	..	2	2
Kingston, Can.	Fairport, Ohio..	Iron ore...	7, 000	1, 000	8, 000	7, 200	800	9	9	..	9	10
Cleveland, Ohio.	Pleasure trip...	.....	75	.....	75	70	5	3	3	..	.....	.....
Oswego, N. Y ..	....do	.....	40	.....	40	40	.....	2	2	..	.....	.....
Buffalo, N. Y ..	....do	.....	200	.....	200	150	50	2	2	..	.....	.....
Sandusky, Ohio.	....do	.....	75	.....	75	75	.....	2	2	..	.....	.....
Oswego, N. Y .	Salmon River, N. Y.	.....	600	.....	600	575	25	2	2	..	.....	.....
Charlotte, N.Y.	Pleasure trip...	.....	35	.....	35	35	.....	2	2	..	.....	.....
.....	.....	.....	298, 040	87, 537	385, 577	313, 902	71, 675	273	272	1	54	75

LAKES HURON AND SUPERIOR.

Alcona, Mich ..	Tonawanda, N. Y.	Lumber ...	.....	.....	.....	.....	.....	9	9	..	.....	.....
Saginaw, Mich	Cleveland, Ohio	Shingles, wheat, &c	15, 000	3, 500	18, 500	.....	18, 500	51	51	..	.....	.....
Oswego, N. Y ..	Chicago, Ill	Coal	18, 000	2, 500	20, 500	16, 750	3, 750	8	8	..	.....	.....
Cleveland, Ohio	Milwaukee, Wis	....do	15, 000	1, 300	16, 300	15, 900	400	8	8	..	.....	.....
Milwaukee, Wis.	Buffalo, N. Y. ..	Flour and grain.	40, 000	37, 600	77, 600	68, 600	9, 000	28	28	..	.....	.....

* No one on board.

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DISTRICT No. 10.—EMBRACING LAKES

Date.	Place.	No. of station.	Name of vessel.	Where owned.	Master.	Tonnage.
1879.						
Oct. 21	One and a quarter miles south of station.	4	Sc. Vampyre	Ashtabula, Ohio	Humphrey	144
Oct. 23	Two miles east of Tawas Dock.	4	Open fish-boat	Au Sable, Mich	Ocha	
Oct. 27	North end Thunder Bay Island.	6	Fish-boat Lady Elgin	Alpena, Mich	McDonald	3
Nov. 6	Ten miles north of station	5	Sc. Gold Hunter*	Cleveland, Ohio	Rose	271
Nov. 24	Four miles north of station.	5	Sc. Curlew	Port Huron, Mich	Buckridge	80
1880.						
Apr. 10	Four miles southeast of station.	2	Sc. Montauk	Chicago, Ill	Gunderson	332
Apr. 10	One-half mile south of Port Hope, Mich.	2	Sc. Home	Port Huron, Mich	Sinclair	144
Apr. 10	New River Dock, four miles northwest of station.	2	Scow Mary Garrett	Detroit, Mich	Sanders	78
Apr. 15	One mile south of Au Sable River, Mich.	4	Sc. Criss Grover	Lorain, Ohio	Jones	133
May 22	Eight miles southeast of station.	5	Sc. Emma C. Hutchinson.	Cleveland, Ohio	Mullen	737
May 30	Three-fourths of a mile south of station.	4	Sc. Mona	Detroit, Mich	Fleming	102
	Total					

DISTRICT No. 11.—EMBRAC

1879.						
July 6	Near station	10	Open boat	Saint Joseph, Mich		
July 6	Three miles southeast of station.	11	Sl. Mischief	Chicago, Ill	Payne	2
July 13	One mile south of station	15	Sail-boat	Milwaukee, Wis		
July 13	Near piers	15	Yawl	do		
July 27	Two and a half miles south of station.	15	Sl. Falcon	Bay View Wis	Batten	6
Aug. 2	Near station	12	Yacht Crusoe	Evanston, Ill	Conwell	
Aug. 15	Five miles from station	14	Sc. Alleghany	Erie, Pa	Reardon	664
Aug. 23	Two miles outside	9	Sl. (no name)	Grand Haven, Mich	Hancock	
Aug. 24	Lincoln Park	11	Str. Bret Harte	Chicago, Ill	Blewerth	18
Sept. 3	Three miles east of harbor	11	Bark Lewis Day	Waukegan, Ill	Clow	375
Sept. 10	Mouth of harbor, Chicago	11	Sl. (no name)	Miller's Station, Ind.	Severence	1
Sept. 13	Three miles south of station	15	St. scow Josephine	Milwaukee, Wis	Ford	350
Sept. 18	Near North Pier, Saint Joseph.	10	Str. G. P. Heath	Saugatuck, Mich	Brittain	73
Sept. 21	Entrance Two Rivers Harbor	17	Sc. Blue Bell	Manitowoc, Wis	Edwards	122
Oct. 2	Five miles south of station	16	Bge J. W. Hanaford	Marquette, Mich	Smith	280
Oct. 5	North Point Reef, 5 miles from station.	15	Sc. Mary Lyons	Rochester, N. Y	Harry	600
Oct. 12	Seven miles north of Chicago	11	Sc. Racine	Chicago, Ill	Thompson	168
Oct. 12	Eight miles north of station.	12	Sc. Thomas Sims	Menominee, Mich	Sauper	213
Oct. 22	Near north Pier, Saint Joseph.	10	Sc. Cora	Benton Harbor	Fish	44
Oct. 28	Near South Pier, Grand Haven.	9	Str. Amazon	Detroit, Mich	Fraser	1,406
Oct. 28	Eight miles southeast of station.	17	Sc. Nellie Wilder	Sackett's Harbor, N. Y.		400
Nov. 2	Near North Pier, Saint Joseph.	10	Sc. Ithaca	Chicago, Ill	Sullivan	144
Nov. 2	White Fish Bay, 8 miles north of station.	15	Str. Menomonee	Kenosha, Wis	Schafforn	796

*Crew came ashore in their own boat.

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HURON AND SUPERIOR—Continued.

Where from.	Where bound.	Cargo.	Estimated value of vessel.	Estimated value of cargo.	Total.	Estimated amount saved.	Estimated amount lost.	No. of persons on board.	No. of persons saved.	No. of persons lost.	No. of persons sheltered at station.	No. of days' shelter afforded.
Marine City, Mich.	East Tawas, Mich.	.....	$2,000	.....	$2,000	$1,700	$300	7	7	....	....	....
East Tawas, Mich.	Fish Point, Mich	Outfits	50	$25	75	65	10	2	2	....	....	....
Sugar Island...	Fishing	Fish	200	100	300	300	.....	2	2	....	....	....
L'Anse, Mich ..	Cleveland, Ohio	Iron ore...	8,000	4,500	12,500	.....	12,500	8	8	....	....	....
Port Huron, Mich.	Alcona, Mich ..	.....	1,500	.....	1,500	.....	1,500	5	5	....	....	....
Buffalo, N. Y...	Chicago, Ill	Coal	12,000	3,200	15,200	5,200	10,000	8	8	....	....	....
Port Hope, Mich.	Toledo, Ohio ...	Salt	7,500	6,000	13,500	6,500	7,000	6	6	....	....	....
New River, Mich.	....do	....do	1,800	850	2,650	1,800	850	4	4	....	....	....
Kelley's Island, Ohio.	Frankfort, Mich	Limestone & md'se.	8,000	1,200	9,200	400	8,800	7	7	....	....	....
Escanaba, Mich	Cleveland, Ohio	Iron ore...	25,000	13,000	38,000	37,900	100	10	10	....	....	....
Saint Clair, Mich.	East Tawas, Mich.	.....	2,000	.....	2,000	1,400	600	6	6	....	....	....
.....	.....	.....	156,050	73,775	229,825	156,515	73,310	169	169	....	....	....

ING LAKE MICHIGAN.

Saint Joseph, Mich.	Pleasure trip...	.....	30	.....	30	30	.....	3	3	....	....	....
Chicago, Ill	To the crib.....	.....	150	.....	150	150	.....	6	6	....	....	....
Milwaukee, Wis	Pleasure trip...	.....	.....	.....	.....	.....	.....	4	4	....	....	....
....do	....do	.....	.....	.....	.....	.....	.....	4	4	....	....	....
Bay View, Wis	Cruising	.....	400	.....	400	325	75	4	4	....	....	....
Evanston, Ill ..	Pleasure trip...	.....	100	.....	100	100	.....	2	2	....	....	....
Milwaukee, Wis	Chicago, Ill	.....	40,000	.....	40,000	34,000	6,000	10	10	....	....	....
Grand Haven, Mich.	On excursion...	.....	200	.....	200	190	10	5	5	....	....	....
Chicago, Ill	Lincoln Park, Ill	.....	4,000	.....	4,000	3,975	25	12	12	....	....	....
Little Cedar River, Mich.	Chicago, Ill	Cedar posts, &c.	3,500	1,500	5,000	4,875	125	9	9	....	....	....
Miller's Station, Ind.	....do	Rags and iron.	70	12	82	59	23	2	2	..	2	3
Milwaukee, Wis	South Point, Wis	Sand	4,000	75	4,075	3,950	125	5	5	....	....	....
Saugatuck, Mich.	Michigan City, Ind.	Lumber ...	8,000	2,000	10,000	9,000	1,000	5	5	....	....	....
White Lake, Mich.	Two Rivers, Wis.	Tanbark ..	5,000	700	5,700	5,700	.....	7	7	....	....	....
Bay City, Mich	Chicago, Ill	Lumber ...	8,000	5,000	13,000	12,800	200	7	7	....	....	....
Cleveland, Ohio	Milwaukee, Wis	Coal	16,000	2,000	18,000	17,600	400	8	8	....	....	....
Muskegon, Mich.	Chicago, Ill	Lumber ...	5,000	1,500	6,500	6,200	300	6	6	....	....	....
Menominee, Mich.	....do	....do	4,000	4,500	8,500	6,300	2,200	5	5	....	....	....
Muskegon, Mich.	Benton Harbor, Mich.	....do	4,000	500	4,500	3,550	950	4	4	..	4	4
Milwaukee, Wis	Grand Haven, Mich.	Provisions	150,000	100,000	250,000	.....	250,000	68	68	....	....	....
Sackett's Harbor, N. Y.	Milwaukee, Wis	Coal	15,000	1,800	16,800	14,800	2,000	9	9	....	....	....
Muskegon, Mich.	Michigan City, Ind.	Lumber ...	4,000	2,000	6,000	.....	6,000	7	7	..	7	7
Green Bay, Wis	Chicago, Ill	Fish, iron, & shingles	50,000	30,000	80,000	78,000	2,000	37	37	....	....	....

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DISTRICT No. 11.—EMBRACING

Date.	Place.	No. of station.	Name of vessel.	Where owned.	Master.	Tonnage.
1879.						
Nov. 3	Two and a half miles from harbor.	10	Sc. Addie	Benton Harbor, Mich.	Belton	30
Nov. 3	Lincoln Park, Ill	11	Sc. Reindeer	Milwaukee, Wis	Jackason	43
Nov. 11	Oak Creek Pier, Wis	15	Sc. Spy*	Oak Creek, Wis	Fowl	160
Nov. 19	Near North Pier, Grand Haven.	9	Sc. Maple Leaf	Milwaukee, Wis	Lund	87
Nov. 19	do	9	Sc. J. A. Holmes	Chicago, Ill	Olsen	132
Nov. 19	do	9	Sc. Margaret Dall	do	Castillo	176
Nov. 19	do	9	Barge C. O. D	Grand Haven, Mich	Mulvaney	290
Nov. 19	do	9	Tug Gen. H. E. Paine	do	Doherty	248
Nov. 19	Half mile north of Grand Haven.	9	Sc. Mystic*	do	Reese	38
Nov. 19	Breakwater, Chicago	11	Sc. Clara Parker*	Chicago, Ill	Lewis	425
Nov. 20	Pentwater, 14 miles south of station.	7	Sc. Mercury	Manistee, Mich	Sterling	
Nov. 22	Channel of Grand River, Grand Haven.	9	Sc. James Catchpole †	Chicago, Ill	Torkelson	129
Nov. 24	North Pier, Ludington	7	S. S. City of New York.	Grand Haven, Mich	Chamberlin.	417
Nov. 25	One mile south of station	6	Sc. Charles J. Smith	South Haven, Mich	Smith	80
Dec. 10	Half mile north of pier, Grand Haven.	9	Sc. Mystic‡	Grand Haven, Mich	Reese	38
Dec. 21	Seven miles north of station.	7	Str City of Toledo	do	Beron	413
1880.						
Jan. 10	Near station	11	Str. Prindeville	Chicago, Ill	Avery	34
Apr. 7	Eight miles northeast of station.	11	Sc. Goshawk	Cleveland, Ohio	Morton	550
Apr. 8	South Harbor Pier, Racine, Wis.	7	Sc. Three Bells	Racine, Wis	Harold	60
Apr. 10	Four and a half miles south of station.	2	Sc. Ida Keith	Chicago, Ill	Keith	490
Apr. 10	Off Point au Bec Scies	17	Sc. G. H. Warmington.	Cleveland, Ohio	Edsen	560
Apr. 11	South of Harbor Pier, Manistee, Mich.	5	Sc. Anna O. Hanson	Manistee, Mich	Griffin	147
Apr. 11	South of South Pier, Racine, Wis.	14	Sc. C. A. King	Chicago, Ill	Patterson	316
Apr. 14	At mouth of Manistee Harbor, Mich.	5	Sc. Z. G. Simmons	Muskegon, Mich	Albrightson.	158
Apr. 14	Off Pier Light, Kenosha, Wis.	13	Sc. W. H. Hawkins	Chicago, Ill	Johnson	135
Apr. 16	One mile south of station	15	Sc. Evergreen	Racine, Wis	Smith	68
Apr. 20	Near station	17	Sailboat	Two Rivers, Wis		
Apr. 21	Outside end of Harbor Pier, Two Rivers, Wis.	17	Tug M. A. Gagnon	do	Gagnon	18
Apr. 22	Entrance of harbor, Sheboygan, Wis.	16	Sc. Stampede	Sheboygan, Wis	Anga	295
Apr. 29	Five miles south of station	2	Sc. Venus	Cleveland, Ohio	Carter	
Apr. 30	Abreast of station	12	Rowboat	Evanston, Ill		
May 1	Near station	11	Rowboat Horace W. Turner.	Chicago, Ill	Forno	
May 7	One and a half miles southwest of station.	17	Sc. Flying Cloud	do	Gonio	255
May 9	Opposite station	15	Rowboat	Milwaukee, Wis		
May 10	Three-quarters mile outside Milwaukee Harbor.	15	do	do		
May 13	One quarter mile north of harbor, Two Rivers, Wis.	17	Sc. Anna	Pentwater, Mich	Morgansen	8
May 30	Two and a half miles southeast of harbor, Racine, Wis.	14	Open Boat	Racine, Wis		
May 31	South of South Point, eight miles south of station.	15	Sc. C. S. Davis	White Lake, Mich.	Halmond	65
June 4	North Point, Wis	15	Sc. Porter	Milwaukee, Wis	Green	748

*Crew got ashore themselves. † No assistance required from life-saving station.
‡Same disaster as reported Nov. 19; crew again imperiled while at work upon vessel.

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LAKE MICHIGAN—Continued.

Where from.	Where bound.	Cargo.	Estimated value of vessel.	Estimated value of cargo.	Total.	Estimated amount saved.	Estimated amount lost.	No. of persons on board.	No. of persons saved.	No. of persons lost.	No. of persons sheltered at station.	No. of days' shelter afforded.
Manistee, Mich.	Benton Harbor, Mich.	Shingles ..	$2,000	$500	$2,500	$2,250	$250	3	3	..	....	....
Muskegon, Mich.	Chicago, Ill	Lumber ...	500	250	750	100	650	2	2	..	....	....
Oak Creek, Wis	Milwaukee, Wis	Bricks	2,000	300	2,300	1,500	800	4	4	..	....	....
White Hall, Mich.	....do	Lumber ...	4,000	1,500	5,500	.....	5,500	4	4	..	4	4
Racine, Wis....	Grand Haven, Mich.	.....	2,000	.....	2,000	2,000	.....	6	6	..	6	6
Chicago, Ill	....do	.....	7,000	.....	7,000	7,000	.....	7	7	..	7	7
....do	....do	.....	14,000	.....	14,000	14,000	.....	5	5	..	....	....
....do	....do	General ...	18,000	200	18,200	.....	18,200	15	15	..	....	....
Racine, Wis....	....do	.....	1,500	.....	1,500	1,500	.....	3	3	..	....	....
Chicago, Ill	Escanaba, Mich	.....	12,500	.....	12,500	4,500	8,000	9	9	..	....	....
Ludington, Mich.	Chicago, Ill	Plank	9,000	3,000	12,000	.....	12,000	7	7	..	....	....
Racine, Wis....	Grand Haven, Mich.	Stone	3,000	500	3,500	3,100	400	6	6	..	6	6
Milwaukee, Wis	Ludington, Mich.	Provisions	15,000	15,000	30,000	19,500	10,500	21	21	..	....	....
Hamlin, Mich ..	South Haven, Mich.	Lumber ...	3,000	600	3,600	3,400	200	5	5	..	....	....
.....	.....	.....	.....	.....	.....	.....	.....	3	3	..	....	....
Milwaukee, Wis.	Ludington, Mich.	Flour and pork.	20,000	14,000	34,000	4,000	30,000	24	24	..	....	....
Chicago, Ill ...	Adrift	.....	3,000	.....	3,000	3,000	.....	(*)	....	....	....	....
....do	Buffalo, N. Y...	Grain	16,000	14,000	30,000	30,000	.....	5	5	..	....	....
Racine, Wis...	Ludington, Mich.	Hay.....	2,000	35	2,035	1,735	300	3	3	..	....	....
Chicago, Ill ...	Buffalo, N. Y...	Corn	30,000	15,000	45,000	8,000	37,000	9	9	..	....	....
....do	....do	Grain	8,500	17,500	26,000	24,800	1,200	9	9	..	....	....
Manistee, Mich.	Milwaukee, Wis.	Lumber ...	7,000	1,790	8,790	8,540	250	7	7	..	....	....
Traverse Bay, Mich.	Racine, Wis....	....do	14,000	5,000	19,000	17,500	1,500	8	8	..	....	....
Chicago, Ill...	Manistee, Mich.	.....	4,000	.....	4,000	3,800	200	6	6	..	....	....
White Lake, Mich.	Chicago, Ill	Wood	3,000	600	3,600	3,500	100	6	6	..	....	....
Muskegon, Mich.	Racine, Wis....	Lumber ...	1,400	550	1,950	550	1,400	4	4	..	....	....
Two Rivers, Wis.	On pleasure trip	.....	40	.....	40	40	.....	2	2	..	....	....
....do	Lake	.....	4,000	.....	4,000	4,000	.....	4	4	..	....	....
Alabaster, Mich.	Sheboygan, Wis.	Plaster rock.	10,000	400	10,400	5,000	5,400	7	7	..	....	....
Kelley's Island, Ohio.	Saint Joseph, Mich.	Limestone	8,000	800	8,800	4,000	4,800	6	6	..	6	54
Evaanston, Ill	On pleasure trip	.....	50	.....	50	50	.....	3	3	..	3	3
Round House, Chicago, Ill.	Breakwater, Chicago, Ill.	.....	50	.....	50	40	10	2	2	..	2	2
Chicago, Ill ...	Menominee, Mich.	.....	19,000	.....	19,000	19,000	.....	7	7	..	....	....
Milwaukee, Wis.	On pleasure trip.	.....	.....	.....	.....	.....	.....	1	1	..	....	....
....do	On pleasure trip.	.....	30	.....	30	30	.....	1	1	..	....	....
Pentwater, Mich.	Manitowoc, Wis.	Lumber ...	500	40	540	510	30	2	2	..	....	....
Racine, Wis.	Pleasure trip...	.....	45	.....	45	45	.....	3	3	..	....	....
White Lake, Mich.	Milwaukee, Wis.	Pine wood blocks.	1,800	1,300	3,100	2,550	550	3	3	..	....	....
Buffalo, N. Y ..	....do	Coal.....	38,000	3,000	41,000	37,500	3,500	11	11	..	....	....

* No one on board.

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DISTRICT No. 11.—EMBBACING

Date.	Place.	No. of station.	Name of vessel.	Where owned.	Master.	Tonnage.
1880.						
June 14	Illinois Central Railroad Dock, Chicago, Ill.	11	Slp. Harry	Chicago, Ill	Payne	12
June 18	One-quarter mile north of station.	15	Rowboat	Milwaukee, Wis		
June 23	Two miles northeast of station.	11	Scow Little Lizzy	Chicago, Ill		
	Total					

DISTRICT No. 12.—

1880.						
Mar. 10	One mile southwest of lower end of Sand Island.	3	Bark Dilharree*	London, Eng	Moor	1,293
Apr. 5	Two and a half miles southwest of station.	2	Schooner Enterprise	San Francisco, Cal	Donnolly	190
	Total					

*No assistance required of Life-Saving Service.

RECAPITU

Districts.	Total number of disasters.	Total value of vessels.	Total value of cargoes.
District No. 1	25	$102,235	$25,305
District No. 2	25	177,500	102,330
District No. 3	22	229,795	110,865
District No. 4	49	267,925	180,949
District No. 5	28	374,415	258,370
District No. 6	13	343,500	26,985
District No. 9	55	298,040	87,537
District No. 10	16	156,050	73,775
District No. 11	65	606,880	247,452
District No. 12	2	60,000	81,800
Aggregate	300	2,616,340	1,195,368

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LAKE MICHIGAN—Continued.

Where from.	Where bound.	Cargo.	Estimated value of vessel.	Estimated value of cargo.	Total.	Estimated amount saved.	Estimated amount lost.	No. of persons on board.	No. of persons saved.	No. of persons lost.	No. of persons sheltered at station.	No. of days' shelter afforded.
.....	.....	.....	$1,500	.....	$1,500	$1,480	$20	1	1	..	.....	.....
Milwaukee, Wis.	Fishing	.....	15	.....	15	15	.....	1	1	..	.....	.....
Chicago, Ill ...	Blown out into the lake.	.....	.....	.....	.....	.....	.....	1	1	..	.....	.....
.....	.....	.....	606,880	247,452	854,332	440,139	414,193	465	465	..	47	96

EMBRACING PACIFIC COAST.

Astoria, Oreg .	Falmouth, Eng .	Wheat....	50,000	80,000	130,000	.....	130,000	2	24	..	.....	.....
South Bend, Shoalwater Bay.	California.....	Lumber...	10,000	1,800	11,800	11,800	.....	9	9	..	6	6
.....	.....	.....	60,000	81,800	141,800	11,800	130,000	33	33	..	6	6

LATION.

Total amount of property involved.	Total amount of property saved.	Total amount of property lost.	Total number of persons on board.	Total number of persons saved.	Total number of persons lost.	Number of shipwrecked persons sheltered at stations.	Total number of days' succor afforded.	Number of disasters involving total loss of vessels.
$127,540	$111,120	$16,420	123	123	.....	11	21	4
279,830	208,805	71,025	149	149	.....	48	92	9
340,660	269,135	71,525	144	144	.....	63	115	8
448,874	276,806	172,068	273	271	2	96	332	16
632,785	518,925	113,860	239	237	2	72	168	7
370,485	312,660	57,825	121	117	4	52	297	4
385,577	313,902	71,675	273	272	1	54	75	5
229,825	156,515	73,310	169	169	.....	.....	.....	4
854,332	440,139	414,193	465	465	.....	47	96	9
141,800	11,800	130,000	33	33	.....	6	6	1
3,811,708	2,619,807	1,191,901	1,989	1,980	9	449	1,202	67

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APPROPRIATIONS AND EXPENDITURES.

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STATEMENT SHOWING THE APPROPRIATIONS AND EXPENDITURES FOR THE MAINTENANCE OF THE LIFE-SAVING SERVICE FOR THE FISCAL YEAR ENDING JUNE 30, 1880.

APPROPRIATION—LIFE-SAVING SERVICE, 1880.

For salary of one superintendent for the life-saving stations on the coasts of Maine and New Hampshire, District No. 1	$1,000 00	
For salary of one superintendent for the life-saving stations on the coast of Massachusetts, District No. 2	1,000 00	
For salary of one superintendent for the life-saving stations on the coasts of Rhode Island and Long Island, District No. 3	1,500 00	
For salary of one assistant superintendent for the life-saving stations on the coasts of Rhode Island and Long Island, District No. 3	500 00	
For salary of one superintendent for the life-saving stations on the coast of New Jersey, District No. 4	1,500 00	
For salary of one superintendent for the life-saving stations on the coasts of Delaware, Maryland, and Virginia, District No. 5	1,000 00	
For salary of one superintendent for the life-saving stations on the coasts of Virginia and North Carolina, District No. 6	1,000 00	
For salary of one superintendent for the houses of refuge on the coast of Florida, District No. 7	1,000 00	
For salary of one superintendent for life-saving and life-boat stations on the coast of Texas, District No. 8	1,000 00	
For salary of one superintendent of life-saving and life-boat stations on the coasts of Lakes Ontario and Erie, District No. 9	1,000 00	
For salary of one superintendent for life-saving and life-boat stations on the coasts of Lakes Huron and Superior, District No. 10	1,000 00	
For salary of one superintendent for life-saving and life-boat stations on the coast of Lake Michigan, District No. 11	1,000 00	
		$12,500 00
For salary of 196 keepers of life-saving and life-boat stations, and of houses of refuge, at $400 each		78,400 00
For pay of crews of experienced surfmen, employed at the life-saving and life-boat stations, at a rate not to exceed forty dollars per month each, during the period of actual employment		376,960 00
For compensation of volunteer crews of life-boat stations for actual and deserving service rendered upon each occasion of disaster, at such rate, not to exceed $10 for each person, as the Secretary of the Treasury may determine, and for pay of volunteer crews for drill and exercise		5,000 00
Total		472,860 00

EXPENDITURES.

Salary of superintendent of life-saving stations in District No. 1	$1,000 00
Salary of superintendent of life-saving stations in District No. 2	1,000 00
Salary of superintendent of life-saving stations in District No. 3	1,500 00
Salary of assistant superintendent of life-saving stations in District No. 3	500 00
Salary of superintendent of life-saving stations in District No. 4	1,500 00

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Salary of superintendent of life-saving stations in District No. 5	$1,000 00	
Salary of superintendent of life-saving stations in District No. 6	1,000 00	
Salary of superintendent of houses of refuge in District No. 7	1,000 00	
Salary of superintendent of life-saving stations in District No. 8, August 20 to December 31, 1879	364 13	
Salary of superintendent of life-saving and life-boat stations in District No. 9	1,000 00	
Salary of superintendent of life-saving and life-boat stations in District No. 10	1,000 00	
Salary of superintendent of life-saving and life-boat stations in District No. 11	1,000 00	
		$11,864 13
Pay of 172 keepers, Districts Nos. 1, 2, 3, 4, 5, 6, 7, 9, 10, 11, and 12, quarter ending September 30, 1879	16,725 96	
Pay of 177 keepers, Districts Nos. 1, 2, 3, 4, 5, 6, 7, 9, 10, 11, and 12, quarter ending December 31, 1879	17,556 50	
Pay of 177 keepers, Districts Nos. 1, 2, 3, 4, 5, 6, 7, 9, 10, 11, and 12, quarter ending March 31, 1880	17,453 88	
Pay of 173 keepers, Districts Nos. 1, 2, 3, 4, 5, 6, 7, 9, 10, 11, and 12, quarter ending June 30, 1880	17,300 00	
		69,036 34
Pay of surfmen in District No. 1, between September 1, 1879, and April 30, 1880	12,888 00	
Pay of surfmen in District No. 2, between September 1, 1879, and April 30, 1880	28,022 70	
Pay of surfmen in District No. 3, between September 1, 1879, and April 30, 1880, and pay of two surfmen from May 1 to June 30, 1880	67,744 90	
Pay of surfmen in District No. 4, between September 1, 1879, and April 30, 1880	70,764 52	
Pay of surfmen in District No. 5, between September 1, 1879, and April 30, 1880	21,120 00	
Pay of surfmen in District No. 6, between September 1, 1879, and April 30, 1880	44,377 07	
Pay of surfmen in District No. 9, between July 1, 1879, and December 15, 1879, and between March 20 and June 30, 1880	18,404 64	
Pay of surfmen in District No. 10, between July 1 and December 15, 1879, and between April 1 and June 30, 1880	17,031 38	
Pay of surfmen in District No. 11, between July 1 and December 31, 1879, and between April 1 and June 30, 1880	26,577 33	
Pay of surfmen in District No. 12, from September 6 to October 19, 1879	57 84	
Pay of surfmen in District No. 1, for services at wrecks which occurred at periods when crews were not required to reside at the stations	45 00	
Pay of surfmen in District No. 3, for services at wrecks which occurred at periods when crews were not required to reside at the stations	90 00	
Pay of surfmen in District No. 4, for services at wrecks which occurred at periods when crews were not required to reside at the stations	111 00	
Pay of surfmen in District No. 5, for services at wrecks which occurred at periods when crews were not required to reside at the stations	30 00	
		307,264 38
Pay of volunteer surfmen in District No. 9, for drill and exercise	630 00	
Pay of volunteer surfmen in District No. 9, for services at wrecks	621 00	
Pay of volunteer surfmen in District No. 11, for services at wrecks	96 00	
Pay of volunteer surfmen in District No. 12, for drill and exercise	12 00	
		1,359 00
Total expenditures from appropriation, Life Saving-Service, 1880		389,523 85
Balance of available funds July 1, 1880		83,336 15
		472,860 00

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APPROPRIATION—LIFE-SAVING SERVICE, CONTINGENT EXPENSES, 1880.

For fuel for 196 stations and houses of refuge; repairs and outfits for the same; supplies and provisions for houses of refuge and for shipwrecked persons succored at stations; traveling expenses of officers under orders from the Treasury Department; and contingent expenses, including freight, storage, repairs to apparatus, medals, labor, stationery, advertising, and miscellaneous expenses that cannot be included under any other head of life-saving stations on the coasts of the United States	$50,000 00	
For deficiency appropriation as above	2,000 00	
		$52,000 00

EXPENDITURES.

Apparatus	10,122 80
Books, charts, stationery, advertising, &c	776 04
Care of stations pending appointment of keepers	96 74
Equipments	1,379 91
Freight, packing, storage, telegraphing, &c	579 89
Fuel for stations	6,503 29
Furniture, supplies, &c	10,016 10
Hire of surf-boat	14 25
Lithography and engraving	40 00
Medals	968 20
Medical services rendered to injured keeper	10 00
Medicines	31 68
Recording deeds	6 56
Removal of stations on account of the encroachment of the sea, &c	325 58
Rent of inspector's office, New York	200 00
Rent of offices of superintendents	145 45
Repairs to stations and apparatus	3,171 19
Sites for stations	110 00
Stables and forage for horses	553 73
Sustenance of persons rescued from wrecked vessels	177 10
Transporting apparatus to and from wrecks	296 00
Traveling expenses of officers	4,048 98
Total expenditures from appropriation for Life-Saving Service, contingent expenses, 1880	39,573 49
Balance of available funds July 1, 1880	12,426 51
	52,000 00

At the beginning of the fiscal year there remained on hand available from the appropriations of the preceding year the following:

	Life-Saving Service, 1879.	Life-Saving Service, contingent expenses, 1879.
Unexpended balance July 1, 1879	$11,680 43	$6,948 06
To which repayments have been made as follows	671 72	563 06
Total available funds	12,352 15	7,511 12

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The expenditures from these balances during the last year, made in payment of indebtedness standing over from the preceding year, were as follows:

Life-Saving Service, 1879, available as above		$12,352 15
Pay of surfmen in Districts Nos. 1, 2, 3, 4, and 9 for services at wrecks when crews were not required to reside at stations	$520 00	
Pay of Surfman W. W. Ware, jr., from March 25 to April 15, 1879, at Life-Saving Station No. 39, District No. 4	29 03	
Pay of Dennis M. Capps for services as surfman at Station No. 3, District No. 6, from September 1 to October 31, 1878	80 00	
Pay of six surfmen for services in testing life-boats at Sandy Hook, May 31, 1879	18 00	
Pay of surfmen acting as keepers of stations	338 31	
Compensation of L. B. Midgett as keeper from November 1, 1878, to May 2, 1879	201 50	
		1,186 84
Balance unexpended July 1, 1880		11,165 31
		12,352 15
Life-Saving Service, contingent expenses, 1879, available as heretofore stated		7,511 12
Apparatus	$103 66	
Books, charts, stationery, advertising, &c	42 30	
Care of stations pending appointment of keepers	106 55	
Equipments	70 00	
Freight, packing, storage, telegraphing, &c	426 82	
Fuel for stations	5 00	
Furniture, supplies, &c	190 23	
Hire of surf-boat	10 00	
Medical services rendered to injured keeper	73 10	
Removal of stations	190 00	
Rent of inspector's office, New York	100 00	
Repairs to stations and apparatus	4,622 34	
Sites for stations	16 50	
Sustenance of persons rescued from wrecked vessels	17 60	
Transporting apparatus to and from wrecks	25 00	
Traveling expenses of officers	660 66	
		6,659 76
Balance unexpended July 1, 1880		851 36
		7,511 12

There also remained unexpended at the close of the fiscal year, from appropriations of 1878, the following:

	Life-Saving Service, 1878.	Life-Saving Service, contingent expenses, 1878.
Unexpended balances July 1, 1879	$11,133 61	$255 18
To which repayments have been made as follows	2 00	.....
Total available funds	11,135 61	255 18

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During the last fiscal year no expenditures were made from the appropriation "Life-Saving Service, 1878," and the balance on hand, $11,135.61, was carried to the surplus fund and covered into the Treasury June 30, 1880.

The expenditures during the year from the appropriation "Life-Saving Service, contingent expenses, 1878," were as follows:

Life-Saving Service, contingent expenses, 1878, available as above stated			255 18
Freight		$0 95	
The following items chargeable to this appropriation erroneously paid from appropriation "Life-Saving Service, contingent expenses, 1879," were corrected during the year ending June 30, 1880, by transfer to the proper appropriation:			
Freight	$1 73		
Repairs	24 80		
Supplies	7 96		
Traveling expenses of officers	78 90		
Balance of bill for the construction of relief boat-house on Cape Cod	140 84		
		254 23	
			255 18

The total net expenditures for the maintenance of the Life-Saving Service made during the fiscal year ending June 30, 1880, were, therefore, as follows:

Life-Saving Service, 1880		$389,523 85	
Life-Saving Service, 1879		1,186 84	
		390,710 69	
Less repayment to the appropriations, Life-Saving Service, 1878 and 1879		673 72	
Net expenditures			$390,036 97
Life-Saving Service, contingent expenses, 1880		39,573 49	
Life-Saving Service, contingent expenses, 1879		6,659 76	
Life-Saving Service, contingent expenses, 1878		255 18	
		46,488 43	
Less amount of repayments to the appropriation, Life-Saving Service, contingent expenses, 1879		563 06	
Net expenditures			45,925 37
Total net expenditures of the service			435,962 34

There remained standing to the credit of the respective appropriations at the close of the fiscal year ending June 30, 1880, available as heretofore stated, the following balances:

Life-Saving Service, 1880	$83,336 15
Life-Saving Service, 1879	11,165 31
Life-Saving Service, contingent expenses, 1880	12,426 51
Life-Saving Service, contingent expenses, 1879	851 36

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The foregoing statement of the net expenditures of the Life-Saving Service for the fiscal year ending June 30, 1880, differs from the expenditures by warrants in the following particulars:

Net expenditures by warrants			$434,905 47
To which add the amount of the following items:			
Amount in hands of disbursing clerk June 30, 1879		$1,680 52	
Excess of repayments to appropriations appearing on the books in the Warrant Division, and carried to the surplus fund, but not included in the foregoing statement, as follows:			
Life-Saving Service, 1877 and prior years	$26 68		
Life-Saving Service, contingent expenses, 1877 and prior years	11 00		
		37 68	
Item of expense payable from the appropriation, Life-Saving Service, 1880, not expended by warrant until the fiscal year 1881		78 00	
		1,796 20	
Less amount reappropriated to Life-Saving Service, contingent expenses, 1877 and prior years, and expended by warrant not included in the foregoing statement	$5 00		
Less balance in hands of disbursing clerk June 30, 1880, belonging to the appropriation, Life-Saving Service, contingent expenses, 1880	734 33		
		739 33	
Total amount of differences			1,056 87
Net expenditures from the appropriations for the year			435,962 34

To the foregoing statement of expenditures for the maintenance of the Life-Saving Service may be added the following:

APPROPRIATION—SALARIES OFFICE OF LIFE-SAVING SERVICE	$19,420 00
EXPENDITURES.	
Compensation of officers and employés in office of Life-Saving Service	19,420 00

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LIST OF LIFE-SAVING DISTRICTS AND STATIONS

ON THE

COASTS OF THE UNITED STATES.

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LIFE-SAVING DISTRICTS AND STATIONS ON THE COASTS OF THE UNITED STATES.

FIRST DISTRICT.

EMBRACING COASTS OF MAINE AND NEW HAMPSHIRE.

No.	Name.	State.	Locality.	Approximate position. Latitude, north.			Longitude, west.		
				°	′	″	°	′	″
1	West Quoddy Head	Me	Carrying Point Cove	44	48	25	66	58	25
2	Cross Island	Me	Off Machiasport	44	37	28	67	16	20
3	Crumple Island	Me	Off Jonesborough	44	28	30	67	37	00
4	LittleCranberryIsland	Me	Off Mount Desert	Not determined.					
5	Whitehead Island	Me	Near Whitehead light	43	58	41	69	07	37
6	Biddeford Pool	Me	Fletcher's Neck	43	26	32	70	20	08
7	Locke's Point	N. H.	Rye Beach	42	59	31	70	45	00

SECOND DISTRICT.

EMBRACING COAST OF MASSACHUSETTS.

1	Plum Island	Mass.	Near Newburyport, 3 miles distant	42	47	05	70	48	41
2	Davis Neck	Mass.	Near Annisquam light	42	40	03	70	40	03
3	Scituate	Mass.	South end of fourth cliff	Not determined.					
4	Gurnett's	Mass.	8 miles northeast of Plymouth	42	00	10	70	35	50
5	Manomet Point	Mass.	7 miles southeast of Plymouth	41	55	29	70	32	18
6	Race Point	Mass.	⅝ mile northeast of Race Point light, Cape Cod.	42	04	12	70	13	58
7	Peaked Hill Bar	Mass.	2½ miles northeast of Provincetown, Cape Cod.	42	04	34	70	08	54
8	Highlands	Mass.	⅞ mile northwest of light, Cape Cod	42	02	47	70	04	05
9	Parmet River	Mass.	3½ miles south of Highland light	41	59	59	70	00	53
10	Cahoon's Hollow	Mass.	2½ miles east of the town of Wellfleet	41	56	38	69	58	40
11	Nausett	Mass.	1¾ miles south of lights	41	50	29	69	56	20
12	Orleans	Mass.	Abreast of Ponchet Island	41	45	31	69	55	31
13	Chatham	Mass.	2 miles north of Chatham light	41	42	12	69	56	34
14	Monomoy	Mass.	2 miles north of Monomoy light	41	36	00	69	58	41
15	Surfside	Mass.	2½ miles south of the town of Nantucket	41	14	33	70	08	36

THIRD DISTRICT.

EMBRACING COASTS OF RHODE ISLAND AND LONG ISLAND.

1	Narragansett Pier	R. I.	Northern part of the town	41	25	59	71	27	04
2	Point Judith	R. I.	Near light-house	41	21	38	71	28	54
3	Watch Hill	R. I.	..... do	41	18	12	71	51	32
4	New Shoreham	R. I.	Block Island, east side, near landing	41	10	30	71	33	07
5	Block Island	R. I.	Block Island, west side, near Dicken's Point.	41	09	41	71	36	13
6	Montauk Point	N. Y.	At the light	41	04	07	71	51	00
7	Ditch Plain	N. Y.	3 miles southwest of Montauk light	41	02	19	71	54	38
8	Hither Plain	N. Y.	½ mile southwest of Fort Pond	41	01	33	71	57	26
9	Napeague	N. Y.	Abreast Napeague Harbor	40	59	38	72	02	24
10	Amagansett	N. Y.	Abreast of the town	40	58	05	72	07	24
11	Georgica	N. Y.	1 mile south of East Hampton	40	56	35	72	11	19
12	Bridgehampton	N. Y.	2 miles south of town	40	54	06	72	17	41
13	Southampton	N. Y.	¾ mile south of town	40	52	13	72	23	07
14	Shinnecock	N. Y.	3 miles from the head of Shinnecock Bay	40	50	40	72	27	30
15	Tyana	N. Y.	4 miles east of Quogue	40	49	36	72	31	16
16	Quogue	N. Y.	½ mile south of the village	40	48	23	72	35	41
17	West Hampton	N. Y.	1½ miles southwest of Patunk village	40	47	52	72	39	01
18	Moriches	N. Y.	2½ miles southwest of Speonk village	40	46	25	72	42	49

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Life saving districts and stations on coasts of the United States—Continued.

THIRD DISTRICT—Continued.

EMBRACING COASTS OF RHODE ISLAND AND LONG ISLAND—Continued.

No.	Name.	State.	Locality.	Approximate position. Latitude, north.			Longitude, west.		
				°	′	″	°	′	″
19	Forge River	N. Y.	3½ miles south of Moriches	40	44	56	72	48	12
20	Smith's Point	N. Y.	Abreast of the point	40	43	51	72	52	20
21	Bellport	N. Y.	4 miles south of the village	40	42	42	72	55	46
22	Blue Point	N. Y.	4½ miles south of Patchogue	40	40	40	73	01	15
23	Lone Hill	N. Y.	4½ miles south of Sayville	40	39	46	73	04	27
24	Point of Woods	N. Y.	5 miles south of Islip	40	38	55	73	08	11
25	Fire Island	N. Y.	East side Fire Island Inlet	40	37	34	73	13	36
26	Oak Island, east end	N. Y.		40	38	15	73	17	39
27	Oak Island, west end	N. Y.		40	37	16	73	22	24
28	Jones's Beach, east end	N. Y.		40	36	27	73	25	20
29	Jones's Beach, west end	N. Y.	6 miles south of South Oyster Bay	40	36	10	73	28	43
30	Short Beach	N. Y.	½ mile east of Jones's Inlet	Not determined.					
31	Discontinued								
32	Long Beach, east end	N. Y.	2 miles west of Jones's Inlet	40	35	18	73	35	47
33	Long Beach, west end	N. Y.	Near Lucy's Inlet	40	35	03	73	39	09
34	Hog Island, west end	N. Y.	Near Hog Island Inlet	40	35	22	73	43	50
35	Rockaway Beach	N. Y.	Near the village of Rockaway	40	35	25	73	46	55
36	do	N. Y.	West end	40	34	15	73	51	08
37	Coney Island	N. Y.	Manhattan Beach	40	34	21	73	56	06
38	Eaton's Neck	N. Y.	East side entrance to Huntington Bay, Long Island Sound.	40	57	12	73	23	45

FOURTH DISTRICT.

EMBRACING COAST OF NEW JERSEY.

1	Sandy Hook	N. J.	383 yards east of main light	40	27	42	73	59	34
2	Spermaceti Cove	N. J.	East of the upper end of cove	40	25	39	73	58	50
3	Seabright	N. J.	About a mile south of Navesink Lights	40	22	46	73	58	11
4	Monmouth Beach	N. J.	3½ miles south of Navesink Lights	40	20	30	73	58	07
5	Long Branch	N. J.	Near Green's Pond	40	16	36	73	58	43
6	Deal	N. J.	Near the town, 328 yards north of Great Pond.	40	14	00	73	59	29
7	Shark River	N. J.	Near the mouth of Shark River	40	11	25	74	00	19
8	Wreck Pond	N. J.	2½ miles below Shark River	40	09	20	74	00	56
9	Squan Beach	N. J.	1 mile southeast of Squan village	40	06	52	74	01	43
10	Point Pleasant	N. J.	At the head of Barnegat Bay	40	03	58	74	02	20
11	Swan Point	N. J.	2½ miles below the head of Barnegat Bay	40	01	37	74	03	15
12	Green Island	N. J.	5 miles below the head of Barnegat Bay	39	59	06	74	03	33
13	Tom's River	N. J.	On the beach abreast of its mouth	39	56	15	74	04	30
14	Island Beach	N. J.		39	53	42	74	04	57
15	Forked River	N. J.		39	51	06	74	05	16
16	South end Island Beach	N. J.	North side of Barnegat Inlet	39	48	08	74	05	40
17	Barnegat	N. J.	South side of Barnegat Inlet	39	45	34	74	06	12
18	Loveladies Island	N. J.	On the beach abreast of the island	39	43	47	74	07	01
19	Harvey Cedars	N. J.		39	40	23	74	08	13
20	Ship Bottom	N. J.		39	38	13	74	10	42
21	Long Beach	N. J.		39	35	03	74	13	03
22	Bond's	N. J.		39	31	59	74	15	16
23	Little Egg	N. J.	Near the light north of inlet	39	30	05	74	17	28
24	Little Beach	N. J.	South side of Little Egg Inlet	39	27	23	74	19	28
25	Brigantine	N. J.	5½ miles above Absecom light	39	25	23	74	20	02
26	Discontinued								
27	Atlantic City	N. J.	Near Absecom light	39	21	57	74	24	31
28	Absecom	N. J.	3 miles below the light	39	20	45	74	27	27
29	Great Egg	N. J.	6 miles below the light	39	19	02	74	30	51
30	Beazleys	N. J.	South side of the inlet	39	17	10	74	34	30
31	Peck's Beach	N. J.	3½ miles above Corson's Inlet	39	14	47	74	36	29
32	Corson's Inlet	N. J.	Near the inlet, north side	39	12	59	74	38	06
33	Ludlam's Beach	N. J.	3½ miles above Townsend's Inlet	39	09	42	74	40	41
34	Townsend's Inlet	N. J.	Near the inlet, north side	39	07	30	74	42	21
35	Stone Harbor	N. J.	3½ miles above Hereford Inlet	39	03	35	74	44	50
36	Hereford Inlet	N. J.	Near Hereford light	39	00	14	74	46	55
37	Turtle Gut	N. J.	6 miles above Cape Island City	38	58	39	74	50	34
38	Two-Mile Beach	N. J.	4 miles above Cape Island City	38	57	08	74	51	09
39	Cape May	N. J.	2 miles above Cape Island City	38	56	01	74	54	00
40	do	N. J.	Near the light	38	55	50	74	57	36
41	Bay Shore	N. J.	2½ miles west of Cape Island City	38	56	37	74	58	03

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Life-saving districts and stations on coasts of the United States—Continued.

FIFTH DISTRICT.

EMBRACING COAST BETWEEN CAPE HENLOPEN AND CAPE CHARLES.

No.	Name.	State.	Locality.	Approximate position. Latitude, north.	Longitude, west.
				° ′ ″	° ′ ″
1	Cape Henlopen	Del		38 46 38	75 04 43
2	Rehoboth Beach	Del		Not determined.	
3	Indian River Inlet	Del		38 36 40	75 04 30
4	Ocean City	Md	Just north of town	Not determined.	
5	Green Run Inlet	Md		38 03 15	75 13 15
6	Pope's Island	Md		Not determined.	
7	Assateague Beach	Va	Abreast of Assateague light	37 54 10	75 19 35
8	Cedar Inlet	Va	South end of Cedar Island	37 35 10	75 36 20
9	Hog Island	Va	South end of Hog Island	37 26 45	75 41 00
10	Cobb's Island	Va	South end of Cobb's Island	37 17 20	75 46 15
11	Smith's Island	Va	South end of Smith's Island	37 06 20	75 55 00

SIXTH DISTRICT.

EMBRACING COAST BETWEEN CAPE HENRY AND CAPE FEAR.

1	Cape Henry	Va		36 55 30	76 00 30
2	Seatack	Va		Not determined.	
3	Dam Neck Mills	Va		Do.	
4	Little Island	Va		Do.	
5	False Cape	Va		36 38 15	75 53 00
6	Deal's Island	N. C		Not determined.	
7	Old Currituck Inlet	N. C		Do.	
8	Jones's Hill	N. C	Currituck Beach	36 22 00	75 49 00
9	Poyner's Hill	N. C		Not determined.	
10	Caffey's Inlet	N. C		Do.	
11	Paul Gamiel's Hill	N. C		Do.	
12	Kitty Hawk	N. C		Do.	
13	Kill Devil Hills	N. C		Do.	
14	Nag's Head	N. C	8 miles north of Oregon Inlet	35 55 30	75 36 15
15	Tommy's Hummock	N. C		Not determined.	
16	Bodie's Island	N. C	½ mile south of Oregon Inlet	35 47 30	75 32 00
17	Pea Island	N. C		Not determined.	
18	Chicamicomico	N. C	5 miles south of New Inlet	35 35 30	75 27 30
19	Cedar Hummock	N. C		Not determined.	
20	Little Kinnakeet	N. C		35 24 30	75 28 30
21	Big Kinnakeet	N. C	6 miles north of Cape Hatteras light-house.	Not determined.	
22	Creed's Hill	N. C	4⅓ miles west of Cape Hatteras light-house.	Do.	
23	Hatteras	N. C	3 miles east of Hatteras Inlet	Do.	
24	Cape Lookout	N. C	Station not yet built		
25	Cape Fear	N. C	....do		

SEVENTH DISTRICT.

EASTERN COAST OF FLORIDA.

1	Thirteen miles north of Indian River Inlet.	Fla		Not determined.
2	Gilbert's Bar	Fla	Saint Lucie Rocks	Do.
3	Orange Grove	Fla		Do.
4	Fort Lauderdale	Fla		Do.
5	Biscayne Bay	Fla		Do.

EIGHTH DISTRICT.

EMBRACING GULF COAST OF UNITED STATES.

1	Sabine Pass	Tex		Not determined.
2	Galveston, east end of island.	Tex	Station not yet built	
3	Galveston, west end of island.	Tex		Not determined.
4	Pass Cavallo	Tex		Do.
5	Aranzas Pass	Tex		Do.
6	Brazos Santiago	Tex		Do.

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Life-saving districts and stations on coasts of the United States—Continued.

NINTH DISTRICT.

EMBRACING LAKES ERIE AND ONTARIO.

No.	Name.	State.	Locality.
1	Big Sandy Creek	N. Y.	East side of mouth of Big Sandy Creek, Lake Ontario.
2	Salmon Creek	N. Y.	East side of mouth of Salmon Creek, Lake Ontario.
3	Oswego	N. Y.	Entrance of Oswego Harbor, Lake Ontario.
4	Charlotte	N. Y.	Entrance of Charlotte Harbor, Lake Ontario.
5	Buffalo	N. Y.	In the harbor, Buffalo, Lake Erie.
6	Presque Isle	Pa	Entrance of Erie Harbor, Lake Erie.
7	Fairport	Ohio	Entrance of Fairport Harbor, Lake Erie.
8	Cleveland	Ohio	Entrance of Cleveland Harbor, Lake Erie.
9	Marblehead Point	Ohio	Marblehead Island, near Quarry Docks, Lake Erie.

TENTH DISTRICT.

EMBRACING LAKES HURON AND SUPERIOR.

1	Sand Beach Harbor	Mich	Lake Huron. Station not yet built.
2	Point aux Barques	Mich	Near light-house, Lake Huron.
3	Port Austin	Mich	Lake Huron. Station not yet built.
4	Ottawa Point (Tawas)	Mich	Near light-house, Lake Huron.
5	Sturgeon Point	Mich	Do.
6	Thunder Bay Island	Mich	Do.
7	Middle Island	Mich	Lake Huron. Station not yet built.
8	Forty-Mile Point	Mich	Hammond's Bay, Lake Huron.
9	Vermillion Point	Mich	Lake Superior.
10	Seven miles west of Vermillion Point.	Mich	Do.
11	Two Heart River	Mich	Near mouth of Two Heart River, Lake Superior.
12	Sucker River	Mich	Near mouth of Sucker River, Lake Superior.
13	Ship Canal	Mich	Near mouth of Portage Lake and Lake Superior Ship-Canal, Lake Superior. Station not yet built.

ELEVENTH DISTRICT.

LAKE MICHIGAN.

1	Beaver Island	Mich	Near light-house.
2	North Manitou Island	Mich	Near Pickard's wharf.
3	Sleeping Bear Point	Mich	Station not yet built.
4	Point au Bec Scies	Mich	Near light-house.
5	Manistee	Mich	In the harbor.
6	Grand Point au Sable	Mich	Near light-house.
7	Ludington	Mich	In the harbor.
8	Muskegon	Mich	In the harbor at Port Sherman.
9	Grand Haven	Mich	Entrance of harbor.
10	Saint Joseph	Mich	In the harbor.
11	Chicago	Ill	Do.
12	Grosse Point	Ill	Evanston, Ill., on Northwestern University grounds.
13	Kenosha	Wis	In the harbor on Washington Island.
14	Racine	Wis	In the harbor.
15	Milwaukee	Wis	Near entrance of harbor.
16	Sheboygan	Wis	Entrance of harbor.
17	Two Rivers	Wis	Do.
18	Bayley's Harbor	Wis	Station not yet built.

TWELFTH DISTRICT.

PACIFIC COAST.

1	Neah Bay	Wash. T.	On Indian reservation.
2	Shoalwater Bay	Wash. T.	Near light-house boat-landing.
3	Cape Disappointment	Wash. T.	Baker's Bay.
4	Cape Arago	Oreg	Coos Bay, near light-house.
5	Humboldt Bay	Cal	Near light-house.
6	Bolinas Bay	Cal	Station not yet built.
7	Golden Gate Park	Cal	On beach in Golden Gate Park, San Francisco.
8	Point Concepcion	Cal	Station not yet built.

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ABSTRACTS

OF RETURNS OF

WRECKS AND CASUALTIES TO VESSELS

WHICH HAVE OCCURRED ON AND NEAR THE

COASTS AND ON THE RIVERS OF THE UNITED STATES,

AND TO

AMERICAN VESSELS AT SEA AND ON THE COASTS OF FOREIGN COUNTRIES,

DURING THE

FISCAL YEAR ENDING JUNE 30, 1880.

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WRECKS, CASUALTIES, AND COLLISIONS AT HOME AND ABROAD.

REMARKS EXPLANATORY OF THE WRECK STATISTICS FOR THE YEAR 1879–'80.

The following is the seventh annual statement of wrecks and casualties which have occurred on or near the coasts and on the rivers of the United States, and to American vessels at sea or on the coasts of foreign countries.

The statistics relating to disasters upon our own coasts are compiled from reports obtained and received through the officers of the customs, in compliance with the acts of June 20, 1874, and June 18, 1878.

Those relating to disasters which have occurred to American shipping in foreign waters are derived from reports received from our consular officers abroad and through the courtesy of officers of foreign governments; an interchange of such information having been effected, through the Department of State, with most other maritime nations.

In the preparation of the accompanying tables it has been found advisable, in order to facilitate reference, to make the following general divisions:

I. Disasters occurring on the Atlantic and Gulf coasts of the United States, embracing—

1. All casualties outside of, but in proximity to, the coast-line;

2. All casualties occurring in the bays and harbors adjacent to the coasts named;

3. All casualties occurring in or near the mouths of rivers emptying into the ocean or gulf.

II. Disasters occurring upon the Pacific coast of the United States, including those occurring in adjacent waters, as in the first division.

III. Disasters occurring on the great lakes, embracing—

1. All casualties occurring on Lakes Superior, Michigan, Huron, Saint Clair, Erie, or Ontario, reported by officers of the customs, whether in waters under the jurisdiction of the United States or of Great Britain;

2. All casualties occurring in rivers, straits, &c., connecting the several lakes named;

3. All casualties occurring in the harbors of any of said lakes, or in or near the mouths of rivers emptying into them, within the United States.

IV. Disasters occurring in rivers within the United States, embracing all rivers except those referred to in the foregoing division.

V. Disasters occurring to American shipping at sea or in foreign waters.

The disasters embraced in the foregoing divisions are classified as follows, viz:

1. *Founderings*—embracing founderings which resulted from the leaking or capsizing of vessels, but not those which resulted from collision, stranding, or striking any sunken wreck, or against piers, snags, or ice.

2. *Strandings*—embracing disasters resulting from running aground, striking a rock, reef, bar, or other natural object, although the vessel may have foundered as a result of such casualty.

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3. *Collisions*—embracing all collisions between vessels only.

4. *Other causes*—embracing disasters resulting from various causes, as follows, viz:

Fire, irrespective of result;
Scuttling, or any intentional damage to vessel;
Collisions with fields or quantities of ice, although vessel may be sunk thereby;
Striking on sunken wrecks, anchors, buoys, piers, or bridges;
Leakage (except when vessel foundered or went ashore for safety);
Loss of masts, sails, boats, or any portion of vessel's equipments;
Capsizing, when vessel did not sink;
Damage to machinery;
Fouling of anchors;
Striking of lightning;
Explosion of boilers;
Breakage of wheels;
Also water-logged, missing, and abandoned vessels.

Since the publication of the annual statement for the fiscal year ending June 30, 1879, information has been received of the occurrence of disasters during that year to 139 American vessels and the loss of 32 lives. The table annexed shows the nature of these casualties and the divisions in which they occurred:

	Foundrings.	Strandings.	Collisions.	Other causes.	Total.	Totally lost.	Partially lost.	Lives lost on vessels damaged.	Lives lost on vessels not damaged.	Total number of lives lost.
Atlantic and Gulf coasts	2	18	15	12	47	10	37	1	1	2
Pacific coast	.....	2	.....	4	6	1	5	.....	1	1
Lakes	.....	1	.....	5	6	.....	6	.....	2	2
Rivers	1	7	4	14	26	4	22	3	4	7
At sea or in foreign waters	4	6	4	40	54	10	44	9	11	20
Total	7	34	23	75	139	25	114	13	19	32

Of the 32 lives lost, reported above, 8 were lost on board the schooner W. H. Whitaker, of Bridgeton, N. J., which foundered off Cape Cod during the gale of March 31, 1879, while on her passage from Philadelphia, Pa., to Gloucester, Mass.; 17 were lost overboard from spars, rigging, &c. (3 of them while drunk, and 1 in a gale); 3 by the capsizing of vessels in sudden squalls; 1 by stranding; and 3 were accidentally killed on board vessels by falling from rigging to deck and by the falling of spars.

As the foregoing could not properly be included in the report for the fiscal year just closed, the general summary table of the previous year, amended so as to include the particulars furnished by the wreck reports mentioned above, is reprinted. The table will be convenient for comparison with the corresponding table in the statement of the present year.

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SUMMARY of disasters to vessels which occurred on and near the coasts and on the rivers of the United States, and to American vessels at sea and on the coasts of foreign countries, during the fiscal year ending June 30, 1879.

Nature of casualties.	Number of vessels.	Aggregate tonnage.	Wrecks involving total loss.	Casualties involving partial damage.	Number of lives lost.
Founderings:					
Atlantic and Gulf coasts	37	4,118	25	12	44
Pacific coast	1	346	.....	1	.....
Great lakes	11	3,118	9	2	.....
Rivers	9	1,203	4	5	18
At sea or in foreign waters	71	19,939	70	1	320
Total	129	28,724	108	21	382
Strandings:					
Atlantic and Gulf coasts	373	66,477	156	217	70
Pacific coast	26	11,730	11	15	14
Great lakes	81	21,301	19	62	7
Rivers	29	5,409	3	26	.....
At sea or in foreign waters	86	33,072	60	26	21
Total	595	137,989	249	346	112
Vessels collided:					
Atlantic and Gulf coasts	340	110,309	21	319	9
Pacific coast	34	18,529	2	32	.....
Great lakes	145	54,800	2	143	4
Rivers	43	19,059	3	40	6
At sea or in foreign waters	68	40,276	6	62	2
Total	630	242,973	34	596	21
Other causes:					
Atlantic and Gulf coasts	233	50,242	25	208	39
Pacific coast	20	2,944	3	17	9
Great lakes	177	55,262	4	173	8
Rivers	97	23,681	32	65	13
At sea or in foreign waters	352	138,188	56	296	172
Total	879	270,317	120	759	241
Grand total	2,233	680,003	511	1,722	*756

RECAPITULATION.

Atlantic and Gulf coasts	983	231,146	227	756	162
Pacific coast	81	33,549	16	65	23
Great lakes	414	134,481	34	380	19
Rivers	178	49,352	42	136	37
At sea or in foreign waters	577	231,475	192	385	515
Total	2,233	680,003	511	1,722	*756

	Atlantic and Gulf coasts.	Pacific coast.	Great Lakes.	Rivers.	At sea or in foreign waters.	Aggregate.
Total value vessels involved	$13,586,282	$2,394,250	$5,641,733	$2,985,700	$12,348,197	$36,956,162
Total value cargoes involved	5,198.485	1,150,403	1,949,873	920,283	11,352,932	20,571,976
Aggregate	18,784,767	3,544,653	7,591,606	3,905,983	23,701,129	57,528,138
Total insurance on vessels	2,179,902	469,150	1,734,900	489,550	4,173,834	9,047,336
Total insurance on cargoes	2,124,092	85,972	922,785	691,950	5,610,367	9,435,166
Aggregate	4,303,994	555,122	2,657,685	1,181,500	9,784,201	18,482,502
Total losses to vessels	1,698,661	658,756	495,801	517,642	3,455,590	6,826,450
Total losses to cargoes	1,124,198	104,835	144,223	253,875	2,990,095	4,617,226
Aggregate	2,822,859	763,591	640,024	771,517	6,445,685	11,443,676
Total ton'ge vessels involved	231,146	33,549	134,481	49,352	231,475	680,003
Total tonnage vessels lost	35,807	7,955	8,782	7,586	59,909	120,039

*In addition to the number of lives lost, here reported, 164 were lost in cases where no other casualty occurred to the vessels, making the total number of lives lost 920.

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As the tables, Nos. 1 to 64 inclusive, embrace all casualties involving losses as low as $50, for the purpose of exhibiting their nature, causes, and localities, the character of vessels, loss of life, and other information of importance, the following table of disasters, involving damage amunting to $500 and upward (damage less than that amount to vessels and cargoes being considered unimportant in a pecuniary sense), is subjoined, the corresponding table for the two previous years being also reprinted for the purpose of comparison.

Fiscal year ending June 30, 1878.

	Amount of losses.													
	$500 to $1,000.	$1,000 to $2,000.	$2,000 to $5,000.	$5,000 to $10,000.	$10,000 to $20,000.	$20,000 to $30,000.	$30,000 to $40,000.	$40,000 to $50,000.	$50,000 to $75,000.	$75,000 to $100,000.	$100,000 to $200,000.	$200,000 to $300,000.	$300,000 and over.	Unknown.	Total.
Atlantic and Gulf coasts	131	85	87	52	34	9	7	6	5	3	3	2	1	62	487
Pacific coast	12	16	18	8	12	2	1	....	....	....	1	....	....	1	71
Great lakes	42	43	47	24	14	4	4	1	1	....	....	....	....	26	206
Rivers	15	13	14	3	9	4	1	3	2	4	1	....	....	4	73
At sea or in foreign waters	53	51	42	54	41	24	13	6	6	5	10	1	1	35	342
Total	253	208	208	141	110	43	26	16	14	12	15	3	2	128	1,179

Fiscal year ending June 30, 1879.

	Amount of losses.													
	$500 to $1,000.	$1,000 to $2,000.	$2,000 to $5,000.	$5,000 to $10,000.	$10,000 to $20,000.	$20,000 to $30,000.	$30,000 to $40,000.	$40,000 to $50,000.	$50,000 to $75,000.	$75,000 to $100,000.	$100,000 to $200,000.	$200,000 to $300,000.	$300,000 and over.	Unknown.	Total.
Atlantic and Gulf coasts	125	119	105	52	33	10	3	2	3	....	4	1	....	49	506
Pacific coast	14	6	11	2	3	2	....	2	....	2	....	....	1	1	44
Great lakes	47	37	26	12	5	2	1	....	1	....	1	....	....	21	153
Rivers	15	17	26	8	8	3	1	2	1	2	....	....	....	6	89
At sea or in foreign waters	71	56	78	67	48	28	8	6	10	4	4	3	2	25	410
Total	272	235	246	141	97	45	13	12	15	8	9	4	3	102	1,202

Fiscal year ending June 30, 1880.

	Amount of losses.													
	$500 to $1,000.	$1,000 to $2,000.	$2,000 to $5,000.	$5,000 to $10,000.	$10,000 to $20,000.	$20,000 to $30,000.	$30,000 to $40,000.	$40,000 to $50,000.	$50,000 to $75,000.	$75,000 to $100,000.	$100,000 to $200,000.	$200,000 to $300,000.	$300,000 and over.	Unknown.	Total.
Atlantic and Gulf coasts	131	104	104	48	23	8	4	2	3	2	....	1	...	73	503
Pacific coast	17	7	12	10	10	1	....	....	1	....	1	....	....	4	63
Great lakes	73	58	57	22	12	4	3	1	2	....	1	....	....	36	269
Rivers	28	28	24	20	19	5	3	4	2	....	1	....	....	14	148
At sea or in foreign waters	50	44	63	46	40	19	10	4	8	2	3	1	....	27	317
Total	299	241	260	146	104	37	20	11	16	4	6	2	...	154	1,300

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The subjoined tables show, by localities, the total number of vessels meeting with casualties, the total value of such vessels and their cargoes, the total losses to both and the total tonnage involved, and the tonnage of vessels totally lost during the fiscal years, 1878–'79 and 1879–'80, with the percentage of increase or decrease of the latter compared with the former.

Total number of vessels involved.

	1878–'79.	1879–'80.	Per cent.
Atlantic	936	1,008	Increase of 7.69 per cent.
Pacific	75	112	Increase of 49.33 per cent.
Great lakes	408	552	Increase of 35.29 per cent.
Rivers	152	211	Increase of 38.82 per cent.
At sea or in foreign waters	523	435	Decrease of 16.83 per cent.
Aggregate	2,094	2,318	Increase of 10.70 per cent.

Total value of vessels and cargoes involved.

	1878–'79.	1879–'80.	Per cent.
Atlantic	$18,229,542	$20,308,770	Increase of 11.41 per cent.
Pacific	3,393,553	3,299,385	Decrease of 2.77 per cent.
Great lakes	7,524,006	11,220,550	Increase of 49.13 per cent.
Rivers	2,935,433	6,121,455	Increase of 108.54 per cent.
At sea or in foreign waters	17,193,866	14,700,540	Decrease of 14.50 per cent.
Aggregate	49,276,400	55,650,700	Increase of 12.94 per cent.

Total loss to vessels and cargoes.

	1878–'79.	1879–'80.	Per cent.
Atlantic	$2,765,180	$2,220,130	Decrease of 19.71 per cent.
Pacific	736,341	487,095	Decrease of 33.85 per cent.
Great lakes	623,314	1,162,840	Increase of 86.56 per cent.
Rivers	700,872	1,168,675	Increase of 66.75 per cent.
At sea or in foreign waters	6,059,160	3,444,475	Decrease of 43.15 per cent.
Aggregate	10,884,867	8,483,215	Decrease of 22.06 per cent.

Total tonnage of vessels involved.

	1878–'79.	1879–'80.	Per cent.
Atlantic	222,217	264,050	Increase of 18.83 per cent.
Pacific	31,132	41,339	Increase of 32.78 per cent.
Great lakes	133,298	207,304	Increase of 55.52 per cent.
Rivers	38,909	81,649	Increase of 109.85 per cent.
At sea or in foreign waters	184,610	179,728	Decrease of 2.64 per cent.
Aggregate	610,166	774,070	Increase of 26.86 per cent.

Total tonnage of vessels totally lost.

	1878–'79.	1879–'80.	Per cent.
Atlantic	35,217	27,236	Decrease of 22.66 per cent.
Pacific	7,835	4,454	Decrease of 43.15 per cent.
Great lakes	8,782	9,984	Increase of 13.69 per cent.
Rivers	7,072	13,864	Increase of 96.04 per cent.
At sea or in foreign waters	54,272	46,055	Decrease of 15.14 per cent.
Aggregate	113,178	101,593	Decrease of 10.24 per cent.

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On the 30th of June, 1880, the total number of registered, enrolled, and licensed vessels belonging to the United States were 24,712, with a total tonnage of 4,068,034; of this number 2,195 vessels, having a total tonnage of 693,537, met with casualties during the year, being 8.88 per cent. of the total number.

The following exhibit shows the number of steam and sailing vessels, canal boats, and barges registered, enrolled, and licensed, belonging to the United States on June 30, 1880; the number of each class which have met with disasters during the year, and the ratio of casualties to the number of vessels:

Comparative table.—Casualties to vessels.

Classification.	Number of vessels belonging to the United States.	Number of casualties to vessels.	Ratio of casualties to number of vessels.
Steam vessels	4,717	459	As 1 to 10.28.
Sailing vessels	16,830	1,679	As 1 to 10.02.
Canal boats	1,235	4	As 1 to 308.75.
Barges	1,930	53	As 1 to 36.41.
Total	24,712	2,195	As 1 to 11.26.

During the year, 774 vessels were reported as having met with collisions, but as two vessels were engaged in each collision (though in a few instances three or more collided with each other in gales, &c.), the actual number of casualties of this nature were a little less than one-half that number.

One hundred and seven foreign vessels, having an aggregate tonnage of 69,169, met with disasters in American waters during the year. The nationalities of these vessels are given in certain of the accompanying tables.

In addition to the lives lost in the disasters to vessels, which are embraced in the tables, 170 persons perished, by drowning or by accident on board, out of crews employed on 148 different vessels. In these cases neither vessels nor cargoes suffered damage, the persons drowned having been lost overboard or having perished by the capsizing of small boats in which they had left their vessels to attend fishing trawls or for other purposes. In some instances lives were lost by falling to the deck from aloft and by being struck by spars, tackling, &c., falling or swinging, owing to the giving way of rigging. These vessels are not included in any of the tables except 63 and 64.

The following exhibit shows the number of persons on board vessels suffering casualties, the number of lives lost, the ratio of those lost to the number on board, and the ratio of lives lost to the number of casualties for the last five fiscal years:

Fiscal years.	Number of casualties.	Number of persons on board.	Number of lives lost.	Ratio of lives lost to number on board.	Ratio of lives lost to number of casualties.
1875–'76	2,173	23,602	*885	As 1 to 26.67..	As 1 to 2.45.
1876–'77	2,062	28,139	*817	As 1 to 34.44..	As 1 to 2.52.
1877–'78	1,942	25,133	*598	As 1 to 42.03..	As 1 to 3.25.
1878–'79	2,094	27,811	*743	As 1 to 37.43..	As 1 to 2.82.
1879–'80	2,318	33,339	*417	As 1 to 79.95..	As 1 to 5.56.

*This number is exclusive of lives lost where vessels suffered no damage.

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The above statement shows a general and almost constant decrease in the number of lives lost in proportion to the number of persons on board vessels suffering casualty, and a similar decrease in the number of lives lost in proportion to the number of disasters.

This remarkable diminution in the mortality attending shipwreck is undoubtedly referable to the unprecedented agitation of the public mind in this country within the last few years, with respect to marine disasters, which has resulted in protective legislation, involving an increase in the number of life saving stations, light-houses, beacons, and buoys, and the institution of improved steamboat inspections and regulations for navigation. It has also resulted in valuable inventions for the management of vessels, as well as for the saving of life in case of accident, besides leading ship-owners to exercise greater discrimination in the selection of their officers and equipments, and care for the condition of their ships.

The operation of these influences is better shown in the following table, which is the same as the one above, except that it is confined to our own domain, the disasters occurring at sea and in foreign waters being excluded:

Fiscal years.	Number of casualties.	Number of persons on board.	Number of lives lost.	Ratio of lives lost to number on board.	Ratio of lives lost to number of casualties.
1875–'76	1,808	19,255	*650	As 1 to 29.62	As 1 to 2.78.
1876–'77	1,525	21,688	*315	As 1 to 68.85.	As 1 to 4.84.
1877–'78	1,531	20,327	*399	As 1 to 50.94.	As 1 to 3.83.
1878–'79	1,571	21,898	*237	As 1 to 92.40.	As 1 to 6.63.
1879–'80	1,883	28,128	*187	As 1 to 150.42.	As 1 to 10.07.

*This number is exclusive of lives lost where vessels suffered no damage.

Thus it appears that upon the coasts and rivers of the United States the loss of life has descended, since the fiscal year ending June 30, 1876, from 1 out of every 29 persons on board vessels suffering disaster to 1 out of every 150 persons, and from 1 out of every 2 such vessels to 1 out of every 10; a reduction of 80 per cent. in the one case and 72 per cent. in the other.

It will be seen that the regular diminution in the ratios from year to year is interrupted in the fiscal year 1877–'78. This is owing to the exceptionally calamitous disasters to the Huron and Metropolis on the North Carolina coast, in which 183 persons perished. It is shown in another part of this report that in one case the Life-Saving Service was inoperant, and in the other crippled, from causes explained.

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TABLES.

ATLANTIC AND GULF COASTS.

TABLE 1.—*Abstract of returns of disasters to vessels on the* ATLANTIC *and* GULF *coasts during the year ending June* 30, 1880, *showing the* NUMBER *and* VALUE *of* VESSELS *and* CARGOES *and amount of* LOSS *to same where known.*

Months.	Total value of vessels.			Total value of cargoes.				Loss to vessels.				Loss to cargoes.			
	Number.	Amount.	Number of vessels, value unknown.	Number.	Amount.	Number of cargoes, value unknown.	Unknown whether laden or not.	Number.	Amount.	Number of vessels totally lost, amount unknown.	Number of vessels damaged, amount unknown.*	Number.	Amount.	Number of cargoes totally lost, amount unknown.	Number of cargoes not damaged, or damage unknown.
July	51	$550,100	1	34	$86,260	....	1	47	$44,625	....	5	16	$5,640	....	19
August	178	1,321,630	4	100	388,755	6	4	171	169,260	....	11	54	29,010	....	56
September	53	532,950	8	28	113,305	....	9	48	55,505	....	13	10	24,680	....	27
October	66	707,815	6	48	247,480	3	4	63	108,595	....	9	27	55,110	...	28
November	114	2,505,650	14	69	658,380	4	15	105	198,610	....	23	25	51,520	...	63
December	85	2,123,300	5	60	706,910	5	5	79	202,150	....	11	28	64,695	....	42
January	49	1,310,700	3	30	1,255,680	3	3	47	110,740	....	5	12	39,120	....	24
February	82	978,025	5	54	574,290	2	4	79	173,260	....	8	20	20,665	....	40
March	86	865,275	7	62	270,040	1	7	82	151,030	....	11	24	53,845	....	46
April	72	1,823,160	8	44	298,190	2	7	71	130,350	....	9	16	10,630	....	37
May	53	669,210	5	35	245,270	2	5	51	83,815	....	7	16	85,525	....	26
June	43	1,848,500	10	26	227,895	1	9	40	293,400	....	13	14	58,350	....	22
Total	932	15,236,315	76	590	5,072,455	29	73	883	1,721,340	....	125	262	498,790	....	430

*In this column are included the casualties in which no damage was sustained by the vessels, for the number of which see appropriate column in Table 2.

TABLE 2.—*Abstract of returns of disasters to vessels on the* ATLANTIC *and* GULF *coasts during the year ending June* 30, 1880, *showing the number of* VESSELS TOTALLY LOST, *the number* DAMAGED, *aggregate* TONNAGE *of vessels totally lost, number of* PASSENGERS *and* CREW, *and number of* LIVES LOST.

Months.	Number of disasters resulting in total loss to vessels.	Number of disasters resulting in partial damage to vessels.	Whether total or partial loss unknown.	Number of casualties resulting in no damage to vessels.	Total.	Total tons burden of vessels totally lost.	Total number of crew, including master, &c.	Total number of passengers.	Total number of lives lost.
July	11	39	1	1	52	671	290	92	.....
August	39	132	4	7	182	2,670	973	527	11
September	9	39	8	5	61	1,085	310	121	3
October	11	52	4	5	72	1,352	947	610	3
November	20	85	14	9	128	4,666	1,046	1,192	11
December	15	64	4	7	90	3,527	802	688	.....
January	6	41	3	2	52	738	517	295	1
February	21	58	5	3	87	2,941	624	84	14
March	16	66	7	4	93	2,576	555	264	8
April	16	55	7	2	80	2,064	911	1,150	5
May	11	40	5	2	58	1,699	440	265	.....
June	11	29	11	2	53	3,247	623	1,845	51
Total	186	700	73	49	1,008	27,236	8,038	7,133	107

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TABLE 3.—*Abstract of returns of disasters to vessels on the* ATLANTIC *and* GULF *coasts during the year ending June* 30, 1880, *showing the number of* VESSELS *and* CARGOES INSURED *and* UNINSURED, *and the* AMOUNT *of* INSURANCE, *where known.*

Months.	Number of vessels and cargoes reported to be insured, and the amount of insurance.					Number of vessels and cargoes reported not insured.		Number of vessels and cargoes, whether insured or not, unknown.		
	Vessels.		Cargoes.		Total amount of insurance.	Vessels.	Cargoes.	Vessels.	Cargoes.	Vessels in ballast.
	Number.	Amount.	Number.	Amount.						
July	10	$73,300	10	$28,310	$101,610	42	22	.....	3	17
August	34	176,200	24	135,545	311,745	140	66	8	20	72
September	13	37,700	12	75,280	112,980	39	11	9	14	24
October	13	50,290	15	70,460	120,750	52	30	7	10	17
November	36	312,005	27	99,285	411,290	73	32	19	29	40
December	25	259,450	19	252,890	512,340	57	30	8	21	20
January	10	299,325	16	600,695	900,020	36	8	6	12	16
February	28	237,940	22	232,430	470,370	51	23	8	15	27
March	18	104,440	20	176,290	280,730	65	33	10	17	23
April	12	262,000	13	19,570	281,570	57	19	11	21	27
May	12	72,100	8	150,535	222,635	39	22	7	12	16
June	19	428,050	10	61,880	489,930	22	14	12	12	17
Total	230	2,312,800	196	1,903,170	4,215,970	673	310	105	186	316

TABLE 4.—*Abstract of returns of disasters to vessels on the* ATLANTIC *and* GULF *coasts during the year ending June* 30, 1880, *distinguishing the* NATURE *of each casualty.*

Nature of casualty.	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	June.	Total.
Foundered	4	12	2	4	3	2	....	3	2	4	3	3	42
Stranded	15	84	12	23	37	33	14	36	30	25	19	10	338
Collided	21	34	42	26	66	45	29	36	42	30	20	34	425
Capsized	....	4	1	1	2	....	1	2	2	1	1	....	15
Damage to hull, masts, rigging, &c	6	32	2	7	13	4	3	7	8	11	4	....	97
Damage to machinery	1	....	....	1	2	1	1	....	1	1	2	1	11
Explosion of boilers	....	1	....	1	....	....	1	....	....	....	....	....	3
Fire	1	1	....	3	1	3	1	1	2	6	3	3	25
Sprung a leak	2	1	....	2	....	....	2	....	1	....	....	....	8
Struck by lightning	2	....	....	....	....	....	....	....	....	....	1	1	4
Struck wharf, bridge, sunken wreck, &c	....	9	1	2	3	1	....	2	4	2	4	1	29
Waterlogged	....	1	....	....	....	....	....	....	....	....	1	....	2
Miscellaneous	....	2	1	2	....	1	....	....	1	....	....	....	7
Unknown	....	1	....	....	1	....	....	....	....	....	....	....	2
Total	52	182	61	72	128	90	52	87	93	80	58	53	1,008

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TABLE 5.—*Abstract of returns of disasters (excluding collisions) to vessels on the* ATLANTIC *and* GULF *coasts during the year ending June* 30, 1880, *distinguishing the* CAUSE *of each disaster.*

Class and cause of disaster.	Foundrings.	Strandings.	Other causes.	Missing vessels.	Total.
CLASS 1.—*Causes connected with the weather:*					
Calms, currents, and tides	.....	22	2	.....	24
Darkness	.....	11	.....	.....	11
Fog, &c	.....	30	1	.....	31
Gales, hurricanes, &c	21	153	104	.....	278
Heavy sea, &c	3	20	15	.....	38
Lightning	.....	.....	4	.....	4
Total of Class 1	24	236	126	.....	386
CLASS 2.—*Causes connected with vessels, equipments, or stowage:*					
Defective hull, masts, rigging, &c	1	1	5	.....	7
Error in compass	.....	4	.....	.....	4
Total of Class 2	1	5	5	.....	11
CLASS 3.—*Causes connected with navigation and seamanship:*					
Errors of masters, officers, or crew	1	34	4	.....	39
Errors of pilots	.....	8	.....	.....	8
Total of Class 3	1	42	4	.....	47
CLASS 4.—*Causes connected with machinery or boilers:*					
Damage to machinery	.....	.....	11	.....	11
Explosion of boilers, &c	.....	.....	3	.....	3
Total of Class 4	.....	.....	14	.....	14
CLASS 5.—*Other causes:*					
Absence of light or buoys	.....	8	2	.....	10
Fire	.....	.....	22	.....	22
Incendiarism	.....	.....	3	.....	3
Inevitable accidents	.....	7	.....	.....	7
Sprung a leak	13	7	3	.....	23
Struck rock, wreck, bridge, &c	.....	5	14	.....	19
Want of pilot	.....	3	.....	.....	3
Miscellaneous	1	12	6	.....	19
Unknown	2	13	4	.....	19
Total of Class 5	16	55	54	.....	125
Aggregate	42	338	203	.....	583

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TABLE 6.—*Abstract of returns of disasters to vessels on the* ATLANTIC *and* GULF *coasts during the year ending June* 30, 1880, *showing the number of vessels* COLLIDED, *and distinguishing the* CAUSE *of each disaster.*

Cause of disaster.	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	June.	Total.
Accidental	....	....	....	....	4	....	4	7	2	....	2	....	19
Bad management	....	4	6	....	6	2	6	2	8	....	....	4	38
Carelessness	4	4	4	....	12	2	....	2	4	4	4	6	46
Darkness	....	2	4	....	4	4	2	2	6	2	....	....	26
Error of judgment	....	....	4	....	4	2	....	....	....	2	....	2	14
Errors of pilots	2	2	....	....	....	....	....	2	....	....	2	2	10
"Fault of other vessel"	2	2	4	8	20	10	....	8	10	4	6	2	76
Fault of tug towing	3	....	2	....	....	6	....	....	....	2	2	....	15
Fog	2	....	2	2	2	2	7	....	....	4	2	2	25
High or baffling winds	2	16	2	6	2	3	2	5	....	2	....	....	40
Misunderstanding signals	....	....	....	....	....	....	....	....	2	2	....	....	4
Misstayed	....	....	....	....	....	....	2	....	....	....	....	....	2
Mistook lights	....	....	....	....	....	....	....	2	....	2	....	....	4
Negligence	4	....	4	6	....	2	2	2	....	2	....	4	26
Tides, currents, &c	....	....	2	2	2	6	2	2	....	2	....	....	18
Stress of weather	....	2	....	....	....	2	....	2	4	....	....	....	10
Want of proper lights	....	2	2	....	2	....	....	....	....	....	2	4	12
Unknown	2	....	6	2	8	4	2	....	6	2	....	8	40
Total	21	34	42	26	66	45	29	36	42	30	20	34	425

TABLE 7.—*Abstract of returns of disasters to vessels on the* ATLANTIC *and* GULF *coasts during the year ending June* 30, 1880, *showing the number of vessels and distinguishing their* DESCRIPTION.

Description of vessels.	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	June.	Total.
Barges	....	....	2	....	....	....	3	1	....	....	2	1	9
Barks	....	4	2	5	4	4	2	3	5	2	2	1	34
Barkentines	....	....	....	....	1	....	....	....	....	....	1	....	2
Brigs	....	2	2	....	6	2	2	4	2	....	1	....	21
Brigantines	....	....	....	1	....	....	....	....	....	....	....	....	1
Canal-boats	....	1	....	....	....	....	1	....	....	1	....	....	3
Ferry-boats	....	....	....	1	1	2	2	....	1	1	....	1	9
Schooners	39	126	44	53	86	58	27	61	69	53	33	25	674
Scows	1	....	....	....	....	....	....	....	1	....	....	....	2
Ships	....	....	....	1	1	2	....	1	....	1	1	....	7
Sloops	3	24	1	1	2	4	2	4	2	1	4	2	50
Steamers	8	21	8	9	26	16	12	11	9	17	11	19	167
Steamships	1	1	2	1	1	1	1	....	....	2	2	1	13
Yacht	....	1	....	....	....	....	....	....	....	....	....	....	1
Unknown	....	2	....	....	....	1	....	2	4	2	1	3	15
Total	52	182	61	72	128	90	52	87	93	80	58	53	1,008

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TABLE 8.—*Abstract of returns of disasters to foreign vessels on the* ATLANTIC *and* GULF *coasts during the year ending June* 30, 1880, *showing* NATIONALITY *and* DESCRIPTION, *and distinguishing those* TOTALLY LOST *and those* PARTIALLY DAMAGED.

Nationality and rig.	July.		August.		September.		October.		November.		December.		January.		February.		March.		April.		May.		June.		Total.		Aggregate.
	Total loss.	Partial loss.	Total loss.	Partial loss.	Total loss.	Partial loss.	Total loss.	Partial loss.	Total loss.	Partial loss.	Total loss.	Partial loss.	Total loss.	Partial loss.	Total loss.	Partial loss.	Total loss.	Partial loss.	Total loss.	Partial loss.	Total loss.	Partial loss.	Total loss.	Partial loss.	Total loss.	Partial loss.	
Argentine bark	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1
British bark	....	....	....	....	....	1	....	....	1	1	....	1	....	1	....	1	1	1	1	....	....	....	....	....	3	6	9
British brig	....	....	....	....	....	....	....	....	....	1	....	....	....	....	1	....	....	....	....	....	....	....	....	....	1	1	2
British brigantine	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1
British schooner	....	....	....	....	....	1	....	1	....	2	2	2	1	1	....	1	....	1	....	....	....	1	....	....	3	10	13
British ship	....	....	....	....	....	....	....	1	....	1	....	1	....	....	....	1	....	....	....	1	....	....	....	....	....	5	5
British steamer	....	....	....	1	....	1	....	....	....	1	....	....	....	1	....	....	....	....	....	....	....	....	....	1	....	5	5
British steamship	....	1	....	....	....	2	....	....	....	3	....	1	....	2	....	....	....	....	....	2	....	1	....	1	....	13	13
German bark	....	....	....	1	....	....	....	1	....	....	....	....	....	....	....	1	....	....	1	....	....	1	....	....	1	4	5
German steamer	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	1	1
Haytien brig	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	1	....	1
Italian bark	....	....	....	....	....	....	....	2	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	2
Norwegian bark	....	....	....	1	....	....	....	1	1	....	....	....	....	....	....	....	1	1	....	....	....	....	....	....	2	3	5
Norwegian brig	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1
Norwegian ship	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1
Spanish brig	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	1	....	1
Spanish schooner	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	1	1
Unknown	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	1	1
Total	....	1	....	3	....	5	....	7	3	9	3	6	1	6	2	5	3	4	2	3	....	3	....	2	14	54	68
Aggregate	1		3		5		7		12		9		7		7		7		5		3		2		68		....

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TABLE 9.—*Abstract of returns of disasters to vessels on the* ATLANTIC *and* GULF *coasts during the year ending June* 30, 1880, *showing the* TONNAGE *and distinguishing the number of those* TOTALLY LOST *and those* PARTIALLY DAMAGED.

Burden of vessels.	July.		August.		September.		October.		November.		December.		January.		February.		March.		April.		May.		June.		Total.		Aggregate.
	Total loss.	Partial loss.	Total loss.	Partial loss.	Total loss.	Partial loss.	Total loss.	Partial loss.	Total loss.	Partial loss.	Total loss.	Partial loss.	Total loss.	Partial loss.	Total loss.	Partial loss.	Total loss.	Partial loss.	Total loss.	Partial loss.	Total loss.	Partial loss.	Total loss.	Partial loss.	Total loss.	Partial loss.	
Not exceeding 50 tons	7	7	23	49	4	10	3	13	5	22	3	7	1	10	8	15	2	17	7	12	5	12	3	4	71	178	249
Over 50 and not exceeding 100 tons	3	9	6	30	2	10	4	17	5	21	3	18	2	6	4	10	6	19	5	14	1	7	2	8	43	169	212
Over 100 and not exceeding 200 tons	....	10	7	15	1	11	2	13	2	20	3	15	2	9	3	11	5	18	1	7	1	10	3	3	30	142	172
Over 200 and not exceeding 300 tons	1	2	2	10	1	4	1	4	2	7	4	9	1	3	3	5	1	5	....	11	1	3	1	5	18	68	86
Over 300 and not exceeding 400 tons	....	3	1	16	....	5	1	2	2	6	....	8	....	3	1	9	....	4	1	3	....	2	....	1	6	62	68
Over 400 and not exceeding 500 tons	....	5	....	7	1	2	....	1	2	7	....	2	....	2	2	3	1	2	....	3	....	5	....	1	6	40	46
Over 500 and not exceeding 600 tons	....	....	....	5	....	1	....	2	....	5	....	1	....	2	....	3	....	1	....	....	2	1	....	4	2	25	27
Over 600 and not exceeding 700 tons	....	1	....	1	....	1	....	2	1	3	1	3	....	....	....	....	....	2	....	4	....	1	1	1	3	19	22
Over 700 and not exceeding 800 tons	....	1	....	1	....	1	....	1	....	2	....	....	....	2	....	....	1	1	....	....	....	....	....	1	1	10	11
Over 800 and not exceeding 900 tons	....	1	....	....	....	....	....	....	....	1	....	3	....	....	....	1	....	....	....	....	....	....	....	....	....	6	6
Over 900 and not exceeding 1,000 tons	....	1	....	1	....	....	....	1	1	2	1	....	....	3	....	....	....	....	1	....	....	1	....	1	3	10	13
Over 1,000 and not exceeding 1,100 tons	....	....	....	1	....	1	....	....	....	....	....	....	....	....	....	2	....	1	....	2	....	1	....	1	....	9	9
Over 1,100 and not exceeding 1,200 tons	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1
Over 1,200 and not exceeding 1,300 tons	....	....	....	1	....	1	....	....	....	....	....	1	....	....	....	....	....	....	....	1	....	....	....	2	....	6	6
Over 1,300 and not exceeding 1,400 tons	....	....	....	....	....	1	....	1	....	....	....	....	....	....	....	....	....	....	....	1	....	1	....	....	....	4	4
Over 1,400 tons	....	1	....	1	....	....	....	1	....	8	....	7	....	6	....	2	....	1	....	4	....	1	1	5	1	37	38
Unknown	....	....	....	5	....	4	....	2	....	4	....	1	....	....	....	5	....	6	1	2	1	2	....	5	2	36	38
Total	11	41	39	143	9	52	11	61	20	108	15	75	6	46	21	66	16	77	16	64	11	47	11	42	186	822	1,008
Aggregate	52		182		61		72		128		90		52		87		93		80		58		53		1,008		.....

NOTE.—In the columns of "Partial loss" in this table are included the casualties in which the vessels sustained no damage, for the number of which see appropriate column in Table 2.

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TABLE 10.—*Abstract of returns of disasters to vessels on the* ATLANTIC *and* GULF *coasts during the year ending June* 30, 1880, *showing the number of vessels and distinguishing* AGE.

Age.	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	June.	Total.
Not exceeding 3 years	5	16	7	5	8	11	10	6	5	6	4	4	87
Over 3 and not exceeding 7 years	10	26	10	14	26	11	5	18	15	8	12	7	162
Over 7 and not exceeding 10 years	5	28	4	4	15	9	7	12	10	4	4	4	106
Over 10 and not exceeding 14 years	9	46	3	14	23	18	9	17	16	17	11	15	198
Over 14 and not exceeding 20 years	10	24	12	6	16	20	8	9	11	23	9	5	153
Over 20 and not exceeding 25 years	5	14	5	7	14	10	7	9	10	7	6	4	98
Over 25 and not exceeding 30 years	3	9	5	8	9	3	2	2	7	7	6	4	65
Over 30 and not exceeding 35 years	2	9	4	5	5	2	1	5	6	1	2	1	43
Over 35 and not exceeding 40 years	1	3	2	2	3	1	1	....	2	....	....	....	15
Over 40 and not exceeding 45 years	....	....	1	2	1	1	....	....	1	....	1	....	7
Over 45 and not exceeding 50 years	....	....	1	1	2	2	....	....	....	2	....	....	8
Over 50 years	1	1	....	....	....	....	....	....	1	....	....	1	4
Unknown	1	6	7	4	6	2	2	9	9	5	3	8	62
Total	52	182	61	72	128	90	52	87	93	80	58	53	1,008

TABLE 11.—*Abstract of returns of disasters to vessels on the* ATLANTIC *and* GULF *coasts during the year ending June* 30, 1880, *showing the number of vessels and distinguishing their* CARGOES.

Cargoes.	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	June.	Total.
Ballast	17	72	24	17	40	20	16	27	23	27	16	17	316
Coal	10	26	7	8	19	16	2	12	10	8	5	1	124
Cotton, &c	....	....	....	....	1	4	2	2	1	....	2	....	12
Flax-seed	....	....	1	....	....	....	....	....	....	....	....	....	1
Fish and oysters	3	7	2	5	7	3	4	5	11	6	2	....	55
Fruit, &c	....	2	....	1	....	1	....	....	....	....	....	....	4
Grain	....	2	1	1	1	1	2	2	1	3	....	....	14
Guano, &c	1	....	....	....	2	2	....	2	....	2	....	....	9
Ice	1	8	2	....	3	2	....	2	2	1	2	5	28
Iron and iron-ore	2	4	2	2	2	2	5	2	2	2	3	....	28
Lime, cement, &c	....	2	1	3	....	....	1	2	2	1	2	2	16
Live stock	....	....	....	....	....	....	....	....	....	....	1	....	1
Logwood, &c	....	1	....	1	....	2	....	1	1	1	....	....	7
Lumber, &c	4	15	3	8	9	7	6	10	16	4	5	3	90
Merchandise (general)	4	7	3	8	9	9	7	6	5	9	5	8	80
Naval stores	....	1	....	....	....	1	....	1	....	1	....	....	4
Petroleum	....	....	....	....	....	....	1	....	....	....	....	....	1
Phosphates	1	1	....	....	3	....	....	2	....	1	2	....	10
Provisions, &c	....	5	2	1	1	1	....	....	....	1	2	....	13
Salt, &c	....	3	....	1	....	2	....	....	1	1	1	....	9
Sand, plaster, &c	1	1	....	....	....	....	....	1	....	....	....	1	4
Slate and roofing material	....	....	....	....	2	....	....	....	....	....	....	....	2
Stone, brick, &c	2	10	2	4	2	5	....	....	1	1	1	1	29
Sugar, molasses, &c	....	1	....	1	....	1	....	....	3	....	1	....	7
Turpentine and rosin	....	1	....	....	....	....	....	....	....	....	....	....	1
Whale-oil	....	1	....	....	....	....	....	....	....	....	....	....	1
Wood, &c	5	2	2	3	3	3	1	2	2	1	1	1	26
Miscellaneous	....	6	....	4	9	3	2	3	5	3	2	5	42
Unknown	1	4	9	4	15	5	3	5	7	7	5	9	74
Total	52	182	61	72	128	90	52	87	93	80	58	53	1,008

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TABLE 12.—*Summary.*—ATLANTIC *and* GULF *coasts.*

Nature of casualties.	Number of vessels.	Total number of tons.	Laden.	Ballast.	Unknown whether laden or not.	Total loss.	Partial and unknown loss.*	Number of passengers.	Number of crew.	Total on board.	Total number of lives lost.
Founderings	42	2,721	31	11	.....	31	11	6	134	140	12
Strandings	338	64,413	237	101	.....	122	216	309	2,171	2,480	21
Vessels collided	425	152,326	224	128	73	16	409	6,024	4,092	10,116	40
Other causes	203	44,590	127	76	.....	17	186	794	1,641	2,435	34
Total	1,008	264,050	619	316	73	186	822	7,133	8,038	15,171	107

* In this column are included the casualties in which no damage was sustained by the vessels, for the number of which see appropriate column in Table 2.

PACIFIC COAST.

TABLE 13.—*Abstract of returns of disasters to vessels on the* PACIFIC *coast during the year ending June* 30, 1880, *showing the* NUMBER *and* VALUE *of* VESSELS *and* CARGOES *and amount of* LOSS *to same where known.*

Months.	Total value of vessels.			Total value of cargoes.				Loss to vessels.				Loss to cargoes.			
	Number.	Amount.	Number of vessels, value unknown.	Number.	Amount.	Number of cargoes, value unknown.	Unknown whether laden or not.	Number.	Amount.	Number of vessels totally lost, amount unknown.	Number of vessels damaged, amount unknown.*	Number.	Amount.	Number of cargoes totally lost, amount unknown.	Number of cargoes not damaged, or damage unknown.
July	1	$16,000	....	1	$4,600	....	....	1	$14,650	....	....	1	$4,350	....	....
August	5	50,000	....	4	8,850	....	1	4	34,425	....	1	2	5,100	....	3
September	8	66,000	....	4	8,500	....	....	8	9,045	....	....	1	1,000	....	3
October	8	126,400	....	6	28,550	....	....	8	32,825	....	....	4	3,050	....	2
November	15	475,900	....	10	339,950	....	....	15	20,105	....	....	2	375	....	8
December	13	181,850	....	8	22,785	....	....	13	26,520	....	....	4	990	....	4
January	11	123,825	....	7	59,755	....	3	9	29,150	....	2	....	5,470	....	10
February	9	75,800	....	6	24,600	....	1	7	8,490	....	2	....	100	....	7
March	17	961,000	....	10	249,570	....	1	15	96,670	....	2	6	90,750	....	5
April	10	137,000	....	6	7,800	1	....	10	25,420	....	....	3	1,250	....	4
May	10	240,700	....	7	53,500	....	....	10	68,350	....	....	1	5,000	....	6
June	5	36,200	....	1	250	....	....	4	3,760	....	1	1	250	....	....
Total	112	2,490,675	....	70	808,710	1	6	104	369,410	....	8	25	117,685	....	52

* In this column are included the casualties in which no damage was sustained by the vessels, for the number of which see appropriate column in Table 14.

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TABLE 14.—*Abstract of returns of disasters to vessels on the* PACIFIC *coast during the year ending June* 30, 1880, *showing the number of* VESSELS TOTALLY LOST, *the number* DAMAGED, *aggregate* TONNAGE *of vessels totally lost, number of* PASSENGERS *and* CREW, *and number of* LIVES LOST.

Months.	Number of disasters resulting in total loss to vessels.	Number of disasters resulting in partial damage to vessels.	Whether total or partial loss unknown.	Number of casualties resulting in no damage to vessels.	Total.	Total tons burden of vessels totally lost.	Total number of crew, including master, &c.	Total number of passengers.	Total number of lives lost.
July	1	.....	.....	.....	1	1,048	16	.....	.....
August	2	2	1	.....	5	471	32	.....	.....
September	1	7	.....	.....	8	86	64	24	1
October	4	4	.....	.....	8	272	57	14	.....
November	2	13	.....	.....	15	168	193	101	.....
December	3	10	.....	.....	13	388	77	28	.....
January	2	7	2	.....	11	110	57	1	.....
February	1	6	.....	2	9	89	49	.....	.....
March	2	13	1	1	17	1,332	267	69	1
April	2	8	.....	.....	10	82	103	91	5
May	2	8	.....	.....	10	340	149	93	.....
June	2	2	.....	1	5	68	24	15	.....
Total	24	80	4	4	112	4,454	1,088	436	7

TABLE 15.—*Abstract of returns of disasters to vessels on the* PACIFIC *coast during the year ending June* 30, 1880, *showing the number of* VESSELS *and* CARGOES INSURED *and* UNINSURED, *and the* AMOUNT *of* INSURANCE, *where known.*

Months.	Number of vessels and cargoes reported to be insured, and the amount of insurance.					Number of vessels and cargoes reported not insured.		Number of vessels and cargoes, whether insured or not, unknown.		Vessels in ballast.
	Vessels.		Cargoes.		Total amount of insurance.	Vessels.	Cargoes.	Vessels.	Cargoes.	
	Number.	Amount.	Number.	Amount.						
July	1	$4,500	1	$2,300	$6,800	.....	.....	.....	.....	.....
August	2	14,500	2	7,600	22,100	2	2	1	1	.....
September	4	21,500	.....	.....	21,500	4	3	.....	1	4
October	5	70,000	.....	.....	70,000	3	5	.....	1	2
November	5	132,100	2	84,000	216,100	8	4	2	4	5
December	3	21,000	.....	.....	21,000	10	7	.....	1	5
January	5	56,500	1	20,000	76,500	3	5	3	4	1
February	4	23,800	.....	.....	23,800	4	6	1	1	2
March	6	48,000	.....	.....	48,000	9	7	2	4	6
April	4	19,800	1	1,000	20,800	6	5	.....	1	3
May	4	100,000	3	26,560	126,560	6	4	.....	.....	3
June	3	15,250	.....	.....	15,250	2	1	.....	.....	4
Total	46	526,950	10	141,460	668,410	57	49	9	18	35

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TABLE 16.—*Abstract of returns of disasters to vessels on the* PACIFIC *coast during the year ending June* 30, 1880, *distinguishing the* NATURE *of each casualty.*

Nature of casualty.	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	June.	Total.
Foundered	....	....	....	....	....	....	....	....	1	1	....	....	2
Stranded	1	2	1	5	4	7	5	3	4	4	3	1	40
Collided	....	2	6	....	8	4	6	6	6	2	4	2	46
Capsized	....	1	....	....	....	....	....	....	....	....	....	1	2
Damage to hull, masts, rigging, &c	....	....	....	2	3	1	....	....	4	1	....	....	11
Damage to machinery	....	....	1	....	....	....	....	....	....	2	3	....	6
Fire	....	....	....	....	....	....	....	....	1	....	....	....	1
Struck wharf	....	....	....	....	....	....	....	....	1	....	....	....	1
Waterlogged	....	....	....	....	....	1	....	....	....	....	....	....	1
Miscellaneous	....	....	....	1	....	....	....	....	....	....	....	1	2
Total	1	5	8	8	15	13	11	9	17	10	10	5	112

TABLE 17.—*Abstract of returns of disasters (excluding collisions) to vessels on the* PACIFIC *coast during the year ending June* 30, 1880, *distinguishing the* CAUSE *of each disaster.*

Class and cause of disaster.	Founderings.	Strandings.	Other causes.	Missing vessels.	Total.
CLASS 1.—*Causes connected with the weather:*					
Calms, currents, and tides	2	5	1	.....	8
Fog, &c	.....	4	.....	.....	4
Gales, hurricanes, &c	.....	16	7	.....	23
Heavy seas	.....	6	6	.....	12
Total of Class 1	2	31	14	.....	47
CLASS 3.—*Causes connected with navigation and seamanship:*					
Errors of masters, officers, or crew	.....	2	.....	.....	2
Errors of pilots	.....	1	.....	.....	1
Total of Class 3	.....	3	.....	.....	3
CLASS 4.—*Causes connected with machinery or boilers:*					
Damage to machinery	.....	.....	6	.....	6
Total of Class 4	.....	.....	6	.....	6
CLASS 5.—*Other causes:*					
Fire	.....	.....	1	.....	1
Sprung a leak	.....	2	.....	.....	2
Struck rock, reef, &c	.....	3	2	.....	5
Miscellaneous	.....	.....	1	.....	1
Unknown	.....	1	.....	.....	1
Total of Class 5	.....	6	4	.....	10
Aggregate	2	40	24	.....	66

NOTE.—Class 2 includes disasters arising from causes connected with vessels, equipments, or stowage. No casualties are reported in this class.

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TABLE 18.—*Abstract of returns of disasters to vessels on the* PACIFIC *coast during the year ending June* 30, 1880, *showing the number of vessels* COLLIDED, *and distinguishing the* CAUSE *of each disaster.*

Cause of disaster.	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	June.	Total.
Accidental	....	....	....	....	....	....	....	....	....	....	2	....	2
Bad management	....	....	....	....	....	....	....	....	....	....	2	....	2
Darkness and storm	....	....	....	....	....	....	....	....	2	....	....	....	2
Error in judgment	....	....	....	....	....	2	....	4	....	....	....	....	6
"Fault of other vessel"	....	....	2	....	....	....	....	....	....	....	....	....	2
Fault of tug towing	....	....	....	....	....	....	2	....	....	....	....	....	2
Fog, &c	....	....	....	....	....	....	2	2	....	....	....	....	4
Heavy seas	....	....	....	....	....	....	....	....	2	....	....	....	2
High winds	....	....	....	....	4	2	....	....	2	....	....	....	8
Negligence	....	....	2	....	....	....	....	....	....	....	....	....	2
Tides and currents	....	2	2	....	2	....	2	....	....	....	....	2	10
Miscellaneous	....	....	....	....	2	....	....	....	....	2	....	....	4
Total	....	2	6	....	8	4	6	6	6	2	4	2	46

TABLE 19.—*Abstract of returns of disasters to vessels on the* PACIFIC *coast during the year ending June* 30, 1880, *showing the* NUMBER *of vessels and distinguishing their* DESCRIPTION.

Description of vessels.	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	June.	Total.
Barks	....	1	....	....	1	1	1	....	4	....	1	....	9
Barkentines	....	....	....	....	....	....	1	....	....	....	1	....	2
Schooners	....	3	6	5	5	9	3	7	6	7	3	3	57
Scows	....	....	....	....	....	....	....	....	1	....	....	....	1
Ships	1	1	....	....	4	....	2	1	2	....	....	....	11
Sloops	....	....	....	1	....	1	2	1	....	....	....	....	5
Steamers	....	....	2	1	5	2	2	....	2	3	4	2	23
Steamships	....	....	....	1	....	....	....	....	2	....	1	....	4
Total	1	5	8	8	15	13	11	9	17	10	10	5	112

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TABLE 20.—*Abstract of returns of disasters to foreign vessels on the* PACIFIC *coast during the year ending June* 30, 1880, *showing* NATIONALITY *and* DESCRIPTION, *and distinguishing those* TOTALLY LOST *and those* PARTIALLY DAMAGED.

Nationality and rig.	July.		August.		September.		October.		November.		December.		January.		February.		March.		April.		May.		June.		Total.		Aggregate.
	Total loss.	Partial loss.	Total loss.	Partial loss.	Total loss.	Partial loss.	Total loss.	Partial loss.	Total loss.	Partial loss.	Total loss.	Partial loss.	Total loss.	Partial loss.	Total loss.	Partial loss.	Total loss.	Partial loss.	Total loss.	Partial loss.	Total loss.	Partial loss.	Total loss.	Partial loss.	Total loss.	Partial loss.	
British barks	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	....	....	....	....	....	....	1	1	2
British ships	....	....	....	1	....	....	....	....	....	3	....	....	....	2	....	1	....	....	....	....	....	....	....	....	....	7	7
Total	....	....	....	1	....	....	....	....	....	3	....	....	....	2	....	1	1	1	....	....	....	....	....	....	1	8	9
Aggregate	....	....	1		....	....	....	....	3		....	....	2		1		2		....	....	....	....	....	....	9		....

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TABLE 21.—*Abstract of returns of disasters to vessels on the* PACIFIC *coast during the year ending June* 30, 1880, *showing the* TONNAGE *and distinguishing the number of those* TOTALLY LOST *and those* PARTIALLY DAMAGED.

Burden of vessels.	July.		August.		September.		October.		November.		December.		January.		February.		March.		April.		May.		June.		Total.		Aggregate.
	Total loss.	Partial loss.	Total loss.	Partial loss.	Total loss.	Partial loss.	Total loss.	Partial loss.	Total loss.	Partial loss.	Total loss.	Partial loss.	Total loss.	Partial loss.	Total loss.	Partial loss.	Total loss.	Partial loss.	Total loss.	Partial loss.	Total loss.	Partial loss.	Total loss.	Partial loss.	Total loss.	Partial loss.	
Not exceeding 50 tons	....	....	....	1	....	1	1	....	1	3	1	6	1	1	....	1	1	1	2	....	....	1	2	1	9	16	25
Over 50 and not exceeding 100 tons	....	....	....	....	1	3	2	2	....	1	1	2	1	....	1	2	....	6	....	2	1	2	....	....	7	20	27
Over 100 and not exceeding 200 tons	....	....	1	....	....	1	1	1	1	2	....	1	....	2	....	2	....	2	....	5	....	....	....	1	3	17	20
Over 200 and not exceeding 300 tons	....	....	....	....	....	2	....	....	....	....	1	....	....	1	....	2	....	....	....	....	1	....	....	....	2	5	7
Over 300 and not exceeding 400 tons	....	....	1	....	....	....	....	....	....	....	....	....	....	1	....	....	....	2	....	....	....	....	....	1	1	4	5
Over 400 and not exceeding 500 tons	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	3	....	....	....	4	4
Over 500 and not exceeding 600 tons	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Over 600 and not exceeding 700 tons	....	....	....	1	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	2	2
Over 700 and not exceeding 800 tons	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	2	2
Over 800 and not exceeding 900 tons	....	....	....	....	....	....	....	....	....	2	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	3	3
Over 900 and not exceeding 1,000 tons	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	1	1
Over 1,000 and not exceeding 1,100 tons	1	....	....	....	....	....	....	....	....	....	....	....	....	2	....	....	....	....	....	....	....	....	....	....	1	2	3
Over 1,100 and not exceeding 1,200 tons	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	2	2
Over 1,200 and not exceeding 1,300 tons	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	1	2	....	1	....	....	....	....	1	4	5
Over 1,300 and not exceeding 1,400 tons	....	....	....	1	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	2
Over 1,400 tons	....	....	....	....	....	....	....	....	....	1	....	1	....	1	....	....	....	1	....	....	....	....	....	....	....	4	4
Unknown	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Total	1	....	2	3	1	7	4	4	2	13	3	10	2	9	1	8	2	15	2	8	2	8	2	3	24	88	112
Aggregate	1		5		8		8		15		13		11		9		17		10		10		5		112		....

NOTE.—In the columns of "Partial loss" in this table are included the casualties in which the vessels sustained no damage, for the number of which see appropriate column in Table 14.

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TABLE 22.—*Abstract of returns of disasters to vessels on the* PACIFIC *coast during the year ending June* 30, 1880, *showing the number of vessels and distinguishing* AGE.

Age.	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	June.	Total.
Not exceeding 3 years	....	1	1	1	5	1	5	1	1	1	1	....	18
Over 3 and not exceeding 7 years	....	3	....	1	2	4	1	5	5	4	3	1	29
Over 7 and not exceeding 10 years	....	....	4	1	1	1	....	....	4	1	....	1	13
Over 10 and not exceeding 14 years	....	1	3	2	3	....	2	1	3	1	3	1	20
Over 14 and not exceeding 20 years	....	....	....	2	2	2	1	1	2	1	3	1	15
Over 20 and not exceeding 25 years	1	....	....	....	2	1	1	....	....	....	....	....	5
Over 25 and not exceeding 30 years	....	....	....	1	....	4	1	1	1	2	....	1	11
Over 30 and not exceeding 35 years	....	....	....	....	....	....	....	....	1	....	....	....	1
Over 35 and not exceeding 40 years	....	....	....	....	....	....	....	....	....	....	....	....	.....
Over 40 and not exceeding 45 years	....	....	....	....	....	....	....	....	....	....	....	....	.....
Over 45 and not exceeding 50 years	....	....	....	....	....	....	....	....	....	....	....	....	.....
Over 50 years	....	....	....	....	....	....	....	....	....	....	....	....	.....
Unknown	....	....	....	....	....	....	....	....	....	....	....	....	.....
Total.	1	5	8	8	15	13	11	9	17	10	10	5	112

TABLE 23.—*Abstract of returns of disasters to vessels on the* PACIFIC *coast during the year ending June* 30, 1880, *showing the number of vessels and distinguishing their* CARGOES.

Cargoes.	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	June.	Total.
Ballast	....	....	4	2	5	5	1	2	6	3	3	4	35
Coal	1	2	....	....	1	....	1	4	1	....	1	....	11
Fish	....	....	....	1	....	....	....	....	....	1	....	1	3
Grain	....	....	1	....	4	1	....	....	3	....	....	....	9
Hides	....	....	....	....	....	....	....	....	1	....	....	....	1
Iron	....	....	....	....	....	....	1	1	....	....	....	....	2
Lumber	....	1	1	1	1	2	3	1	2	3	3	....	18
Merchandise (general)	....	1	1	2	1	2	1	....	3	3	1	....	15
Provisions	....	....	....	....	1	....	....	....	....	....	....	....	1
Sugar	....	....	....	....	....	....	....	....	....	....	1	....	1
Wood	....	....	1	....	....	2	1	....	....	....	....	....	4
Miscellaneous	....	....	....	2	2	1	....	....	....	....	1	....	6
Unknown	....	1	....	....	....	....	3	1	1	....	....	....	6
Total	1	5	8	8	15	13	11	9	17	10	10	5	112

TABLE 24.—*Summary*—PACIFIC *coast.*

Nature of casualties.	Number of vessels.	Total number of tons.	Laden.	Ballast.	Unknown whether laden or not.	Total loss.	Partial and unknown loss.*	Number of passengers.	Number of crew.	Total on board.	Total number of lives lost.
Founderings	2	141	2	.....	.....	1	1	3	9	12	6
Strandings	40	7,493	32	8	.....	22	18	85	287	372	.....
Vessels collided	46	24,854	23	17	6	.....	46	145	416	561	.....
Other causes	24	8,851	14	10	.....	1	23	203	376	579	1
Total	112	41,339	71	35	6	24	88	436	1,088	1,524	7

*In this column are included the casualties in which no damage was sustained by the vessels, for the number of which see appropriate column in Table 14.

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GREAT LAKES.

TABLE 25.—*Abstract of returns of disasters to vessels on the* GREAT LAKES *during the year ending June* 30, 1880, *showing the* NUMBER *and* VALUE *of* VESSELS *and* CARGOES *and amount of* LOSS *to same where known.*

Months.	Total value of vessels.		Number of vessels, value unknown.	Total value of cargoes.		Number of cargoes, value unknown.	Unknown whether laden or not.	Loss to vessels.		Number of vessels totally lost, amount unknown.	Number of vessels damaged, amount unknown.*	Loss to cargoes.		Number of cargoes totally lost, amount unknown.	Number of cargoes not damaged, or damage unknown.
	Number.	Amount.		Number.	Amount.			Number.	Amount.			Number.	Amount.		
July	24	$42,400	1	15	$67,650	1	1	22	$18,520	....	3	2	$1,500	....	15
August	44	838,900	3	34	292,960	1	4	37	22,945	....	10	7	3,920	....	32
September	70	1,185,500	2	49	459,560	2	2	64	94,940	....	8	20	43,850	....	33
October	70	1,019,300	2	56	660,585	1	2	62	136,645	....	10	18	140,030	....	41
November	113	1,422,000	6	68	583,420	1	5	106	212,485	....	13	39	159,180	....	35
December	12	117,700	....	8	74,000	....	....	12	36,750	....	....	5	28,800	....	3
January	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
February	1	10,000	....	....	....	....	....	1	1,100	....	....	....	....	....	....
March	4	45,000	....	2	2,050	....	....	4	5,600	....	....	2	250	....	....
April	109	1,892,700	9	94	987,165	1	8	104	127,525	....	14	34	67,830	....	69
May	31	438,900	9	22	109,370	1	8	29	24,060	....	11	4	560	....	27
June	36	495,650	6	28	175,740	....	6	35	34,575	....	7	7	1,775	....	27
Total	514	7,838,050	38	376	3,412,500	8	36	476	715,145	....	76	138	447,695	....	282

* In this column are included the casualties in which no damage was sustained by the vessels, for the number of which see appropriate column in Table 26.

TABLE 26.—*Abstract of returns of disasters to vessels on the* GREAT LAKES *during the year ending June* 30, 1880, *showing the number of* VESSELS TOTALLY LOST, *the number* DAMAGED, *aggregate* TONNAGE *of vessels totally lost, number of* PASSENGERS *and* CREW, *and number of* LIVES LOST.

Months.	Number of disasters resulting in total loss to vessels.	Number of disasters resulting in partial damage to vessels.	Whether total or partial loss unknown.	Number of casualties resulting in no damage to vessels.	Total.	Total tons burden of vessels totally lost.	Total number of crew, including master, &c.	Total number of passengers.	Total number of lives lost.
July	2	20	1	2	25	659	196	586	5
August	2	34	4	7	47	324	467	256	.....
September	3	61	2	6	72	545	682	157	8
October	6	57	2	7	72	2,249	591	47	2
November	22	85	5	7	119	3,896	944	109	17
December	3	9	.....	.....	12	803	93	30	1
January	.....	.....	.....	.....	.....	.....	.....	.....	.....
February	.....	1	.....	.....	1	.....	3	.....	.....
March	1	3	.....	.....	4	77	34	.....	.....
April	5	101	8	4	118	1,168	965	19	1
May	2	26	8	4	40	146	278	202	.....
June	2	32	6	2	42	117	269	.....	1
Total	48	429	36	39	552	9,984	4,522	1,406	35

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TABLE 27.—*Abstract of returns of disasters to vessels on the* GREAT LAKES *during the year ending June* 30, 1880, *showing the number of* VESSELS *and* CARGOES INSURED *and* UNINSURED, *and the* AMOUNT *of* INSURANCE, *where known.*

Months.	Number of vessels and cargoes reported to be insured, and the amount of insurance.					Number of vessels and cargoes reported not insured.		Number of vessels and cargoes, whether insured or not, unknown.		Vessels in ballast.
	Vessels.		Cargoes.		Total amount of insurance.	Vessels.	Cargoes.	Vessels.	Cargoes.	
	Number.	Amount.	Number.	Amount.						
July	10	$120,000	5	$19,400	$139,400	12	9	3	3	8
August	26	331,500	13	200,615	532,115	17	16	4	10	8
September	33	249,875	25	252,515	502,390	37	19	2	9	19
October	29	418,850	25	429,555	848,405	40	25	3	9	13
November	49	466,440	28	385,620	852,060	65	38	5	8	45
December	3	20,000	3	65,000	85,000	9	5	.....	.....	4
January	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
February	1	2,500	.....	.....	2,500	.....	.....	.....	.....	1
March	2	25,000	.....	.....	25,000	2	2	.....	.....	2
April	67	855,000	51	770,255	1,625,255	39	37	12	15	15
May	18	201,500	10	74,095	275,595	13	11	9	10	9
June	16	247,600	12	156,000	403,600	20	16	6	6	8
Total	254	2,938,265	172	2,353,055	5,291,320	254	178	44	70	132

TABLE 28.—*Abstract of returns of disasters to vessels on the* GREAT LAKES *during the year ending June* 30, 1880, *distinguishing the* NATURE *of each casualty.*

Nature of casualty.	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	June.	Total.
Foundered	1	1	....	2	2	....	....	....	....	1	....	1	8
Stranded	5	6	16	25	54	8	....	....	4	36	3	3	160
Collided	6	26	22	22	28	....	....	....	....	34	26	18	182
Capsized	....	....	....	2	1	....	....	....	....	1	....	1	5
Damage to hull, masts, rigging, &c	7	3	13	15	17	1	....	....	....	27	4	9	96
Damage to machinery	1	....	5	1	2	1	....	....	....	1	4	2	17
Explosion of boiler, &c	....	....	2	....	....	....	....	....	....	....	....	....	2
Fire	3	1	4	1	1	....	....	1	....	....	1	1	13
Ice	....	....	....	....	....	2	....	....	....	....	....	....	2
Sprung a leak	1	5	....	1	4	....	....	....	....	4	2	1	18
Struck bridge, pier, sunken wreck, &c	1	3	4	1	7	....	....	....	....	9	....	4	29
Waterlogged	....	1	1	....	....	....	....	....	....	1	....	2	5
Miscellaneous	....	1	5	2	3	....	....	....	....	4	....	....	15
Total	25	47	72	72	119	12	....	1	4	118	40	42	552

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TABLE 29.—*Abstract of returns of disasters (excluding collisions) to vessels on the* GREAT LAKES *during the year ending June 30, 1880, distinguishing the* CAUSE *of each disaster.*

Class and cause of disaster.	Foundrings.	Strandings.	Other causes.	Missing vessels.	Total.
CLASS 1.—*Causes connected with the weather:*					
Current	.....	5	1	.....	6
Darkness	.....	8	2	.....	10
Fog	.....	17	1	.....	18
Gales, hurricanes, &c	4	70	87	.....	161
Heavy seas	1	15	27	.....	43
Total of Class 1	5	115	118	.....	238
CLASS 2.—*Causes connected with vessels, equipments, or stowage:*					
Defective hull, masts, rigging, &c	.....	.....	8	.....	8
Error in compass	.....	3	.....	.....	3
Total of Class 2	.....	3	8	.....	11
CLASS 3.—*Causes connected with navigation and seamanship:*					
Errors of masters, officers, or crew	1	10	1	.....	12
Errors of pilots	.....	6	6	.....	12
Total of Class 3	1	16	7	.....	24
CLASS 4.—*Causes connected with machinery or boilers:*					
Damage to machinery	.....	.....	17	.....	17
Explosion of boiler, bursting of steam-pipes, &c	.....	.....	2	.....	2
Total of Class 4	.....	.....	19	.....	19
CLASS 5.—*Other causes:*					
Absence of light or buoys	.....	3	1	.....	4
Fire	.....	.....	10	.....	10
Ice	.....	3	10	.....	13
Incendiarism	.....	.....	3	.....	3
Inevitable accident	.....	1	.....	.....	1
Spontaneous combustion	.....	.....	1	.....	1
Sprung a leak	2	3	1	.....	6
Struck rock, wreck, pier, &c	.....	3	10	.....	13
Waterlogged	.....	2	.....	.....	2
Miscellaneous	.....	8	9	.....	17
Unknown	.....	3	5	.....	8
Total of Class 5	2	26	50	.....	78
Aggregate	8	160	202	.....	370

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TABLE 30.—*Abstract of returns of disasters to vessels on the* GREAT LAKES *during the year ending June* 30, 1880, *showing the number of vessels* COLLIDED, *and distinguishing the* CAUSE *of each disaster.*

Cause of disaster.	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	June.	Total.
Accidental	....	....	....	2	....	....	....	....	....	....	2	....	4
Bad management	....	2	....	....	4	....	....	....	....	2	4	....	12
Carelessness	....	....	4	....	....	....	....	....	....	....	2	....	6
Darkness	....	2	2	....	....	....	....	....	....	2	....	....	6
Error in judgment	....	....	2	....	....	....	....	....	....	....	....	....	2
"Fault of other vessel"	2	4	2	8	4	....	....	....	....	10	2	2	34
Fault of tug towing	2	10	4	2	....	....	....	....	....	6	6	....	30
Fog	....	2	2	4	....	....	....	....	....	....	6	6	20
High winds, &c.	2	2	2	2	20	....	....	....	....	8	....	2	38
Ice	....	....	....	....	....	....	....	....	....	4	....	....	4
Misunderstanding signals	....	2	2	....	....	....	....	....	....	2	....	2	8
Narrow channel	....	2	....	....	....	....	....	....	....	....	....	....	2
Negligence	....	....	2	....	....	....	....	....	....	....	2	....	4
Strong current	....	....	....	....	....	....	....	....	....	....	....	2	2
Miscellaneous	....	....	....	2	....	....	....	....	....	....	....	2	4
Unknown	....	....	....	2	....	....	....	....	....	....	2	2	6
Total	6	26	22	22	28	....	....	....	....	34	26	18	182

TABLE 31.—*Abstract of returns of disasters to vessels on the* GREAT LAKES *during the year ending June* 30, 1880, *showing the number of vessels and distinguishing their* DESCRIPTION.

Description of vessels.	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	June.	Total.
Barges	4	2	3	2	6	1	....	....	1	5	....	2	26
Barks	1	1	....	1	1	....	....	....	....	2	....	1	7
Barkentines	....	....	....	....	1	....	....	....	....	....	....	....	1
Brigs	1	....	....	1	....	....	....	....	....	....	....	....	2
Brigantines	....	....	....	1	....	....	....	....	....	....	....	....	1
Canal-boats	....	....	....	....	....	....	....	....	....	....	1	....	1
Schooners	12	28	46	51	90	3	....	....	2	100	26	29	387
Scows	....	1	....	4	1	....	....	....	....	....	....	....	6
Sloops	....	2	13	....	1	....	....	....	....	1	1	....	18
Steamers	7	13	10	10	19	8	....	1	1	10	11	10	100
Steamships	....	....	....	2	....	....	....	....	....	....	1	....	3
Total	25	47	72	72	119	12	....	1	4	118	40	42	552

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TABLE 32.—*Abstract of returns of disasters to foreign vessels on the* GREAT LAKES *during the year ending June* 30, 1880, *showing* NATIONALITY *and* DESCRIPTION, *and distinguishing those* TOTALLY LOST *and those* PARTIALLY DAMAGED.

Nationality and rig.	July.		August.		September.		October.		November.		December.		January.		February.		March.		April.		May.		June.		Total.		
	Total loss.	Partial loss.	Total loss.	Partial loss.	Total loss.	Partial loss.	Total loss.	Partial loss.	Total loss.	Partial loss.	Total loss.	Partial loss.	Total loss.	Partial loss.	Total loss.	Partial loss.	Total loss.	Partial loss.	Total loss.	Partial loss.	Total loss.	Partial loss.	Total loss.	Partial loss.	Total loss.	Partial loss.	Aggregate.
British brigantines	....	....	1	....	....	....	1	3	..	..	....	....	..	....	....	..	....	....	....	4	....	1	....	1	3	12	15
British schooners	....	....	....	....	....	1	....	..	2	5	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1
British scows	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	3	3
British steamers	....	1	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Total	....	1	1	....	....	2	1	4	2	5	....	....	..	....	....	....	....	....	....	4	....	2	....	1	4	19	23
Aggregate	1		1		2		5		7		....		....		....		....		4		2		1		23		

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TABLE 33.—*Abstract of returns of disasters to vessels on the* GREAT LAKES *during the year ending June* 30, 1880, *showing the* TONNAGE *and distinguishing the number of those* TOTALLY LOST *and those* PARTIALLY DAMAGED.

Burden of vessels.	July.		August.		September.		October.		November.		December.		January.		February.		March.		April.		May.		June.		Total.		Aggregate.
	Total loss.	Partial loss.	Total loss.	Partial loss.	Total lost.	Partial loss.	Total loss.	Partial loss.	Total loss.	Partial loss.	Total loss.	Partial loss.	Total loss.	Partial loss.	Total loss.	Partial loss.	Total loss.	Partial loss.	Total loss.	Partial loss.	Total loss.	Partial loss.	Total loss.	Partial loss.	Total loss.	Partial loss.	
Not exceeding 50 tons	....	3	....	2	1	6	1	6	6	8	....	5	....	....	....	1	....	....	....	4	1	....	1	6	10	41	51
Over 50 and not exceeding 100 tons	....	....	....	1	1	5	1	6	4	8	1	1	....	....	....	....	1	....	2	5	..	5	1	1	11	32	43
Over 100 and not exceeding 200 tons	1	2	1	4	....	6	1	13	3	15	....	....	....	....	....	....	....	1	1	21	1	3	....	7	7	72	79
Over 200 and not exceeding 300 tons	....	4	1	10	....	16	2	10	7	23	....	....	....	....	....	....	....	1	1	17	....	10	....	8	11	99	110
Over 300 and not exceeding 400 tons	....	6	....	7	....	13	....	7	1	11	1	....	....	....	....	....	....	....	....	20	....	4	....	4	2	72	74
Over 400 and not exceeding 500 tons	1	2	....	3	1	5	....	4	2	7	1	1	....	....	....	....	....	....	1	11	....	2	....	1	6	36	42
Over 500 and not exceeding 600 tons	....	3	....	1	....	4	....	3	....	7	....	1	....	....	....	....	....	....	....	8	....	3	....	3	....	33	33
Over 600 and not exceeding 700 tons	....	1	....	4	....	4	....	5	....	6	....	....	....	....	....	....	....	....	....	8	....	1	....	3	....	32	32
Over 700 and not exceeding 800 tons	....	....	....	3	....	1	....	5	....	4	....	....	....	....	....	....	....	....	....	4	....	4	....	3	....	24	24
Over 800 and not exceeding 900 tons	....	....	....	2	....	....	....	....	....	3	....	....	....	....	....	....	....	....	....	4	....	1	....	....	....	10	10
Over 900 and not exceeding 1,000 tons	....	....	....	....	....	2	....	2	....	1	....	....	....	....	....	....	....	....	....	4	....	....	....	1	....	10	10
Over 1,000 and not exceeding 1,100 tons	....	1	....	1	....	2	....	2	....	1	....	....	....	....	....	....	....	1	..	1	....	....	....	2	....	11	11
Over 1,100 and not exceeding 1,200 tons	....	....	....	4	....	1	....	....	....	2	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	8	8
Over 1,200 and not exceeding 1,300 tons	....	1	....	....	....	....	....	3	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	4	4
Over 1,300 and not exceeding 1,400 tons	....	....	....	1	....	2	....	....	....	1	....	1	....	....	....	....	....	....	....	....	....	1	....	....	....	6	6
Over 1,400 tons	....	....	....	1	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	4	....	1	....	....	1	6	7
Unknown	....	....	....	1	....	2	....	....	....	....	....	....	....	....	....	....	....	....	....	2	....	3	....	....	....	8	8
Total	2	23	2	45	3	69	6	66	22	97	3	9	....	....	....	1	1	3	5	113	2	38	2	40	48	504	552
Aggregate	25		47		72		72		119		12		....		1		4		118		40		42		552		

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TABLE 34.—*Abstract of returns of disasters to vessels on the* GREAT LAKES *during the year ending June* 30, 1880, *showing the number of vessels and distinguishing* AGE.

Age.	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	June.	Total.
Not exceeding 3 years	3	2	5	3	6	3	....	....	....	6	....	3	31
Over 3 and not exceeding 7 years	9	26	18	20	29	2	....	....	1	31	13	7	156
Over 7 and not exceeding 10 years	2	2	9	7	10	2	....	....	....	13	6	9	60
Over 10 and not exceeding 14 years	5	7	13	23	25	3	....	....	1	28	6	7	118
Over 14 and not exceeding 20 years	2	4	17	8	19	2	....	1	1	17	5	7	83
Over 20 and not exceeding 25 years	3	2	6	7	17	....	....	....	1	12	6	8	62
Over 25 and not exceeding 30 years	....	1	2	1	6	....	....	....	....	8	1	....	19
Over 30 and not exceeding 35 years	....	1	....	1	3	....	....	....	....	....	....	1	6
Over 35 and not exceeding 40 years	1	....	....	....	....	....	....	....	....	....	....	....	1
Over 40 and not exceeding 45 years	....	....	....	....	....	....	....	....	....	....	....	....	....
Over 45 and not exceeding 50 years	....	....	....	....	....	....	....	....	....	....	....	....	....
Over 50 years	....	....	....	....	....	....	....	....	....	....	....	....	....
Unknown	....	2	2	2	4	....	....	....	....	3	3	....	16
Total	25	47	72	72	119	12	....	1	4	118	40	42	552

TABLE 35.—*Abstract of returns of disasters to vessels on the* GREAT LAKES *during the year ending June* 30, 1880, *showing the number of vessels and distinguishing their* CARGOES.

Cargoes.	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	June.	Total.
Ballast	8	8	19	13	45	4	....	1	2	15	9	8	132
Coal	6	6	11	11	11	1	....	....	....	17	3	2	68
Fruits, &c	....	....	1	....	....	....	....	....	....	....	....	....	1
Grain	....	9	11	13	15	3	....	....	....	37	4	6	98
Hides and furs	....	....	....	....	....	1	....	....	....	....	....	....	1
Iron and iron ore	3	4	8	5	8	....	....	....	....	2	6	2	38
Lime, &c	....	....	....	1	1	....	....	....	....	1	....	....	3
Lumber, &c	6	9	14	16	19	1	....	....	2	26	7	12	112
Merchandise (general)	1	5	3	2	3	....	....	....	....	2	1	2	19
Provisions, flour, &c	....	....	....	3	3	2	....	....	....	....	1	....	9
Salt	....	1	1	1	1	....	....	....	....	2	....	....	6
Sand	....	....	....	....	....	....	....	....	....	3	....	1	4
Stone, brick, &c	....	....	....	3	2	....	....	....	....	2	....	....	7
Wood, &c	....	1	1	....	3	....	....	....	....	2	1	3	11
Miscellaneous	....	....	1	2	3	....	....	....	....	1	....	....	7
Unknown	1	4	2	2	5	....	....	....	....	8	8	6	36
Total	25	47	72	72	119	12	....	1	4	118	40	42	552

TABLE 36.—*Abstract of returns of disasters to vessels on the* GREAT LAKES *during the year ending June* 30, 1880, *showing the number of vessels and distinguishing the* LAKES *and* CONNECTING RIVERS *on which they occurred.*

Localities.	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	June.	Total.
Lake Erie	5	12	14	15	24	1	....	....	2	17	7	9	106
Lake Huron	4	4	17	4	17	1	....	....	....	13	3	1	64
Lake Michigan	8	16	27	35	63	5	....	1	2	57	23	29	266
Lake Ontario	4	2	2	7	9	....	....	....	....	4	2	....	30
Lake Superior	....	....	1	2	1	3	....	....	....	....	1	....	8
Lake Saint Clair	....	....	5	2	....	....	....	....	....	2	2	1	12
Straits of Mackinac	1	2	....	....	1	1	....	....	....	15	....	....	20
Detour Passage	....	1	....	....	....	....	....	....	....	....	....	1	2
Detroit River	3	....	5	2	1	....	....	....	....	2	....	1	14
Saint Clair River	....	4	1	3	3	1	....	....	....	8	2	....	22
Sault Sainte Marie River	....	5	....	2	....	....	....	....	....	....	....	....	7
Welland Canal	....	1	....	....	....	....	....	....	....	....	....	....	1
Total	25	47	72	72	119	12	....	1	4	118	40	42	552

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TABLE 37.—*Summary.*—GREAT LAKES.

Nature of casualties.	Number of vessels.	Total number of tons.	Laden.	Ballast.	Unknown whether laden or not.	Total loss.	Partial and unknown loss.*	Number of passengers.	Number of crew.	Total on board.	Total number of lives lost.
Founderings	8	862	5	3	.....	7	1	18	35	53	9
Strandings	160	59,818	125	35	.....	29	131	127	1,331	1,458	10
Vessels collided	182	75,536	98	48	36	1	181	809	1,348	2,157	.....
Other causes	202	71,088	156	46	.....	11	191	452	1,808	2,260	16
Total	552	207,304	384	132	36	48	504	1,406	4,522	5,928	35

* In this column are included the casualties in which no damage was sustained by the vessels, for the number of which see appropriate column in Table 26.

RIVERS.

TABLE 38.—*Abstract of returns of disasters to vessels on the* RIVERS *of the United States during the year ending June* 30, 1880, *showing the* NUMBER *and* VALUE *of* VESSELS *and* CARGOES *and amount of* LOSS *to same where known.*

Months.	Total value of vessels.		Number of vessels, value unknown.	Total value of cargoes.		Number of cargoes, value unknown.	Unknown whether laden or not.	Loss to vessels.		Number of vessels totally lost, amount unknown.	Number of vessels damaged, amount unknown.*	Loss to cargoes.		Number of cargoes totally lost, amount unknown.	Number of cargoes not damaged, or damage unknown.
	Number.	Amount.		Number.	Amount.			Number.	Amount.			Number.	Amount.		
July	17	$290,400	1	11	$122,090	....	1	16	$26,750	.....	2	4	$1,300	.....	8
Aug	20	217,200	3	10	13,800	1	2	20	23,090	.....	3	6	4,275	.....	7
Sept	28	464,150	2	18	726,800	1	2	27	81,700	.....	3	14	184,350	.....	7
Oct	14	574,000	2	10	192,900	1	2	13	34,600	.....	3	4	26,050	.....	9
Nov	24	296,000	1	15	186,580	....	....	23	55,755	.....	2	6	55,400	.....	9
Dec	18	413,500	3	10	320,020	2	3	17	22,620	.....	4	3	5,025	.....	12
Jan	13	323,600	....	9	177,015	2	....	12	48,845	.....	1	7	145,240	.....	4
Feb	15	180,400	1	12	226,820	....	....	15	40,500	.....	1	4	27,050	.....	8
Mar	11	131,200	....	9	180,950	....	....	10	33,800	.....	1	5	24,700	.....	4
Apr	13	253,100	1	7	104,000	1	1	12	56,960	.....	2	5	46,470	.....	4
May	13	354,900	1	7	198,200	....	1	13	127,475	.....	1	4	30,200	.....	4
June	10	65,000	....	7	108,830	....	....	10	27,350	.....	.....	4	38,570	.....	3
Total	196	3,563,450	15	125	2,558,005	8	12	188	580,045	.....	23	66	588,630	.....	79

* In this column are included the casualties in which no damage was sustained by the vessels, for the number of which see appropriate column in Table 39.

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TABLE 39.—*Abstract of returns of disasters to vessels on the* RIVERS *of the United States during the year ending June* 30, 1880, *showing the number of* VESSELS TOTALLY LOST, *the number* DAMAGED, *aggregate* TONNAGE *of vessels totally lost, number of* PASSENGERS *and* CREW, *and number of* LIVES LOST.

Months.	Number of disasters resulting in total loss to vessels.	Number of disasters resulting in partial damage to vessels.	Whether total or partial loss unknown.	Number of casualties resulting in no damage to vessels.	Total.	Total tons burden of vessels totally lost.	Total number of crew, including master, &c.	Total number of passengers.	Total number of lives lost.
July	4	12	1	1	18	414	135	64	5
August	4	16	3	.....	23	282	210	236	3
September	10	17	2	1	30	3,962	585	248	1
October	3	10	2	1	16	1,585	323	273	6
November	6	17	1	1	25	1,396	303	299	.....
December	1	16	3	1	21	122	343	109	4
January	3	9	.....	1	13	1,239	260	102	14
February	4	11	.....	1	16	512	354	136	.....
March	3	7	.....	1	11	324	259	75	.....
April	4	8	1	1	14	357	245	118	2
May	7	6	1	.....	14	3,421	351	284	3
June	1	9	.....	.....	10	250	96	97	.....
Total	50	138	14	9	211	13,864	3,464	2,041	38

TABLE 40.—*Abstract of returns of disasters to vessels on the* RIVERS *of the United States during the year ending June* 30, 1880, *showing the number of* VESSELS *and* CARGOES INSURED *and* UNINSURED, *and the* AMOUNT *of* INSURANCE, *where known.*

Months.	Number of vessels and cargoes reported to be insured, and the amount of insurance.					Number of vessels and cargoes reported not insured.		Number of vessels and cargoes, whether insured or not, unknown.		Vessels in ballast.
	Vessels.		Cargoes.		Total amount of insurance.	Vessels.	Cargoes.	Vessels.	Cargoes.	
	Number.	Amount.	Number.	Amount.						
July	2	$80,000	1	$14,815	$94,815	15	9	1	2	6
August	4	72,500	3	6,400	78,900	16	8	3	2	10
September	8	196,500	11	695,000	891,500	20	5	2	5	9
October	5	195,500	5	131,900	327,400	9	4	2	4	3
November	6	89,500	7	128,500	218,000	18	4	1	4	10
December	8	127,500	5	85,000	212,500	10	3	3	7	6
January	7	176,200	3	150,000	326,200	6	5	.....	3	2
February	7	79,500	8	149,220	228,720	9	2	.....	2	4
March	4	20,500	5	155,470	175,970	7	1	.....	3	2
April	7	125,500	4	68,800	194,300	6	3	1	2	5
May	8	231,000	5	203,000	434,000	5	2	1	1	6
June	2	14,000	3	55,000	69,000	8	3	.....	1	3
Total	68	1,408,200	60	1,843,105	3,251,305	129	49	14	36	66

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TABLE 41.—*Abstract of returns of disasters to vessels on the* RIVERS *of the United States during the year ending June* 30, 1880, *distinguishing the* NATURE *of each casualty.*

Nature of casualty.	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	June.	Total.
Foundered	1	....	7	....	....	....	1	1	....	2	....	1	13
Stranded	3	11	5	1	3	1	....	2	....	2	1	4	33
Collided	9	8	4	8	8	12	4	2	....	4	2	2	63
Capsized	....	....	....	....	....	....	1	....	....	....	....	....	1
Damage to hull, masts, rigging, &c	....	....	3	2	1	1	1	1	....	....	1	....	10
Damage to machinery	....	....	1	1	2	3	....	1	1	1	2	1	13
Explosion	....	1	1	....	....	1	2	....	....	1	....	....	6
Fire	....	1	2	....	1	1	1	....	4	1	3	1	15
Ice	....	....	....	....	2	1	2	....	1	....	....	....	6
Snagged	1	....	3	1	....	....	....	1	....	1	1	1	9
Sprung a leak	....	....	....	....	2	....	....	....	....	....	....	....	2
Struck wreck, bridge, or hidden obstruction	3	2	4	3	6	1	1	8	5	2	4	....	39
Miscellaneous	1	....	....	....	....	....	....	....	....	....	....	....	1
Total	18	23	30	16	25	21	13	16	11	14	14	10	211

TABLE 42.—*Abstract of returns of disasters (excluding collisions) to vessels on the* RIVERS *of the United States during the year ending June* 30, 1880, *distinguishing the* CAUSE *of each disaster.*

Class and cause of disaster.	Foundering.	Strandings.	Other causes.	Missing vessels.	Total.
CLASS 1.—*Causes connected with the weather:*					
Currents, tides, &c	.....	3	.....	.....	3
Darkness	.....	.....	1	.....	1
Gales, hurricanes, &c	7	17	5	.....	29
Heavy seas	2	.....	.....	.....	2
Total of Class 1	9	20	6	.....	35
CLASS 2.—*Causes connected with vessels, equipments, or stowage:*					
Defective hull, masts, rigging, &c	1	.....	1	.....	2
Total of Class 2	1	.....	1	.....	2
CLASS 3.—*Causes connected with navigation and seamanship:*					
Errors of masters, officers, or crew	.....	1	2	.....	3
Errors of pilots	.....	3	3	.....	6
Total of Class 3	.....	4	5	.....	9
CLASS 4.—*Causes connected with machinery or boilers:*					
Damage to machinery	.....	1	13	.....	14
Explosion	.....	.....	6	.....	6
Total of Class 4	.....	1	19	.....	20
CLASS 5.—*Other causes:*					
Absence of proper lights	.....	.....	1	.....	1
Fire	.....	.....	15	.....	15
Freshet	.....	.....	1	.....	1
Ice	.....	.....	6	.....	6
Sprung a leak	1	1	2	.....	4
Struck rock, snag, sunken wreck, &c	1	3	40	.....	44
Want of power in tug towing	.....	.....	1	.....	1
Miscellaneous	.....	4	4	.....	8
Unknown	1	.....	1	.....	2
Total of Class 5	3	8	71	.....	82
Aggregate	13	33	102	.....	148

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TABLE 43.—*Abstract of returns of disasters to vessels on the* RIVERS *of the United States during the year ending June* 30, 1880, *showing the number of vessels* COLLIDED, *and distinguishing the* CAUSE *of each disaster.*

Cause of disaster.	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	June.	Total.
Accidental	2	....	....	....	....	....	....	....	....	....	....	....	2
Carelessness	....	2	....	2	....	2	....	2	....	....	....	....	8
Darkness	2	2	....	....	....	2	....	....	....	....	....	....	6
Errors of pilots	....	2	....	....	2	2	....	....	....	2	....	....	8
"Fault of other vessel"	2	....	....	4	4	....	....	....	....	....	2	....	12
Fault of tug towing	....	....	2	....	....	....	....	....	....	....	....	....	2
Fog	....	....	....	....	....	2	4	....	....	....	....	....	6
High wind	....	....	....	....	2	....	....	....	....	....	....	....	2
Tide	3	....	....	....	....	....	....	....	....	....	....	....	3
Want of proper lights	....	....	....	....	....	2	....	....	....	....	....	....	2
Unknown	....	2	2	2	....	2	....	....	....	2	....	2	12
Total	9	8	4	8	8	12	4	2	....	4	2	2	63

TABLE 44.—*Abstract of returns of disasters to vessels on the* RIVERS *of the United States during the year ending June* 30, 1880, *showing the number of vessels and distinguishing their* DESCRIPTION.

Description of vessels.	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	June.	Total.
Barges	1	....	4	2	4	....	2	2	....	2	....	1	18
Barks	....	....	1	....	....	....	....	....	....	....	....	....	1
Ferry-boats	....	....	....	....	1	1	....	....	2	....	....	....	4
Schooners	8	7	3	3	3	1	....	2	....	2	....	1	30
Ships	....	....	....	....	....	2	....	....	....	1	....	....	3
Sloops	....	1	....	1	1	2	2	....	9	....	1	1	18
Steamers	7	13	21	9	16	12	9	12	....	9	13	7	128
Steamships	2	1	1	1	....	3	....	....	....	....	....	....	8
Steam-yachts	....	1	....	....	....	....	....	....	....	....	....	....	1
Total	18	23	30	16	25	21	13	16	11	14	14	10	211

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TABLE 45.—*Abstract of returns of disasters to foreign vessels on the* RIVERS *of the United States during the year ending June* 30, 1880, *showing* NATIONALITY *and* DESCRIPTION, *and distinguishing those* TOTALLY LOST *and those* PARTIALLY DAMAGED.

Nationality and rig.	July.		August.		September.		October.		November.		December.		January.		February.		March.		April.		May.		June.		Total.		Aggregate.
	Total loss.	Partial loss.	Total loss.	Partial loss.	Total loss.	Partial loss.	Total loss.	Partial loss.	Total loss.	Partial loss.	Total loss.	Partial loss.	Total loss.	Partial loss.	Total loss.	Partial loss.	Total loss.	Partial loss.	Total loss.	Partial loss.	Total loss.	Partial loss.	Total loss.	Partial loss.	Total loss.	Partial loss.	
British steamers	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	1
British steamships	.....	1	.....	1	.....	1	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4	4
French steam yachts	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	1
Italian bark	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	1
Total	.....	1	.....	2	.....	2	.....	.....	.....	.....	.....	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	7	7
Aggregate	.....	1	.....	2	.....	2	.....	.....	.....	.....	.....	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	7	

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TABLE 46.—*Abstract of returns of disasters to vessels on the* RIVERS *of the United States during the year ending June 30, 1880, showing the* TONNAGE *and distinguishing the number of those* TOTALLY LOST *and those* PARTIALLY DAMAGED.

Burden of vessels.	July.		August.		September.		October.		November.		December.		January.		February.		March.		April.		May.		June.		Total.		Aggregate.
	Total loss.	Partial loss.	Total loss.	Partial loss.	Total loss.	Partial loss.	Total loss.	Partial loss.	Total loss.	Partial loss.	Total loss.	Partial loss.	Total loss.	Partial loss.	Total loss.	Partial loss.	Total loss.	Partial loss.	Total loss.	Partial loss.	Total loss.	Partial loss.	Total loss.	Partial loss.	Total loss.	Partial loss.	
Not exceeding 50 tons	2	6	1	8	2	1	....	1	....	3	....	4	1	1	1	1	1	....	2	2	1	2	....	3	11	32	43
Over 50 and not exceeding 100 tons	1	3	2	3	2	1	1	1	1	3	....	....	....	1	2	2	1	1	1	....	2	....	....	2	13	17	30
Over 100 and not exceeding 200 tons	....	....	1	2	1	3	....	1	4	3	1	3	....	2	....	....	1	1	....	2	....	....	1	2	9	19	28
Over 200 and not exceeding 300 tons	1	1	....	1	2	4	....	2	....	2	....	3	....	1	....	1	....	3	1	1	1	1	....	1	5	21	26
Over 300 and not exceeding 400 tons	....	1	....	2	....	1	....	1	....	2	....	1	....	2	1	1	....	....	....	....	....	1	....	1	1	13	14
Over 400 and not exceeding 500 tons	....	....	....	....	....	3	1	2	....	1	....	1	1	....	....	1	....	....	....	....	1	....	....	....	3	8	11
Over 500 and not exceeding 600 tons	....	....	....	....	....	3	....	1	....	1	....	1	....	1	....	1	....	....	....	....	....	1	....	....	....	9	9
Over 600 and not exceeding 700 tons	....	....	....	....	....	....	....	....	1	2	....	1	....	....	....	1	....	1	....	....	....	....	....	....	1	5	6
Over 700 and not exceeding 800 tons	....	....	....	....	1	....	....	....	....	....	....	....	1	1	....	1	....	....	....	2	....	....	....	....	2	4	6
Over 800 and not exceeding 900 tons	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	1	1
Over 900 and not exceeding 1,000 tons	....	1	....	2	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	1	....	....	....	1	4	5
Over 1,000 and not exceeding 1,100 tons	....	....	....	....	....	....	1	....	....	1	....	1	....	....	....	2	....	....	....	....	....	....	....	....	1	4	5
Over 1,100 and not exceeding 1,200 tons	....	1	....	....	1	2	....	....	....	....	....	2	....	....	....	1	....	....	....	1	....	....	....	....	1	7	8
Over 1,200 and not exceeding 1,300 tons	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1
Over 1,300 and not exceeding 1,400 tons	....	....	....	....	1	1	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	1	2	3
Over 1,400 tons	....	1	....	....	....	1	....	3	....	....	....	1	....	....	....	....	....	1	....	1	1	2	....	....	1	10	11
Unknown	....	....	....	1	....	....	....	1	....	1	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	4	4
Total	4	14	4	19	10	20	3	13	6	19	1	20	3	10	4	12	3	8	4	10	7	7	1	9	50	161	211
Aggregate	18		23		30		16		25		21*		13		16		11		14		14		10		211		

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TABLE 47.—*Abstract of returns of disasters to vessels on the* **RIVERS** *of the United States during the year ending June 30, 1880, showing the number of vessels and distinguishing* **AGE.**

Age.	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	June.	Total.
Not exceeding 3 years	3	8	6	2	1	3	3	2	4	3	3	....	38
Over 3 and not exceeding 7 years	4	6	13	3	5	7	3	5	2	3	3	2	56
Over 7 and not exceeding 10 years	3	4	6	2	4	4	3	2	2	3	3	3	39
Over 10 and not exceeding 14 years	2	1	2	4	4	1	2	3	2	2	3	1	27
Over 14 and not exceeding 20 years	1	1	1	2	6	4	....	3	....	2	1	1	22
Over 20 and not exceeding 25 years	1	....	....	....	1	....	....	....	....	....	....	1	3
Over 25 and not exceeding 30 years	1	1	....	....	1	....	....	....	....	....	....	2	5
Over 30 and not exceeding 35 years	2	....	1	....	....	....	1	....	....	....	....	....	4
Over 35 and not exceeding 40 years	....	....	....	....	1	....	....	....	....	....	....	....	1
Over 40 and not exceeding 45 years	....	1	....	....	....	....	....	....	....	....	....	....	1
Over 45 and not exceeding 50 years	....	....	....	....	....	....	....	....	....	....	....	....	....
Over 50 years	....	....	....	1	....	....	....	....	....	....	....	....	1
Unknown	1	1	1	2	2	2	1	1	1	1	1	....	14
Total	18	23	30	16	25	21	13	16	11	14	14	10	211

TABLE 48.—*Abstract of returns of disasters to vessels on the* **RIVERS** *of the United States during the year ending June 30, 1880, showing the number of vessels and distinguishing their* **CARGOES.**

Cargoes.	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	June.	Total.
Ballast	6	10	9	3	10	6	2	4	2	5	6	3	66
Coal	1	1	1	1	....	2	2	1	....	1	....	1	11
Cotton and cotton seed	....	....	2	....	2	4	1	2	5	....	1	1	18
Fruit	....	....	....	....	....	....	1	....	....	....	....	....	1
Grain	1	2	4	3	3	....	1	1	....	....	1	....	16
Hides and furs	....	....	....	....	....	....	....	....	....	....	....	1	1
Ice	....	1	....	....	....	....	....	....	....	....	....	....	1
Iron	....	....	....	....	....	....	....	1	....	1	....	....	2
Lime	....	....	....	1	....	....	....	....	....	....	....	....	1
Lumber, &c	1	2	2	....	2	....	....	....	....	2	....	....	9
Merchandise (general)	3	1	9	4	4	3	4	3	2	2	3	1	39
Phosphates	....	1	....	....	....	....	....	....	....	....	....	....	1
Provisions, &c	....	....	....	1	1	1	....	1	....	....	1	....	5
Sand	2	....	....	....	....	....	1	....	....	....	....	....	3
Stone, brick, &c	1	1	....	1	1	....	....	....	....	....	....	2	6
Sugar, molasses, &c	1	....	....	....	....	....	....	....	1	....	....	....	2
Wood	....	1	1	....	....	....	....	....	1	....	....	....	3
Miscellaneous	1	1	....	....	2	2	1	3	....	2	1	1	14
Unknown	1	2	2	2	....	3	....	....	....	1	1	....	12
Total	18	23	30	16	25	21	13	16	11	14	14	10	211

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TABLE 49.—*Abstract of returns of disasters to vessels on the* RIVERS *of the United States during the year ending June* 30, 1880, *distinguishing the* RIVERS *on which they occurred.*

Rivers.	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	June.	Total.
Albemarle and Currituck Canal	....	....	....	....	....	....	....	....	1	....	....	....	1
Altamaha, Georgia	1	....	....	....	....	....	....	....	....	....	....	....	1
Arkansas	....	....	....	....	....	....	....	....	....	....	1	....	1
Atchafalaya, Louisiana	....	....	2	....	....	....	....	....	....	....	....	....	2
Bayou Sale, Louisiana	....	....	1	....	....	....	....	....	....	....	....	....	1
Blackwater, Virginia	....	....	....	2	....	....	....	....	....	....	....	....	2
Calcasieu, Louisiana	....	8	....	....	....	....	....	....	....	....	....	....	8
Chattahoochee	....	....	1	....	....	1	....	....	1	....	....	....	3
Cheboygan, Michigan	....	....	....	....	....	....	....	....	....	....	1	....	1
Cohansey Creek, New Jersey	....	2	....	....	....	....	....	....	....	....	....	....	2
Delaware	8	4	2	2	3	6	....	2	....	....	....	....	27
Elizabeth, New Jersey	....	....	....	....	....	....	1	....	....	....	....	....	1
Exeter, New Hampshire	....	....	....	....	....	....	....	....	....	1	....	....	1
Green, Kentucky	....	....	1	....	....	....	....	....	....	....	....	....	1
Hudson	3	2	1	2	5	....	1	....	....	....	2	....	16
James	....	....	....	2	....	....	....	1	....	....	1	1	5
Kennebec	....	1	....	....	....	....	....	....	....	....	....	....	1
Merrimac	....	....	....	....	....	....	....	....	....	....	....	1	1
Mississippi	1	2	16	4	9	10	3	6	5	8	6	2	72
Missouri	....	1	2	....	2	1	....	2	1	1	....	1	11
Mokelumne, California	....	....	....	....	....	1	....	....	....	....	....	....	1
Ocklawaha, Florida	....	....	....	....	....	....	1	....	....	....	....	....	1
Ohio	....	1	....	....	1	....	2	2	....	2	....	1	9
Penobscot	....	....	....	....	1	....	....	....	....	....	....	....	1
Potomac	....	1	....	....	....	....	4	1	....	1	1	....	8
Quinsigamond Lake, Massachusetts	1	....	....	....	....	....	....	....	....	....	....	....	1
Raritan, New Jersey	....	....	....	....	....	....	....	....	....	....	....	1	1
Red, Louisiana	....	....	....	....	....	....	1	....	2	....	....	1	4
Rio Grande	....	....	....	....	....	....	....	....	....	....	....	1	1
Roanoke	....	....	2	....	....	....	....	....	....	....	....	....	2
Rogue, Oregon	....	....	1	....	....	....	....	....	....	....	....	....	1
Sabine	....	1	....	....	....	....	....	....	....	....	....	....	1
Sacramento	1	....	....	1	2	....	....	....	....	....	....	....	4
Saginaw, Michigan	....	....	....	....	1	....	....	....	....	1	....	....	2
Saint Francis	....	....	....	....	....	1	....	....	....	....	....	....	1
Saint Lawrence	....	....	....	1	1	....	....	....	....	....	2	....	4
Santee	....	....	1	....	....	....	....	....	....	....	....	....	1
Tar	1	....	....	....	....	....	....	....	....	....	....	....	1
Thames, Connecticut	....	....	....	1	....	....	....	....	....	....	....	....	1
Tennessee	....	....	....	1	....	....	....	1	....	....	....	....	2
Wabash	1	....	....	....	....	1	....	....	....	....	....	....	2
White, Arkansas	....	....	....	....	....	....	....	1	....	....	....	....	1
Willamette, Oregon	....	....	....	....	....	....	....	....	1	....	....	....	1
Winnebago Lake, Wisconsin	....	....	....	....	....	....	....	....	....	....	....	1	1
York, Virginia	1	....	....	....	....	....	....	....	....	....	....	....	1
Total	18	23	30	16	25	21	13	16	11	14	14	10	211

TABLE 50.—*Summary*—RIVERS.

Nature of casualties.	Number of vessels.	Total number of tons.	Laden.	Ballast.	Unknown whether laden or not.	Total loss.	Partial and unknown loss.*	Number of passengers.	Number of crew.	Total on board.	Total number of lives lost.
Founderings	13	4,595	7	6	.....	9	4	14	88	102	.....
Strandings	33	6,483	23	10	.....	7	26	116	268	384	.....
Vessels collided	63	30,587	32	19	12	6	57	701	660	1,361	.....
Other causes	102	39,981	71	31	.....	28	74	1,210	2,448	3,658	38
Total	211	81,649	133	66	12	50	161	2,041	3,464	5,505	38

*In this column are included the casualties in which no damage was sustained by the vessels, for the number of which see appropriate column in Table 39.

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AT SEA OR IN FOREIGN WATERS.

TABLE 51.—*Abstract of returns of disasters to American* vessels* AT SEA *or in* FOREIGN WATERS *during the year ending June* 30, 1880, *showing the* NUMBER *and* VALUE *of* VESSELS *and* CARGOES *and amount of* LOSS *to same where known.*

Months.	Total value of vessels.			Total value of cargoes.				Loss to vessels.				Loss to cargoes.			
	Number.	Amount.	Number of vessels, value unknown.	Number.	Amount.	Number of cargoes, value unknown.	Unknown whether laden or not.	Number.	Amount.	Number of vessels totally lost, amount unknown.	Number of vessels damaged, amount unknown.†	Number.	Amount.	Number of cargoes totally lost, amount unknown.	Number of cargoes not damaged, or damage unknown.
July	21	$306,500	3	15	$657,300	2	3	20	$99,300	...	4	10	$73,250	....	10
August	95	1,050,500	5	75	641,740	6	5	92	315,445	....	8	42	102,005	1	43
September	17	319,000	....	14	320,330	1	....	16	135,150	....	1	7	60,900	....	8
October	38	508,855	1	32	640,350	2	1	35	160,105	....	4	16	167,240	1	18
November	36	507,050	3	29	450,475	1	3	34	360,870	....	5	19	141,525	....	14
December	20	572,080	2	16	1,621,600	1	2	20	154,580	....	2	6	37,700	....	13
January	30	812,000	3	23	875,500	3	3	29	152,000	....	4	6	243,450	....	23
February	41	555,600	....	35	694,275	4	....	40	194,325	....	1	15	101,205	1	23
March	41	814,200	2	39	1,038,315	1	2	41	176,555	....	2	18	184,560	....	24
April	35	680,000	7	27	818,830	5	5	35	198,660	1	6	9	34,110	2	26
May	19	183,500	1	14	132,400	1	1	19	101,085	....	1	7	57,800	....	9
June	15	152,100	....	13	348,040	....	1	14	62,725	....	1	7	129,930	....	7
Total	408	6,461,385	27	332	8,239,155	27	26	395	2,110,800	1	39	162	1,333,675	5	218

* In the totals of casualties presented in the following thirteen tables are included, in order to show the whole number of vessels in collision, sixteen foreign vessels which have collided with American vessels at sea or in foreign waters during the year.

† In this column are included the casualties in which no damage was sustained by the vessels, for the number of which see appropriate column in Table 52.

TABLE 52.—*Abstract of returns of disasters to American vessels* AT SEA *or in* FOREIGN WATERS *during the year ending June* 30, 1880, *showing the number of* VESSELS TOTALLY LOST, *the number* DAMAGED, *aggregate* TONNAGE *of vessels totally lost, number of* PASSENGERS *and* CREW, *and number of* LIVES LOST.

Months.	Number of disasters resulting in total loss to vessels.	Number of disasters resulting in partial damage to vessels.	Whether total or partial loss unknown.	Number of casualties resulting in no damage to vessels.	Total.	Total tons burden of vessels totally lost.	Total number of crew, including master, &c.	Total number of passengers.	Total number of lives lost.
July	7	13	3	1	24	1,154	228	.....	1
August	20	72	5	3	100	5,833	831	32	49
September	7	9	.....	1	17	3,339	217	1	6
October	13	23	1	2	39	3,983	494	47	36
November	17	17	3	2	39	7,493	406	19	46
December	4	16	2	.....	22	3,111	340	29	24
January	4	25	3	1	33	3,163	346	31	18
February	13	27	.....	1	41	5,514	461	21	31
March	10	31	2	.....	43	3,074	532	196	18
April	11	24	6	1	42	4,998	513	147	.....
May	9	10	1	.....	20	2,521	187	4	1
June	5	9	1	.....	15	1,872	121	8	.....
Total	120	276	27	12	435	46,055	4,676	535	230

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TABLE 53.—*Abstract of returns of disasters to American vessels* AT SEA *or in* FOREIGN WATERS *during the year ending June* 30, 1880, *showing the number of* VESSELS *and* CARGOES INSURED *and* UNINSURED, *and the* AMOUNT *of* INSURANCE, *where known.*

Months.	Number of vessels and cargoes reported to be insured, and the amount of insurance.					Number of vessels and cargoes reported not insured.		Number of vessels and cargoes, whether insured or not, unknown.		Vessels in ballast.
	Vessels.		Cargoes.		Total amount of insurance.	Vessels.	Cargoes.	Vessels.	Cargoes.	
	Number.	Amount.	Number.	Amount.						
July	13	$127,000	8	$419,300	$546,300	7	4	4	8	4
August	50	303,790	33	296,525	600,315	41	29	9	24	14
September	8	151,800	4	106,800	258,600	8	4	1	7	2
October	22	238,430	20	449,715	688,145	14	6	3	9	4
November	22	185,840	20	339,610	525,450	12	5	5	8	6
December	17	248,400	12	998,800	1,247,200	2	1	3	6	3
January	22	343,300	16	760,365	1,103,665	5	6	6	7	4
February	28	258,315	21	202,470	460,785	12	6	1	12	2
March	30	330,145	23	590,660	920,805	9	8	4	11	1
April	22	319,340	12	421,300	740,640	12	6	8	19	5
May	15	47,400	11	69,950	117,350	4	2	1	3	4
June	7	33,800	4	100,940	134,740	6	5	2	5	1
Total	256	2,587,560	184	4,756,435	7,343,995	132	82	47	119	50

TABLE 54.—*Abstract of returns of disasters to American vessels* AT SEA *or in* FOREIGN WATERS *during the year ending June* 30, 1880, *distinguishing the* NATURE *of each casualty.*

Nature of casualty.	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	June.	Total.
Foundered	2	1	3	2	3	....	....	2	3	2	2	....	20
Stranded	3	9	4	6	8	4	4	6	5	7	7	6	69
Collided	10	10	....	2	8	4	6	....	4	10	2	2	58
Abandoned	....	....	1	1	2	....	....	2	1	2	....	....	9
Capsized	....	6	....	1	....	1	....	....	3	....	....	....	11
Condemned	....	....	....	....	2	....	....	....	....	1	....	....	3
Damage to hull, masts, rigging, &c	3	58	5	17	11	6	12	16	17	12	6	3	166
Damage to machinery and boiler	....	2	....	2	....	1	....	....	....	1	....	1	7
Fire	1	1	1	2	....	....	....	....	1	1	....	....	7
Ice	....	....	....	....	....	1	....	....	....	....	....	....	1
Never heard from	....	3	1	1	1	1	1	3	1	....	....	....	12
Sprung a leak	4	3	1	2	2	4	6	6	4	4	1	2	39
Struck by lightning	....	....	....	....	....	....	....	....	....	....	....	1	1
Struck sunken object	....	....	....	....	....	....	....	....	....	....	1	....	1
Waterlogged	....	1	....	1	....	....	....	....	....	....	....	....	2
Miscellaneous	1	6	1	1	2	....	4	5	4	2	....	....	26
Unknown	....	....	....	1	....	....	....	1	....	....	1	....	3
Total	24	100	17	39	39	22	33	41	43	42	20	15	435

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TABLE 55.—*Abstract of returns of disasters (excluding collisions) to American vessels* **AT SEA** *or in* **FOREIGN WATERS** *during the year ending June 30, 1880, distinguishing the* **CAUSE** *of each disaster.*

Class and cause of disaster.	Foundrings.	Strandings.	Other causes.	Missing vessels.	Total.
CLASS 1.—*Causes connected with the weather:*					
Calms, currents, and tides	.....	11	.....	.....	11
Darkness	.....	2	.....	.....	2
Fog, &c.	.....	3	.....	.....	3
Gales, hurricanes, &c	9	23	204	.....	236
Heavy seas	2	4	33	.....	39
Lightning	.....	.....	4	.....	4
Total of Class 1	11	43	241	.....	295
CLASS 2.—*Causes connected with vessels, equipments, or stowage:*					
Defective hull, mast, rigging, &c	.....	.....	4	.....	4
Error of chronometer	.....	5	.....	.....	5
Total of Class 2	.....	5	4	.....	9
CLASS 3.—*Causes connected with navigation and seamanship:*					
Errors of masters, officers, and crew	.....	5	.....	.....	5
Errors of pilots	.....	3	.....	.....	3
Total of Class 3	.....	8	.....	.....	8
CLASS 4.—*Causes connected with machinery or boilers:*					
Damage to machinery and boiler	.....	.....	7	.....	7
Total of Class 4	.....	.....	7	.....	7
CLASS 5.—*Other causes:*					
Absence of buoys	.....	1	.....	.....	1
Fire	.....	.....	5	.....	5
Ice	.....	.....	2	.....	2
Spontaneous combustion	.....	.....	2	.....	2
Sprung a leak	9	2	.....	.....	11
Struck rock, reef, &c	.....	3	1	.....	4
Miscellaneous	.....	5	6	.....	11
Unknown	.....	2	8	12	22
Total of Class 5	9	13	24	12	58
Aggregate	20	69	276	12	377

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TABLE 56.—*Abstract of returns of disasters to American vessels* AT SEA *or in* FOREIGN WATERS *during the year ending June* 30, 1880, *showing the number of vessels* COLLIDED, *and distinguishing the* CAUSE *of each disaster.*

Cause of disaster.	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	June.	Total.
Bad management	....	....	....	....	2	....	....	....	....	....	2	....	4
Carelessness	2	....	....	....	....	....	2	....	....	....	....	....	4
Darkness	....	....	....	....	....	....	....	....	....	....	....	2	2
"Fault of other vessel"	4	8	....	2	2	2	....	....	2	....	....	....	20
Fog	2	....	....	....	....	....	2	....	2	....	....	....	6
High winds	....	....	....	....	....	....	....	....	....	4	....	....	4
Negligence	....	....	....	....	....	....	2	....	....	....	....	....	2
Want of proper lights	....	....	....	....	2	2	....	....	....	4	....	....	8
Unknown	2	2	....	....	2	....	....	....	....	2	....	....	8
Total	10	10	....	2	8	4	6	....	4	10	2	2	58

TABLE 57.—*Abstract of returns of disasters to American vessels* AT SEA *or in* FOREIGN WATERS *during the year ending June* 30, 1880, *showing the number of vessels and distinguishing their* DESCRIPTION.

Description of vessels.	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	June.	Total.
Barks	5	9	2	6	4	3	8	6	10	9	2	2	66
Barkentines	....	1	....	1	2	....	1	1	2	....	2	....	10
Brigs	3	10	1	2	5	1	3	6	7	7	4	4	53
Schooners	11	67	8	24	22	7	15	23	18	16	11	7	229
Ships	2	6	6	3	5	9	2	3	4	5	1	1	47
Sloops	....	1	....	....	....	....	....	....	....	....	....	....	1
Steamers	2	4	....	3	1	....	1	1	2	1	....	....	15
Steamships	1	....	....	....	....	2	2	1	....	1	....	1	8
Unknown	....	2	....	....	....	....	1	....	....	3	....	....	6
Total	24	100	17	39	39	22	33	41	43	42	20	15	435

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TABLE 58.—*Abstract of returns of disasters to American vessels* AT SEA *or in* FOREIGN WATERS *during the year ending June* 30, 1880, *showing the* TONNAGE *and distinguishing the number of those* TOTALLY LOST *and those* PARTIALLY DAMAGED.

Burden of vessels.	July.		August.		September.		October.		November.		December.		January.		February.		March.		April.		May.		June.		Total.		Aggregate.
	Total loss.	Partial loss.	Total loss.	Partial loss.	Total loss.	Partial loss.	Total loss.	Partial loss.	Total loss.	Partial loss.	Total loss.	Partial loss.	Total loss.	Partial loss.	Total loss.	Partial loss.	Total loss.	Partial loss.	Total loss.	Partial loss.	Total loss.	Partial loss.	Total loss.	Partial loss.	Total loss.	Partial loss.	
Not exceeding 50 tons	2	1	1	2	1	....	....	....	....	....	....	....	....	....	....	....	1	....	1	1	1	....	....	1	7	5	12
Over 50 and not exceeding 100 tons	1	2	4	13	1	....	4	5	5	4	1	1	....	4	2	5	3	7	1	5	1	3	1	1	24	50	74
Over 100 and not exceeding 200 tons	1	2	5	11	1	3	3	5	3	6	1	2	....	3	4	5	1	4	2	6	1	2	....	1	22	50	72
Over 200 and not exceeding 300 tons	1	4	4	17	....	2	....	8	....	....	....	2	....	7	....	4	....	5	2	3	3	1	....	3	10	56	66
Over 300 and not exceeding 400 tons	2	....	3	13	1	....	3	6	4	5	....	1	....	4	1	4	3	2	....	1	1	2	2	1	19	39	58
Over 400 and not exceeding 500 tons	....	1	1	9	1	....	....	....	1	1	....	....	....	3	3	4	1	3	2	4	1	....	1	3	11	28	39
Over 500 and not exceeding 600 tons	....	2	....	1	....	....	1	....	....	2	....	1	1	1	....	2	....	3	....	....	....	1	1	....	3	13	16
Over 600 and not exceeding 700 tons	....	....	1	4	....	1	....	....	....	....	....	....	1	....	....	1	....	2	1	2	....	....	....	....	3	10	13
Over 700 and not exceeding 800 tons	....	2	....	3	....	....	....	....	....	1	....	....	1	2	....	....	....	....	....	....	1	....	....	....	2	8	10
Over 800 and not exceeding 900 tons	....	....	....	1	....	....	2	....	1	1	....	1	....	....	1	....	....	....	....	1	....	....	....	....	4	4	8
Over 900 and not exceeding 1,000 tons	....	....	1	....	....	....	....	1	....	....	....	....	....	1	1	....	....	....	....	....	....	....	....	....	2	2	4
Over 1,000 and not exceeding 1,100 tons	....	....	....	....	1	....	....	....	....	....	....	1	....	....	....	2	....	....	1	....	....	....	....	....	2	3	5
Over 1,100 and not exceeding 1,200 tons	....	....	1	1	1	....	....	....	1	1	....	1	....	....	....	....	1	1	....	1	....	1	....	....	4	6	10
Over 1,200 and not exceeding 1,300 tons	....	2	....	1	....	1	....	....	....	1	1	....	1	....	....	1	....	2	....	....	....	....	....	....	2	8	10
Over 1,300 and not exceeding 1,400 tons	....	....	....	....	....	1	....	....	....	....	....	2	....	1	1	....	....	....	....	1	....	....	....	....	1	5	6
Over 1,400 tons	....	1	....	1	....	2	....	1	2	....	1	6	....	2	....	....	....	3	1	2	....	....	....	....	4	18	22
Unknown	....	....	....	3	....	....	....	....	....	....	....	....	....	1	....	....	....	1	....	4	....	1	....	....	....	10	10
Total	7	17	20	80	7	10	13	26	17	22	4	18	4	29	13	28	10	33	11	31	9	11	5	10	120	315	435
Aggregate	24		100		17		39		39		22		33		41		43		42		20		15		435		

NOTE.—In the columns of "Partial loss" in this table are included the casualties in which the vessels sustained no damage, for the number of which see appropriate column in Table 52.

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TABLE 59.—*Abstract of returns of disasters to American vessels* AT SEA *or in* FOREIGN WATERS *during the year ending June* 30, 1880, *showing the number of vessels and distinguishing* AGE.

Age.	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	June.	Total.
Not exceeding 3 years	4	5	1	6	5	2	....	....	1	6	2	....	32
Over 3 and not exceeding 7 years	2	25	5	7	6	6	8	11	10	7	5	3	95
Over 7 and not exceeding 10 years	2	8	1	3	7	3	7	3	10	3	....	3	50
Over 10 and not exceeding 14 years	9	22	6	10	5	5	6	12	10	7	6	3	101
Over 14 and not exceeding 20 years	4	19	2	4	4	1	4	6	6	4	2	2	58
Over 20 and not exceeding 25 years	2	8	1	2	6	3	3	2	3	2	2	3	37
Over 25 and not exceeding 30 years	....	6	1	5	2	2	1	4	1	6	1	1	30
Over 30 and not exceeding 35 years	1	2	....	....	4	....	1	1	....	3	1	....	13
Over 35 and not exceeding 40 years	....	....	....	1	....	....	....	....	....	....	....	....	1
Over 40 and not exceeding 45 years	....	....	....	....	....	....	....	....	....	....	....	....	....
Over 45 and not exceeding 50 years	....	....	....	....	....	....	....	1	....	....	....	....	1
Over 50 years	....	1	....	1	....	....	....	....	1	....	....	....	3
Unknown	....	4	....	....	....	....	3	1	1	4	1	....	14
Total	24	100	17	39	39	22	33	41	43	42	20	15	435

TABLE 60.—*Abstract of returns of disasters to American vessels* AT SEA *or in* FOREIGN WATERS *during the year ending June* 30, 1880, *showing the number of vessels and distinguishing their* CARGOES.

Cargoes.	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	June.	Total.
Ballast	4	14	2	4	6	3	4	2	1	5	4	1	50
Coal	....	16	3	3	5	....	3	5	1	1	....	3	40
Cotton and cotton seed	1	....	....	....	....	2	2	3	....	....	....	....	8
Fish and oysters	1	6	....	7	1	....	1	2	7	1	1	....	27
Fruits, spices, coffee, &c	....	1	1	....	3	....	2	....	3	....	1	....	11
Grain	....	....	1	1	....	1	1	....	3	2	....	....	9
Guano	1	1	....	....	....	1	....	1	1	....	1	....	6
Hides and furs	....	....	....	....	....	....	....	....	....	1	....	....	1
Ice	....	2	....	1	....	....	1	....	....	1	3	2	10
Iron and iron ore	....	3	1	2	1	....	1	2	1	1	....	....	12
Lime	....	1	....	....	....	....	....	....	....	....	....	....	1
Logwood	....	2	....	....	....	1	1	3	....	1	....	....	8
Lumber, &c	3	12	1	5	4	1	1	4	5	2	1	3	42
Merchandise (general)	1	6	1	4	3	5	1	3	2	3	2	1	32
Naval stores	....	1	....	1	....	....	....	....	....	1	....	....	3
Petroleum	....	....	2	1	3	1	2	2	2	....	....	....	13
Phosphates	....	1	1	....	1	....	1	2	1	....	....	....	7
Provisions	1	....	1	....	1	....	....	2	1	1	....	....	7
Salt	1	4	....	....	....	1	....	1	1	4	1	....	13
Sand	....	2	....	....	1	....	....	....	....	1	....	....	4
Stone, brick, &c	....	1	....	....	....	....	....	1	....	....	1	....	3
Sugar and molasses	4	9	1	1	2	1	4	3	7	4	2	2	40
Whale oil and bone	1	5	....	3	2	....	....	1	2	1	....	....	15
Wood, staves, &c	....	4	1	1	1	....	2	1	....	....	....	....	10
Miscellaneous	3	4	1	4	2	3	3	3	3	7	2	2	37
Unknown	3	5	....	1	3	2	3	....	2	5	1	1	26
Total	24	100	17	39	39	22	33	41	43	42	20	15	435

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TABLE 61.—*Summary*—AT SEA *or in* FOREIGN WATERS.

Nature of casualty.	Number of vessels.	Total number of tons.	Laden.	Ballast.	Unknown whether laden or not.	Total loss.	Partial and unknown loss.*	Number of passengers.	Number of crew.	Total on board.	Total number of lives lost.
Founderings	20	8,829	19	1	.....	19	1	28	202	230	31
Strandings	69	26,490	56	13	.....	52	17	9	709	718	.....
Vessels collided	58	28,527	26	6	26	5	53	22	435	457	39
Other causes	288	115,882	258	30	.....	44	244	476	3,330	3,806	160
Total	435	179,728	359	50	26	120	315	535	4,676	5,211	230

*In this column are included the casualties in which no damage was sustained by the vessels, for the number of which see appropriate column in Table 52.

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TABLE 62.—GENERAL SUMMARY

Nature of casualties.	Number of vessels.	Aggregate tonnage.	Laden.	Ballast.	Unknown whether laden or not.	Wrecks involving total loss.	Casualties involving partial and unknown damage.	Number of passengers.	Number of crew.	Total on board.	Number of lives lost.
Founderings:											
Atlantic and Gulf coasts	42	2,721	31	11	.....	31	11	6	134	140	12
Pacific coast	2	141	2	.....	.....	1	1	3	9	12	6
Great lakes	8	862	5	3	.....	7	1	18	35	53	9
Rivers	13	4,598	7	6	.....	9	4	14	88	102	.....
At sea or in foreign waters	20	8,829	19	1	.....	19	1	28	202	230	31
Total	85	17,151	64	21	.....	67	18	69	468	537	58
Strandings:											
Atlantic and Gulf coasts	338	64,413	237	101	.....	122	216	309	2,171	2,480	21
Pacific coast	40	7,493	32	8	.....	22	18	85	287	372	.....
Great lakes	160	59,818	125	35	.....	29	131	127	1,331	1,458	10
Rivers	33	6,483	23	10	.....	7	26	116	268	384	.....
At sea or in foreign waters	69	26,490	56	13	.....	52	17	9	709	718	.....
Total	640	164,697	473	167	.....	232	408	646	4,766	5,412	31
Vessels collided:											
Atlantic and Gulf coasts	425	152,326	224	128	73	16	409	6,024	4,092	10,116	40
Pacific coast	46	24,854	23	17	6	.....	46	145	416	561	.....
Great lakes	182	75,536	98	48	36	1	181	809	1,348	2,157	.....
Rivers	63	30,587	32	19	12	6	57	701	660	1,361	.....
At sea or in foreign waters	58	28,527	26	6	26	5	53	22	435	457	39
Total	774	311,830	403	218	153	28	746	7,701	6,951	14,652	79
Other causes:											
Atlantic and Gulf coasts	203	44,590	127	76	.....	17	186	794	1,641	2,435	34
Pacific coast	24	8,851	14	10	.....	1	23	203	376	579	1
Great lakes	202	71,088	156	46	.....	11	191	452	1,808	2,260	16
Rivers	102	39,981	71	31	.....	28	74	1,210	2,448	3,658	38
At sea or in foreign waters	288	115,882	258	30	.....	44	244	476	3,330	3,806	160
Total	819	280,392	626	193	.....	101	718	3,135	9,603	12,738	249
Grand total	2,318	774,070	1,566	599	153	428	1,890	11,551	21,788	33,339	*417

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RECAPITULATION.

Atlantic and Gulf coasts	1,008	264,050	619	316	73	186	822	7,133	8,038	15,171	107
Pacific coast	112	41,339	71	35	6	24	88	436	1,088	1,524	7
Great lakes	552	207,304	384	132	36	48	504	1,406	4,522	5,928	35
Rivers	211	81,649	133	66	12	50	161	2,041	3,464	5,505	38
At sea or in foreign waters	435	179,728	359	50	26	120	315	535	4,676	5,211	230
Total	2,318	774,070	1,566	599	153	428	1,890	11,551	21,788	33,339	*417

	Atlantic and Gulf coasts.	Pacific coast.	Great lakes.	Rivers.	At sea or in foreign waters.	Aggregate.
Total value vessels involved	$15,236,315	$2,490,675	$7,808,050	$3,563,450	$6,461,385	$35,559,875
Total value cargoes involved	5,072,455	808,710	3,412,500	2,558,005	8,239,155	20,090,825
Aggregate	20,308,770	3,299,385	11,220,550	6,121,455	14,700,540	55,650,700
Total insurance on vessels	2,312,800	526,950	2,938,265	1,408,200	2,587,560	9,773,775
Total insurance on cargoes	1,903,170	141,460	2,353,055	1,843,105	4,756,435	10,997,225
Aggregate	4,215,970	668,410	5,291,320	3,251,305	7,343,995	20,771,000
Total losses to vessels	1,721,340	369,410	715,145	580,045	2,110,800	5,496,740
Total losses to cargoes	498,790	117,685	447,695	588,630	1,333,675	2,986,475
Aggregate	2,220,130	487,095	1,162,840	1,168,675	3,444,475	8,483,215
Total tonnage vessels involved	264,050	41,339	207,304	81,649	179,728	774,070
Total tonnage vessels lost	27,236	4,454	9,984	13,864	46,055	101,593

* In addition to the number of lives lost here reported, 170 lives were lost in cases where no other casualty occurred to the vessels, making the total number of lives lost 587.

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TABLE 63.—*Wrecks and casualties on and near the coasts and on the rivers of the United States, and to American vessels at sea or in foreign waters, involving* LOSS OF LIFE, *during the year ending June* 30, 1880, *in four divisions, viz:* (1) *Founderings;* (2) *Strandings;* (3) *Collisions; and* (4) *Casualties from other causes; showing in each case, when known, the* DESCRIPTION *of the* VESSELS *and the* CARGO, *the number of* LIVES LOST, *and the* DATE *and* PLACE *of disaster, &c.*

(1.) FOUNDERINGS.

Date of disaster.	Name of vessel.	Description of vessel.	Tons.	Port sailed from.	Port bound to.	Whether resulting in total or partial loss.	Nature of cargo.	No. of lives lost.	Place of disaster.
1879.									
July 31	Josephine	American steam yacht.	5	Clayton, N. Y	Kingston, Ontario	Partial.	Ballast	5	Clayton, N. Y., Saint Lawrence River.
Aug. 18	John C. Henry	American schooner	118	Philadelphia, Pa	City Point, Va	Total	Coal	1	4 miles east of Gwinn's Island, Va., Chesapeake Bay.
18	Jane E. Carhart	American sloop	21	Eastville, Va	Dragged out in bay by gale.	do	Ballast	3	Chesapeake Bay.
Sept. 5	West Wind	do		Wescott's residence, Jefferson Co., N. Y.	Henderson Harbor, N. Y.	No damage.	do	7	Campbell's Point, Henderson Bay, Lake Ontario.
Oct. 24	H. Roney	British brigantine	295	Kingston, Ontario	Charlotte, N. Y	Total	Lime, stone, and laths.	1	3 miles east of Charlotte, Lake Ontario.
27	Sally	American barkentine	226	Pensacola, Fla	Havana, Cuba	do	Lumber	6	Gulf of Mexico.
29	Petrel	American schooner	61	New Bedford, Mass	Cape Verde Islands	do	Ballast	15	Lat. 40° N., Long. 70° W.
Nov. 17	Philip Becker	American steamer	21	Montreal, Canada	Buffalo, N. Y	do	do	3	10 miles from Oswego, N. Y., Lake Ontario.
20	Minnehaha	American schooner	98	Baltimore, Md	James River, Va	do	Shells	1	Chesapeake Bay (mouth of Pianka tank River).
1880.									
Feb. 3	Guisborough	British brig	240	New London, Conn	New York City	do	Ballast	3	Opposite Crab Meadow Creek, Long Island Sound.
3	Lizzie M. Merrill	do	458	New York City	New Orleans, La	do	General merchandise.	8	Lat. 35° 20′ N., Long. 72° 50′ W.
Mar. 9	Fanny Lake	American steamer	96	Seattle, Wash. Ter	Whatcom, Wash. Ter	Partial.	do	1	Seattle, Wash. Ter.
26	Aldana Rokes	American schooner	340	Philadelphia, Pa	Bath, Me	Total	Coal	2	60 miles west-northwest of Cape Cod, Mass.
Apr. 6	James M. Kissam	do	69	New York City	Providence, R. I	do	Iron	4	Off Cornfield Point, Long Island Sound.
27	Olivia Schultze	do	45	Sinslaw River, Oregon	San Francisco, Cal	do	Fish and stave-bolts.	15	Pacific Ocean (mouth of Sinslaw River.)

Totals: Vessels, 15; tonnage, 2,093; total losses, 12; partial losses, 2; no damage, 1; lives lost, 65.

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(2.) STRANDINGS.

1879.										
Aug.	18	Nina	American sloop	5	New London, Conn	Fishing	Partial		2	Gardiner's Island, Long Island Sound.
	18	Jennie A. Shepard	American schooner	316	Baltimore, Md	New Haven, Conn	do	Coal	1	4 miles north of Smith's Point, Va.
Oct.	10	Rapidan	do	116	Makelyville, N. C	Washington, D. C	No damage.	Lumber	1	Ragged Point, Va.
Nov.	3	Leesburg	do	124	Bangor, Me	Boston, Mass	Total	Sawdust	2	Cape Elizabeth, Me.
	13	Bay Queen	do	65	do	Quincy, Mass	do	Lumber	4	Boon Island Ledge, Me
	19	Prairie State	American barge	428	Bay City, Mich	Toledo, Ohio	do	do	1	Sand Beach, Mich., Lake Huron.
	19	Louis Wells	do	210	Saginaw, Mich	do	do	do	2	Sand Beach, Mich., Lake Huron.
	19	J. P. Clark	American steamer	81	Lake Huron	Detroit, Mich	Partial	Ballast	1	Belle Isle, Detroit River.
	19	W. B. Phelps	American schooner	297	Milwaukee, Wis	Oswego, N. Y	Total	Wheat	5	1 mile below Glen Arbor, Mich., Lake Michigan.
	30	M. and E. Henderson	do	387	Bull River, S. C	Baltimore, Md	do	Phosphate rock	4	North Point of New Inlet, N. C.
Dec.	21	Amethyst	American steamer	14	Grand Marais, Lake Superior.	Duluth, Minn	Partial	Ballast	1	8 miles northeast of Beaver Bay, Lake Superior.
1880.										
Feb.	3	George Taulane	American schooner	235	Pamunkey River, Va	New York City	Total	Wood	2	1 mile south of Green Island, N. J.
	13	Luxor	British bark	810	New York City	St. John, N. B	Partial	Ballast	1	½ mile north of Browney Island, Me.
Mar.	29	West Wind	American schooner	185	Bath, Me	New Haven, Conn	Total	Ice	5	Nantucket, Mass., Chord of the Bay.

Totals: Vessels, 14; tonnage, 3,273; total losses, 8; partial losses, 5; no damage, 1; lives lost, 32.

(3.) COLLISIONS.

1879.										
Aug.	11	Curlew	American yacht		Oxford, Pa	Chester River	Partial	Ballast	1	Off Love Point, Chesapeake Bay.
	18	Jacob Birdsall	American schooner	146	Georgetown, D. C	New York City	Total	Coal	5	Off the eastern shore of Virginia.
	21	Mary Shaw	American steamer	43	Baltimore, Md	Smith's Point, Chesapeake Bay.	No damage.	Ballast	1	Baltimore Harbor, Md.
Sept.	16	Thomas W. Finney	American schooner	32	Potomac River	Baltimore, Md	Total	Oysters	3	Cedar Point, Chesapeake Bay.
Nov.	7	Champion	American steamer	1,418	New York City	Charleston, S. C	do	General merchandise.	31	15 miles from Delaware lightship.
	10	Pathway	American schooner	145	Corrotoman River, Va.	Bath, Me	do	Ship-timber	1	60 miles south-southeast of the Highlands, N. J.
	12	J. H. Bowers*	American bark	704	Rotterdam, Holland	Sunderland, England	No damage.	Ballast	†1	Flamborough Head, North Sea.

*In collision with British schooner John Allen.

†From the British schooner.

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TABLE 63.—*Wrecks and casualties on and near the coasts and on the rivers of the United States, &c.*—Continued.

(3.) COLLISIONS—Continued.

Date of disaster.	Name of vessel.	Description of vessel.	Tons.	Port sailed from.	Port bound to.	Whether resulting in total or partial loss.	Nature of cargo.	No. of lives lost.	Place of disaster.
1880.									
Jan. 23	Sarah E. Frazier.....	American bark.....	521	Portland, Me.....	Matanzas, Cuba.....	Total ..	Wood.....	2	At sea.
Feb. 2	Corning.....	American sloop	29	New London, Conn....	Glen Cove, Long Island.	Partial.	Ballast.....	3	New Haven, Conn.
2	Kate Newman.....	American schooner..	146	Baltimore, Md.....	Danversport, Mass..	Total ..	Coal	5	2 miles off Monmouth Beach, N. J.
Mar. 10	E. A. Packer	American steamer...	73	In New York Harbor..	.....	Partial.	Ballast.....	1	New York Harbor.
May 13	Jennie and Julia	American schooner..	14	.....	.....	No damage.	.....	1	Off Thatcher's Island, Mass.
June 11	Narragansett.....	American steamer...	1,634	New York City	Stonington, Conn....	Partial	General merchandise.	27	Near Cornfield Point Shoal, Long Island Sound.

Totals: Vessels, 13; tonnage, 4,905; total losses, 6; partial losses, 4; no damage, 3; lives lost, 83.

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TABLE 63.—*Wrecks and casualties on and near the coasts and on the rivers of the United States, &c.*—Continued.

(4.) OTHER CAUSES.

Date of disaster.	Name of vessel.	Description of vessel.	Tons.	Port sailed from.	Port bound to.	Whether resulting in total or partial loss.	Nature of cargo.	Number of lives lost.	Place of disaster.	Nature of casualty.
1879.										
July 1	R. Leach	Am. sch	89	Boston, Mass	Lockport, N. S	No damage	General merchandise.	1	10 miles from Lockport, N. S.	Fell from mast-head to deck.
2	Cassandra Adams	Am. bark	1,127	San Francisco, Cal	Seabec, Wash	do	Ballast	1	San Francisco Bar	Fell overboard from main rail.
4	Col. Isaac Davis	Am. str	15	Worcester, Mass	Excursion	Partial	do	5	Lake Quinsigamond, Mass.	Upper deck gave way.
4	Flora	Am. sch	38	North Haven, Me	North Bay, B. A	No damage	do	1	Port Mulgrave, N. S	Capsizing of dory.
4	Martha	Am. str	175	Port Eads, La	New Orleans, La	do		1	Bel Air Landing, La., Mississippi River.	Fell overboard while drunk.
6	Cricket	do	133	Quincy, Ill	Keokuk, Iowa	do	Ballast	1	Lone-tree Crossing, Mississippi River.	Jumped overboard while drunk.
16	H. W. Foster	Am. sch	507	At anchor in Nantucket Sound.		do		1	Nantucket Sound, Mass.	Capsizing of small boat.
17	Satilla	do	312	Booth Bay, Me	Savannah, Ga	do	Ice	1	20 miles southeast by east of Currituck Light, N. C.	Washed overboard by heavy sea.
17	J. R. Pelton	do	126	Toledo, Ohio	Cleveland, Ohio	do	Wheat	1	12 miles north of Black River, Ohio, Lake Erie.	Fell overboard from fore gaff.
22	Thetis	do	50	Boston, Mass	Baker's Island, Mass.	do	Ballast	1	Off Baker's Island, Mass.	Fell overboard
26	Eva Adelle	do	171	Laguna, Mexico	New York City	do		1	At sea	Jumped overboard while crazed by fever.
27	Magellan	Am. ship	1,073	Talcaguana, Chili	Boston, Mass	do		1	Lat. 50° S., Long. 83° W.	Fell overboard from top-gallant yard.
27	Hannah W. Dudley	Am. bark	1,128	Iloilo, Philippine Islands.	New York City	do	Sugar	1	Indian Ocean	Unknown.
28	Laetitia	do	208	Mahe, Seychelle Island, Indian Ocean.	Whaling cruise	Total	Sperm oil	1	do	Lost overboard in a gale.
29	Henry A. Kent	Am. sch	772	Chicago, Ill	Buffalo, N. Y	No damage	Corn	1	Buffalo Harbor, Lake Erie.	Fell overboard from main rigging.
Aug. 6	Saint Mark	Am. ship	1,973	New York City	San Francisco, Cal	do	General	1	Near Equator, Pacific Ocean.	Fell from aloft, vessel rolling heavily.
7	Kate Lyons	Am. sch	237	Muskegon, Mich	Chicago, Ill	do	Lumber	1	Muskegon River, Mich.	Fell overboard while clearing towline from martingale.

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TABLE 63.—*Wrecks and casualties on and near the coasts and on the rivers of the United States, &c.*—Continued.

(4.) OTHER CAUSES—Continued.

Date of disaster.	Name of vessel.	Description of vessel.	Tons.	Port sailed from.	Port bound to.	Whether resulting in total or partial loss.	Nature of cargo.	Number of lives lost.	Place of disaster.	Nature of casualty.
1879.										
Aug. 7	Mary F. Chisholm	Am. sch	74	Shelburne, N. S	Fishing	No damage	Fish	1	Western Bank, N. F	Sinking of dory by overloading.
8	Georgie Willard	do	55	Portland, Me	do	do		1	At sea	Fell from masthead to deck.
9	Iron Valley	Am. str	95	Wheeling, W. Va	Pittsburgh, Pa	Partial	Ballast	3	New Cumberland, W. Va., Ohio River.	Explosion of boiler.
12	John Welsh, jr	Am. brig	316	Havana, Cuba	Philadelphia, Pa	No damage	Molasses	1	At sea	Fell overboard.
13	Rival	Am. str	26	Benicia, Cal	Mare Island, Cal	do	Ballast	2	Karquinez Strait, Cal	Washed overboard.
15	Monticello	Am. sch	316	Buffalo, N. Y	Duluth, Minn	do	Coal	1	Off Long Point, Canada, Lake Erie.	Slipped off the rail.
17	Sarah S. Harding	do	385	Richmond, Me	Baltimore, Md	do	Ice	1	10 miles northwest of Smith's Island Light, Va.	Fell overboard from bow.
18	Sarah P	do	62	Jonesport, Me	Boston, Mass	do	Lumber	1	30 miles east of Thatcher's Island, Mass.	Fell overboard from main-boom.
18	Harriet Thomas	do	746	Boston, Mass	Richmond, Va	Partial	Ballast	1	18 miles north of Hog Island, Va.	Swept overboard by heavy sea.
18	Montana	do	380	Bath, Me	Baltimore, Md	do	Ice	1	8 miles northwest of Assateague, Va.	Fell overboard while catting anchor.
18	Stephen Bennett	do	244	Boston, Mass	do	Total	Ballast	10	Off Chincoteague, Va	Capsized.
18	Manson	Am. brig	264	New York City	Charleston, S. C	Partial	Stone	1	At sea	Dismasted in a hurricane.
18	Magnolia	Am. sch	64	Barrington, N. S	Booth Bay, Me	do	Fish	2	80 miles west of Cape Sable, N. S.	Hove down and deck swept.
19	E. F. Williams	do	53	New York City	Cruising	do	Ballast	1	At sea	Capsized.
21	Theodore H. Allen	Am. ship	1,537	Baltimore, Md	San Francisco, Cal	do	Coal	1	Latitude 18° 28′ N., longitude 48° 20′ W.	Lost overboard in a gale.
22	Cascatello	Am. brig	423	New York City	Calcasieu Pass, La	do	Railroad iron	2	Off Calcasieu Light, La	Washed overboard.
25	Presto	Am. sch	85	Machias, Me	Boston, Mass	No damage	Lumber	1	10 miles east of Boon Island, Me.	Fell overboard in a fit.
25	John Smith	do	66	Gloucester, Mass	Fishing cruise	do	Fish	1	Saint George's Bank	Fell overboard from bowsprit.
25	Jennie Sweeney	Am. bktne	643	Boston, Mass	Philadelphia, Pa	do	Ballast	1	Off Fire Island, N. Y	Fell overboard while reefing sail at night.
27	L. B. Sheppard	Am. sch	221	Chicago, Ill	Muskegon, Mich	do	do	1	12 miles south-southwest of Muskegon, L. M.	Fell overboard.

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	27	Essex	Am. str	765	In New York Harbor.		Partial	do	1	New York Harbor	Explosion of boiler.
	30	E. R. Blake	Am. sch	201	Chicago, Ill	Racine, Wis	No damage	Staves	1	Racine Harbor, Lake Michigan.	Fell overboard; supposed had a fit.
	31	Midnight	do	288	Bay City, Mich	Tonawanda, N. Y	do	Lumber	1	Tonawanda, N. Y	Fell overboard while drunk.
	—	Helen M. Condon	do	143	Philadelphia, Pa	Gloucester, Mass	Total	Coal	5	At sea	Missing.
	—	White Wing	do	90	Baltimore, Md	Ruatan, Honduras	do	General merchandise.	7	do	Do.
	-	Arizona	do	79	Barbadoes, W. I	Whaling voyage	do	Whale oil	15	Off Hatteras, N. C. (supposed).	Do.
Sept.	1	John Gilmore	Am. str	503	Saint Louis, Mo	New Orleans, La	Partial	Ballast	1	Mulatto Bend, Mississippi River.	Lost overboard in a gale.
	1	Yankee	Am. barge	236	Bay City, Mich	Buffalo, N. Y	do	Lumber	1	Off Fairport, Ohio, Lake Erie.	Carried overboard with timber in a gale.
	5	Alaska	Am. str	511	Detroit, Mich	Sandusky, Ohio	do	Iron and merchandise.	3	Bar Point, Lake Erie	Bursting of steam chimney.
	6	Daniel S. Miller	Am. sch	131	Virginia	New York City	No damage	Wood	1	At sea	Fell overboard.
	7	S. E. Davis	do	79	Newfoundland	Grand Bank	do	Fish	1	Grand Bank	Capsizing of dory.
	8	Lucy J. Clark	Am. brig	309	Pensaukee, Wis	Chicago, Ill	do	Lumber	1	North of Grosse Point, Ill., Lake Michigan.	Slipped from cross-tree, struck gaff, and fell overboard.
	10	Grandee	Am. ship	1,295	New York City	Yokahama, Japan	Partial	Kerosene	2	Off Van Diemen's Land	Decks swept in gale.
	10	Enterprise	Am. str	246	San Francisco, Cal	Sacramento, Cal	do	General merchandise.	1	Freeport, Cal	Breaking of cylinder head.
	12	Malay	Am. bkne	743	In Sydney Harbor, New South Wales.		No damage	Lumber	1	Sydney Harbor, New South Wales.	Fell overboard while drunk.
	12	W. H. Kenney	Am. sch	28	Norfolk, Va	Naswaddox Creek, Va.	do	Barrels	1	Near Sewell's Point, Chesapeake Bay.	Empty barrel on which he stepped, rolled and threw him overboard.
	16	Sea Gull	do	201	Buffalo, N. Y	Sailor's Encampment, Mich.	do	Ballast	1	8 miles NNE. from Point au Pelee, Lake Erie.	Fell off bow of boat as she was coming to anchor.
	16	C. H. Macomber	do	120	Baltimore, Md	Saco, Me	do	Coal	1	Sandy Point, Chesapeake Bay.	Fell overboard while asleep.
	17	L. and M. Knowles	do	177	Saint Mary's, Ga	Havana, Cuba	do	Railroad sleepers.	1	Lat. 24° 25′ N., long. 79° 30′ W.	Fell from mast-head to deck.
	20	Mary Ann	Am. sloop	18	Cohansey Creek, N. J.	Philadelphia, Pa	do	Oysters	1	Cohansey Creek, Delaware.	Knocked overboard by boom.
	22	Charles W. Parker.	Am. str	36	Chicago, Ill	Towing vessel out	Total	Ballast	4	2 miles off Chicago, Lake Michigan.	Explosion of boiler.
	28	Laura Pike	Am. sch	146	San Francisco, Cal	Humboldt, Cal	No damage	do	1	Mendocino City, Cal	Lost overboard during gale.
	30	Dove	Am. str	440	Bay City, Mich	Alpena, Mich	do	General merchandise.	1	Saginaw Bay, Lake Huron.	Fell overboard.
	—	Leonora	Am. sch	38	Galveston, Tex	Brashear, La	Total	Ballast	4	At sea	Missing.
Oct.	8	Samuel D. Lankford.	do	41	At work on dredging grounds, Chesapeake Bay.		No damage	Oysters	1	Off Point-no-Point, Chesapeake Bay.	Knocked overboard by jib-sheet.
	8	Armenia	Am. ship	1,699	New York City	San Francisco, Cal	Partial	General	1	Cape Horn, South America.	Swept overboard by sea.

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TABLE 63.—*Wrecks and casualties on and near the coasts and on the rivers of the United States, &c.*—Continued.

(4.) OTHER CAUSES—Continued.

Date of disaster.	Name of vessel.	Description of vessel.	Tons.	Port sailed from.	Port bound to.	Whether resulting in total or partial loss.	Nature of cargo.	Number of lives lost.	Place of disaster.	Nature of casualty.
1879.										
Oct. 8	Iowa	Am. str.	74	Saint Louis, Mo	Reed's Landing, Minn.	Partial	Ballast	1	Dallas, Ill., Mississippi River.	Frightened and jumped overboard.
13	A. Walton	Am. bge.	373	Buffalo, N. Y	East Saginaw, Mich.	No damage	do	1	Lake Erie	Fell overboard.
16	Richard Rush	U. S. rev. str.	280	Oonalaska, Alaska	San Francisco, Cal.	do	Ammunition	1	Lat. 46° 13′ N., long. 132° 31′ W.	Supposed to have fallen overboard.
17	Josephine	Am. str.	73	Seattle, Wash	Skagit River, Wash.	do	Lumber and merchandise.	1	Stillaguamish River, Wash.	Fell overboard.
17	Frankie Wilcox	Am. scow.	230	Milwaukee, Wis	Manistee, Mich	Total	Lumber	1	4 miles north of Manistee, Mich., Lake Michigan.	Capsized in a gale.
18	Minnesota	Am. str	482	Saint Louis, Mo	Dubuque, Iowa	No damage	Ballast	1	Keithsburg, Ill., Mississippi River.	Mashed by pitman.
19	Northampton	Am. sch	36	Cone River, Va	Baltimore, Md	Partial	Oysters	1	Magothy River, Md	Capsized in sudden squall.
19	William H. Payne	Am. str	87	New York City	Albany, N. Y	No damage	Ballast	1	Hudson River, N. Y	Fell overboard.
21	Canton	Am. sch	44	At work on dredging-grounds, Chesapeake Bay.		do	Oysters	1	Off Sparrow's Point, Chesapeake Bay.	Do.
21	Rapidan	Am. str	406	Waterloo, Ala	Paducah, Ky	Total	General	2	Diamond Island Chute, Tennessee River.	Striking unseen obstruction and sinking.
23	Stephen J. Watts	Am. sch	105	Lynn, Mass	Jonesboro', Me	No damage	Ballast	1	3 miles northeast of Matinicus Rock, Me.	Fell overboard from jib-boom.
24	T. H. Moore	Am. str	251	Apalachicola, Fla	Columbus, Ga	do	General merchandise.	1	Apalachicola, Fla	Capsizing of small boat.
27	Cora Bickford	Am. sch	12	Indianola, Tex	Tres Palacios, Tex	do	Ballast	1	13 miles east of Indianola, Tex.	Thrown overboard by breaking of jib-sheet.
29	H. C. Miller	Am. barge	500	Colusa County, Cal	San Francisco, Cal	Partial	Wheat	3	Six-mile Bar, Sacramento River, Cal.	Breaking of capstan.
29	Daniel Brown	Am. str	17	In New York Harbor.		Total	Ballast	2	New York Harbor	Explosion of boiler and sinking of vessel.
—	N. H. Phillips	Am. sch	67	Gloucester, Mass	Bank Quaren	do	Fish	14	At sea	Missing.
—	George V. Jordan	do	697	Newry, Ireland	New York City	No damage	Ballast	1	do	Crushed against boom by swinging of spanker gaff.

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Nov. 4	Virginia S. Lawson	....do	46	Fox Creek, Va	Chesapeake Bay ..	....do	Oysters	1	Mouth Fox Creek, Chesapeake Bay.	Knocked overboard by main-sheet jibing.
6	Lizzie A. Law	....do	747	Chicago, Ill	Buffalo, N. Y.....	....do	Corn	1	North Point, Milwaukee, Lake Michigan.	Fell overboard while repairing sail.
7	Lulu	....do	72	San Francisco, Cal	Stillwater Cove, Cal.	....do	General merchandise.	1	San Francisco Bar, Cal..	Thrown overboard by lurching of vessel.
9	City of Vera Cruz	Am. str ...	1,874	Havana, Cuba	New York City...	....do	Sugar and tobacco.	1	Off Sombrero Light, Fla.	Fell overboard while washing anchor.
9	Alice Kimball	Am. sch ..	107	San Francisco, Cal	Cuffey's Cove, Cal.	....do	Ballast	1	Lat. 38° 51′ N., Long. 124° 33′ W.	Fell overboard from forecastle.
10	Robert R. Thompson.	Am. str...	1,158	Upper Cascades, Columbia River.	Dalles, Oreg	No damage		1	Dalles, Columbia River, Oreg.	Thrown overboard by parting of line.
12	Our Son	Am. sch...	720	Escanaba, Mich...	Cleveland, Ohio ...	....do	Iron ore	1	25 miles northeast of Point aux Barques, Lake Huron.	Washed overboard by heavy sea.
14	C. G. Breed	....do	385	Detroit, Mich	Buffalo, N. Y.....	Total	Wheat.....	5	Off Ashtabula, Lake Erie.	Capsized in a squall.
17	Star of Hope	....do	277	Bay City, Mich ...	Toledo, Ohio	No damage	Lumber.....	1	Near Turtle Island, Lake Erie.	Fell overboard while jibing fore-sheet.
17	Keystone	Am. brig..	431	Waterford, Ireland	New York City ...	....do	Iron	1	35 miles east of Barnegat, N. J.	Fell overboard.
17	George D. Seymour	Am. str...	76	Ogdensburg, N. Y.	Port Dalhousie, Canada.	....do	Ballast	5	Between Galloo Light and Oswego N. Y., Lake Ontario.	Sinking of dredge in tow.
20	Imperial	Am. sch...	299	Black River, Mich.	Chicago, Ill	....do	Lumber.....	1	Off Biddle's Point, Mich., Lake Michigan.	Fell off top-gallant forecastle.
20	R. B. Gove	Am. brig..	463	New York City ...	Antwerp, Belgium	....do	Naphtha.....	1	Lat. 44° 9′ N., long. 32° 28′ W.	Swept overboard by heavy sea.
22	Charles F. Ward..	Am. bark .	542	Dublin, Ireland ...	New York City...	....do	Ballast	1	At sea	Lost overboard in gale.
22	Enchantress	Am. sch...	371	New York City...	Savannah, Ga	....do	General.....	1	16 miles northeast of Cape Hatteras, N. C.	Fell overboard while unhooking boom-tackle.
—	Andrew Leighton.	....do	84	Gloucester, Mass..	La Have Bank, Nova Scotia.	Total	Fishing outfits	14	At sea	Missing.
—	Landseer	Am. ship..	1,419	Dublin, Ireland ...	Philadelphia, Pa ..	No damage	Old rails	1	.....do	Fell from aloft.
Dec. 1	J. Bentley	Brit. sch ..	456	In Oswego Harbor, N. Y.	.....	....do	Barley	1	Oswego, Lake Ontario...	Fell from cross-trees to deck.
1	Highflyer	Am. sch...	56	Gloucester, Mass..	Fishing	....do	Fish	2	27 miles southeast from Thatcher's Island, Mass.	Went out to attend trawls and were never heard of after.
3	Agnes Barton	Am. brig..	400	Baltimore, Md	Savannah, Ga	....do	Guano	1	1½ miles east of Thomas Point, Chesapeake Bay.	Fell overboard from rail.
11	Northern Light...	Am. barge.	494	Bay City, Mich ...	Detroit, Mich	....do	Lumber.....	1	Off Forestville, Mich., Lake Huron.	Fell overboard.
12	Washington	Am. str ...	148	San Francisco Cal.	Mokelumne River, Cal.	Partial....	Potatoes	1	Mokelumne, River, Cal..	Jumped overboard; vessel on fire.
18	Champion	Am. sch...	43	Neah Bay, Wash..	Cruising	No damage	Ballast	1	12 miles southeast of Tatoosh Island, Wash.	Knocked overboard by main boom.
18	Mary E. Russ	....do	235	Eureka, Cal.....	San Francisco, Cal	..do	Lumber.....	1	Off Cape Mendocino Bay, Cal.	Knocked overboard by main boom.
27	Laura Nelson	....do	89	Gloucester, Mass .	Grand Bank	..do	Fish	3	Grand Bank	Capsizing of dory in squall.

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TABLE 63.—*Wrecks and casualties on and near the coasts and on the rivers of the United States, &c.*—Continued.

(4.) OTHER CAUSES—Continued.

Date of disaster.	Name of vessel.	Description of vessel.	Tons.	Port sailed from.	Port bound to.	Whether resulting in total or partial loss.	Nature of cargo.	Number of lives lost.	Place of disaster.	Nature of casualty.
1879.										
Dec. 27	Prairie City	Am. str	122	Wabash Switch, Ill.	New Harmony, Ind	Total	Miscellaneous.	3	Hodges' Island, Wabash River.	Explosion of boiler.
—	Harvey C. Mackay	Am. sch	65	Gloucester, Mass	Grand Bank	do	Ballast	10	Grand Bank	Missing.
—	Mary D. Pomeroy	do	115	Crescent City, Cal	San Francisco, Cal	do	Lumber	14	At sea	Do.
1880.										
Jan. 3	Augusta H. Johnson.	do	66	Gloucester, Mass	Grand Bank	No damage	Fish	2	Grand Bank	Left vessel to attend trawls and were never heard of after.
3	C. Fisher	Am. str	76	Pensacola, Fla	Freeport, Fla	Total	Ballast	1	Choctawhatchee Bay, Fla.	Explosion of boiler.
6	T. H. Moore	do	251	Eufaula, Ala	Apalachicola, Fla	No damage	General merchandise.	1	Fort Gaines, Georgia (Chattahoochee River).	Fell overboard trying to jump ashore.
7	Plymouth Rock	Am. sch	97	Gloucester, Mass	Grand Bank	do	Ballast	3	Grand Bank	Left vessel to attend trawls and were never heard of after.
8	Victoria	Am. steam ship.	1,084	Nanaimo, B. C	San Francisco, Cal	Partial	Coal	1	At sea	Washed overboard by heavy sea.
11	Idlewild	Am. str	576	Evansville, Ind	Cairo, Ill	do	Merchandise	5	Ohio River	Explosion of boiler.
13	Wm. H. Van Name	Am. sch	97	York River, Va	New York City	do	Oysters	2	Off Barnegat, N. J	Fell overboard from jib-boom in a gale.
14	Golden Rule	Am. ship	1,195	London, Eng		do	Iron	1	At sea	Fell to deck from mizzen-topgallant yard.
19	Wachusett	do	1,599	San Francisco, Cal	Queenstown, Ireland.	do	Wheat	1	do	Fell from fore-topsail yard to deck.
25	Charmer	Am. str	493	Grand Ecore, La	New Orleans, La	Total	Cotton and molasses.	8	Red River, (2½ miles above mouth) La.	Fire.
25	Shields	do	117			No damage		1	Mississippi River	Fell overboard while loading cotton.
29	J. P. Wyman	Am. sch	165	Boston, Mass	Jacksonville, Fla	do		1	At sea	Fell from topgallant forecastle in gale.
29	Chas. F. Sampson	do	534	Providence, R. I	Baltimore, Md	do	Ballast	1	Off Fire Island Light, N. Y.	Knocked overboard by jibing of spanker boom.
30	Stephen D. Barnes	do	92	York River, Va	New York City	do	Oysters	1	Off Little Egg Harbor, N. J.	Washed from bow of the vessel in a gale.
31	S. R. Lane	do	72	Gloucester, Mass	St. George's Bank	do	Ballast	1	St. George's Bank	Thrown overboard by fore peak downhaul.

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31	Caroline Virginia	do	51	Potomac River	Baltimore, Md	do	Oysters	1	2½ miles below Seven-foot Knoll, Chesapeake Bay.	Knocked overboard by falling boom.
31	Whisper	Am. str	362	New Orleans, La	Plaquemines, La	Partial	General merchandise.	1	Donaldsonville, La., Mississippi River.	Explosion of steam-pipe.
	City of Brooklyn	Am. ship	1,745	Liverpool, Eng	St. John's, New Brunswick.	No damage		1	Mobile Bay, Ala	Fell between decks into the hold.
	Ray R. Sharp	Am. bkne	741	Philadelphia, Pa	Lisbon, Portugal	Total	Grain and staves.	13	At sea	Missing.
Feb. 2	David A. Story	Am. schr	91	Gloucester, Mass	Fishing	No damage	Fish	2	do	Left vessel to attend trawls; storm came up; they were never heard of after.
2	Emma D. Endicott	do	336	Port Limon, Costa Rica.	Progreso, Mexico	do	Hemp	1	Progreso, Mexico	Capsizing of yawl in boarding another vessel.
3	Queen Ann	do	33	In Baltimore Harbor, Md.		do	Oysters	1	Baltimore Harbor, Md	Fell overboard while drunk.
3	T. H. Moore	Am. str	251	Columbia, Ala	Bainbridge, Ga	do	Guano	1	Bainbridge, Ga., Flint River.	Walked overboard at night.
8	Walter Smith	Am. brig	413	Matanzas, Cuba	New York City	Partial	Sugar	1	Lat. 38° 25′ N., long. 73° 20′ W.	Fell overboard from lower yard in gale.
9	Helen W. Almy	Am. bark	314	Honolulu, Sandwich Islands.	San Francisco, Cal.	No damage	Sugar and rice.	1	Lat. 36° 26′ N., long. 24° 41′ W.	Fell overboard from main topsail yard.
10	Bellerophon	Am. schr	86	Gloucester, Mass	Bank Queron	Partial	Fish	2	At sea	Swamping of dory in a snow storm.
12	Ivy	Am. ship	1,243	New Orleans, La	Havre, France	do	Cotton and corn	2	Lat. 44° 10′ N., long. 34° 40′ W.	Washed overboard in a gale.
15	Northern Light	Am. bark	385	San Francisco, Cal.	New Bedford, Mass	No damage	Sperm and whale oil.	1	Near Cape Horn	Fell overboard from aloft in a gale.
19	Bride	Am. schr	8	At work on dredging grounds, Chesapeake Bay.		do	Oysters	1	Off Pool's Island, Chesapeake Bay.	Knocked overboard by handle of windlass.
23	Albemarle	Am. bark	435	Rio de Janeiro, South America.	Baltimore, Md	do	Coffee	1	Near Cape Henry, Va	Fell overboard from main yard.
29	M. W. Drew	Am. schr	165	Jacksonville, Fla	New London, Conn	do	Wood	1	At sea	Knocked overboard by main boom while taking in sail in a gale.
29	J. B. Leeds	do	229	San Francisco, Cal.	Umpqua River, Oreg.	do	Ballast	1	2 miles west of Umpqua, Oreg.	Fell overboard from jib-boom in a gale.
—	Agenora	Am. brig	451	New York City	Havana, Cuba	Total	Coal	9	At sea	Missing.
—	Eliza	Am. schr	74	Perth Amboy, N. J.	New London, Conn	do	do	3	Supposed off New Haven, Conn.	Do.
—	Sarah	do	106	San Francisco, Cal.	Humboldt Bay, Cal	do	Ballast	6	Supposed off Humboldt Bay, Cal.	Do.
Mar. 1	Josephus	do	23	In Baltimore Harbor, Md.		Partial	do	2	Baltimore Harbor, Md	Fire.
3	Joseph M. Fitzpatrick.	do	212	Philadelphia, Pa	Savannah, Ga	No damage	Coal	1	Off Cape Hatteras, N. C.	Fell overboard while reefing mainsail in a gale.
5	Ellen Austin	Am. ship	1,813	London, Eng	New York City	do	General	1	At sea	Fell from mizzen topsail yard while stowing sail.

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TABLE 63.—*Wrecks and casualties on and near the coasts and on the rivers of the United States, &c.*—Continued.

(4.) OTHER CAUSES—Continued.

Date of disaster.	Name of vessel.	Description of vessel.	Tons.	Port sailed from.	Port bound to.	Whether resulting in total or partial loss.	Nature of cargo.	Number of lives lost.	Place of disaster.	Nature of casualty.
1880. Mar. 11	Ann	Am. schr..	41	Baltimore, Md.....	Potomac River....	No damage	Ballast.....	1	Off Lazaretto Point, Baltimore Harbor, Md.	Fell overboard while weighing anchor.
19	Cascatelle.....	Am. brig..	422	Bath, Me.....	Baltimore, Md.....	....do	Ice.....	1	Off Poplar Island, Chesapeake Bay.	Fell overboard.
20	Seth Stockbridge..	Am. schr..	90	Gloucester, Mass..	Grand Bank.....	Partial	Fish	1	At sea	Washed overboard in a gale.
23	Benj. Sewall.....	Am. ship..	1,434	Singapore	New York City....	No damage	General	1	Off Cape of Good Hope, Africa.	Fell from foretopsail yard.
25	Bullion.....	Am. str ...	147	In San Francisco Harbor, Cal.	.....	....do	Coal	1	San Francisco Harbor, Cal.	Block strap parted, and coal-tub fell on him.
27	Jose Rodriguez Lopez.	Am. bkne.	418	Matanzas, Cuba...	Portland, Me.....	Partial	Molasses	1	Lat. 32° 26′ N., long. 78° 40′ W.	Washed overboard in a gale.
28	Henry Warren	....do	348	Portland, Me.....	Montevideo, South America.	No damage	Lumber	1	Lat. 29° 38′ S., long. 44° 7′ W.	Washed off bowsprit.
28	Marion.....	Am. schr..	82	Gloucester, Mass..	Western Bank, Newfoundland.	....do	Ballast.....	2	Western Bank, Newfoundland.	Went out in dory to attend trawls; snow-storm came up, and they were never heard of after.
29	Fannie Butler	Am. sch ..	199	Providence, R. I ..	Savannah, Ga.....	No damage	Hay	1	Off Block Island, R. I....	Knocked overboard by main boom.
30	Colorado.....	Am. str ...	633	Saint Louis, Mo...	Memphis, Tenn ...	....do	.....	1	Kaskaskia Bar, Mississippi River.	Struck on head by falling spar.
—	Annie C. Norwood.	Am. sch ..	60	Gloucester, Mass .	St. George's Bank.	Total	Fish	14	At sea	Missing.
Apr. 1	H. D. Moore.....	....do	143	In Chicago Harbor, Ill.	.....	No damage	Ballast.....	1	Chicago Harbor, Ill	Fell from topmast rigging to deck.
1	Chicago	Am. str ...	747	Manitowoc, Wis ..	Chicago, Ill	....do	General.....	1	Manitowoc, Wis., Lake Michigan.	Struck by crank.
6	Goshawk	Am. sch ..	550	Chicago, Ill	Erie, Pa	....do	Wheat.....	1	40 miles north of Chicago, Lake Michigan.	Fell overboard while reefing mizzen-sail in snow storm.
7	Calliope	Am. str ...	143	Lying at dock in Portland Harbor, Oreg.	.....	....do	Ballast	1	Portland, Oreg.....	Fell overboard.

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	10	City of Augusta	....do	310	Lying at Simmesport, La.		....do		1	Simmesport, Atchafalaya River, La.	Fell overboard while loading vessel.
	10	Pleiades	Am. ship	1,154	Liverpool, Eng.	Portland, Me	....do	Salt	1	Near entrance English Channel.	Fell overboard.
	10	Washington	Am. str	53	Hermann, Mo	Across river	Total	Ballast	1	Hermann, Mo., Missouri River.	Fire.
	10	Elizabeth Jones	Am. sch	636	Buffalo, N. Y	Chicago, Ill	No damage	Coal	1	1½ miles east of Tawas Point, Lake Huron.	Fell overboard while heaving lead in snow-storm.
	11	Ada Carter	Am. bark	435	Porto Rico, W. I	Boston, Mass	....do	Sugar	1	Off Boston Light, Mass.	Washed overboard from jib-boom while furling sail in squall.
	12	Jane Louisa	Am. barge	25	New River, N. C	Norfolk, Va	....do	Lumber	1	North Landing River, Va.	Rope broke in towing.
	15	E. L. Rowe	Am. sch	69	Gloucester, Mass	St. George's Bank	....do	Ballast	1	Isle au Haut, Me	Fell overboard while putting up lantern.
	15	H. B. Plant	Am. str	288	Jacksonville, Fla	Palatka, Fla	....do		1	Palatka, Fla., Saint John's River.	Fell overboard, not having observed removal of rail.
	16	Miami Belle	Am. sch	269	Buffalo, N. Y	Toledo, Ohio	....do	Ballast	1	4 miles below Point Abino, Lake Erie.	Fell out of yawl while lowering it.
	16	Garibaldi	....do	16	Unknown	Unknown	....do		1	Off Racine, Wis., Lake Michigan.	Unknown.
	16	L. A. Burnham	Am. yacht	389	Pensacola, Fla	Boston, Mass	....do	Lumber	1	Near Tortugas, Fla	Do.
	18	Grace M. Filer	Am. sch	237	Chicago, Ill	Menominee, Mich	Partial	Ballast	1	10 miles west of Beaver Point, Lake Michigan.	Knocked overboard by mainsail.
	18	Ernest	Am. brig	242	Portland, Me	Guadeloupe, W. I	No damage	Shooks and heads.	1	Off Cape Elizabeth, Me	Fell overboard from bowsprit.
	20	Sunny South	Am. sch	45	Baltimore, Md	Rappahannock River, Va.	....do	Ballast	1	1 mile below Lazaretto Point, Baltimore Harbor	Knocked overboard by jibing of jib-sheet.
	20	Florence	Am. brig	334	New London, Conn	New York City	....do	....do	1	Off Captain's Island, Long Island Sound.	Knocked off forecastle by jib-sheets.
	20	George V. Jordan	Am. sch	697	Boston, Mass	Bath, Me	....do	....do	1	Kennebec River, Me	Knocked overboard by jibing of spanker-boom.
	21	L. B. Coates	....do	207	Muskegon, Mich	Chicago, Ill	....do	Lumber	1	5 miles north of Milwaukee, Lake Michigan.	Fell overboard from main cross-trees.
	24	Annie Laurie	Am. str	21	New Orleans, La	Gretna, La	Total	Ballast	1	Gretna, La., Mississippi River.	Explosion of boiler.
	25	S. W. Smith	....do	320	In Baltimore Harbor, Md.		No damage	....do	1	Locust Point, Baltimore Harbor, Md.	Walked overboard while drunk.
	28	Sunnyside	Am. sch	563	Cleveland, Ohio	Chicago, Ill	....do	Coal	1	Chicago Harbor, Ill	Slipped and fell overboard.
	—	Carl D. Lothrop	....do	293	Philadelphia, Pa	St. John, N. B	....do	....do	1	Delaware Bay	Fell overboard getting the boat to davits.
May	6	Nellie V. Rokes	....do	296	New London, Conn	Race Rock, Long Island Sound.	....do	Ballast	2	Near Race Rock, Long Island Sound.	Knocked overboard by spanker-boom in squall.
	6	Ivy	Am. ship	1,243	Havre, France	New York City	....do	....do	1	Off Sable Island	Fell overboard during gale.

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TABLE 63.—*Wrecks and Casualties on and near the Coasts and on the Rivers of the United States, &c.*—Continued.

(4.) OTHER CAUSES.

Date of disaster.	Name of vessel.	Description of vessel.	Tons.	Port sailed from.	Port bound to.	Whether resulting in total or partial loss.	Nature of cargo.	Number of lives lost.	Place of disaster.	Nature of casualty.
1880.										
May 6	Alice Knowles	Am. bark	303	Tristan d'Acunha, South Atlantic Ocean.	Whaling cruise	No damage	Whale-oil	1	St. Helena Island, South Atlantic Ocean.	Fell overboard from boat while fast to a whale.
7	Maggie Thompson	Am. sch	156	Chicago, Ill	White Lake, Mich.	do	Ballast	1	Chicago Harbor, Ill	Capsizing of small boat.
7	Isaac L. Adkins	do	47	Baltimore, Md	Potomac River	do	do	1	Chesapeake Bay (mouth of Potomac River).	Fell overboard while in a fit.
13	Stina Nicolaison	do	45	San Francisco, Cal.	Rough and Ready, Cal.	do	do	1	Off Point Reyes, Cal	Fell overboard while reefing mainsail.
14	Lulu Worth	Am. str	71	Saint Louis, Mo	Hatchie River, Tenn.	do	do	1	95 miles from mouth of Hatchie River, Tenn.	Fell overboard while standing on chair on deck.
15	John McDermott	Am. brig	564	New Orleans, La	Almeria, Spain	Partial	Staves	1	At sea	Hurricane.
23	City of Knoxville	Am. str	233	Chattanooga, Tenn	Excursion	No damage	Ballast	1	Tennessee River (mouth of Soddy Creek).	Fell overboard while drunk.
25	Reno	Am. sch	142	New York City	Newburyport, Mass.	do	Coal	1	Near Staten Island	Fell overboard from small boat.
30	Seneca	Am. str	26	In New York Harbor.		Partial	Ballast	1	New York Harbor	Fire.
31	Golden Eagle	do	942	Keokuk, Iowa	Saint Louis, Mo.	Total	Miscellaneous.	3	7 miles below Cap Au Gris, Mississippi River.	Fire.
June 1	Theodore Weems	do	688	Baltimore, Md	Cambridge, Md	No damage	Ballast	1	Near Poplar Island, Chesapeake Bay.	Fell overboard.
3	David Kelley	Am. sch	48	Monroe, Mich	Toledo, Ohio	Partial	Sand	1	3 miles west of Turtle Island, Lake Erie.	Do.
4	Champlain	Am. str	438	Port Huron, Mich.	Chicago, Ill	No damage	General merchandise.	1	35 miles west of Ludington, Mich., Lake Michigan.	Fell overboard at night.
4	Ira H. Owen	do	573	Chicago, Ill	Escanaba, Mich	do	Ballast	1	Milwaukee, Wis	Fell overboard attempting to jump ashore.
5	Charles Wall	Am. sch	629	Cleveland, Ohio	Chicago, Ill	do	do	1	Port Huron, Saint Clair River.	Caught in tow-line and pulled overboard.
11	Susquehanna Canal Co., No. 11.	Am. canal-boat.	250	Columbia, Pa	Baltimore, Md	do	Coal	1	Off Still Pond Point, Chesapeake Bay.	Fell overboard at night.

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12	Gaslight	Am. sch	39	Stockton, Cal	Vallejo, Cal	do	Wheat	2	Whiskey Slough, San Joaquin River, Cal.	Boat swamped by carelessness in letting go of anchor.
17	No name	Row-boat		In New York Harbor.		do		2	Off Castle Garden, N. Y.	Upsetting of boat in getting out of way of a passing steamer.
19	B. F. Lowell	Am. sch	325	Porto Rico, W. I	Boston, Mass	do		1	At sea	Fell overboard.
28	Seawanhaka	Am. str	612	New York City	Hempstead, L. I	Total	Merchandise	24	Ward's Island, N. Y	Fire.

Totals: Vessels, 204; tonnage, 72,891; total losses, 27; partial losses, 34; no damage, 143; lives lost, 408.

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TABLE 64.—*Summary of Wrecks and Casualties on or near the Coasts and on the Rivers of the United States, and at Sea or in Foreign Waters, during the year ending June 30, 1880, involving loss of life.*

Nature of casualties.	Number of vessels.	Tonnage.	Total loss.	Partial loss.	No damage to vessels.	Number of lives lost.
Founderings	15	2,093	12	2	1	65
Strandings	14	3,273	8	5	1	32
Vessels collided	13	4,905	6	4	3	82
Other causes	204	72,891	27	34	143	408
Total	246	83,162	53	45	148	587

NOTE.—In this table are included 170 lives lost in cases where no damage was sustained by the vessel or cargo meeting with such casualty; for example, seamen lost overboard in gales, falling from masts and rigging, knocked overboard by spars, drowned by upsetting of small boats, &c., shown in Table 63.

TABLE 65.—*Principal Places on the Coasts of the United States where Vessels have Stranded during the last ten years.*

ATLANTIC AND GULF COASTS.

Name of place.	Fiscal year ending June 30—										Total.
	1871.	1872.	1873.	1874.	1875.	1876.	1877.	1878.	1879.	1880.	
Absecom, N. J	....	1	....	....	3	2	....	....	....	5	11
Addison, Me	....	....	....	....	....	2	....	....	....	....	2
Ajax Reef, Fla	....	....	....	1	....	....	....	....	....	....	1
Alden Rock, Portland, Me	....	....	....	....	....	1	....	1	....	....	2
Allen Island, Penobscot Bay, Me	....	....	....	....	1	....	....	....	....	....	1
Amagansett, Long Island	....	....	....	....	....	....	....	....	2	....	2
Amazeen Island, N. H	....	....	....	....	1	....	....	....	....	....	1
American Shoal, Florida Reefs	....	....	....	1	....	....	....	2	....	....	3
Anastasia Island, Fla	....	1	....	1	1	....	....	....	....	....	3
Anchorage Island, Little Egg Harbor, N. J	....	....	....	....	....	....	....	....	....	2	2
Annisquam Light (¼ mile east of), Mass	....	....	....	....	....	....	....	1	....	....	1
Aransas, Tex	1	1	....	1	....	1	1	....	1	....	6
Asbury Beach, N. J	....	....	....	....	....	....	....	1	....	....	1
Ash Island, Muscle Ridge Channel, Me	....	....	....	....	....	....	....	1	....	....	1
Ash Island Point, Me	....	....	....	....	....	....	....	....	....	1	1
Ash Point, Lark Ledges, Me	....	....	....	....	....	....	....	....	....	1	1
Assateague Island, Va	....	....	....	....	....	1	....	2	....	....	3
Assawaman Inlet, Va	....	....	....	1	....	....	....	....	....	....	1
Atlantic City, N. J	....	....	....	....	....	....	1	....	1	....	2
Atlanticville, N. J	....	....	....	....	....	....	....	....	1	....	1
Avery's Ledge, Mass	....	....	....	1	....	....	1	....	....	....	2
Back Beach, Me	....	....	....	....	1	....	....	....	....	....	1
Back River Shoals, Chesapeake Bay	....	....	....	....	....	....	....	1	....	3	4
Baker's Island Bar, Mount Desert, Me	....	....	....	....	....	2	....	....	1	....	3
Baker's Island Shoals, Mass	....	....	....	....	....	....	....	....	....	1	1
Bang's Island, Me	....	....	1	....	....	1	....	....	....	....	2
Bantam Ledge, Penobscot Bay, Me	....	....	....	....	....	....	....	1	2	....	3
Barnegat, N. J	2	2	....	3	2	3	2	1	3	2	20
Barnegat Light (4 miles south of), N. J	....	....	....	....	....	....	1	....	....	....	1
Barnegat Light (6 miles south of), N. J	....	....	....	....	....	....	1	....	2	....	3
Bar Harbor, Mount Desert, Me	....	....	....	....	....	....	1	....	....	....	1
Barrett's Point, N. Y	....	....	....	....	....	1	....	....	....	....	1
Barter's Island, Southeast Bay, Me	....	....	....	....	1	....	....	....	....	....	1
Bartlett's Reef, Conn	....	....	....	1	....	....	....	2	2	....	5
Bass Island, Cape Porpoise, Me	....	....	....	....	....	2	....	....	....	....	2
Bass River Breakwater, Cape Cod, Mass	....	1	....	....	....	....	1	....	....	....	2
Bating Hollow Beach, Long Island	....	....	....	....	....	....	1	....	....	....	1
Bayou Lafourche, La	....	....	....	....	....	....	....	....	1	....	1
Bayou Reef, South Pass, La	....	....	....	....	1	....	....	....	....	....	1
Bay Shore, N. J	....	....	1	....	....	....	....	....	....	....	1
Bay View, Cape Ann, Mass	....	....	....	....	1	....	....	....	....	....	1
Beach Haven, N. J	....	....	....	....	....	1	....	....	....	....	1
Beach Island, Penobscot Bay, Me	....	....	....	1	....	....	....	....	....	....	1
Beach Point, Truro, Mass	....	....	....	....	....	....	1	....	....	....	1
Beacon Ledge, Portsmouth, N. H	....	....	....	....	....	....	....	2	....	....	2
Bear Island, Me	....	....	....	....	....	....	....	....	....	1	1

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TABLE 65.—*Principal Places on the Coasts of the United States where Vessels have Stranded, &c.*—Continued.

ATLANTIC AND GULF COASTS—Continued.

Name of place.	Fiscal year ending June 30—										Total.
	1871.	1872.	1873.	1874.	1875.	1876.	1877.	1878.	1879.	1880.	
Bearse's Shoal, Cape Cod, Mass	....	....	....	1	....	....	....	....	....	....	1
Beaufort, N. C	....	1	....	....	2	1	1	....	....	4	9
Beaufort, S. C	....	....	....	1	....	....	....	1	....	....	2
Beaver Tail Point, R. I	2	1	....	1	1	1	1	....	....	....	7
Bedloe's Island Reef, New York Bay	....	....	....	....	....	....	....	....	1	1	2
Beermore Ledge, Cape Ann, Mass	....	....	....	....	....	....	1	....	....	....	1
Berkley Flats, Norfolk, Va	....	....	....	....	....	....	....	....	....	4	4
Biddeford Pool, Me	....	....	....	1	....	....	....	....	....	....	1
Billingsgate Shoal, Cape Cod Bay, Mass	....	....	....	....	....	....	....	....	2	....	2
Birch Point, Sheepscot River, Me	....	....	....	....	....	....	....	....	1	....	1
Birch Point, Weskeag River, Me	....	....	....	....	....	1	....	....	....	....	1
Bird Island, Galveston Bar, Tex	....	....	....	....	....	....	....	....	1	....	1
Bishop and Clerk's Shoal, Mass	....	....	....	....	1	....	2	....	1	....	4
Black Head (off), Me	....	....	....	....	....	....	....	1	....	....	1
Black Island, Me	....	....	....	....	1	....	....	....	....	....	1
Black Ledge, New London, Conn	....	....	....	....	....	1	1	....	....	1	3
Black Rock, New London, Conn	....	....	....	....	....	2	2	....	....	....	4
Black Rock, Newburyport, Mass	....	....	....	....	....	....	....	....	1	....	1
Black Rock, Rye Beach, N. H	....	....	....	....	....	....	....	....	....	1	1
Blackwell's Island, N. Y	....	....	....	1	....	....	....	1	....	1	3
Block Island, Rhode Island	1	....	2	....	4	3	1	4	....	....	15
Block Island (Grove Point), R. I	....	....	....	....	....	....	....	....	....	1	1
Block Island Breakwater, R. I	....	....	....	....	....	....	....	....	....	1	1
Block Island (northeast end of), R. I	....	....	....	....	....	....	....	....	1	....	1
Block Island (northwest part of), R. I	....	....	....	....	....	....	....	....	1	....	1
Block Island (southeast point of), R. I	....	....	....	....	....	....	....	1	....	....	1
Block Island (southwest shore of), R. I	....	....	....	....	....	....	2	....	2	....	4
Block Island (west side), R. I	....	....	....	....	....	....	....	....	4	....	4
Blue Rock, R. I	....	....	....	....	....	....	....	....	1	....	1
Bluff Island, Saco Bay, Me	....	....	....	....	....	1	....	....	....	....	1
Bodkin Bar, Chesapeake Bay, Md	....	....	....	1	....	....	1	....	....	....	2
Bodie's Island Light, N. C	....	....	....	1	....	....	....	....	....	....	1
Bogue Inlet, N. C	....	....	....	....	....	....	1	....	....	....	1
Bogue Island, N. C	....	....	....	....	....	....	1	....	....	....	1
Boisbubert Island, Me	....	....	....	....	1	....	....	....	....	....	1
Bolivar Beach, Tex	1	....	....	....	....	1	....	....	....	....	2
Bombay Hook, Delaware Bay	....	....	....	....	....	....	1	1	....	....	2
Boon Island, Me	....	....	1	1	....	....	....	....	....	1	3
Boon Island Ledge, Me	....	....	....	....	....	....	....	....	....	3	3
Booth Bay, Me	....	....	....	1	1	....	....	1	....	....	3
Boston, Mass	..	....	....	....	....	....	....	....	....	1	1
Bowdoinham Bar, Me	....	....	....	....	....	....	....	....	1	....	1
Bower's Beach, Delaware Bay, Del	....	....	....	....	....	....	....	1	....	....	1
Brace's Cove, Cape Ann, Mass	....	....	....	....	....	....	....	....	....	2	2
Brace's Cove Point, Cape Ann, Mass	....	....	....	....	....	....	....	1	....	....	1
Brandywine Shoal, Delaware Bay	....	....	....	2	3	1	1	....	2	2	11
Branford Reef, Long Island Sound	....	....	....	....	....	....	1	1	....	....	2
Brant Island, Pamlico Sound, N. C	....	....	....	....	....	1	....	....	....	....	1
Brant Point, Cape Cod, Mass	....	....	....	....	....	....	....	....	1	....	1
Brazos Bar, Tex	....	1	....	....	....	1	....	1	3	....	6
Brazos de Santiago, Tex	....	....	....	....	4	....	....	....	1	....	5
Breaking Ledge, Me	....	....	....	....	1	....	....	....	....	....	1
Brenton's Reef, R. I	....	....	1	1	....	....	1	....	1	2	6
Brewster Breakwater, Mass	....	....	....	....	....	....	....	....	1	....	1
Brewster Islands, Boston Harbor, Mass	....	....	....	....	....	....	....	....	2	....	2
Brewster's Reef, Fla	....	....	....	1	....	....	....	....	....	....	1
Bridgehampton Beach, Long Island, N. Y	....	....	....	....	....	....	1	....	....	....	1
Brigadier Island, Penobscot Bay, Me	....	....	....	....	....	....	....	1	....	....	1
Brigantine, N. J	2	....	2	6	1	2	1	1	3	....	18
Brigantine Beach, N. J	....	....	....	....	....	....	....	....	....	1	1
Brimstone Point, N. J	....	....	....	....	....	....	....	1	....	....	1
Broad Cove Rock, Casco Bay, Me	....	....	....	....	....	....	....	....	....	1	1
Broadkill River (mouth of), Del	....	....	....	....	....	....	....	....	1	....	1
Browney Island, Me	....	....	....	....	....	1	....	....	....	....	1
Browney Island Ledge, Me	....	....	....	....	....	....	....	....	....	1	1
Brown's Cove, North Haven Island, Me	....	....	....	....	....	....	....	....	....	1	1
Brown Ledges, Penobscot Bay, Me	....	....	....	....	1	....	....	....	2	....	3
Buckle's Island Harbor, Me	....	....	....	....	....	1	....	....	....	....	1
Bull Rock, Boston Bay, Mass	....	....	....	1	....	....	....	....	....	....	1
Bull Rock, Carver Harbor, Me	....	....	....	....	....	....	....	1	....	....	1
Bull's Island Shoal, S. C	....	....	....	....	....	....	....	....	1	....	1
Burnt Island, Seal Harbor, Me	....	....	....	....	....	....	....	....	2	....	2
Calcasieu Bar, La	....	....	....	....	....	....	....	....	1	....	1
Calf Island, Boston Harbor, Mass	....	....	....	....	....	....	2	....	....	....	2
Caney Creek, Tex	....	....	....	....	1	....	....	....	....	....	1

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TABLE 65.—*Principal Places on the Coasts of the United States where Vessels have Stranded, &c.*—Continued.

ATLANTIC AND GULF COASTS—Continued.

Name of place.	Fiscal year ending June 30—										Total.
	1871.	1872.	1873.	1874.	1875.	1876.	1877.	1878.	1879.	1880.	
Cape Ann, Mass	1	....	....	....	....	....	1	1	....	....	3
Cape Arundel, Me	....	....	....	....	1	....	....	....	....	....	1
Cape Canaveral, Fla	....	1	....	....	....	....	....	....	....	....	1
Cape Canaveral (15 miles south of), Fla	....	....	....	....	....	....	....	....	1	....	1
Cape Canaveral (25 miles north of), Fla	....	....	....	....	....	....	....	....	....	1	1
Cape Charles, Va	....	....	....	1	....	....	....	....	1	1	3
Cape Cod, Mass	1	....	1	....	....	....	1	....	....	....	3
Cape Elizabeth, Me	....	....	....	1	1	2	1	....	....	1	6
Cape Fear, N. C	....	....	....	1	....	....	....	....	....	1	2
Cape Fear River (mouth of), N. C	....	....	....	....	2	1	1	1	....	2	7
Cape Florida Light-house	....	....	....	....	....	....	1	....	....	....	1
Cape Hatteras, N. C	1	2	2	....	1	3	....	....	1	2	12
Cape Henlopen, Del	....	....	....	5	1	5	5	....	1	3	20
Cape Henlopen (5 miles south of), Del	....	....	....	....	....	....	1	....	....	....	1
Cape Henlopen (7 miles south of), Del	....	....	....	....	....	....	....	1	....	....	1
Cape Henry, Va	....	....	....	....	3	1	6	2	2	2	16
Cape Island, Me	....	....	....	....	....	....	....	....	....	1	1
Cape Lookout, N. C	....	1	1	1	2	1	....	1	2	1	10
Cape May, N. J	....	....	3	1	2	1	1	....	2	2	12
Cape Poge, Mass	....	....	....	2	....	1	1	....	2	....	6
Cape Porpoise, Me	....	1	....	....	1	....	....	....	....	1	3
Cape Romain, S. C	....	....	....	....	....	1	....	....	....	....	1
Cape Romano, Fla	....	....	....	....	....	....	....	....	1	....	1
Cape San Blas, Fla	....	....	....	....	....	1	....	1	....	....	2
Cape Small Point, Me	....	....	....	1	....	....	....	....	....	1	2
Captain's Island, Long Island Sound	....	....	....	....	....	....	....	1	....	....	1
Caroline Shoal, N. C	....	....	....	1	....	....	....	....	....	....	1
Carter's Bar, Va	....	....	....	....	....	1	....	....	....	....	1
Carysfort Reef, Florida Reefs	....	....	....	....	1	....	....	....	....	1	2
Castle Hill, R. I	....	....	....	....	....	....	1	....	....	....	1
Cedar Hammock, N. C	....	....	....	....	....	....	3	....	....	....	3
Cedar Island, Va	....	....	....	1	....	1	....	....	....	....	2
Cedar Keys, Fla	1	....	1	....	....	....	....	1	....	....	3
Cedar Point, Chesapeake Bay, Md	....	....	....	....	....	....	....	....	2	....	2
Cedar Tree Neck, Vineyard Sound, Mass	....	....	....	....	1	....	....	....	....	....	1
Chandeleur Island, La	....	....	....	....	1	....	....	....	....	1	2
Chandeleur Island Light (4 miles southeast of), La	....	....	....	....	....	1	....	....	....	....	1
Chandeleur Island Light (14 miles southwest of), La	....	....	....	....	....	....	1	....	....	....	1
Chappaquiddick Point, Martha's Vineyard, Mass	....	....	....	....	....	....	....	....	1	....	1
Charles Island, Conn	....	....	....	....	1	....	....	....	....	....	1
Charleston Bar, S. C	....	....	....	1	1	....	....	....	1	1	4
Charleston Harbor, S. C	....	....	....	....	....	2	....	....	....	....	2
Charlotte Harbor, Fla	....	....	....	....	....	....	....	1	....	....	1
Chatham, Mass	....	....	....	....	1	....	....	1	....	2	4
Chatham Bar, Cape Cod, Mass	2	1	6	2	....	5	....	2	2	....	20
Chebeag Islands, Casco Bay, Me	....	....	....	....	....	1	1	....	....	....	2
Cherrystone Inlet, Va	....	....	....	....	....	....	1	....	....	....	1
Cherrystone Inlet (5 miles above), Va	....	....	....	....	....	1	....	....	....	....	1
Chincoteague Island, Va	1	....	....	1	....	....	....	....	....	....	2
Chincoteague Shoals, Va	....	....	....	....	....	1	1	....	1	1	4
City Island, Long Island, N. Y	....	....	....	....	....	....	1	1	2	....	4
Clapboard Island, Casco Bay, Me	....	....	....	....	....	1	....	....	....	....	1
Clapboard Island Ledge, Casco Bay, Me	....	....	....	....	....	1	....	....	....	....	1
Clark's Island, Me	....	....	....	....	1	....	....	....	1	....	2
Clark's Island, Portsmouth, N. H	....	....	....	....	....	1	....	1	....	....	2
Clay Head, Block Island Sound	....	....	....	....	....	....	....	....	1	....	1
Cobb's Island, Va	1	....	....	....	....	....	1	1	1	....	4
Cobscook Bay, Me	....	....	....	....	....	....	1	....	....	....	1
Coffee Island, Ga	....	....	....	....	....	....	....	....	....	1	1
Cohasset Rocks, Mass	....	....	....	....	....	....	....	....	1	....	1
Cold Spring Inlet, N. J	....	1	1	2	2	1	6	2	5	2	22
Collins Beach, Delaware Bay, Del	....	....	....	....	....	....	....	....	1	....	1
Common Flats, Cape Cod, Mass	....	....	....	1	....	....	....	....	4	....	5
Conanicut Island, R. I	....	....	2	....	1	....	....	....	1	....	4
Coney Island, N. Y	....	....	1	....	....	....	1	....	....	....	2
Copp's Island, Conn	....	....	....	....	1	....	....	....	....	....	1
Coral Reef, Florida Reefs	....	....	1	....	....	....	....	....	....	....	1
Corson's Inlet, N. J	....	....	1	....	....	....	....	....	....	....	1
Couch Reef, Florida Reefs	....	....	....	....	....	....	2	....	....	....	2
Cove Beach, Va	....	....	....	....	....	....	....	....	....	1	1
Cove Harbor, Stamford, Conn	....	....	....	....	....	....	....	....	....	1	1
Cove Point, Chesapeake Bay, Md	....	....	....	....	....	1	1	....	....	....	2
Cow Shoal, Conn	....	....	....	....	....	....	....	1	....	....	1
Cox's Head, Me	....	....	....	....	....	1	....	....	....	....	1
Cox's Shoal, N. J	....	....	1	....	....	....	....	....	....	....	1

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TABLE 65.—*Principal Places on the Coasts of the United States where Vessels have Stranded, &c.*—Continued.

ATLANTIC AND GULF COASTS—Continued.

Name of place.	Fiscal year ending June 30—										Total.
	1871.	1872.	1873.	1874.	1875.	1876.	1877.	1878.	1879.	1880.	
Crab Meadow, Long Island Sound	....	....	1	....	....	....	....	....	....	....	1
Crabtree Point, North Haven, Me	....	....	....	....	....	....	1	....	....	....	1
Cranberry Island, Me	....	....	....	....	....	2	1	2	....	....	5
Cranberry Island Light, Petty Pan Reef, Me	....	....	....	....	....	1	....	....	....	....	1
Crane's Neck Point, Long Island, N. Y	....	....	....	....	....	....	....	1	....	....	1
Craney Island, Hampton Roads, Va	....	....	....	....	....	....	....	....	....	1	1
Crocker's Reef, Fla	....	....	....	1	....	....	....	....	....	....	1
Cross Island, Machias Bay, Me	2	....	....	2	....	....	....	....	1	....	5
Crow Shoal, Delaware Bay, Del	....	....	....	....	....	....	....	....	2	....	2
Cuckolds (The), Me	....	....	....	2	....	....	....	....	....	....	2
Cumberland Island, Ga	....	....	....	1	....	....	....	....	....	....	1
Currituck Beach, N. C	1	....	2	2	1	....	....	1	....	....	7
Curtis Island, Conn	....	....	....	....	....	1	....	....	....	....	1
Cushing Island, Casco Bay, Me	....	....	....	....	....	....	1	....	....	....	1
Cutler, Me	2	....	....	1	....	....	....	1	....	2	6
Cuttyhunk Island, Mass	....	2	....	....	2	3	4	2	1	1	15
Damiscove Island, Me	....	....	....	....	....	....	1	....	....	....	1
Davis Neck, Mass	....	....	....	....	2	....	....	....	....	....	2
Davis Shoal, Florida Reefs	....	....	....	....	2	....	....	....	....	....	2
Deal Beach, N. J	....	....	....	....	....	2	1	2	1	....	6
Dearmon Ledge, near Gloucester, Mass	....	....	....	....	....	....	1	....	....	....	1
Decros Point, Tex	....	....	....	....	....	1	....	....	....	....	1
Decros Point (3½ miles east of), Tex	....	....	....	....	....	....	....	....	....	1	1
Delaware Breakwater, Del	2	1	....	1	2	2	1	2	3	1	15
Dennisport, Mass	....	....	....	....	....	....	....	1	....	8	9
Despair Island, Narragansett Bay	....	....	....	....	....	....	1	....	....	....	1
Devil's Back, Boston Harbor, Mass	....	....	....	....	....	....	1	....	1	1	3
Diamond Shoals, Cape Hatteras, N. C	....	....	....	....	....	1	....	3	2	1	7
Dick's Flat, Mass	....	....	....	....	1	....	....	....	....	....	1
Dighton, Mass	....	....	....	....	....	....	....	....	....	1	1
Dixie Island, Mobile Bay, Ala	....	....	....	....	....	....	....	....	....	1	1
Dog Island, Fla	....	....	....	....	....	....	....	....	....	1	1
Dogfish Ledges (entrance to Cross Island Narrows), Me	....	....	....	....	....	....	....	1	....	....	1
Dow Ledges, Deer Island Thoroughfare, Me	....	....	....	....	....	....	....	....	....	1	1
Dread Ledge, Mass	....	....	....	1	....	....	....	....	....	....	1
Drinkwater Point, Me	....	....	....	....	....	....	....	1	....	....	1
Duck Island, Mass	....	....	....	....	1	....	....	1	....	....	2
Duck Key, Florida Reefs	....	....	....	....	....	....	1	....	....	....	1
Duck Ledges, Me	....	....	....	....	1	....	....	....	....	....	1
Dumpling Rock, Buzzard's Bay, Mass	....	....	....	....	....	1	....	....	....	....	1
Dutch Island, R. I	....	....	....	1	....	2	1	1	3	....	8
East Bank (off Coney Island), N. Y	....	....	....	....	....	....	....	1	....	....	1
East Chop, Vineyard Haven, Mass	....	....	....	....	2	....	1	....	1	1	5
Eastern Egg Rock (near Moos-a-bec Light), Me	....	....	....	....	....	....	....	....	1	....	1
East Hampton, Long Island, N. Y	....	....	....	....	....	....	....	....	....	2	2
East Orleans, Mass	....	....	....	....	....	....	....	....	1	....	1
Eaton's Neck, Long Island, N. Y	....	....	....	1	....	....	....	....	3	1	5
Edgartown Harbor, Mass	....	....	....	....	....	....	....	2	4	1	7
Egg Harbor Bar, N. J	....	....	....	....	....	....	....	....	....	1	1
Egg Island, Altamaha Sound, Ga	....	....	....	....	....	....	....	....	1	....	1
Egg Rock (near Browney Island), Me	....	....	....	....	....	....	....	....	1	....	1
Eldridge's Shoal, Vineyard Sound, Mass	....	....	....	....	....	1	....	....	....	....	1
Elihu's Island, Pawtucket Bay, R. I	....	....	....	....	....	1	....	....	....	....	1
Emery's Point, Me	....	....	....	1	....	....	....	....	....	....	1
Execution Rocks, Long Island Sound	....	....	....	....	....	....	....	....	....	1	1
Falkner's Island, Long Island Sound	....	....	....	....	....	1	....	....	1	....	2
Fall River, Mass	....	....	....	....	....	3	....	....	1	....	4
Falmouth, Mass	....	....	....	....	....	....	....	1	1	....	2
False Cape, Va	....	....	....	....	2	....	....	1	1	1	5
Federal Point, N. C	....	....	....	....	....	....	....	....	....	1	1
Fenwick's Island, Md	....	....	....	....	....	....	1	4	1	1	7
Fernandina Bar, Fla	....	....	....	....	1	....	....	....	....	....	1
Fiddler's Ledge, Fox Island, Me	....	....	....	....	....	....	....	....	....	1	1
Fingers (The), N. C	....	....	....	....	....	....	....	....	....	1	1
Fire Island, Long Island, N. Y	....	....	2	1	2	4	....	....	3	1	13
Fire Island Light (8 miles east of), Long Island, N. Y	....	....	....	....	....	1	....	1	....	....	2
Fire Island, Penobscot Bay, Me	....	....	....	....	....	1	....	....	....	....	1
Fisher's Island, Long Island Sound	....	....	....	3	1	1	1	1	1	....	8
Fisherman's Inlet, Cape Charles, Va	....	....	....	....	....	....	1	....	....	....	1
Fisherman's Island, Me	....	....	....	1	....	1	....	....	1	....	3
Fishing Creek Shoal, Delaware Bay, N. J	....	....	....	....	....	....	....	....	....	1	1
Fishing Island, N. H	....	....	....	....	1	....	....	....	....	....	1
Fishing Point, Assateague Island, Va	....	....	....	....	....	....	....	....	1	....	1
Five Mile Beach, N. J	....	....	....	....	....	....	1	....	1	....	2
Flander's Bay, Long Island, N. Y	....	....	....	....	1	....	....	....	....	....	1

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TABLE 65.—*Principal Places on the Coasts of the United States where Vessels have Stranded, &c.*—Continued.

ATLANTIC AND GULF COASTS—Continued.

Name of place.	Fiscal year ending June 30—										Total.
	1871.	1872.	1873.	1874.	1875.	1876.	1877.	1878.	1879.	1880.	
Flat Rock, New Haven, Conn	....	....	....	....	....	....	....	....	....	1	1
Flatty Creek Bar, Albemarle Sound	....	....	....	....	....	....	....	....	1	....	1
Fletcher's Neck, Me	....	....	....	....	1	....	....	....	....	....	1
Florida Reefs	2	....	....	1	....	....	1	1	....	....	5
Flye Island Light-house, Me	....	....	....	....	....	1	....	....	....	....	1
Folly Island, Cape Porpoise, Me	....	....	....	....	....	1	....	....	....	....	1
Fort Green, R. I	....	....	....	....	....	1	....	....	....	....	1
Fort Island, Me	....	....	....	1	....	....	....	....	....	....	1
Fort Macon, N. C	....	....	....	....	1	....	....	....	....	....	1
Fort Picken's Point, Fla	....	....	....	....	....	....	....	....	1	....	1
Fort Point Rock, Gloucester Harbor, Mass	....	....	....	....	....	....	1	....	....	....	1
Fort Pond Bay, Long Island, N. Y	....	....	....	1	....	....	....	....	....	....	1
Fort Preble, Cape Elizabeth, Me	....	....	....	....	....	1	....	....	....	....	1
Fort Taylor, Fla	....	....	....	....	1	....	....	....	....	....	1
Foster's Island, Me	....	....	....	....	....	....	....	....	....	1	1
Fowey Rocks, Florida Reefs	....	....	....	....	....	....	....	1	....	....	1
Franklin Island Light, Me	....	....	....	....	1	....	....	....	....	....	1
French Reef, Florida Reefs	....	....	1	....	1	....	....	....	1	....	3
Freshwater Cove, Mass	....	....	....	1	....	....	....	....	....	....	1
Frying Pan Shoals, N. C	1	....	....	....	....	....	....	2	....	....	3
Gallup's Island, Boston Harbor, Mass	....	....	....	....	1	....	....	....	1	....	2
Galveston, Tex	3	2	....	2	....	1	2	2	....	1	13
Galveston Bar, Tex	....	....	....	....	....	....	....	....	....	1	1
Galveston Island, Tex	....	....	....	....	....	3	....	....	....	....	3
Gangway Ledge, Muscle Ridge Channel, Me	....	....	....	....	....	....	....	....	....	1	1
Gangway Rock (off Watch Hill), R. I	....	....	....	....	....	1	....	....	....	....	1
Gardiner's Island, Long Island Sound	....	....	....	....	1	....	1	1	....	5	8
Gardiner's Island (west side), Long Island Sound	....	....	....	....	....	....	....	....	....	1	1
Gay Head, Martha's Vineyard, Mass	....	1	....	....	....	....	1	....	....	1	3
George's Island, Boston Harbor, Mass	....	....	....	....	1	....	1	....	....	....	2
George's Island, Me	....	....	1	....	....	....	....	....	....	1	2
Georgetown Harbor, S. C	....	3	1	....	....	2	....	2	....	....	8
Gerrish's Island, Portsmouth Harbor, N. H	....	....	....	....	....	1	....	....	....	....	1
Gilgo Inlet Bar, Long Island, N. Y	....	....	....	....	....	....	....	1	....	....	1
Gloucester, Mass	....	....	....	....	....	4	1	2	2	1	10
Glover's Rock, Me	....	....	....	....	....	....	1	....	....	....	1
Goat Island, Cape Porpoise, Me	....	....	....	....	....	3	....	1	....	....	4
Goat Island, R. I	....	....	....	1	....	....	....	....	....	....	1
Goose Island, Long Island Sound	....	....	....	....	....	1	....	....	....	1	2
Gooseberry Island, R. I	....	....	....	....	....	....	....	....	....	1	1
Goose Rocks, Kennebunkport, Me	....	....	....	....	....	....	....	....	1	....	1
Goshen Reef, Long Island Sound, Conn	....	....	....	....	1	2	1	....	1	....	5
Gould Island, R. I	....	....	....	....	....	....	....	....	....	1	1
Governor's Run, Chesapeake Bay	....	....	....	....	....	....	....	....	....	1	1
Grand Grozier Shoal, La	....	....	....	....	....	....	....	....	....	1	1
Graves (The), Boston Harbor, Mass	....	....	....	....	3	....	....	....	....	....	3
Great Cranberry Island, Me	....	....	....	....	....	....	....	....	....	1	1
Great Egg Harbor, N. J	....	1	....	1	....	1	....	1	1	1	6
Great Fawn Bar, Boston Bay, Mass	....	....	....	1	....	....	1	....	1	1	4
Great Island Shoal, Portsmouth, N. H	....	....	....	....	....	....	1	....	....	....	1
Great Rock, (near Seaconett), R. I	....	....	....	....	....	1	....	....	....	....	1
Greenbury's Point, Chesapeake Bay, Md	....	....	....	....	....	....	....	....	1	....	1
Green Island, Boston Harbor, Mass	....	....	....	....	1	....	....	....	....	....	1
Green Island Ledge, Casco Bay, Me	....	....	....	....	....	1	1	....	....	....	2
Green Island Reef, Me	....	....	....	....	....	....	....	....	....	1	1
Green Island, N. J	....	....	....	....	....	....	....	....	....	1	1
Green Run Inlet, Md	....	....	....	....	1	....	1	1	1	....	4
Greenport, N. Y	....	....	....	....	....	....	....	1	....	....	1
Greenwich Point, Conn	....	....	....	....	....	....	....	....	....	2	2
Grindstone Ledge, Muscle Ridge Channel, Me	....	....	....	....	....	....	....	1	....	....	1
Guilford, Conn	....	....	....	....	1	....	....	....	....	1	2
Gull Rock, Long Island Sound	....	....	....	1	....	....	....	....	....	....	1
Gull Rock, Newport Harbor, R. I	....	....	....	....	2	....	....	....	....	....	2
Gull Rock, Pamlico Sound, N. C	....	....	....	....	....	....	1	....	....	....	1
Gun Rock, Lubec Narrows, Me	....	....	....	....	....	1	....	1	....	....	2
Gurnet, Mass	....	....	....	....	....	....	1	....	....	....	1
Hadlock's Point, Me	....	....	....	....	....	....	....	....	....	1	1
Half Tide Rock, New Haven, Conn	....	....	....	....	....	....	....	....	....	1	1
Halibut Point, Mass	....	....	....	....	....	....	....	....	2	....	2
Hampton Bar, Va	....	....	....	....	....	1	2	....	....	1	4
Hampton Beach, N. H	....	....	....	....	....	....	....	1	....	....	1
Handkerchief Shoal, Mass	....	....	....	....	2	....	....	....	1	3	6
Harbor Island, Me	....	....	....	....	....	1	....	....	....	....	1
Harbor Island Bar, N. C	....	....	....	....	....	....	....	....	1	....	1
Harding's Ledge, Boston Bay, Mass	....	....	....	....	....	1	....	....	....	2	3

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TABLE 65.—*Principal Places on the Coasts of the United States where Vessels have Stranded, &c.*—Continued.

ATLANTIC AND GULF COASTS—Continued.

Name of place.	Fiscal year ending June 30—										Total.
	1871.	1872.	1873.	1874.	1875.	1876.	1877.	1878.	1879.	1880.	
Harding's Beach, Cape Cod Bay, Mass						1					1
Hart Island, Long Island Sound		1		2	1	2	2				8
Haskell's Island, Me						1					1
Hatchett's Point (1 mile west of), Conn							1				1
Hatchett s Reef, Long Island Sound, Conn									1		1
Hatteras Inlet, N. C						2	4	3		3	12
Hawes' Shoal, Vineyard Sound, Mass							1		1		2
Hawkins' Point, Chesapeake Bay, Md					1						1
Hay Island Ledge, Seal Harbor, Me								1	1		2
Head Harbor Island, Me				1				1			2
Hedge Fence Shoal, Vineyard Sound, Mass					2	1	2	1	1	1	8
Hell Gate, N. Y			3	4	6	6	5	3	1	1	29
Hell Gate (Hallet's Point), N. Y										1	1
Hell Gate (Negro Head), N. Y										1	1
Hell Gate (Steep Rock), N. Y						1	1				2
Hen and Chickens Shoal, Del		1						1			2
Henry's Point, Castine Harbor, Me									1		1
Hereford Inlet, N. J				3	1	3	1	1			9
Hereford Light (6 miles northeast of), N. J									1		1
Heron Island Point, Me								1		1	2
Heron Neck (ledge near), Me										1	1
Herring Bay, Chesapeake Bay, Md					2			1			3
Herring Gut, Me							2	1			3
Highlands, N. J					1					1	2
Highland Light, Cape Cod, Mass				1			1				2
Hillsborough Inlet, Fla							1				1
Hills' Point, Va				1						1	2
Hodgdon's Cove, Tremont, Me						1					1
Hodgdon's Ledge, Me							1				1
Hodgdon's Point, Me									1		1
Hog Island, Va		1	3	3		3	2			4	16
Hog Island Ledge, Seal Harbor, Me									1	1	2
Holland Point, Chesapeake Bay, Md							1				1
Holland's Island, Chesapeake Bay, Md									1		1
Hooper's Island Ledge, Herring Gut Harbor, Me								1			1
Hooker's Island, Chesapeake Bay									1		1
Hope Island, R. I		1									1
Horn Island, Mississippi Sound						1		1			2
Horn Point, Chesapeake Bay, Va								1			1
Horse's Race, Boston Bay, Mass				1							1
Horse Shoe Shoal, Chesapeake Bay								1			1
Horse Shoe Shoal, Nantucket Sound, Mass									1		1
Horton's Point, N. Y			1		1						2
Hunnewell's Point, Me										1	1
Hunting Island, S. C				1			1				2
Huntington Neck, Long Island Sound					1						1
Hyannis, Mass						2	1			3	6
Hypocrite Ledge, Me							1		1	1	3
Indianola, Tex	1		1			1					3
Indianola (2 miles west of), Tex						1					1
Indianola (2 miles southwest of), Tex						2					2
Indian Point, Penobscot Bay, Me							1				1
Indian River Inlet, Del										2	2
Indian River Inlet, Fla	1										1
Indian River Inlet (30 miles north of), Fla									1		1
Inlet Point, Long Island, N. Y						1			1		2
Ipswich Bar, Mass				2	4	1		1	1	1	10
Isaac Shoals, Va										1	1
Island Beach, N. J					1					2	3
Island Ledge, Mass						1					1
Isle au Haut, Penobscot Bay, Me										1	1
Isles of Shoals						2	1			2	5
Jacob's Point, Long Island, N. Y						1					1
Jamaica Island, off Kittery, Me						1					1
James Ledge, Wickford, R. I						1					1
Jamestown Island, Va										1	1
Jekyll Island, Ga							1				1
Jekyll Spit, Ga								1			1
Jerry's Point, Portsmouth Harbor, N. H				1							1
Jewell's Island Reef, Me							1				1
Joe Flogger Shoal, Delaware Bay					1	1	1			2	5
Johnson's Point Reef, Ga									1		1
Jones' Beach, Long Island, N. Y					3			1			4
Jones Hill, N. C						1					1
Jonesport, Me	3	4	3					1			11

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TABLE 65.—*Principal Places on the Coasts of the United States where Vessels have Stranded, &c.*—Continued.

ATLANTIC AND GULF COASTS—Continued.

Name of place.	Fiscal year ending June 30—										Total.
	1871.	1872.	1873.	1874.	1875.	1876.	1877.	1878.	1879.	1880.	
Joshua Rock (mouth of Connecticut River)	....	....	....	....	....	....	....	....	....	2	2
Jupiter Inlet, Fla	4	1	1	....	....	....	....	....	....	....	6
Kegs, (The) Muscongus Bay, Me	....	....	....	....	....	....	1	....	....	....	1
Kelsey's Ledge, Damariscotta River, Me	....	....	....	....	....	....	....	....	....	1	1
Kennebunkport, Me	....	....	....	....	....	....	....	1	....	....	1
Kent Island, Chesapeake Bay, Md	....	....	....	....	....	....	1	1	1	2	5
Key West, Fla	....	....	....	....	....	1	....	....	....	....	1
Key West (18 miles northeast of), Fla	....	....	....	....	....	....	....	1	....	....	1
Key West (18 miles northwest of), Fla	....	....	....	....	....	....	....	1	....	....	1
Key West Harbor, Fla	....	....	....	....	....	....	1	....	1	....	2
Key West Island, Fla	....	....	....	....	....	....	1	....	....	....	1
Kill Pond Bar, Mass	....	....	....	1	....	....	....	....	....	....	1
King's Beach, Lynn, Mass	....	....	....	....	....	2	....	....	....	....	2
Kinnakeet, N. C	....	....	2	....	....	1	....	....	....	....	3
Kittery (ledge near), Me	....	....	....	....	....	....	....	1	....	....	1
Kittery Point, Me	....	....	....	....	....	2	....	....	....	....	2
Kitty Hawk, N. C	....	....	....	....	....	....	1	....	....	....	1
Lambert's Cove, Vineyard Sound, Mass	....	....	....	....	....	1	....	....	....	....	1
Lambert's Point, Va	....	....	....	....	....	....	....	....	....	1	1
Lane's Island, Penobscot Bay, Me	....	....	....	....	....	....	....	....	1	....	1
Lanesville, Mass	....	....	....	....	....	....	....	....	....	1	1
Latimer's Reef, Long Island Sound	....	....	....	....	1	....	....	1	....	....	2
Laralette City, N. J	....	....	....	....	....	....	....	....	1	....	1
Leaming's Beach, N. J	....	....	....	....	....	1	....	....	....	....	1
Leete's Reef, Conn	....	....	....	....	....	....	1	1	....	....	2
Leighton's Point, Pembroke, Me	....	....	....	....	....	....	1	....	....	....	1
Lewes, Del	....	....	....	2	....	1	3	1	3	2	12
L'Homme Dieu Shoal, Vineyard Sound, Mass	....	....	....	1	....	2	....	2	....	2	7
Libbey Island, Machias Bay, Me	....	1	....	....	....	2	....	....	....	....	3
Little Bay, Va	....	....	....	....	....	....	....	....	....	1	1
Little Beach, N. J	....	....	....	1	....	....	....	1	....	....	2
Little Cove Point, Chesapeake Bay, Md	....	....	....	....	....	....	....	1	....	....	1
Little Cranberry Island, Me	....	....	....	....	1	....	....	....	....	1	2
Little Cumberland Islands, Ga	....	....	....	1	....	....	....	....	....	....	1
Little Egg Harbor, N. J	....	3	....	1	....	4	....	....	4	1	13
Little Gull Island, Long Island Sound	....	....	....	....	....	1	....	....	....	1	2
Little Inlet, Long Island Sound	....	....	....	....	....	1	....	....	....	....	1
Little Island, Vineyard Haven, Mass	....	....	....	1	....	....	....	....	....	....	1
Little Island, Va	....	....	....	....	....	....	....	....	....	1	1
Little Moriches Beach, Long Island, N. Y	....	....	....	....	1	....	....	....	....	....	1
Little Mud Thoroughfare, N. J	....	....	....	....	....	....	....	....	1	....	1
Little River Island, Me	....	....	....	....	....	1	....	....	....	....	1
Little Round Shoal, Mass	....	....	1	....	....	....	....	....	....	....	1
Little Spoon Island, Me	....	....	....	....	....	....	1	....	....	....	1
Lloyd's Neck, Long Island, N. Y	....	....	....	....	1	....	1	....	....	1	3
Lobster Rocks, Beverly Harbor, Mass	....	....	....	....	....	....	1	....	....	....	1
Lobster Rock, Saco Bay, Me	....	....	....	....	....	....	....	....	1	....	1
Lockwood's Folly Inlet, N. C	....	....	....	....	1	1	....	....	....	1	3
Londoner, (The) near Thatcher's Island, Mass	....	....	....	....	....	....	....	1	....	....	1
Long Beach (6 miles east of Cape Ann Harbor), Mass	....	....	....	....	....	....	....	....	1	....	1
Long Beach, N. J	1	....	....	....	....	....	....	....	....	7	8
Long Branch, N. J	....	....	1	....	1	3	1	....	....	3	9
Loggerhead Reef (south point of), Florida Reefs	....	....	....	....	....	....	....	1	....	....	1
Long Island, Boston Harbor, Mass	....	....	....	....	....	....	....	1	....	....	1
Long Island, Harbor Head, Me	....	....	....	....	....	1	....	....	....	....	1
Long Ledge, Seal Harbor, Me	....	....	....	....	....	....	....	1	....	....	1
Long Ledge, Scituate, Mass	....	....	....	....	....	....	....	....	....	1	1
Long Point, Cape Cod, Mass	....	....	....	....	....	....	....	....	2	....	2
Long Shoal, Nantucket Sound, Mass	....	....	....	....	....	....	2	1	....	....	3
Lord's Gifts Flats, Me	....	....	....	....	....	....	....	....	....	1	1
Lovell's Island, Boston Harbor, Mass	....	....	....	....	1	....	....	....	....	....	1
Love Ladies' Island, N. J	....	....	....	....	....	....	....	....	1	....	1
Lowell's Point, Me	....	....	....	2	....	....	....	....	....	....	2
Lowell's Rock, Penobscot Bay, Me	....	....	....	....	....	....	....	....	....	1	1
Lower Hell Gate, Me	....	....	....	1	....	....	....	....	....	....	1
Lowe's Point, Chesapeake Bay, Md	....	....	....	....	....	....	....	....	1	....	1
Ludlam's Beach, N. J	....	....	....	....	....	....	1	1	1	....	3
Lynn Haven Bay, Va	....	....	....	1	....	....	1	1	1	....	4
Machias, Me	....	....	....	....	....	1	....	....	....	....	1
Machiasport, Me	....	....	....	....	....	2	....	....	....	....	2
Machipongo Inlet, Va	....	....	....	....	....	....	1	....	....	....	1
Main Inlet Bar (2½ miles northeast of), N. C	....	....	....	....	....	....	1	....	....	....	1
Mamaroneck, N. Y	....	....	....	....	....	....	....	....	1	....	1
Manhattan Beach, N. Y	....	....	....	....	....	....	....	....	....	1	1

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TABLE 65.—*Principal Places on the Coasts of the United States where Vessels have Stranded, &c.*—Continued.

ATLANTIC AND GULF COASTS—Continued.

Name of place.	Fiscal year ending June 30—										Total.
	1871.	1872.	1873.	1874.	1875.	1876.	1877.	1878.	1879.	1880.	
Manomet Point, Mass	....	....	....	....	....	....	....	....	....	1	1
Manor Hills, (The) Long Island, N. Y	....	....	....	....	....	....	2	....	....	....	2
Mansfield Ledge, Deer Island Thoroughfare, Me	....	....	....	....	....	1	....	....	....	....	1
Marblehead, Mass	....	....	....	....	....	....	....	....	1	....	1
Marblehead Neck, Mass	....	....	....	....	....	1	....	....	....	....	1
Mark Island Ledge, Penobscot Bay, Me	....	....	....	1	....	1	....	....	....	....	2
Marsh Bank Bar, off Harwich, Mass	....	....	....	....	....	1	....	....	....	....	1
Marshfield Beach, Boston Bay, Mass	....	....	....	....	....	....	....	....	....	1	1
Marshall's Island, Me	....	....	....	....	....	....	....	....	1	....	1
Marquesas Key, Florida Reefs	....	....	....	1	1	1	2	....	....	....	5
Matagorda Bay, Tex	....	....	1	2	....	7	....	....	....	....	10
Matagorda Island, Tex	....	....	....	....	....	4	....	2	1	2	9
Matagorda Peninsula, (6 miles from mouth of Cany Creek)	....	....	....	....	....	1	....	....	....	....	1
Matanzas Inlet (mouth of), Fla	....	....	....	....	....	....	....	....	....	1	1
Matinicus Island, Me	....	....	....	....	....	....	....	....	....	1	1
Matinicock Point, Long Island, N. Y	....	....	....	....	....	....	1	....	....	....	1
Mayport Beach, Fla	....	....	....	....	....	....	....	....	2	....	2
Menunktesuck Point, Conn	....	....	....	1	....	....	....	....	....	....	1
Merrimac River (North Breakers, mouth of), Mass	....	....	....	....	....	1	3	1	1	1	7
Merwin's Point, Conn	....	....	....	....	....	....	1	....	....	....	1
Metinic Island, Me	....	....	....	....	....	....	....	1	1	....	2
Metompkin Inlet, Va	....	....	....	....	....	....	1	1	....	....	2
Micomit Rip, Mass	....	....	....	1	....	....	....	....	....	....	1
Middle Ground, Chesapeake Bay	....	....	....	....	....	....	....	1	1	1	3
Middle Ground, N. C	....	....	....	....	....	....	....	....	....	1	1
Middle Reef, (near Woolsey's Point), Long Island, N. Y	....	....	....	....	....	....	1	....	....	....	1
Milk Island, Mass	....	....	....	1	1	....	....	....	....	....	2
Mishaum Point, Mass	....	....	1	....	....	....	....	....	....	....	1
Mispillion Light, Del	....	....	....	1	....	....	....	....	1	....	2
Mistake Island, Me	....	....	....	....	1	....	1	....	....	....	2
Mobile Bay, Ala	....	....	....	....	....	....	....	1	....	1	2
Mobile Point, Ala	....	....	....	....	....	....	....	....	....	1	1
Molasses Reef, Fla	....	....	....	....	....	....	1	....	....	....	1
Monhegan Island, Me	....	....	....	....	....	1	....	....	....	....	1
Monmouth Beach N. J	....	....	....	....	....	....	1	....	....	....	1
Monomoy Light, Mass	....	....	....	....	....	....	....	....	....	1	1
Monomoy Point, Cape Cod, Mass	1	....	....	....	....	1	2	....	1	1	6
Montauk Point, Long Island, N. Y	....	....	....	....	....	....	....	1	1	....	2
Moose Island, Booth Bay Harbor, Me	....	....	....	....	1	....	....	....	....	....	1
Moriches, Long Island, N. Y	....	....	....	....	....	....	....	....	1	....	1
Morris' Cove, New Haven Harbor, Conn	....	....	....	....	1	....	1	....	....	....	2
Morris' Island, S. C	....	....	....	....	....	....	....	1	....	....	1
Mount Desert Rock, Me	....	....	....	....	....	....	....	....	1	....	1
Monroe Island, Penobscot Bay, Me	....	....	....	....	....	....	1	....	....	4	5
Muskeget Island, Nantucket Sound, Mass	....	....	....	1	....	....	....	....	3	....	4
Musquito Inlet, Fla	1	2	....	....	....	1	1	1	1	....	7
Musquito Inlet (3 miles north of), Fla	....	....	....	....	....	....	....	....	2	....	2
Musquito Inlet (7 miles north of), Fla	....	....	....	....	....	....	....	....	1	....	1
Musquito Inlet (4 miles south of), Fla	....	....	....	....	....	....	....	....	1	....	1
Musquito Island, Me	....	....	....	....	1	....	....	....	....	....	1
Mustang Island, Tex	....	....	....	1	....	....	....	....	....	....	1
Myrtle Island, Va	....	....	....	....	....	....	1	....	....	....	1
Nag's Head, N. C	....	1	....	....	....	....	....	1	1	1	4
Nancy Ledge, Lubec, Me	....	....	....	....	....	....	....	....	1	....	1
Nantucket, Mass	1	1	2	....	4	....	....	....	3	....	11
Nantucket Bay, Mass	....	....	....	....	....	....	....	1	....	....	1
Nantucket, Great Point, Mass	1	3	....	....	1	....	....	1	3	1	10
Nantucket, Sankaty Light, Mass	....	....	....	....	....	....	....	1	....	....	1
Nantucket Shoal, Mass	....	....	....	....	....	....	1	....	3	....	4
Napatree Point, Conn	....	....	....	....	....	1	....	....	2	1	4
Napeague, Long Island, N. Y	....	....	....	....	....	....	1	....	....	....	1
Nappertrice Point, Martha's Vineyard, Mass	....	....	1	....	....	....	....	....	....	....	1
Narragansett Pier, R. I	....	....	1	1	....	....	....	1	....	....	3
Nashawena Island, Vineyard Sound, Mass	....	2	....	....	....	....	1	....	1	....	4
Nash's Island, Me	....	....	....	1	....	....	....	....	....	....	1
Nassau Inlet, Fla	....	....	....	1	....	....	....	....	....	....	1
Nausett Beach, Cape Cod, Mass	....	1	....	9	1	1	3	3	....	....	18
Naushon Island, Vineyard Sound, Mass	....	....	....	....	....	1	....	1	....	....	2
Negro Island, Saco Bay, Me	....	....	....	....	....	1	....	....	....	....	1
New Bedford Harbor, Mass	....	....	....	....	1	....	1	....	1	1	4
Newburyport, Mass	....	....	....	1	1	1	....	....	1	....	4
Newcomb's Hollow, Mass	....	....	....	....	....	2	....	....	....	....	2
New Haven, Conn	....	....	....	....	1	1	1	....	....	....	3
New Inlet, Long Island, N. Y	1	1	....	....	1	1	2	....	3	1	10

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TABLE 65.—*Principal Places on the Coasts of the United States where Vessels have Stranded, &c.*—Continued.

ATLANTIC AND GULF COASTS—Continued.

Name of place.	Fiscal year ending June 30—										Total.
	1871.	1872.	1873.	1874.	1875.	1876.	1877.	1878.	1879.	1880.	
New Inlet, N. C	....	....	....	....	2	....	1	....	....	1	4
New Inlet, N. J	....	....	....	....	1	....	....	....	....	....	1
New London, Conn	....	....	2	....	....	....	3	....	1	....	6
Newport, R. I	....	....	....	....	1	....	2	....	....	1	4
Newport News, Va	....	....	....	....	....	....	1	....	....	....	1
New River (mouth of), N. C	....	....	....	....	....	....	....	....	....	1	1
Nix's Mate, Boston Harbor, Mass	....	....	....	....	....	....	1	....	....	....	1
Nonamesset Island, Vineyard Sound, Mass	....	....	....	....	1	....	....	....	....	....	1
Norman's Woe, Mass., Cape Ann	....	....	....	1	....	....	....	....	....	....	1
North Inlet, S. C	....	....	....	....	1	....	....	....	....	....	1
North Point, Chesapeake Bay, Va	....	....	....	....	....	....	....	....	2	....	2
Northport, Me	....	....	....	....	....	....	1	....	....	....	1
Northport Harbor, N. Y	....	....	....	....	....	....	....	....	....	1	1
North River Bar, N. C	....	....	....	....	....	....	....	....	1	2	3
North Truro, Mass	....	....	....	....	....	....	....	....	2	....	2
Northwest, Long Island, N. Y	....	....	....	....	....	....	....	....	....	2	2
Norton's Cove (ledge in), Me	....	....	....	....	....	....	....	....	1	....	1
Norton's Island, Seal Harbor, Me	....	....	....	....	....	....	1	....	....	....	1
Norton's Point, Carver Harbor, Me	....	....	....	....	....	....	....	1	....	....	1
Norton's Shoals, Mass	....	....	....	2	....	....	....	....	....	....	2
Norwalk, Conn	....	....	....	....	....	....	....	1	....	....	1
Norwalk Island, Long Island Sound	....	....	....	....	1	....	....	....	....	....	1
Noyes Point, R. I	....	....	....	....	....	....	1	1	....	....	2
Oak's Ledge, Mass	....	....	....	1	....	....	....	....	....	....	1
Ocean Beach, N. J	....	....	....	....	....	....	....	1	1	....	2
Ocean City, Md	....	....	....	....	....	1	....	....	1	....	2
Ocean Grove, N. J	....	....	....	1	....	....	1	1	....	....	3
Ocean View, Va	....	....	....	....	....	....	1	....	1	2	4
Ocracoke Inlet, N. C	....	....	1	....	....	1	3	1	1	1	8
Odiorne's Point, N. H	....	....	....	....	....	....	1	....	....	....	1
O'Donnell's Point, Lubec Narrows, Me	....	....	....	....	....	....	....	....	1	....	1
Old Cilley Ledge, Penobscot Bay, Me	....	....	....	....	1	1	....	....	....	1	3
Old Currituck Inlet, N. C	....	....	....	....	....	....	....	....	....	1	1
Old Ferry Point, N. Y	....	....	....	....	....	....	....	....	....	1	1
Old Field Point Light, Long Island, N. Y	....	....	....	....	....	....	....	1	....	....	1
Old Inlet, Long Beach, N. J	....	....	....	....	....	1	....	....	....	....	1
Old Man Ledge, Penobscot Bay, Me	....	....	....	....	1	....	....	1	1	....	3
Old Prince (The), Cape Porpoise Harbor, Me	....	....	....	....	....	....	....	....	1	....	1
Old Woman Ledge, Me	....	....	....	....	....	....	....	....	....	1	1
Oregon Inlet, N. C	1	7	3	....	1	1	1	....	....	....	14
Orleans Beach, Cape Cod, Mass	....	....	....	....	....	....	2	2	....	....	4
Ossabaw Island, Ga	....	....	....	....	....	....	....	....	....	1	1
Outer Diamond Shoal, Cape Hatteras, N. C	....	....	....	....	....	....	....	....	....	1	1
Owl's Head, Me	....	....	....	1	1	....	....	....	....	....	2
Oyster Bay, N. Y	....	....	....	....	....	....	....	....	....	2	2
Oyster Pond Reef, N. Y	....	....	....	....	1	....	....	....	....	....	1
Oyster Rock, Wilmington Harbor, N. C	....	....	....	....	....	....	1	....	....	....	1
Padre Island, Tex	....	....	....	....	....	....	....	2	....	....	2
Palacios Point, Matagorda Bay, Tex	....	....	....	....	....	....	....	1	....	....	1
Pamet Hollow, Cape Cod, Mass	....	....	....	....	....	....	....	1	....	....	1
Parker's Cove, Islesboro', Me	....	....	....	....	....	....	1	....	....	....	1
Parker's Island, N. Y	....	....	....	....	....	....	....	1	....	....	1
Pascagoula Bar, Miss	....	....	....	....	1	....	....	....	....	....	1
Pasque Island, Vineyard Sound, Mass	....	....	....	2	3	....	1	....	....	....	6
Pass à l'Outre, mouth of Mississippi River	....	....	....	1	1	....	....	....	....	....	2
Pass Cavallo, Tex	....	1	1	....	....	3	....	....	....	1	6
Pass Christian, Miss	....	....	....	1	....	....	....	....	....	....	1
Patapsco River (mouth of), Chesapeake Bay, Md	....	....	....	....	....	....	....	....	3	1	4
Patuxent River (mouth of), Md	....	....	....	....	....	....	1	....	1	1	3
Pavilion Beach, Mass	....	....	....	....	....	2	....	1	....	....	3
Peaked Hill Bar, Cape Cod, Mass	....	....	1	....	2	1	1	....	1	1	7
Peak's Island, Casco Bay, Me	....	....	....	....	....	....	....	....	1	....	1
Peck's Beach, N. J	....	....	1	....	....	....	....	....	1	1	3
Pelican Island, Tex	....	....	....	....	....	....	....	....	....	1	1
Pelican Reef, Florida Reefs	....	1	....	....	1	1	....	....	....	1	4
Pembroke, Me	....	....	....	....	1	....	....	....	....	....	1
Penfield's Reef, Conn	....	....	....	....	....	....	....	....	1	....	1
Penikese Island, Buzzard's Bay	....	....	....	....	....	....	....	1	....	....	1
Pensacola, Fla	....	....	2	....	....	....	....	2	....	....	4
Pensacola Bay Bar, Fla	....	....	....	....	....	1	....	1	....	....	2
Pepperell's Cove, Portsmouth Harbor, N. H	....	....	....	....	....	....	1	....	....	....	1
Perdido Bay Bar, Fla	....	....	....	....	....	1	....	....	....	....	1
Perkins' Ledge (mouth of Kennebec River), Me	....	....	....	....	1	....	....	....	....	....	1
Perry's Creek, Penobscot Bay, Me	....	....	....	....	....	....	....	2	....	....	2
Petit Manan Island, Me	....	....	....	1	1	....	2	1	....	2	7

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TABLE 65.—*Principal Places on the Coasts of the United States where Vessels have Stranded, &c.*—Continued.

ATLANTIC AND GULF COASTS—Continued.

Name of place.	Fiscal year ending June 30—										Total.
	1871.	1872.	1873.	1874.	1875.	1876.	1877.	1878.	1879.	1880.	
Piancatank River Bar, Va	....	....	....	....	....	....	....	....	2	....	2
Pickard's Point, Penobscot Bay, Me	....	....	....	....	1	....	....	....	....	....	1
Pickle's Reef, Florida Reefs	....	....	....	....	....	....	1	2	1	....	4
Pine Island, off New London, Conn	....	....	....	....	....	....	....	....	1	....	1
Plum Island, Long Island Sound	....	....	1	....	1	....	....	1	....	....	3
Plum Island Point, Mass	....	....	....	....	....	....	....	....	....	1	1
Plum Point, Chesapeake Bay, Md	....	....	....	....	....	....	....	....	1	1	2
Plymouth, Mass	....	....	1	....	....	....	....	....	....	....	1
Point Allerton, Boston Harbor, Mass	....	....	....	1	1	....	....	....	....	....	2
Point au Fer, La	....	....	....	....	1	....	....	....	....	....	1
Point Gammon, Mass	....	....	....	1	....	....	....	....	....	....	1
Point Isabel, Tex	....	....	....	....	3	....	....	....	....	....	3
Point Judith, R. I	....	2	....	1	2	1	1	....	2	1	10
Point No Point, Chesapeake Bay, Md	....	....	....	....	....	....	....	1	....	....	1
Point No Point, Conn	....	....	....	....	....	....	....	....	....	1	1
Point of Rocks, Lynn, Mass	....	....	....	....	....	....	....	....	1	....	1
Point Pleasant, N. J	....	....	....	....	....	....	....	....	1	....	1
Point Seguin, Me	....	....	....	....	....	....	....	....	....	1	1
Pollock Rip, Mass	....	....	....	....	1	1	....	....	....	....	2
Pond Cove, Cape Elizabeth, Me	....	....	....	....	....	....	1	....	....	....	1
Pond Cove Island, Englishman's Bay, Me	....	....	....	....	....	1	....	....	....	....	1
Popasquash Point, Narragansett Bay	....	....	....	....	....	....	....	....	1	....	1
Pool's Island (3 miles southeast of), Chesapeake Bay	....	....	....	....	....	....	....	....	1	....	1
Portland Head, Cape Elizabeth, Me	....	....	....	....	....	1	....	....	1	....	2
Port Jefferson, Long Island, N. Y	....	....	....	....	....	....	1	....	....	....	1
Port Morris (rock near), N. J	....	....	....	....	....	....	....	....	1	....	1
Portsmouth, N. H	....	....	....	....	....	....	1	3	2	....	6
Portsmouth, Va	....	....	....	....	....	....	....	....	....	1	1
Powder Horn Bayou, Tex	....	....	....	1	....	2	....	....	....	....	3
Promised Land, Long Island, N. Y	....	....	....	....	....	....	....	....	....	5	5
Prospect Harbor	....	....	....	....	....	5	....	....	....	....	5
Provincetown, Mass	....	....	4	....	....	5	2	....	7	4	22
Pulaski Shoals, Florida Reefs	....	....	....	....	....	....	....	....	1	....	1
Pumpkin Hill Shoal, Charleston, S. C	....	....	....	....	....	1	1	....	1	....	3
Quoddy Bay (west side), Me	....	....	....	....	....	....	....	....	1	....	1
Quoddy Head, Me	....	....	....	....	1	1	....	1	1	1	5
Quogue, Long Island, N. Y	....	1	1	....	....	....	....	....	....	....	2
Quonochontaug Beach, R. I	....	....	....	....	....	1	....	....	....	1	2
Race Point, Cape Cod, Mass	1	1	1	3	2	4	....	....	2	1	15
Race Point (near Cutler), Me	....	....	....	....	....	....	....	1	....	....	1
Race Rock, Long Island Sound	....	....	....	....	....	....	1	....	....	....	1
Rackliff Island, Seal Harbor, Me	....	....	....	....	....	....	....	....	1	....	1
Ragged Island, Penobscot Bay, Me	....	....	....	....	....	1	....	....	....	....	1
Ragged Point, Assateague Island, Va	....	....	....	....	....	....	....	1	....	....	1
Ram Island Reef, Long Island Sound	....	....	....	....	....	....	1	....	....	....	1
Ram's Head Ledge, Boston Harbor, Mass	....	....	....	....	1	....	....	....	....	....	1
Red Beach, Calais, Me	....	....	....	....	....	....	....	2	....	....	2
Red Fish Bar, Tex	....	....	....	....	....	....	1	....	2	....	3
Red Spring Point, Long Island, N. Y	....	....	....	....	....	1	....	....	....	....	1
Rehoboth Beach, Del	....	....	....	....	....	....	....	....	....	1	1
Revenue Point Shoal, Ala	....	....	....	....	1	....	....	....	....	....	1
Rich Inlet, N. C	....	....	....	....	....	....	....	....	1	....	1
Richmond's Island, Casco Bay, Me	....	....	....	1	....	1	1	....	....	....	3
Rip-Raps, Hampton Roads	....	....	....	....	....	....	1	....	....	....	1
Robbins' Reef Bay, New York Harbor	....	....	....	....	....	....	....	....	....	1	1
Robert's Harbor, Penobscot Bay, Me	....	....	....	....	....	1	....	....	....	....	1
Robinson's Beach (southwest harbor), Me	....	....	....	....	....	....	....	....	....	1	1
Robinson's Hole, Vineyard Sound, Mass	....	....	....	....	....	....	....	1	....	....	1
Rockaway, Long Island, N. Y	....	....	1	1	....	....	3	....	1	1	7
Rockaway Beach (main inlet), Long Island, N. Y	....	....	....	....	....	....	....	....	1	....	1
Rockaway Shoals, Long Island Sound	....	....	....	....	....	1	1	....	....	....	2
Rock Island Beach, Long Island Sound	....	....	....	....	1	....	....	....	....	....	1
Rockland, Me	....	....	....	....	....	....	....	1	1	1	3
Rock Point, Chesapeake Bay, Md	....	....	....	....	....	1	....	....	1	....	2
Rockport, Mass	....	....	....	1	....	....	....	....	....	....	1
Rocky Neck, Gloucester, Mass	....	....	....	....	....	....	....	....	1	....	1
Rocky Point, Long Island Sound	....	....	....	....	....	1	....	1	....	....	2
Rocky Point, Mass	....	....	....	1	....	....	....	....	....	....	1
Romer Shoal, N. Y	....	....	....	1	1	3	....	....	2	1	8
Rose Island, R. I	....	....	....	....	....	....	....	....	1	....	1
Round Shoal, Quoddy Bay, Me	....	....	....	....	....	....	....	....	....	1	1
Rudder Rock, Deer Island Thoroughfare, Me	....	....	....	....	....	1	....	....	....	....	1
Rye Beach, N. H	1	....	....	....	....	....	....	....	2	....	3
Rye Ledge, N. H	....	....	....	....	....	....	....	....	2	....	2
Sabine Pass, Tex	....	....	....	....	....	1	....	....	....	2	3

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TABLE 65.—*Principal Places on the Coasts of the United States where Vessels have Stranded, &c.*—Continued.

ATLANTIC AND GULF COASTS—Continued.

Name of place.	Fiscal year ending June 30—										Total.
	1871.	1872.	1873.	1874.	1875.	1876.	1877.	1878.	1879.	1880.	
Sachem's Head, Conn	....	....	....	....	....	....	....	....	1	....	1
Saddle Island, Penobscot Bay, Me	....	....	....	....	....	1	....	....	....	....	1
Sag Harbor, Long Island, N. Y	....	....	....	....	....	....	....	....	....	1	1
Sail Rock, Lubec Narrows, Me	1	....	....	....	....	....	....	....	....	....	1
Saint Augustine, Fla	....	....	....	....	....	....	....	1	....	....	1
Saint Augustine (12 miles north of), Fla	....	....	....	....	....	....	....	....	....	1	1
Saint Augustine Bar, Fla	....	....	....	....	....	....	1	....	1	....	2
Saint George's Island, Chesapeake Bay	....	....	....	....	....	....	....	....	....	1	1
Saint George's Island, Fla	....	....	1	....	....	....	....	....	....	....	1
Saint John's Bar, Fla	....	....	....	3	1	....	1	2	2	2	11
Saint Lucie (10 miles north of), Fla	....	....	....	....	....	....	....	....	1	....	1
Saint Simon's Bar, Ga	....	2	....	1	....	....	....	....	....	1	4
Saint Vincent's Island, Fla	....	....	....	....	....	....	....	1	....	....	1
Sakonnet Point, R. I	....	....	....	....	....	2	....	....	1	3	6
Salem, Mass	....	....	....	....	....	....	....	....	....	1	1
Salt Island Ledge, Mass	....	....	....	....	1	....	....	....	....	....	1
Saluria, Tex	....	....	....	....	....	2	....	....	....	....	2
Sand Shoal Inlet, Va	....	....	....	....	....	....	....	1	....	....	1
Sandwich, Mass	....	....	....	....	....	....	....	....	....	1	1
Sandy Hook, N. J	2	1	....	4	....	4	1	3	2	2	19
Sandy Keys, Florida Reefs	....	....	....	....	....	....	....	1	....	....	1
Sandy Point, Chesapeake Bay	....	....	....	....	....	....	4	....	....	....	4
Sandy Point, Conn	....	....	....	....	....	....	....	....	....	1	1
San Luis Pass, Tex	....	....	....	....	4	....	....	....	1	....	5
San Luis Pass (2 miles northeast of), Tex	....	....	....	....	....	....	....	1	....	....	1
San Luis Pass (4 miles west of), Tex	....	....	....	....	....	....	....	....	1	....	1
San Luis Pass (5 miles west of), Tex	....	....	....	....	....	....	....	1	....	....	1
Santa Rosa Island, Fla	....	....	....	1	1	....	2	....	2	1	7
Sapelo Shoals, Ga	1	2	....	1	....	....	....	....	....	....	4
Saquish Point, Mass	....	....	....	....	....	....	....	....	....	1	1
Saybrook Bar, Conn	2	2	....	1	1	1	2	3	....	3	15
Saybrook Point, Conn	....	....	....	....	....	....	....	....	1	....	1
Schoodic Island, Frenchman's Bay, Me	....	....	....	....	....	....	....	1	....	1	2
School-Ship Rock, Mass	....	....	....	....	....	....	....	....	1	....	1
Scituate, Mass	1	1	3	....	3	....	2	3	1	2	16
Seabright, N. J	....	....	....	....	....	....	....	....	....	2	2
Sea Grove, N. J	....	....	....	....	....	....	1	....	....	....	1
Seal Cove, Mount Desert, Me	....	....	....	....	....	1	....	....	....	....	1
Seal Harbor, Muscle Ridge Channel, Me	....	....	....	....	....	....	1	2	1	....	4
Seal Island, Machias, Me	....	....	....	....	....	....	....	1	....	....	1
Searsport Harbor, Me	....	....	....	....	....	1	....	....	....	....	1
Seavey's Island, Portsmouth Harbor, N. H	....	....	....	....	....	1	....	....	....	....	1
Seven Mile Beach, N. J	....	1	....	....	....	....	....	....	....	....	1
Severn River (mouth of), Md	....	....	....	....	....	....	....	1	....	....	1
Sewell's Point, Chesapeake Bay, Va	....	....	....	....	....	1	....	....	....	....	1
Shabbit Island, Me	....	....	....	....	1	....	....	....	....	....	1
Shallotte Inlet, N. C	....	....	....	....	....	....	1	....	1	....	2
Shark River, N. J	....	2	....	1	....	....	....	1	....	....	4
Sheep's Head Bay Bar, Long Island, N. Y	....	....	....	1	....	....	....	....	....	....	1
Sheepscot River (mouth of), Me	....	....	....	....	....	....	....	1	....	....	1
Shinnecock, Long Island, N. Y	....	....	....	1	....	2	1	....	....	....	4
Ship Bottom, Long Beach, N. J	....	....	....	....	....	....	....	....	1	....	1
Ship Shoals, Va	....	....	....	....	....	....	1	....	....	....	1
Shippan Point Reef, Long Island Sound	....	1	....	1	1	....	....	....	....	....	3
Shiverly Ledge, off Spruce Head, Me	....	....	....	....	....	....	....	1	....	....	1
Shore Island, R. I	....	....	....	....	....	....	....	1	....	....	1
Short Beach, N. J. (½ mile south L. S. S. No. 23)	....	....	....	....	....	....	....	....	3	....	3
Shovelful Shoal, Nantucket Sound, Mass	1	....	....	....	1	3	....	1	2	....	8
Simonton's Cove, Cape Elizabeth, Me	....	....	....	....	....	1	....	....	....	....	1
Sinepuxent Neck, Md	....	....	1	1	....	....	1	2	1	....	6
Skinner's Head, Marblehead Harbor, Mass	....	....	....	....	....	....	1	1	....	....	2
Sloop Ledge, Sheepscot Bay, Me	....	....	....	....	....	....	....	....	1	....	1
Smith's Island, Va	....	....	1	....	....	3	....	1	1	1	7
Smith's Point, Chesapeake Bay, Va	....	....	....	1	....	....	....	....	....	3	4
Smith's Point, Long Island, N. Y	....	....	....	....	....	....	....	1	1	....	2
Smith's Reef, Long Island Sound	....	....	....	1	....	....	....	....	....	....	1
Smith's Rock, Long Island Sound	....	....	....	1	....	....	....	....	....	....	1
Smith's Rock, Scituate Neck, Mass	....	....	....	....	....	....	1	....	....	....	1
Smithtown Harbor, Long Island, N. Y	....	....	....	....	....	....	2	1	....	....	3
Smithville, N. C	....	....	....	1	....	....	....	....	....	....	1
Somer's Point, N. J	....	....	....	....	....	....	....	....	2	....	2
South Breaker, off Baker's Island	....	....	....	....	....	....	....	2	....	....	2
South Chatham, Mass	....	....	....	....	....	....	....	1	....	....	1
South Dennis, Mass	....	3	....	....	....	....	....	....	....	....	3
Southern Island (near Saint George), Me	....	....	....	....	....	....	....	1	....	....	1

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ATLANTIC AND GULF COASTS—Continued.

Name of place.	Fiscal year ending June 30—										Total.
	1871.	1872.	1873.	1874.	1875.	1876.	1877.	1878.	1879.	1880.	
South Gardiner, Me	....	....	....	....	....	....	....	1	....	....	1
South Hampton, Long Island, N. Y	....	1	....	1	1	....	....	....	....	....	3
South Harwich, Mass	....	....	....	....	....	....	....	....	....	1	1
South Island, Fishing Bank, S. C	....	....	....	....	....	....	....	....	....	1	1
South Marshfield, Beattie's Island, Me	....	....	....	....	1	....	....	....	....	....	1
Southport Bar, Conn	....	....	....	1	....	....	1	....	....	....	2
Southport, Me	....	....	....	3	....	....	....	....	....	....	3
South Saint George, Me	....	....	....	....	....	....	2	....	....	....	2
Southwest Harbor, Me	....	....	....	1	....	....	....	....	....	....	1
Southwest Ledge, New London, Conn	....	....	....	....	....	....	....	....	....	1	1
Southwest Pass, mouth of Mississippi River	....	....	....	....	....	....	1	....	....	....	1
Sow and Pigs, Vineyard Sound, Mass	....	....	....	1	....	....	1	....	....	2	4
Spectacle Island, Cumberland Inlet, Ga	....	....	....	....	....	....	1	....	....	....	1
Spruce Head Island, Penobscot Bay, Me	....	....	....	....	....	....	....	....	1	....	1
Spruce Island, off Machias (south side of), Me	....	....	....	....	....	....	....	1	....	....	1
Spruce Point, Booth Bay Harbor, Me	....	....	....	....	....	....	1	....	....	1	2
Spruce Point Ledge, Me	....	....	....	1	1	....	....	....	....	....	2
Squan Beach, N. J	....	6	2	1	2	2	2	1	....	2	18
Squash Meadow Shoals, Vineyard Sound, Mass	....	....	....	....	2	1	....	....	....	....	3
Stage Island, Saco Bay, Me	....	....	....	....	....	....	....	....	1	....	1
Stamford, Conn	....	....	....	....	1	....	....	....	....	1	2
Stamford (sunken ledge off), Conn	....	....	....	....	....	....	....	....	1	....	1
Stanley's Point, Me	....	....	....	....	....	....	....	....	....	1	1
Staten Island, N. Y	....	1	....	....	1	1	1	....	....	....	4
Stingray Point, Chesapeake Bay, Va	....	....	....	....	....	2	....	....	....	....	2
Stirrup Key, Florida Reefs	....	....	....	....	....	....	....	1	....	....	1
Stone Beacon Ledge, Portsmouth Harbor, N. H	....	....	....	....	....	....	1	....	....	....	1
Stone Horse Shoal, Nantucket Sound, Mass	....	....	....	....	....	1	1	1	....	1	4
Stone Horse Shoal (near Tybee Island), Ga	....	....	....	....	....	2	....	....	....	....	2
Stonington Harbor (Academy Ground), Conn	....	....	....	....	....	1	....	....	....	....	1
Stono Inlet, S. C	....	....	....	....	....	2	....	....	1	....	3
Stony Point, Cape Poge, Mass	....	....	....	....	....	....	1	....	....	....	1
Straitsmouth Island, Mass	....	....	....	....	....	....	....	....	1	....	1
Stratford Shoals, Conn	....	....	....	1	....	....	1	....	....	....	2
Straw's Point (ledge near), N. H	....	....	....	....	....	....	....	....	1	....	1
Succonesset Light, Nantucket Sound, Mass	1	....	....	....	....	....	....	....	....	....	1
Sugar Loaf (mouth of Kennebec River), Me	....	....	....	....	....	....	....	....	....	1	1
Swampscott, Mass	....	....	....	....	....	2	....	....	....	....	2
Swan Point, Chesapeake Bay	....	....	....	....	....	....	....	1	....	....	1
Sweet's Island, Sheepscott River (mouth of), Me	....	....	....	....	....	....	....	1	....	....	1
Tally's Point, Chesapeake Bay, Md	....	....	....	....	....	....	....	1	....	....	1
Tampa, Fla	....	1	1	....	....	....	....	1	....	....	3
Tanner's Point, Long Island, N. Y	....	....	....	....	....	....	....	1	....	....	1
Tarpaulin Cove, Vineyard Sound, Mass	....	....	....	1	3	....	....	....	1	1	6
Taylor's Island, Chesapeake Bay, Md	....	....	....	....	....	....	....	....	1	1	2
Tennant's Harbor, Me	....	....	....	....	....	....	....	1	....	....	1
Ten-Pound Island, Mass	....	....	....	1	....	2	....	....	....	1	4
Terry Ledge (off White Head Light), Me	....	....	....	....	....	1	....	....	....	....	1
Thatcher's Island, Mass	....	....	....	....	....	3	2	....	....	1	6
Thimble (The), Long Island Sound	....	....	....	....	2	....	....	....	1	1	4
Thomaston, Me	....	....	....	1	....	....	....	....	....	....	1
Thompson's Ledge, Cranberry Island, Me	....	....	....	....	....	....	....	....	....	1	1
Three Sisters, Chesapeake Bay	....	....	....	....	....	1	....	....	....	....	1
Three Tree Island, Me	....	....	....	....	1	....	....	....	....	....	1
Throg's Point (rock near), Long Island Sound	....	....	....	....	....	....	....	....	1	....	1
Thrumb Cap Island, Mass	....	....	....	....	1	....	....	....	....	....	1
Tiger Island, Ga	....	....	....	....	....	....	....	....	1	....	1
Tighlman's Island, Chesapeake Bay, Md	....	....	....	....	....	....	....	....	1	....	1
Timbalier Island, La	....	....	....	....	....	....	....	1	....	1	2
Tiverton, R. I	....	....	....	....	....	....	....	1	1	....	2
Toddy Rock, Boston Harbor, Mass	....	....	....	....	....	1	....	....	....	1	2
Tom Moore's Rocks, Mass	....	....	....	....	....	....	....	....	1	....	1
Tom Never's Head, Nantucket Sound, Mass	....	....	....	....	....	....	....	....	1	....	1
Tom's River, N. J	....	....	....	....	....	....	....	....	1	....	1
Toos Point, Chesapeake Bay, Va	....	....	....	1	1	....	....	....	....	....	2
Tortugas, Fla	....	....	....	....	....	1	1	....	....	....	2
Tortugas (southwest reef), Fla	....	....	....	....	....	....	1	....	1	....	2
Townsend's Inlet, N. J	....	....	....	1	4	2	....	....	2	2	11
Truro, Mass	....	....	1	....	1	....	1	1	....	....	4
Tucker Beach, N. J	1	....	1	1	....	....	....	....	....	....	3
Tuckernuck Shoals, Nantucket Sound, Mass	2	....	....	....	2	....	2	1	2	1	10
Turner's Shoal, Assateague, Va	....	....	....	1	....	....	....	....	1	....	2
Turtle Gut Inlet, N. J	....	....	1	....	....	....	1	1	....	....	3
Two Brothers, Wickford, R. I	....	....	....	....	1	....	....	....	....	....	1
Tybee Island, Ga	....	....	....	....	2	....	....	1	....	....	3
Vancock Shoals, Tex	....	....	....	....	1	....	....	....	....	....	1

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TABLE 65.—*Principal Places on the Coasts of the United States where Vessels have Stranded, &c.*—Continued.

ATLANTIC AND GULF COASTS—Continued.

Name of place.	Fiscal year ending June 30—										Total.
	1871.	1872.	1873.	1874.	1875.	1876.	1877.	1878.	1879.	1880.	
Vineyard Haven, Mass	....	....	2	1	6	3	....	4	12	6	34
Wading River, Long Island, N. Y	....	....	....	....	....	....	....	....	....	1	1
Ward's Island, N. Y	....	....	1	....	....	....	....	....	....	....	1
Warren Harbor, R. I	....	....	1	....	....	....	....	....	....	....	1
Warren's Cove, Mass	....	....	....	....	....	....	....	....	1	....	1
Watchapreague Inlet, Va	....	....	1	3	2	2	2	3	....	1	14
Watch Hill, R. I	....	1	....	1	....	....	....	....	....	2	4
Webber's Ledge, Muscongus Sound, Me	....	....	....	....	....	1	....	....	....	....	1
Wellfleet, Cape Cod, Mass	1	....	3	1	....	....	....	....	....	1	6
Wells' Beach, Me	....	1	....	1	....	1	....	....	....	....	3
West Chop, Vineyard Sound, Mass	....	....	....	1	2	9	....	....	1	1	14
West Dennis, Cape Cod, Mass	....	....	....	1	....	....	....	....	....	1	2
Western Dry Docks, Florida Reef	....	....	....	....	....	....	1	....	....	....	1
West Hampton Bar, Long Island	....	....	....	....	....	....	....	1	....	....	1
West Harbor, Me	....	....	....	1	....	....	....	....	....	....	1
Westport Point, Mass	....	....	....	....	....	....	....	1	....	....	1
West Triangle, Me	....	....	....	....	....	....	....	....	....	1	1
Whale Back Shoal, Cape Cod, Mass	....	....	....	....	....	....	....	....	1	....	1
Whale Rock, R. I	....	1	....	....	....	....	....	....	1	1	3
Whale Rock Light, Me	....	....	....	....	1	....	....	....	....	....	1
Wheeler's Bay (Red Ledge in), Me	....	....	....	....	....	1	....	....	....	....	1
White Head, Me	....	....	....	1	2	....	....	....	....	....	3
White Head (1 mile south of light), Me	....	....	....	....	....	....	....	....	1	....	1
Whitestone Point, N. Y	....	....	....	....	....	....	....	....	....	1	1
Whortleberry Island, Long Island Sound	....	....	....	....	....	....	....	....	....	1	1
Wicopesset Reef, Conn	....	....	....	....	....	....	....	....	1	....	1
Wilkes' Ledge, Buzzard's Bay	....	....	....	....	1	....	....	....	....	....	1
Williams' Shoal, Cobb's Island, Va	....	....	....	....	....	....	....	....	1	2	3
Willoughby Shoal, Chesapeake Bay	....	....	....	1	....	....	....	....	....	....	1
Willoughby Spit, Chesapeake Bay	....	....	....	....	....	....	....	....	1	....	1
Wilmington Bar, N. C	....	....	....	1	....	....	....	....	....	....	1
Windmill Point, Stonington, Conn	....	....	....	....	....	1	....	....	....	....	1
Winter Quarter Shoals, Md	1	....	....	2	1	1	....	....	....	2	7
Winthrop Beach, Boston Bay, Mass	....	....	....	1	1	....	....	....	....	....	2
Winthrop Head, Boston Bay, Mass	....	....	....	....	....	....	....	....	1	....	1
Wiscasset Ledge, Me	....	....	1	....	....	....	....	....	....	....	1
Wolftrap Shoal, Mob Jack Bay, Va	....	....	....	....	....	1	....	1	....	....	2
Wood End, Cape Cod, Mass	....	....	....	....	5	1	1	1	4	....	12
Wood's Holl, Mass	....	....	....	....	....	1	....	....	1	....	2
Wood Island, Saco Bay, Me	....	....	1	....	....	....	....	1	....	....	2
Wood Island Ledges, Kennebec River, Me	....	....	....	....	....	....	....	....	1	....	1
Woodville Landing, Conn	....	....	....	....	....	....	....	....	....	1	1
Wreck Shoal, Mass	....	....	....	....	....	....	....	....	1	....	1
York Beach, Me	....	....	....	1	....	1	....	....	1	....	3
York Ledge, Me	....	....	....	....	1	....	1	....	....	....	2
York Point, Blue Hill Bay, Me	....	....	....	....	....	....	....	....	1	....	1
Young's Point, Fox Island Thoroughfare, Me	....	....	....	....	....	1	....	....	....	....	1

PACIFIC COAST.

Albion River, Cal	....	....	....	....	....	....	....	....	1	....	1
Alcatraz Island, San Francisco Bay, Cal	....	....	....	....	....	1	....	1	....	....	2
Angel Island, San Francisco Bay, Cal	....	....	....	....	....	....	....	....	....	1	1
Aquina Bar, Oreg	....	....	....	....	....	1	....	....	....	....	1
Arch Rock, San Francisco Bay, Cal	....	....	....	....	....	....	....	1	....	....	1
Arestable Island, Alaska	....	....	1	....	....	....	....	....	....	....	1
Astoria, Oreg	....	....	....	....	1	....	....	....	....	....	1
Baker's Bay, Wash. Ter	1	....	....	....	....	....	....	....	....	....	1
Baker's Island, San Francisco Bay, Cal	1	....	....	....	....	....	....	....	....	....	1
Belkopsky, (one of the Ounga Islands), Alaska	....	....	....	....	....	....	....	....	1	....	1
Berkley, San Francisco Bay, Cal	....	....	....	....	....	....	....	....	....	1	1
Black Point, San Francisco Bay, Cal	....	....	....	....	....	....	....	....	....	1	1
Bodega Head, Cal	....	....	....	....	....	....	....	....	....	2	2
Bolinas, Cal	....	....	....	....	....	....	....	....	1	....	1
Bowen's Landing, Mendocino County, Cal	1	....	....	....	....	....	2	1	1	....	5
Brother's Island, San Francisco Bay, Cal	....	....	....	....	....	....	....	....	....	1	1
Cape Flattery, Wash. Ter	....	1	1	....	....	1	1	....	....	....	4
Cape Foulweather (10 miles north of), Oreg	....	....	....	....	....	2	....	....	....	....	2
Caprian Islands, Alaska	....	....	....	....	....	1	....	....	....	....	1
Caspar, Mendocino County, Cal	3	....	....	....	....	1	....	....	....	1	5
Clarence Straits, Alaska	1	....	....	....	....	....	....	....	....	....	1
Clark's Island Reef, Washington Sound	....	....	....	....	1	....	....	....	....	....	1

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TABLE 65.—*Principal Place on the Coasts of the United States where Vessels have Stranded, &c.*—Continued.

PACIFIC COAST—Continued.

Name of place.	Fiscal year ending June 30—										Total.
	1871.	1872.	1873.	1874.	1875.	1876.	1877.	1878.	1879.	1880.	
Clatsop's Spit (mouth of Columbia River)	....	....	....	....	1	1	....	....	....	....	2
Columbia River	....	1	....	....	2	....	1	1	....	....	5
Columbia River Bar	....	....	....	....	....	....	....	3	1	1	5
Cook's Inlet, Alaska	1	2	....	....	....	....	....	....	....	....	3
Coos Bay, Oreg	....	....	....	2	....	....	....	....	....	....	2
Coos Bay Bar, Oreg	....	....	....	....	....	....	....	1	1	2	4
Coos Bay Bar (9 miles north of), Oreg	....	....	....	1	1	....	....	....	....	....	2
Coquilla River, Oreg	....	1	....	....	....	....	....	....	....	....	1
Coquilla River (5 miles south of), Oreg	....	....	....	....	....	....	1	....	....	....	1
Cottoneva, Cal	....	....	....	....	....	....	1	....	....	....	1
Crescent Bay, Wash. Ter	....	....	....	....	....	....	....	1	....	1	2
Crescent City, Cal	....	....	....	....	....	....	1	1	1	2	5
Cuffey's Cove, Cal	....	1	....	1	....	....	1	....	....	....	3
Davenport's Landing, Santa Cruz County, Cal	....	1	....	....	....	....	....	....	....	....	1
Deadman's Island, San Pedro Bay, Cal	....	....	....	....	....	....	....	....	....	1	1
Destruction Island, Wash. Ter	....	....	....	....	....	1	....	....	....	....	1
Drake's Bay, Cal	....	....	....	....	....	....	....	2	....	....	2
Duncan's Mill, Sonoma County, Cal	....	....	....	....	1	....	....	....	....	....	1
Duxbury Point Reef, Cal	....	....	....	1	1	....	....	1	1	....	4
Ediz Hook, Wash. Ter	....	....	....	....	....	....	....	....	....	1	1
Eel River Bar, Cal	....	....	....	....	....	....	....	2	....	....	2
Farallon Islands, Cal	....	1	....	....	2	....	....	....	....	....	3
Fidalgo Island, Alaska	....	....	....	....	....	....	....	....	....	1	1
Fish Rock, Mendocino County, Cal	....	....	....	....	1	....	....	1	1	1	4
Fisk's Mill, Sonoma County, Cal	....	....	....	....	....	1	....	....	....	....	1
Fort Point, San Francisco Bay, Cal	....	1	....	....	1	....	1	....	....	....	3
Fort Ross, Cal	....	....	....	....	1	....	....	....	....	1	2
Fort Stevens, Oreg	....	....	....	....	1	....	....	....	....	....	1
Four Fathom Bank, Cal	....	....	1	....	....	....	....	....	....	....	1
Freshwater Bay, Wash. Ter	....	....	....	....	1	....	....	....	....	1	2
Gerstler's Cove, Cal	....	....	....	....	....	....	....	1	....	....	1
Goleta, Cal	....	....	....	....	....	....	....	1	....	....	1
Humboldt Bar, Cal	1	....	....	....	....	....	....	2	....	....	3
Hunter's Point, San Francisco Bay, Cal	....	....	....	....	....	....	....	1	....	....	1
Kadiak Harbor (21 miles southeast of), Alaska	....	....	....	....	1	....	....	....	....	....	1
Kake Island, Alaska	....	....	....	1	1	....	....	....	....	....	2
Kalwack, Alaska	1	....	....	....	....	....	....	....	....	....	1
Karquines Strait, Cal	....	....	....	....	....	....	1	....	....	2	3
Lime Point, San Francisco Bay, Cal	....	....	....	....	....	....	....	1	....	....	1
Little River, Cal	....	....	....	....	....	1	....	1	1	1	4
Marrowstone Point, Wash. Ter	....	....	....	....	....	1	....	....	....	....	1
Mendocino, Cal	....	2	....	....	....	....	....	1	....	....	3
Middle Ground, Suisun Bay, Cal	....	....	....	....	....	....	....	....	....	1	1
Mile Rocks, entrance to San Francisco Bay, Cal	....	....	....	....	....	....	1	2	....	1	4
Mission Rocks, San Francisco Bay, Cal	....	....	....	....	....	....	....	....	1	....	1
Monterey Harbor, Cal	....	....	....	....	....	....	....	....	1	....	1
Mora Bay, Cal	....	....	....	....	....	....	2	....	....	....	2
New Dungeness, Wash. Ter	....	....	....	1	....	....	....	....	2	....	3
Newport, Los Angeles County, Cal	....	....	....	1	....	....	....	....	....	....	1
Newport North, Mendocino County, Cal	....	....	....	....	....	....	....	....	....	1	1
North Beach, San Francisco Bay, Cal	....	....	....	....	....	....	....	....	....	1	1
North Head, San Francisco Bay, Cal	....	....	....	....	1	....	....	....	....	....	1
Novarro River (reef), Cal	....	1	....	....	....	....	....	....	1	....	2
Noyo River (mouth of), Cal	....	....	....	....	....	....	....	1	....	....	1
Oonalaska Island, Alaska	....	....	....	....	....	....	....	....	....	1	1
Ounga Island, Alaska	....	....	....	....	....	....	1	....	....	....	1
Pajaro, Cal	1	....	....	....	....	....	....	....	....	....	1
Pillar Point, Cal	....	....	....	....	....	....	1	....	....	....	1
Point Adams, Oregon	....	....	....	....	....	....	....	....	1	....	1
Point Arena, Cal	....	1	....	1	1	1	....	....	1	1	6
Point Arena Harbor, Cal	....	....	....	....	1	....	....	....	....	....	1
Point Bonita, Cal	....	1	....	....	....	....	....	1	....	....	2
Point Bonita (5¼ miles northwest of), Cal	....	....	....	....	....	....	....	....	1	....	1
Point Diablo, Golden Gate, Cal	....	1	....	....	....	....	....	....	....	....	1
Point Fermin, Cal	....	1	....	....	....	....	....	....	....	....	1
Point Gorda, Cal	....	....	....	1	....	....	....	....	....	....	1
Point Grenville, Wash. Ter	....	....	....	1	....	....	....	....	....	1	2
Point Hueneme, Cal	1	....	....	....	....	....	....	....	....	....	1
Point of Rocks, Mission Bay, Cal	....	....	....	....	....	....	....	1	....	....	1
Point of Rocks, Wrangel, Alaska	....	....	....	....	....	1	....	....	....	....	1
Point Reyes, Cal	2	....	....	....	1	....	1	1	1	....	6
Point Sal, Cal	....	....	....	....	....	1	....	1	....	....	2
Point San Pedro, Cal	....	1	....	....	....	....	....	....	....	1	2
Point Sur, Cal	....	....	....	....	1	....	....	....	....	....	1
Point Wilson, Wash. Ter	....	....	....	....	....	1	....	....	....	....	1

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TABLE 65.—*Principal Places on the Coasts of the United States where Vessels have Stranded, &c.*—Continued.

PACIFIC COAST—Continued.

Name of place.	Fiscal year ending June 30—										Total.
	1871.	1872.	1873.	1874.	1875.	1876.	1877.	1878.	1879.	1880.	
Port Orford, Oreg						1					1
Port Orford (15 miles south of), Oreg								1			1
Port Townsend, Wash. Ter										1	1
Red Rock, San Francisco Bay, Cal										1	1
Rincon Point, San Francisco Bay, Cal		1									1
Rocky Point, Cal							1				1
Rogue River Bar, Oreg					1	1				2	4
Rough and Ready (5 miles south of Point Arena), Cal								1			1
Salmon Creek, Cal			1					1			2
San Buenaventura, Cal						3	1				4
San Diego Bay, Cal								1			1
San Juan Island, Straits of Fuca, Wash. Ter				1			1				2
San Miguel Island, Cal										2	2
San Pablo Bay, Cal								1			1
San Pedro, Cal			1								1
Sand Island, Oreg				1		1			1		3
Santa Cruz Point, Cal							1			1	2
Shoalwater Bay, Wash. Ter						1				1	2
Smith's Point, Oreg						1					1
Smith's River (mouth of), Cal								1	1		2
South Beach, San Francisco Bay, Cal					1	1					2
Stewart's Point, Cal	6					1					7
Stillwater Cove, Cal	1										1
Timber Cove, Cal		1									1
Tomales Point, Cal				1							1
Trinidad, Cal								1			1
Umpqua Bar, Oreg			2	1		1			1		5
Westport, Humboldt Bay, Cal									1	1	2
Wilmington Bay, Cal						1					1
Yaquina Bay, Cal				1		1	1	1			4

LAKE COASTS.

[NOTE.—This list includes also places on the Canadian shore where American vessels have stranded.]

Ahnapee, Lake Michigan, Wis		1			1						2
Ahnapee (2¾ miles south of), Lake Michigan, Wis									1		1
Alabaster Reef, Lake Huron, Mich		1	1			1					3
Alaska, Lake Michigan, Wis										1	1
Alcona, Lake Huron, Mich				1				2			3
Alpena, Lake Huron, Mich				2							2
Amherstburg, Detroit River, Canada					2			1			3
Amherst Island, Lake Ontario, Canada									1		1
Amsterdam, Lake Michigan, Mich	1										1
Antrim, Lake Michigan					1	1					2
Apostle Islands, Lake Superior, Wis					1						1
Ashtabula, Lake Erie, Ohio	1		1		1	2	2		1		8
Au Sable River, Lake Huron, Mich								1		2	3
Avon Point, Lake Erie, Ohio					1						1
Bailey's Harbor, Lake Michigan, Wis	1					2					3
Barcelona, Lake Erie, N. Y							1				1
Bark River (mouth of), Green Bay, Mich							1	1			2
Bar Point, Lake Erie, Canada	1	3	4	4	1	1		1		1	16
Beaver Bay (2 miles northeast of), Lake Superior										1	1
Beaver Bay (8 miles northeast of), Lake Superior										1	1
Beaver Island, Lake Michigan, Mich		3		2		1			1	2	9
Belle Island, Detroit River, Mich				4	1	1				2	8
Biddle's Point, Lake Michigan, Mich									1		1
Big Point au Sable, Lake Michigan, Mich	1										1
Big Sandy Creek, Lake Ontario, N. Y										5	5
Big Sodus, Lake Ontario		1						2		2	5
Black Lake Harbor, Lake Michigan, Mich										1	1
Black River, Lake Erie, Ohio	2	1		1							4
Black River, Lake Huron, Mich					2						2
Black River, Lake Michigan, Wis										1	1
Black River Island Reef, Lake Huron, Mich										2	2
Bois Blanc Island, Detroit River, Canada						1			1		2
Bois Blanc Island, Straits of Mackinac, Mich			2	2	1	2				1	8
Braddock's Point, Lake Ontario, N. Y							1				1
Buffalo (4 miles west of), Lake Erie, N. Y										1	1
Buffalo Harbor, Lake Erie, N. Y	1	3	1	1	2	1	1	2		5	17
Burnt Cabin Point Reef, Lake Huron, Mich								1			1

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TABLE 65.—*Principal Places on the Coasts of the United States where Vessels have Stranded, &c.*—Continued.

LAKE COASTS—Continued.

Name of place.	Fiscal year ending June 30—										Total.
	1871.	1872.	1873.	1874.	1875.	1876.	1877.	1878.	1879.	1880.	
Buckhorn Dock, Lake Erie, Canada	....	....	....	....	....	....	1	....	....	....	1
Cape Ipperwash, Lake Huron, Canada	1	1	....	....	....	....	....	....	....	....	2
Calumet Reef, Lake Michigan, Ill	....	....	....	....	1	....	....	....	....	....	1
Cana Island, Lake Michigan, Wis	....	....	....	....	1	....	....	....	....	....	1
Cape Hurd, Lake Huron, Canada	....	1	....	....	....	....	....	....	....	....	1
Carlton Island, Lake Ontario, Canada	....	....	1	....	....	....	....	....	....	....	1
Carlton, Lake Michigan, Wis	....	....	....	1	....	....	....	....	1	....	2
Cat-Head Point, Lake Michigan, Mich	....	....	....	....	1	....	....	....	....	....	1
Cedar Point, Lake Huron	....	....	....	....	....	....	....	....	....	1	1
Cedar Point, Sandusky Bay, Lake Erie, Ohio	....	1	....	2	1	1	....	....	....	2	7
Cedar River, Lake Michigan, Mich	1	....	....	....	....	1	....	....	....	....	2
Chambers' Island, Lake Michigan, Wis	....	1	....	1	....	....	....	....	....	....	2
Charity Island, Lake Huron Mich	....	1	....	....	....	....	....	....	....	....	1
Charlevoix, Lake Michigan, Mich	....	....	....	....	....	....	1	....	....	....	1
Charlotte, Lake Ontario, N. Y	....	1	....	....	1	1	....	....	2	....	5
Charlotte (4 miles west of), Lake Ontario, N. Y	....	....	....	....	....	....	....	1	....	....	1
Cheboygan (Straits of Mackinac), Mich	....	....	....	1	....	4	....	1	1	1	8
Chester's Reef, Lake Erie	....	....	....	....	1	....	....	....	....	....	1
Chicago Harbor, Lake Michigan, Ill	....	3	1	1	1	6	....	2	....	2	16
Chicago (5 miles south of), Lake Michigan, Ill	....	....	....	....	....	....	....	1	....	....	1
Chick-e-no-lee Reef, Lake Erie, Canada	1	....	1	1	....	....	....	....	....	1	4
Chocolay River (1 mile east of), Lake Superior	....	....	....	....	....	....	1	....	....	....	1
Clay Banks, Lake Erie	....	2	1	1	....	....	....	....	....	....	4
Clay Banks, Lake Michigan, Wis	....	....	....	....	....	....	....	....	....	2	2
Cleveland Harbor, Lake Erie, Ohio	5	1	....	3	1	2	....	1	....	2	15
Cobourg, Lake Ontario, Canada	1	....	....	....	....	....	....	....	....	....	1
Cockburn Island, Lake Huron, Canada	....	1	....	....	....	....	....	....	2	....	3
Colchester Reef, Lake Erie, Canada	1	1	1	....	1	....	....	....	1	....	5
Collingwood, Lake Huron, Canada	....	....	....	....	....	....	....	....	1	1	2
Conneaut, Lake Erie, Ohio	....	2	....	....	....	....	....	....	....	....	2
Conneaut (4 miles east of), Lake Erie, Ohio	....	....	....	....	....	....	....	....	1	....	1
Cove Island, Lake Huron, Canada	3	....	....	1	....	....	....	....	....	....	4
Death's Door, Lake Michigan, Wis	1	....	....	1	1	1	1	....	....	....	5
Detour, Detour Channel, Mich	....	3	....	....	1	....	....	1	....	2	7
Detour, Detroit River, Mich	....	....	....	....	1	....	....	....	....	....	1
Detroit Island, Lake Michigan	....	....	1	....	....	....	....	....	....	....	1
Dorney's Reef Point, Lake Michigan	....	....	....	....	1	....	....	....	....	....	1
Duck Island, Lake Ontario, Canada	....	....	1	....	....	....	....	....	....	....	1
Duluth, Lake Superior, Minn	....	....	1	....	....	....	....	....	....	....	1
Dunkirk Harbor, Lake Erie, N. Y	3	1	....	....	2	1	....	....	....	....	7
Dykesville, Lake Michigan, Wis	....	1	....	....	....	....	....	....	....	....	1
Eagle Harbor, Green Bay, Lake Michigan, Wis	....	....	....	....	....	....	....	....	1	....	1
Eagle Harbor, Lake Superior, Mich	....	....	1	1	....	....	....	....	....	....	2
East Hamburg, Lake Erie, N. Y	....	....	....	....	....	....	1	....	....	....	1
East Sister Island, Lake Erie, Canada	1	1	1	....	....	....	....	....	....	....	3
East Sister Reef, Lake Erie, Canada	....	....	....	....	....	....	....	....	1	....	1
Eleven-Foot Shoals, Green Bay, Lake Michigan	....	1	....	....	1	....	....	....	....	....	2
Elk Creek, Lake Erie, Pa	....	....	....	....	....	....	....	....	....	1	1
Elk Rapids, Lake Michigan, Mich	....	....	....	....	....	....	....	....	....	1	1
Ellison Bay, Lake Michigan, Wis	....	....	....	....	....	....	1	....	....	....	1
Erie Harbor, Lake Erie, Pa	3	3	2	....	2	1	....	1	....	2	14
Escanaba, Lake Michigan, Mich	....	1	....	....	....	1	....	....	....	....	2
Euclid, Lake Erie, Ohio	....	1	....	....	....	....	....	....	....	....	1
Evanston, Lake Michigan, Ill	....	....	2	2	....	....	....	1	....	1	5
Fairport, Lake Erie, Ohio	1	1	1	2	2	1	....	1	1	1	11
False Ducks, Lake Ontario, Canada	....	....	1	....	....	....	....	....	....	....	1
False Presque Isle, Lake Huron, Mich	1	....	....	....	....	2	....	2	....	1	6
Featherbed Shoals, Lake Ontario	....	....	....	....	1	....	....	....	....	....	1
Fighting Island, Detroit River, Canada	....	....	....	....	1	....	....	....	1	1	3
Fish Point, near Point au Pelée, Lake Erie, Canada	....	....	....	....	....	....	....	....	1	....	1
Fisherman's Island Reef, Lake Michigan, Mich	....	....	....	....	....	1	....	....	....	....	1
Ford Shoals, Lake Ontario, N. Y	....	....	....	....	....	....	....	....	1	....	1
Forest Bay, Lake Huron, Mich	....	....	....	....	1	....	....	....	1	....	2
Forester, Lake Huron, Mich	....	1	....	....	....	....	....	....	....	....	1
Forty-Mile Point, Lake Huron, Mich	....	1	....	....	1	....	1	1	....	....	4
Forty-Mile Point, Lake Ontario, N. Y	....	....	....	....	....	....	....	1	....	....	1
Foscoro, Lake Michigan, Wis	....	....	....	....	....	....	....	....	....	1	1
Frankfort, Lake Michigan, Mich	....	....	2	3	1	2	....	....	1	....	9
Gallup Island, Lake Ontario, N. Y	....	....	....	....	....	....	....	1	....	....	1
Garden Island, Lake Michigan	....	....	....	....	....	....	....	....	....	1	1
Geneva (off), Lake Erie, Ohio	....	....	....	....	1	....	....	....	....	....	1
Glen Arbor, Lake Michigan, Mich	....	....	....	....	....	....	....	....	....	1	1
Glencoe, Lake Michigan, Ill	....	....	....	....	....	....	....	....	....	1	1
Goderich, Lake Huron, Canada	1	1	1	....	....	....	....	....	....	....	3
Good Harbor Bay, Lake Michigan, Mich	....	....	....	....	....	2	....	....	....	....	2

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TABLE 65.—*Principal Places on the Coasts of the United States where Vessels have Stranded, &c.*—Continued.

LAKE COASTS—Continued.

Name of place.	Fiscal year ending June 30—										Total.
	1871.	1872.	1873.	1874.	1875.	1876.	1877.	1878.	1879.	1880.	
Goose Island Shoal, Straits of Mackinac, Mich	....	....	....	....	....	....	....	....	....	1	1
Graham's Shoals, Straits of Mackinac, Mich	....	....	....	1	....	....	....	2	....	....	3
Grand Haven, Lake Michigan, Mich	2	1	....	6	3	6	2	2	9	9	40
Grand Haven (4 miles north of), Lake Michigan	....	....	....	....	....	....	....	1	....	....	1
Grand Isle, Lake Superior, Mich	2	....	1	1	1	1	1	....	....	....	7
Grand Manitoulin, Lake Huron, Canada	....	....	....	....	....	....	....	....	1	....	1
Grand Marais, Lake Superior, Minn	....	....	....	....	....	1	....	....	....	1	2
Gray's Reef, Lake Michigan, Mich	....	....	....	....	....	....	....	....	1	....	1
Griffith's Island, Lake Huron, Canada	....	....	1	....	....	....	....	....	....	....	1
Grindstone City, Lake Huron, Mich	....	....	....	....	....	1	1	....	....	1	3
Grosse Isle, Detroit River, Mich	....	....	....	1	....	1	1	....	....	....	3
Grosse Point, Lake Michigan, Ill	1	1	....	....	....	....	....	....	....	....	2
Gull Island, Lake Michigan, Mich	....	....	....	....	....	....	....	1	1	....	2
Gull Island, Lake Ontario, N. Y	....	2	....	....	1	....	....	....	....	....	3
Gull Island Reef, Lake Erie	....	....	....	....	....	....	....	....	....	2	2
Gull Island Rock, Lake Superior	....	....	....	....	....	....	....	....	1	....	1
Hamlin, Lake Michigan, Mich	....	....	....	....	....	....	....	....	....	2	2
Hammond's Bay, Lake Huron, Mich	....	1	1	1	....	....	....	....	....	....	3
Harrisville, Lake Huron, Mich	....	....	....	....	....	....	....	1	....	....	1
Hat Island, Green Bay, Lake Michigan, Wis	1	....	....	....	1	....	....	....	....	....	2
Herson's Island, Lake Saint Clair, Mich	1	....	....	....	1	....	....	1	....	1	4
Hog Island Reefs, Lake Michigan	1	1	....	....	....	....	....	....	....	....	2
Holland, Lake Michigan, Mich	....	....	1	....	....	1	1	1	....	1	5
Horn Pier, Lake Michigan, Wis	....	....	....	....	....	....	....	....	....	1	1
Horseshoe Reef, Lake Erie, N. Y	....	....	....	....	....	....	....	....	1	1	2
Horseshoe Reef, Green Bay, Lake Michigan	....	....	....	....	....	....	....	....	1	....	1
Huron City, Lake Huron, Mich	1	....	....	....	....	....	....	....	....	....	1
Huron Island, Lake Superior, Mich	....	....	....	....	....	1	....	....	....	....	1
Hyde Park (off), Lake Michigan, Ill	....	....	....	....	....	....	....	1	....	....	1
Indian Town Reef, Green Bay, Lake Michigan	....	....	....	....	....	....	....	....	1	....	1
Inverhuron Harbor, Lake Huron, Canada	....	....	....	....	2	....	....	....	....	....	2
Irondequoit, Lake Ontario, N. Y	....	....	....	....	....	....	....	....	....	1	1
Isle Royale, Lake Superior, Mich	....	....	1	....	....	....	1	....	....	....	2
Jacksonport, Lake Michigan, Wis	....	....	....	....	....	....	....	1	....	....	1
Kalamazoo River (mouth of), Lake Michigan	....	....	....	....	....	....	....	....	1	1	2
Kelley's Island, Lake Erie, Ohio	....	....	1	2	1	1	....	....	....	....	5
Kenosha, Lake Michigan, Wis	....	2	....	1	1	....	1	....	1	....	6
Kewaunee, Lake Michigan, Wis	....	1	....	2	....	1	....	....	....	....	4
Keweenaw Bay, Lake Superior, Mich	....	....	....	....	....	....	1	....	....	....	1
Kincardine, Lake Huron, Canada	....	4	....	....	....	....	....	....	....	....	4
Lake Forest (2 miles south of), Lake Michigan, Ill	....	....	....	....	....	....	....	....	....	1	1
Laughing Reef, Lake Superior, Mich	....	2	....	....	....	....	....	....	....	....	2
Leamington, Lake Ontario, Canada	....	....	....	....	....	1	....	....	....	....	1
Leland, Lake Michigan, Mich	....	3	1	....	....	....	....	1	....	1	6
Lexington, Lake Huron, Mich	....	....	....	....	....	1	....	1	....	1	3
Limekiln Crossing, Detroit River	....	....	....	....	....	....	....	....	....	5	5
Limekiln Reef, Detroit River	....	....	2	4	3	2	1	2	....	....	14
Limekiln Reef (mouth of Niagara River), Lake Ontario	....	....	....	....	....	....	....	....	....	2	2
Limestone Island, Georgian Bay, Canada	....	....	....	....	....	....	1	....	....	....	1
Lincoln Park, Lake Michigan, Ill	....	....	....	....	....	....	....	....	....	2	2
Little Manitou Island, Lake Michigan, Mich	....	....	....	....	1	....	....	....	....	....	1
Little Sturgeon Bay, Lake Michigan, Wis	....	....	....	....	....	1	....	....	....	....	1
Little Summer Island Reef, Lake Michigan, Mich	....	....	....	....	....	....	....	....	....	1	1
Long Point, Lake Erie, Canada	7	6	2	....	5	2	....	4	....	1	27
Long Point, Lake Ontario	....	....	....	....	....	....	....	....	....	1	1
Long Tail Point, Lake Michigan, Wis	....	....	....	....	....	....	....	1	....	....	1
Ludington, Lake Michigan, Mich	2	....	2	....	1	....	....	....	2	1	8
Mackinac City, Straits of Mackinac, Mich	....	....	....	....	....	1	....	1	....	....	2
McGulpen Point, Straits of Mackinac, Mich	....	....	....	....	....	....	....	....	....	1	1
Madison, Lake Erie, Ohio	....	1	....	....	....	....	....	....	....	....	1
Maitland, Lake Erie, Canada	....	....	....	....	....	....	....	....	....	1	1
Malden, Detroit River, Canada	....	....	....	1	1	....	....	....	....	....	2
Mamajudy Light, Detroit River, Mich	1	....	....	....	....	....	....	....	....	....	1
Manistee, Lake Michigan, Mich	2	....	1	2	1	2	1	....	....	5	14
Manitowoc, Lake Michigan, Wis	....	....	....	....	1	3	....	....	....	....	4
Marblehead, Lake Erie, Ohio	....	....	1	....	....	1	....	1	....	4	7
Marquette, Lake Superior, Mich	....	....	2	2	....	....	....	....	....	....	4
Maumee, Lake Erie, Ohio	....	....	1	....	....	....	....	....	....	....	1
Michigan City, Lake Michigan, Ind	....	....	2	1	2	1	....	2	....	3	11
Michipicoton, Lake Superior, Canada	....	....	1	....	....	....	....	....	....	....	1
Middle Bass Island, Lake Erie, Ohio	....	....	....	....	1	....	....	....	....	....	1
Middle Island, Lake Huron, Mich	....	....	1	1	....	....	....	....	....	....	2
Middle Sister Island, Lake Erie, Canada	....	....	2	....	....	....	....	....	....	....	2

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TABLE 65.—*Principal Places on the Coasts of the United States where Vessels have Stranded, &c.*—Continued.

LAKE COASTS—Continued.

Name of place.	Fiscal year ending June 30—										Total.
	1871.	1872.	1873.	1874.	1875.	1876.	1877.	1878.	1879.	1880.	
Middle Village, Lake Michigan, Mich	....	....	....	....	....	....	....	1	....	....	1
Milwaukee, Lake Michigan, Wis	2	....	1	2	1	2	....	1	....	3	12
Mission Point, Lake Michigan, Mich	....	....	....	....	....	1	....	....	....	....	1
Mission Reef, Lake Michigan Mich	1	....	....	....	....	....	....	....	....	....	1
Morgan Point, Lake Erie, Canada	....	1	1	....	1	....	1	....	..	....	4
Muskegon, Lake Michigan, Mich	1	....	2	3	1	1	1	1	....	1	11
Napanee, Lake Ontario, Canada	2	....	....	....	....	....	....	....	....	....	2
Nebish Rapids, Saint Mary's River	....	1	1	4	4	1	....	....	....	....	11
New Buffalo, Lake Michigan, Mich	1	....	....	....	....	1	....	....	....	....	2
Niagara Reef, Lake Erie, Ohio	....	....	....	....	....	....	1	....	....	..	1
Niagara River, Lake Erie	....	1	....	1	....	....	....	....	1	..	3
Nicholson's Island, Lake Ontario, Canada	....	1	....	....	....	....	....	....	....	....	1
Nine-Mile Creek, Lake Ontario, N. Y	....	2	....	....	....	....	....	....	....	....	2
Nine-Mile Point, Lake Huron, Mich	....	....	....	....	....	....	....	....	....	2	2
North Bay, Lake Michigan, Wis	....	1	....	....	1	1	....	....	....	....	3
North Harbor Island Reef, Lake Erie, Canada	....	2	....	....	2	....	....	....	....	....	4
North Manitou Island, Lake Michigan, Mich	1	1	....	4	1	2	2	....	....	2	13
North Point, Lake Huron, Mich	....	....	....	....	....	....	....	4	..	1	5
North Point, Lake Michigan, Wis	....	....	2	1	....	....	....	....	....	1	4
Northport, Lake Michigan, Mich	....	1	....	....	....	....	....	....	....	....	1
Oak Creek, Lake Michigan, Wis	....	....	....	....	....	....	....	....	....	1	1
Oconto Reef, Lake Michigan, Wis	....	....	....	....	....	1	....	....	....	....	1
Old Fort Mackinac, Straits of Mackinac, Mich	....	....	....	....	....	3	1	....	....	....	4
Oscoda, Lake Huron, Mich	....	....	....	....	....	....	....	....	1	....	1
Oswego, Lake Ontario, N. Y	5	2	3	1	....	1	2	....	2	1	17
Oswego (3½ miles west of), Lake Ontario, N. Y	....	....	....	....	....	....	....	....	....	1	1
Oswego (5 miles east of), Lake Ontario, N. Y	....	....	....	....	....	....	....	....	....	1	1
Owen Sound, Georgian Bay, Lake Huron	....	1	....	....	....	....	....	....	....	....	1
Pancake Shoal, Green Bay, Lake Michigan	....	1	....	....	....	....	....	....	....	....	1
Papoose Island, Lake Huron, Canada	....	....	1	....	....	....	....	....	....	....	1
Peche Island, Lake Saint Clair, Canada	....	....	....	....	1	....	....	....	....	....	1
Peninsula Point, Lake Michigan, Mich	....	....	....	....	....	1	....	....	....	....	1
Peninsula Point (reef 5 miles from), Mich	....	....	....	....	....	....	....	....	....	1	1
Pentwater, Lake Michigan, Mich	....	2	....	2	....	....	....	....	1	....	5
Peshtigo Reef, Lake Michigan, Wis	....	....	1	1	1	..	....	....	....	....	3
Picton, Lake Ontario, Canada	....	1	....	....	....	....	....	....	....	....	1
Pigeon Bay, Lake Erie, Canada	....	1	....	2	....	....	....	2	....	....	5
Pigeon Island, Lake Ontario, Canada	1	1	....	....	1	....	....	....	....	....	3
Pillar Point, Lake Ontario, N. Y	....	1	....	....	....	....	....	....	....	....	1
Pilot Island, Lake Michigan, Wis	....	1	1	1	....	1	....	2	....	1	7
Pine River, Lake Michigan, Mich	....	....	....	1	....	....	....	1	....	....	2
Plum Island, Lake Michigan, Wis	....	....	....	....	1	1	....	1	....	1	4
Point Abino, Lake Erie, Canada	....	2	....	....	3	....	....	....	1	1	7
Point au Pelée, Lake Erie, Canada	3	11	5	4	3	3	..	2	1	....	32
Point au Pelée Island, Lake Erie, Canada	....	....	....	....	....	....	....	2	..	2	4
Point au Sable, Lake Huron, Mich	..	....	3	....	....	....	....	....	....	....	3
Point au Sable, Straits of Mackinac, Mich	....	1	....	....	....	1	....	..	....	1	3
Point aux Barques, Lake Huron, Mich	1	2	....	1	1	1	....	1	....	....	7
Point aux Barques (2 miles east of), Lake Huron, Mich	....	....	....	....	....	....	....	....	....	1	1
Point aux Barques (4½ miles above), Lake Huron, Mich	....	....	....	....	....	....	....	....	1	....	1
Point aux Becs Scies, Lake Michigan, Mich	2	..	1	....	....	....	....	....	....	....	3
Point aux Pins, Lake Erie, Canada	....	....	1	....	....	....	....	....	....	....	1
Point Clark, Lake Huron, Canada	....	....	....	....	..	1	....	....	....	....	1
Point La Barbe, Straits of Mackinac, Mich	....	....	....	....	....	1	....	....	....	....	1
Point Moullier, Lake Erie, Mich	....	....	....	....	1	....	....	....	....	....	1
Point Peninsula, Lake Michigan, Mich	1	....	....	....	....	....	....	....	....	....	1
Point Peninsula, Lake Ontario, N. Y	....	....	....	....	....	....	1	....	....	1	2
Point Saint Ignace, Straits of Mackinac, Mich	....	....	....	....	....	....	....	....	....	1	1
Portage, Lake Michigan, Mich	....	....	....	....	....	....	1	....	....	....	1
Portage Island Reef, Green Bay, Lake Michigan	....	....	....	....	....	....	....	....	1	....	1
Portage River, Lake Superior, Mich	....	....	..	....	1	....	....	....	....	....	1
Port Austin, Lake Huron, Mich	....	3	....	1	2	2	....	2	....	.	10
Port Bruce, Lake Erie, Canada	....	....	2	....	....	....	....	....	....	....	2
Port Burwell, Lake Erie, Canada	2	1	2	1	....	1	....	....	....	....	7
Port Colborne, Lake Erie, Canada	3	2	1	....	1	....	....	1	1	1	10
Port Dalhousie, Lake Ontario, Canada	....	....	....	....	....	1	....	....	....	....	1
Port Elgin, Lake Huron, Canada	2	....	....	....	....	....	....	....	....	....	2
Port Hope, Lake Huron, Mich	....	1	....	....	....	....	....	....	1	1	3
Port Maitland, Lake Erie, Canada	....	....	2	....	4	....	....	....	....	....	6
Port Ontario, N. Y	....	....	....	....	....	....	....	....	....	1	1
Port Ryerse, Lake Erie, Canada	....	....	....	....	....	....	....	1	....	....	1
Port Sanilac, Lake Huron, Mich	....	....	....	1	....	....	....	1	....	....	2
Port Sarnia, Saint Clair River, Canada	1	2	....	....	1	....	....	....	1	....	5
Port Stanley, Lake Erie, Canada	....	1	1	....	....	....	....	....	....	....	2
Port Washington, Lake Michigan, Wis	1	....	....	....	1	....	....	....	....	....	2

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TABLE 65.—*Principal Places on the Coasts of the United States where Vessels have Stranded, &c.*—Continued.

LAKE COASTS—Continued.

Name of place.	Fiscal year ending June 30—										Total.
	1871.	1872.	1873.	1874.	1875.	1876.	1877.	1878.	1879.	1880.	
Poverty Island, Lake Michigan, Mich	....	....	1	....	....	....	....	1	....	....	2
Presque Isle, Lake Erie, P	....	....	2	....	....	....	....	1	....	....	3
Presque Isle, Lake Huron, Mich	1	3	....	1	1	....	....	2	....	1	9
Put-in-Bay Island, Lake Erie, Ohio	....	1	....	....	1	....	....	....	1	1	4
Pultneyville (2 miles east of), Lake Ontario, N. Y	....	....	....	....	....	....	....	....	1	....	1
Quinte Bay, Lake Ontario, Canada	2	....	....	....	....	1	....	....	....	....	3
Racine, Lake Michigan, Wis	....	....	....	....	....	....	3	....	....	4	7
Racine Point, Lake Michigan, Wis	....	....	....	....	....	....	....	....	....	2	2
Racine Reef, Lake Michigan, Wis	3	3	2	2	2	1	....	1	....	....	14
Rock Falls, Lake Huron, Mich	....	....	....	....	2	....	....	....	....	....	2
Rock Island, Lake Michigan, Wis	....	....	....	1	....	....	....	....	....	....	1
Rondeau, Lake Erie, Canada	....	....	6	....	....	....	....	....	....	....	6
Round Island, Lake Michigan, Mich	1	1	....	....	....	....	....	....	....	....	2
Saginaw River (mouth of), Lake Huron, Mich	....	....	....	....	1	....	....	....	1	1	3
Saint Clair Flats, Lake Saint Clair	1	....	....	....	2	....	....	1	....	1	5
Saint Helena Island, Straits of Mackinac, Mich	2	....	2	....	....	1	....	1	....	1	7
Saint Joseph, Lake Michigan, Mich	....	3	2	1	....	3	2	2	1	6	20
Saint Martin's Island, Lake Michigan, Mich	1	....	....	1	....	....	....	....	1	....	3
Saint Martin's Shoal, Lake Michigan, Mich	....	....	....	....	....	....	....	....	....	1	1
Salmon Point, Lake Ontario, Canada	1	....	....	....	....	....	....	....	....	....	1
Sand Beach, Lake Huron, Mich	....	....	....	....	1	....	....	2	1	8	12
Saugatuck, Lake Michigan, Mich	....	....	1	....	....	....	....	....	....	....	1
Sault Sainte Marie (1 mile above)	....	....	....	....	....	....	....	2	....	....	2
Sheboygan, Lake Michigan, Wis	....	3	2	1	2	1	....	....	....	1	10
Sister Bay, Lake Michigan, Wis	....	....	....	....	....	....	1	....	....	....	1
Sister Island, Lake Michigan, Wis	....	....	....	....	....	1	....	....	....	....	1
Sister Reef Island, Lake Michigan	....	....	....	1	....	....	....	....	....	....	1
Skillegalee, Lake Michigan, Mich	....	....	....	....	....	....	1	....	....	....	1
Sleeping Bear Point, Lake Michigan, Mich	1	....	....	....	1	1	....	....	....	....	3
Snake Island, Lake Ontario, Canada	....	2	....	....	....	....	....	....	....	....	2
South Bay, Lake Ontario, Canada	1	1	....	....	....	....	....	....	....	....	2
South Bay Point, Lake Ontario, Canada	....	....	....	....	....	....	....	....	....	1	1
South Fox Island, Lake Michigan, Mich	....	....	....	1	....	....	....	....	....	1	2
South Haven, Lake Michigan, Mich	1	....	1	....	1	4	....	....	....	2	9
South Haven (3 miles south of), Lake Michigan, Mich	....	....	....	....	....	....	....	....	1	....	1
South Manitou Island, Lake Michigan, Mich	....	1	1	....	1	5	2	....	....	1	11
South Point, Lake Michigan, Wis	....	....	....	....	....	....	....	....	....	1	1
Spider Island, Lake Michigan, Wis	....	....	2	....	....	....	....	1	....	....	3
Stowe Island Reef, Lake Erie	....	....	....	....	2	1	....	1	1	....	5
Stony Island, Detroit River	....	....	1	....	1	....	....	....	1	....	4
Stony Point, Lake Ontario, N. Y	....	....	....	....	....	....	2	....	....	....	2
Strawberry Island, Lake Michigan, Wis	....	2	....	....	....	....	....	....	....	....	2
Sturgeon Point, Lake Erie, N. Y	....	1	1	....	1	....	....	....	....	....	3
Sturgeon Point, Lake Huron, Mich	....	1	....	....	1	....	....	....	....	1	3
Sugar Island, Lake Huron, Mich	....	2	....	....	....	....	....	1	....	....	3
Tawas Harbor, Lake Huron, Mich	....	1	2	1	....	....	....	....	....	....	4
Tawas Point, Lake Huron, Mich	....	....	....	....	1	....	....	....	....	1	2
Thunder Bay, Lake Huron, Mich	1	....	1	....	....	....	2	2	1	....	7
Thunder Bay Island, Lake Huron, Mich	....	....	....	....	....	....	....	....	1	1	2
Tibbit's Point, Lake Ontario, N. Y	....	....	....	....	....	....	....	1	....	....	1
Toronto, Lake Ontario, Canada	1	....	....	....	....	1	1	....	....	....	3
Turtle Island, Lake Erie, Ohio	....	1	....	....	....	....	....	....	....	....	1
Twin Rivers Lake Michigan, Wis	1	2	....	....	....	....	....	....	....	3	6
Twin Rivers Point, Lake Michigan, Wis	....	....	....	....	....	1	....	....	....	....	1
Twin Rivers Point (2 miles north of), Lake Michigan, Wis	....	....	....	....	....	....	....	....	....	1	1
Two Creeks, Lake Michigan, Wis	....	....	....	....	....	1	....	....	....	....	1
Vermillion Point, Lake Superior	....	1	....	....	....	....	....	....	....	....	1
Walker's Point, Lake Huron, Canada	....	....	....	....	....	....	....	....	1	....	1
Washington Island, Lake Michigan, Wis	1	1	....	1	....	....	....	....	2	....	5
Waugoshance, Lake Michigan	1	....	....	....	....	3	....	....	1	....	5
Waukegan, Lake Michigan, Ill	....	....	1	....	1	2	....	....	....	....	4
Whale Back Shoal, Green Bay, Lake Michigan	....	....	1	....	....	....	....	....	....	....	1
Whiskey Bay, Lake Superior	....	....	....	....	....	....	....	....	....	1	1
White Lake Harbor, Lake Michigan	1	....	1	3	1	1	....	2	2	2	13
White Rock, Saginaw Bay, Lake Huron, Mich	....	....	....	....	1	....	....	....	....	....	1
White Shoals, Straits of Mackinac, Mich	1	2	....	....	....	....	....	....	....	....	3
Wilson Harbor, Lake Ontario, N. Y	1	....	....	....	1	....	....	....	....	....	2
Wind Point, Lake Michigan, Wis	....	....	....	....	....	1	1	....	....	....	2
Windmill Point, Lake Erie, Canada	3	....	....	....	....	....	....	....	....	....	3
Wolf Island, Lake Ontario, Canada	1	....	....	1	....	....	....	....	....	....	2

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TABLE 66.—*List of Places where American Vessels have Stranded in* FOREIGN WATERS *during the last six years.*

Name of place.	Fiscal year ending June 30—						Total.
	1875.	1876.	1877.	1878.	1879.	1880.	
Abraham's Bay, Monguana Island		1					1
Adacora, Venezuela				1			1
Adjuah, west coast of Africa					1		1
Altalta (sand beach, 20 miles north), Mexico	1						1
Altalta (off), Mexico				1			1
Altalta Harbor, Mexico				1			1
Alvarado (25 miles east of), Mexico		1					1
Alvarado Bar, Mexico						1	1
Amherst Island, Gulf of Saint Lawrence	1	2					3
Anegada Island, British West Indies				1	1		2
Anquilla Island (Salt Key Bank), Straits of Florida	1						1
Argyle (Old Man), Nova Scotia		1					1
Arica, Peru					1		1
Arecibo, Porto Rico					1		1
Arogant Shoal (latitude 5° 17′ south, longitude 113° 29′ east)		1					1
Aspinwall, Central America					2	2	4
Atlas Straits, East Indies						1	1
Bahamas			2				2
Bahamas (Abaco Island)					1		1
Bahamas (Abaco Light, 15 miles north of)				1			1
Bahama Bank			1				1
Bahamas (Bimini Island)						2	2
Bahamas (Bone Fish Bay)		1					1
Bahamas (Caicos Island)		1	1	1		2	5
Bahamas (Castle Island)						1	1
Bahamas (Cay Bars)			1				1
Bahamas (Crooked Island)	1	1			1		3
Bahamas (Gingerbread Ground)						1	1
Bahamas (Grand Bahama Island)	1						1
Bahamas (Grand Cay Reef)				1			1
Bahamas (Grand Sand Cay)		1					1
Bahamas (Grand Turk and Salt Cay, reef between)					1		1
Bahamas (Green Turtle Key)		1					1
Bahamas (Harbor Island)					1		1
Bahamas (Hogstic s Reef)			1			2	3
Bahamas (Little Bahama Island)					1		1
Bahamas (Mariguana Reef)	1	1				2	4
Bahamas (Matanilla Reef)			1				1
Bahamas (Middle Reef)	1						1
Bahamas (Miradpurvos Island)					1		1
Bahamas (Moselle Shoals)	1						1
Bahamas (Nassau, New Providence)					1		1
Bahamas (No Name Cay)				1			1
Bahamas (North Bimini)			1				1
Bahamas (Northwest Reef)	1						1
Bahamas (Powell's Key)		1					1
Bahamas (Rum Cay)		2					2
Bahamas (Sandy Cay)					1	1	2
Bahamas (Sheep Keys Shoals)			1				1
Bahamas (Silver Key Bank)						1	1
Bahamas (South Bimini)	1	1					2
Bahamas (Whale Key)					1		1
Bahamas (Wood Key)		1					1
Balahare Island, Hebrides				1			1
Banca Straits, East Indies						1	1
Baracoa Harbor, Cuba			2				2
Barbadoes		1					1
Barbaretta Island, Honduras			1				1
Barbuda Island, British West Indies		1					1
Barington, Nova Scotia						1	1
Batavia Harbor (Neptune's Shoal), Java			1				1
Bay of Fundy				1			1
Bay of Fundy (Saint Mary's Ledges, entrance to)					1		1
Belfast (Carrickfergus Bank), Ireland		1					1
Belize (main reef, 30 miles off)		1					1
Benoit's Cove, Newfoundland				1			1
Bermuda		2	2				4
Bermuda (Adventure Reef)					1		1
Bermuda Reef (15 miles from)					1		1
Bermuda (Saint George Island)					1		1
Black Point, Honduras, Central America	1						1
Bog Shippegan Gully, New Brunswick					1		1
Boiling Reef, Gulf of Georgia	1						1
Bolton Island, Molucca Group, East Indies	1						1
Bonacca Harbor, Honduras, Central America	1						1
Brava Island, Cape Verde Islands		1					1
Brazil (latitude 5° 2′ south, longitude 25° 22′ west)				1			1

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TABLE 66.—*List of Places where American Vessels have Stranded in* FOREIGN WATERS, *&c.*—Continued.

Name of place.	Fiscal year ending June 30—						Total.
	1875.	1876.	1877.	1878.	1879.	1880.	
Brazil Rock, Nova Scotia						1	1
Brier Island, Bay of Fundy		2					2
Buckos Reef, Tobago, British West Indies	1						1
Bull Ledge (off Cape Canso) Nova Scotia						1	1
Byron Island, Gulf of Saint Lawrence					1		1
Campobello Island, New Brunswick		1					1
Cape Agulhas (15 miles north of), Africa			1				1
Cape Bollard, Newfoundland				1			1
Cape Breton Island		2		1			3
Cape Corrientes, Cuba						1	1
Cape Frio, Brazil				1			1
Cape Henry, Anticosti Island, Gulf of Saint Lawrence					1		1
Cape Hogan, Arichat Island, Nova Scotia		1					1
Cape Horn, South America				1			1
Cape Isabella, San Domingo, West Indies			1				1
Cape Negro, Brazil, South America		1					1
Cape Negro Harbor, Nova Scotia					1		1
Cape Negro Island, Nova Scotia	1		1				2
Cape Sable, Nova Scotia	1						1
Cape Saint Mary, Newfoundland			1				1
Cape Saint Mary (5 miles south of), Newfoundland				1			1
Cape Town, Africa					1		1
Cape Verde Islands		2					2
Cardenas, Cuba			3				3
Cariaco, Venezuela			1				1
Caribbean, Cuba		1					1
Carimata Straits, East Indies	1						1
Carlisle Bay, Barbadoes		1					1
Carnarvon Bar, North Wales				1			1
Cascumpeque, Prince Edward Island					1		1
Cay Largo Island, Cuba			1				1
Cette, France				1			1
Charles Island (Galapagos Group), Pacific Ocean						1	1
Charlottetown, Prince Edward Island				1			1
Cheticamp, Cape Breton Island			1				1
Chickotan Island (Kurile Islands), Asia			1				1
China Sea			2	1			3
Chincorro Reef (off east coast of Yucatan)		1					1
Cienfuegos Harbor (west head of), Cuba		1	1				2
Coachman's Reef, Nova Scotia					1		1
Coatzacoalcos River Bar, Mexico		1					1
Cockburn Harbor Shoal, E. C		1					1
Cocorocame Reef, Honduras, Central America					1		1
Colonia Harbor Rock, Uruguay, South America	1						1
Colorado Reef, Cuba	1		2				3
Colorado Reef, Lord Howe's Island, Australia			1				1
Comacho Bay, Peru			1				1
Constantinople, Turkey		1					1
Coral Island, Japan Bay				1			1
Coru Island, Central America	1				1		2
Coxyde, Belgium				1			1
Cruz del Padre, Cuba						1	1
Cuba (reef north side of), W. I						1	1
Cumberland Gulf, British America						1	1
Dartmouth, England			1				1
Deer Island, New Brunswick	1	1		1	1		4
Demas Key (Salt Key Banks), West Indies		1					1
Dona Maria Inlet, Cuba	1						1
Duck Island, New Brunswick		1			1		2
Dugeon Shoal, Yorkshire, England		1					1
Dunkirk Roads (entrance to), France					1		1
Dungeness, Kent County, England					1		1
East London, Africa			1				1
Emulous Ledges, Nova Scotia				1			1
English Bank, Bristol Channel	1						1
Ensenada, mouth of Bristol Channel, Argentine Republic			1				1
Falmouth Harbor Reef, Jamaica					1		1
Fiji Islands, northeast group			1				1
Flores Islands		1					1
Flushing, Holland				1			1
Flushing Roads, below Antwerp, Belgium					1		1
Formentera, Balearic Islands		1					1
Frenchman's Harbor, Isle of Ruatan		1					1
Galway, Ireland					1		1
Garrucha Roadstead, Spain				1			1
Gibraltar		1					1
Gonaive Island, West Indies			1				1

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TABLE 66.—*List of Places where American Vessels have Stranded in* FOREIGN WATERS, *&c.*—Continued.

Name of place.	Fiscal year ending June 30—						Total.
	1875.	1876.	1877.	1878.	1879.	1880.	
Goodwin Sands, England			1				1
Gough's Island, South Pacific Ocean					1		1
Grand Cayman, West Indies				1			1
Grand Manan Island, New Brunswick			1		1		2
Grand Sands, near Trieste, Austria			1				1
Grand Turk Island, British West Indies		1					1
Greytown, Nicaragua				1			1
Grindstone Island, New Brunswick	1						1
Guanabana, Cuba				1			1
Gull Island, Long Harbor, Newfoundland			1				1
Gull Island, Nova Scotia	1						1
Gun Fleet Sound, Essex, England					1		1
Hake (South Banks), Nieuwe-Diepe, Holland				1			1
Halifax, Nova Scotia			1				1
Hammond's Knoll (off Yarmouth Head)		1					1
Harbor Island, Bay of Islands, Newfoundland			1				1
Havana (reef south side of), Cuba					1		1
Havana and Matanzas (between), Cuba		1					1
Havo, Main Rock, Bay of Yeddo, Japan		1					1
Helgoland, North Sea						1	1
Hesquot Sound, Vancouver's Island	1						1
Hong-Kong, China	2						2
Hoogly River, Diamond Harbor, British India	1						1
Hook Point, Wexford, Ireland					1		1
Hope Point, England						1	1
Hudson Bay			1				1
Idsumosaki Island, Japan					1		1
Imbetiba, Brazil					1		1
Indian Island, Labrador		1					1
Isle Bois, Straits of Belle Isle					1		1
Isle de Aves, Venezuela, South America						2	2
Jacquemel Bay, Hayti		1			1		2
Jardinillos Reef, West Indies		1	1				2
Jarvis Island, South Pacific				1			1
Jeremie Harbor, Hayti, West Indies			1		2		3
Jig Rock, near Shelburne, Nova Scotia			1				1
Kaloot Bank, Holland		1					1
Kamschatka, Sea of Okhotsk			1				1
Kapaa, Sandwich Islands						1	1
Kingston Harbor, Jamaica						1	1
Kutsino Island, off the coast of Japan					1		1
Lamoig, Jutland			1				1
Langlade Island, Newfoundland						1	1
Last Island, Gulf of Mexico		1					1
Leones Islands, Montego Bay, Jamaica	1						1
Lepreaux, Bay of Fundy, New Brunswick					1		1
Liberty Point, Campobello Island, New Brunswick	1						1
Liscomb Harbor, Nova Scotia				1			1
Little Curaçoa, Caribbean Sea				1			1
Liverpool, England			1				1
Lockport Harbor (ledge off), Nova Scotia				1			1
Lockville, Geography Bay, West Australia	1						1
Los Palmos, Canary Islands			1				1
Lueca (reef at), Jamaica					1		1
Macassar Straits, East Indies	1						1
MacNutt's Island, Nova Scotia		1					1
Madeira Island		1					1
Magdalen Islands, Gulf of Saint Lawrence		1				1	2
Malpec Bar, Gulf of Saint Lawrence	1						1
Main à Dieu Reef, Cape Breton Island			1				1
Manchioneal Reef, Jamaica, West Indies						1	1
Manilla Bay, Philippine Islands						1	1
Maquabo, Porto Rico			1				1
Marfa Drychon Beach, Cardigan Bay, Wales	1						1
Matane (Saint Lawrence River), Canada				1			1
Matanzas Harbor, Cuba		1	1		1		3
Mayo Island, Cape Verde Group	1						1
Mazatlan Mexico				1			1
Mexico (coast of)			1		1		2
Middle Wolf, New Brunswick			1				1
Milford Haven, South Wales					1		1
Miragoane, Hayti, West Indies					1	1	2
Mistaken Point, Newfoundland			1				1
Monte Rugginore (east of), Sardinia		1					1
Montevideo, Uraguay, South America						1	1
Morant Cays, Jamaica, West Indies				1			1
Moule, Guadeloupe, West Indies					1		1

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TABLE 66.—*List of Places where American vessels have Stranded in* FOREIGN WATERS, *&c.*—Continued.

Name of place.	Fiscal year ending June 30—						Total.
	1875.	1876.	1877.	1878.	1979.	1880.	
Murder Island Ledge (near Yarmouth), Nova Scotia			1				1
Musquash, Bay of Fundy, New Brunswick			1				1
Nag's Head, Louisburg, Cape Breton		1	1				2
Nanaimo, British America						1	1
Neiva (between Saint Domingo and Navassa)				1			1
Nevis, Windward Islands				1			1
New Guinea (coral reef off southwest coast of)					1		1
New Harbor Point, Nova Scotia				1			1
Newport Roads, Wales		1					1
Nicaragua (coast of)						1	1
Noel's Point Reef (entrance to Saint George's Harbor), N. F.		1					1
Noon Day Rock, Pacific Ocean						1	1
Nuevitas Harbor, Cuba		1		1			2
Opobo, west coast of Africa						1	1
Outer Brandy Rock, Newfoundland						1	1
Pabillon de Pica, South America			1				1
Packet Rock, Saint Thomas Harbor, West Indies						1	1
Palance Shoals (near Manila), Philippine Islands		1					1
Para River (mouth of), South America	1						1
Pictou, Nova Scotia					1		1
Piraguara Bay, Brazil, South America					1		1
Platte River (mouth of), South America						1	1
Plover Bay, Siberia						1	1
Point Barbara, San Domingo Island						1	1
Point Castilla, Honduras, Central America				1			1
Point Della Madona, South America					1		1
Point Negro and Point race (between), South America			1				1
Ponape Islands, Caroline Group, Pacific Ocean						1	1
Ponce, Porto Rico and Saint Thomas (between)				1			1
Popa Island, Malay Archipelago, Pacific Ocean			1				1
Porter's Passage (east side of), Halifax, Nova Scotia			1				1
Port Elizabeth, South Africa					1		1
Portland Point, Vancouver's Island, British America						1	1
Port Maria, Jamaica	1						1
Port Natal, South Africa					2	1	3
Porto Rico, West Indies			1				1
Progreso, Mexico		1					1
Prospect, Nova Scotia		1					1
Puerto Cortez (6 miles from), Honduras Bay, Cent. America						1	1
Puntas Arenas (18 miles south of), Costa Rica					1		1
Quoin Point, Cape of Good Hope, Africa		1					1
Quronata, Honduras, Central America				1			1
Rhio Straits, near Singapore, Malay Peninsula, East Indies						1	1
Rio de Contas (mouth of), Brazil, South America					1		1
Rio Grande do Sul Bar, Brazil, South America						1	1
Rocas Reef (125 miles northwest of Cape St. Roque), Brazil	1						1
Rocky Reef, Point Carlisle Bay, Jamaica				1			1
Round Reef, Saint John Harbor, New Brunswick						1	1
Russell's Point, Cape Breton Island						1	1
Rustico Harbor, Prince Edward Island						1	1
Sable Island, Nova Scotia		2					2
Saint Antonio, Brazil, South America						1	1
Saint Christopher Island, British West Indies					1		1
Saint George, New Brunswick	1						1
Saint George Bay, Newfoundland		1					1
Saint George's Bay, Syria						1	1
Saint John, New Brunswick						1	1
Saint John's, Porto Rico, West Indies			1				1
Saint Mary's Bay, Nova Scotia	1						1
Saint Pierre, Newfoundland			1				1
Saint Thomas Harbor, West Indies			3				3
Sand Island (island near), Straits of Formosa					1		1
San Antonio Light (15 miles east of), Cuba				2			2
San Felipe Keys, Cuba				1		1	2
San Geronimo Island, Lower California				1			1
San José de Guatemala		1					1
San Juan, Vancouver's Island, British America						1	1
San Quentin Harbor, Lower California				1			1
San Salvador, West Indies				1			1
Sanger Island, Hoogly River, British India			1				1
Santa Anna, Mexico					3		3
Santa Catalina Island, Pacific Ocean					1		1
Santiago de Cuba					1		1
Saona Island, Hayti, West Indies			1		1		2
Scarborough Shoals, China Sea	1						1
Scilly Island, South Pacific					1		1
Seal Shoal, Newfoundland			1				1

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TABLE 66.—*List of Places where American Vessels have Stranded in* FOREIGN WATERS, *&c.*—Continued.

Name of place.	Fiscal year ending June 30—						Total.
	1875.	1876.	1877.	1878.	1879.	1880.	
Serranilla Bank, Caribbean Sea	.....	.....	1	.....	.....	.....	1
Seven Stones, (off Land's End, England)	.....	.....	.....	1	.....	.....	1
Shag Harbor, Nova Scotia	.....	.....	.....	.....	1	.....	1
Shark's Point (mouth of Congo River), Africa	.....	.....	1	.....	.....	.....	1
Sheelee River (mouth of), Nova Scotia	.....	.....	.....	.....	.....	1	1
Shoal Bay, Newfoundland	.....	.....	.....	1	.....	.....	1
Sicily Island (near Avola)	1	.....	.....	.....	.....	.....	1
Smith's Island, Port Hood Harbor, Cape Breton Island	.....	.....	.....	2	.....	.....	2
Soledad Lagoon, Lower California	.....	.....	.....	1	.....	.....	1
Stackpole, England	1	1	.....	.....	.....	.....	2
Straits of Georgia, British North America	.....	.....	.....	.....	2	.....	2
Straits of Magellan, South America	.....	1	.....	.....	.....	.....	1
Sumatra, Gaspar Straits	.....	.....	1	.....	.....	.....	1
Suwarrow Reef, South Pacific	.....	.....	1	.....	.....	.....	1
Swallow Reef, China Sea	.....	.....	.....	1	.....	.....	1
Swansea, Wales	.....	.....	.....	.....	.....	1	1
Talbot's Passage, Cape Horn	.....	1	.....	.....	.....	.....	1
Taylor's Bank, Mersey River, England	.....	1	.....	.....	.....	.....	1
Tecumshin, Wexford, Ireland	.....	.....	.....	.....	1	.....	1
Tequish Island, Prince Edward Island	.....	.....	.....	.....	.....	1	1
Terra del Fuego, South America	.....	.....	.....	.....	.....	1	1
Terschelling Light, Netherlands	.....	.....	1	.....	.....	.....	1
Tonala Bar, Mexico	1	1	.....	1	.....	.....	3
Tongue Island, English Channel	.....	1	.....	.....	.....	.....	1
Torkeo, Sweden	.....	1	.....	.....	.....	.....	1
Trackio, Nova Scotia	.....	.....	.....	.....	1	.....	1
Trial Island, British Columbia	.....	1	.....	.....	.....	.....	1
Trinidad, West Indies	.....	.....	.....	1	.....	.....	1
Tristan d'Acunha Island, South Atlantic	.....	.....	.....	.....	.....	1	1
Truxillo, Honduras, Central America	.....	.....	.....	1	.....	.....	1
Tusket Island, Nova Scotia	1	.....	.....	.....	1	.....	2
Tuspan, Mexico	.....	.....	.....	.....	.....	1	1
Tuspan River Bar, Mexico	1	1	.....	1	.....	.....	3
Two Rivers, Nova Scotia	.....	.....	.....	.....	1	.....	1
Tyaartoos Island, Barclay Sound, British Columbia	.....	1	.....	.....	.....	.....	1
Unknown Reef, latitude 59° south, longitude 107° east	.....	.....	.....	.....	.....	1	1
Valdes Peninsula, Patagonia	1	.....	.....	.....	.....	.....	1
Verdon Roads (near Bordeaux), France	.....	1	.....	.....	.....	.....	1
Victoria Harbor, British Columbia	.....	.....	1	.....	.....	.....	1
Waihie Island, Sandwich Islands	.....	.....	.....	.....	.....	1	1
Walney Island, England	.....	.....	.....	1	.....	.....	1
Wentworth Creek, Nova Scotia	.....	.....	.....	.....	.....	1	1
White Head, Nova Scotia	.....	.....	.....	.....	1	.....	1
Wicklow Bay, Ireland	.....	.....	1	.....	.....	.....	1
Wood Creek, New Brunswick	.....	.....	.....	.....	.....	1	1
Wood's Island, Bay of Islands, British America	1	.....	.....	.....	.....	.....	1
Woody Island, Cape Breton, British America	1	.....	.....	.....	.....	.....	1
Yabucoa, Porto Rico	.....	.....	1	.....	.....	.....	1
Yarmouth, Nova Scotia	.....	1	1	.....	.....	.....	2
Zanzibar, Africa	.....	.....	1	.....	.....	.....	1

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REPORT

ON THE

MANUFACTURE AND PROOF

OF

LYLE LIFE-SAVING GUNS.

BY

LIEUTENANT C. W. WHIPPLE,
ORDNANCE DEPARTMENT, U. S. A.

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LETTERS OF TRANSMITTAL.

OFFICE OF INSPECTOR OF U. S. LIFE-SAVING STATIONS,
No. 16 BROADWAY, NEW YORK,
November 22, 1880.

SUMNER I. KIMBALL, Esq.,
General Superintendent U. S. Life-Saving Service:

SIR: Herewith is respectfully referred to your consideration a communication from Lieut. D. A. Lyle, Ordnance Department, United States Army, dated the 19th instant, transmitting a report by Lieut. C. W. Whipple, Ordnance Department, United States Army, on the manufacture and proof of two hundred 2.5-inch bronze guns, Lieutenant Lyle's model, made for the Life-Saving Service.

This report was published in the report of the Chief of Ordnance, United States Army, for 1879.

As the report contains much valuable information in regard to the fabrication of small bronze guns, and complete data of the manufacture, inspection, and proof of the two hundred guns referred to, I concur in the recommendation of Lieutenant Lyle that it be republished in the annual report of the General Superintendent of the Life-Saving Service, for the information of all persons interested in so important a subject.

Very respectfully, your obedient servant,

J. H. MERRYMAN,
Captain, U. S. R. M., Inspector.

NATIONAL ARMORY,
Springfield, Mass., November 19, 1880.

Capt. J. H. MERRYMAN, *U. S. R. M.*,
President of Board on Wreck-Ordnance, &c.:

SIR: I have the honor to inclose herewith a report by Lieut. C. W. Whipple, Ordnance Department, United States Army, on the "manufacture and proof of two hundred 2.5-inch bronze guns, Lieutenant Lyle's model, made for the Life-Saving Service." This report was published in Ordnance Notes No. 102, and in the report of the Chief of Ordnance, United States Army, for 1879, but is not directly available for the use of the Life-Saving Service.

I would, therefore, respectfully recommend its republication in the annual report of the General Superintendent of the United States Life-Saving Service, for the following reasons:

1st. Because it contains much valuable information in regard to the fabrication of small bronze guns that may be of future use to the officers of the Life-Saving Service.

2d. It contains a faithful record of the difficulties and failures experienced in the fabrication, and of the methods adopted to overcome them.

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3d. It explains the manner of proving and inspecting the guns.

4th. It embraces tables giving all the detailed physical data for each gun cast.

5th. It contains the firing record of the gun "subjected to extreme proof."

The writer has been asked a number of times by surfmen whether the service bronze gun was liable to burst explosively or not.

The inclosed report shows that a gun which the inspector adjudged to be too weak, and which he condemned, was fired 303 times without bursting. Of these rounds, 203 were fired with the maximum charge (one rarely used in service), and the gun found to be in serviceable condition at the end of the experiments.

The remaining 100 rounds were fired with excessive charges, ranging from 9 to 18 ounces of powder, with a resulting enlargement of only a little over thirteen hundredths (0."138) of an inch externally.

There can be no doubt as to the safety of good bronze for life-saving guns.

Lieutenant Whipple deserves great credit for the signal ability he displayed in superintending the fabrication of these guns, and the judgment he exercised in their proof and inspection, which have resulted in securing the requisite accuracy and efficiency of the present line-throwing guns and projectiles.

Very respectfully, your most obedient servant,

D. A. LYLE,
Lieutenant of Ordnance, U. S. A.

(Through the commanding officer of the National Armory.)

[Indorsement.]

NATIONAL ARMORY, *November* 19, 1880.

Respectfully forwarded.

J. G. BENTON,
Colonel of Ordnance, Commanding.

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REPORT

BY LIEUT. C. W. WHIPPLE, ORDNANCE DEPARTMENT, ON THE MANUFACTURE AND PROOF OF TWO HUNDRED 2.5-INCH BRONZE GUNS—LIEUTENANT LYLE'S MODEL—MADE FOR THE LIFE-SAVING SERVICE.

(Seven plates.)

WEST POINT FOUNDRY,
Cold Spring, N. Y., March 10, 1879.

On the 12th of last September a contract was awarded the West Point Foundry for the construction of two hundred 2.5-inch bronze guns, designed by Lieut. D. A. Lyle, Ordnance Department, for the United States Life-Saving Service, and a period of four months was allowed for its completion. As the resident inspector at this foundry, I was first directed to supervise the construction of these guns, and finally to inspect them; and I have the honor to submit the following description of the various incidental operations:

The West Point Foundry had had no experience in the manufacture of bronze guns, except that derived from casting a few, at long intervals, for yachts. The contract prescribed * * "that the guns shall be made of bronze, the composition to consist of 90 per cent. of Lake Superior ingot copper and 10 per cent. of Banca ingot tin. It is further stipulated that no scrap metal, such as zinc, old copper, or old bronze shall be used in the fabrication. It is stipulated that the guns shall be cast in iron chills; diameter of chills at breech 6½ inches; diameter of chills at muzzle 5½ inches; sinking-head at least 18 inches high. One bronze specimen for testing, as per drawing attached, to be furnished for each gun. The tensile strength and other physical properties shall be subject to the approval of the inspecting officer. Diameter of finished bore to be two and five-tenths (2.5) to two and five hundred and five thousandths (2.505) inches." * * *

Plate I is a copy of the drawing which accompanied the contract.

The South Boston Foundry had, not long before, made a few guns for the same purpose. Lieutenant Lyle's report on the subject had not yet been published, but it was understood here that one difficulty encountered was the presence of minute filiform cracks, which covered the surface of the casting and necessitated the excess of metal (0.5 inch) required by the contract. In fact, this was supposed to be the only, though a very serious, obstacle to be overcome. Any means which would prevent the formation of these cracks would prevent the necessity of the extra metal, and save considerable time in finishing. It was thought this might be secured by casting the guns under pressure; and with this object in view, more than any expectation of improving the physical qualities of the alloy, a special mold (Plate III) was made, to be presently described. As a precaution, however, another mold was made similar in size and shape to that used at the South Boston Foundry, except that was designed with the intention of casting with the

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breech down, in order to save labor in finishing. The details of this mold as first made are shown in Fig. 1, Plate II, and the description of its construction is so similar to that given by Lieutenant Lyle (page 219, Report of Chief of Ordnance, 1878) that it will not be necessary to repeat it. The thickness of the chill, however, was 2.5 inches instead of 1.75 inches, and there was no sand-head.*

Chill-mold No. 3 (Plate III) was similar in its general features to No. 1 (Plate II). It was, however, 0.5 inch smaller in interior diameter, and was arranged for a length of sinking-head of 11 inches instead of 18 inches. The mouth of the mold was closed by a cast-iron plate 2.5 inches thick, bolted to the upper horizontal flange of the chill. A hole was bored through the axis of this plate to allow the admission of the metal and of a small steel plunger 5 inches long by 4 inches diameter. Two iron uprights, secured at bottom to the iron bed-plate, supported above the mold a 30-ton hydraulic jack.

Mold No. 1, completed first, was first used, and three guns were cast of inferior metal, simply for the purpose of educating the molders.

Six guns were then cast, using the prescribed metals. The details of the operations as conducted differ from those described by Lieutenant Lyle principally in the fact that the tin was melted in a separate crucible, and that its mixture with the copper, which was poured on top of it, took place in the pouring-ladles.

To summarize these details:

1. *Heating the chill-mold.*—No convenient furnace being on hand, this was accomplished by building a wood fire about the chill, which was inclosed in an iron cage. A special furnace was ultimately built for the purpose.

2. *The furnaces.*—Three pots were used for the copper, each containing one crucible. The tin was melted in two crucibles, introduced into the same pot.

3. *Charging the crucibles.*—The metals were placed in the crucibles, and after being weighed the tin was removed.

4. *Melting.*—The fires were lighted before the crucibles were introduced. When the copper was fairly melted, the crucibles containing the tin were placed in the pot. When melted, the tin was poured into two heated pouring-ladles, to each of which was added the charge of copper contained in one crucible, the mass being stirred with an iron rod. The charge of the third crucible (the hottest being retained for the purpose) was finally divided between the two ladles.

5. *Casting.*—The ladles were then poured in succession into the runner-box as rapidly as possible, the surface of the running metal being skimmed with a wooden scraper.†

6. *Cooling.*—With gun No. 1 the mold was placed, during casting, in a barrel, which was filled with running water, in the hope of preventing the expansion of the chill. As a consequence the chill cracked. With guns Nos. 2 and 3 water was poured freely on the chill after casting with Nos. 4 and 5 less water was used, and with No. 6 and following none was used at all.

The results obtained with these six guns are contained in the annexed table. The specimens were taken from the lower part of the sinking-head, and the dimensions, shown in Fig. 1, Plate V, were the same as of

* These preparations for casting were commenced by the West Point Foundry upon notification that the contract had been awarded them, and were completed before the receipt of the articles of agreement.

† Subsequently the pouring-ladle was made self-skimming.

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those taken from the guns made at the South Boston Foundry and tested by Mr. C. B. Richards.

Number of gun.	Weight of copper, Lake Superior, (Quincy).	Weight of heads.	Weight of tin (Banca).	Total weight of charge.	Per cent. of copper.	Per cent. of tin.	Specific gravity.	Tensile strength.	Extension per inch at rupture.
	Lbs.	*Lbs.*	*Lbs.*	*Lbs.*				*Lbs.*	
1	270	.....	28	298	90.6	9.4	8.494	34,996	0″.105
2	270	.....	28	298	90.6	9.4	.....	23,900	0″.03
3	270	.....	28	298	90.6	9.4	Condemned for cavities as soon as cast.		
4	240	30	25	295	90.5	9.5	8.2764	26,457	0″.04
5	240	30	25	295	90.5	9.5	Condemned for cavities as soon as cast.		
6	240	30	25	295	90.5	9.5	8.4357	29,957	0″.049

The appearance of the fracture of each specimen indicated loose, coarse texture, and imperfect mixture of the metals. All of these guns were at once condemned.

Gun No. 7 was then cast under pressure as follows: While the metal was in the crucibles the chill and the plunger were raised to a dull heat. As soon as the metal was ready to pour, the mold was lowered into its pit and adjusted on the bed-plate so as to be directly under the press. When the metal reached the level of the hole in the upper plate the runner-box was removed, and the plunger, picked up by tongs, quickly fitted to the hole. Two men then pumped the jack down as far as the quickly hardening metal would permit. Eight guns were ultimately cast under pressure with results as shown in following table:

Number of gun.	Weight of copper.	Weight of bronze.*		Weight of tin.	Time of melting copper.	Time from mixing metals to casting.	Depth to which plunger sinks.	Length of time between pouring and removing casting.	Specific gravity.	Tenacity.	Extension per inch at rupture.	Appearance of fracture.
		Heads.	Chips.									
	Lbs.	*Lbs.*	*Lbs.*	*Lbs.*	*H.*	*M.*	*Inches.*	*Hrs.*		*Lbs.*	*Inch.*	
7	128	90	8	14.5	....	....	.....	.....	8.5535	44,099	0.153	Very fine close texture, thoroughly mixed.
11	132.5	90	12	15	3	5	3⅛	1¾	8.5812	31,984	0.054	Rather coarse, well mixed, but excess of tin.
12	185	73	11	18.5	3	7	Failed to work.	.....	8.5847	33,189	0.09	Rather coarse and poorly mixed.
13	128	128	4	12.75	2½	20	3	.....	8.5815	38,205	0.156	Close and well mixed.
14	158	100	7	15.75	3¼	20	2½	.....	8.6836	47,311	0.287	Very fine, close, and well mixed.
15	158	103	8	15.75	1½	10	3	20	8.7174	40,170	0.152	Close and well mixed.
16	158	79	15⅞	15⅞	2⅛	30	Failed to work.	35	8.6741	37,537	0.106	Rather close and tolerably well mixed.
18	192	121	3	21¼	1⅝	15	...do	45	8.6303	35,671	0.144	Rather coarse, fairly mixed, but tinny.

Guns 8, 9, and 10 had in the mean time been cast without pressure. Up to No. 10 every gun, except No. 7, had been condemned either as imperfect castings, or for low tenacity, low density, or poor mixture of

* "Heads" is used to designate metal taken from the body of condemned castings and from the main part of sinking-heads; "chips," that metal which works its way into the joints of the mold during casting, and the very upper part of sinking-heads.

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the metals. Fortunately, Mr. Davis, superintendent of the ordnance shops at the Washington navy-yard, who had had much experience in the manufacture of bronze guns, was present at this time, and suggestions were asked from him in regard to improving the character of the castings. These suggestions were as follows:

1. The guns should be cast breech up, for the purpose of increasing the diameter and consequent weight of the sinking-head.

2. The tin should be melted by simply adding it at the proper time to the copper in the crucibles; not melted separately.

3. No pouring-ladle should be used, but the crucibles emptied simultaneously into the mold, pouring rapidly until the mold is filled to the trunnions, and afterwards more slowly.

He had never seen pressure applied to a casting and ventured no opinion on it. He disapproved of heating the chill beyond merely warming it, or cooling it by water after casting, and ultimately recommended increasing the length of the sinking-head by the addition of a sand-head, the diameter of which should be greater than the diameter of the rest of the sinking-head.

His suggestion as to reversing the position of the mold so as to cast with the breech up was never attempted, but in casting No. 12 his recommendations were carried out to the extent of adding the tin to the copper in the crucibles, but the contents were mixed in the pouring-ladle. An attempt to apply pressure to this gun was unsuccessful, as the plunger jammed from being improperly centered.

Nos. 13, 14, 15, and 16 were cast under pressure and according to his suggestions, except that the mold was in each case hotter than desired.

No. 17 was cast in mold No. 2, which had been increased 12 inches in length by the addition of a sand-head (Plate IV). This mold also differed from No. 1 in that the interior diameter at chase was 5 inches instead of 5.5 inches.

No. 18 was the last gun cast under pressure, the operation and results being too irregular to warrant further experiment.

No. 19 was cast in the same mold as No. 17, and in this and all subsequent castings an attempt was made to follow uniformly the operations as conducted in gun No. 17. Two molds were used, alternating with each other. (Chill No. 2, Plate IV.)

From the fact that the upper parts of sinking-heads and the "chips" which were formed by the joints of the mold were known to contain a greater percentage of tin than the body of a casting, all parts of a sinking-head, after being cut from a casting, and all condemned guns* were broken into small pieces and arranged into "classes," according to their respective distances from the surface of the sinking-head. It was assumed that the upper parts of sinking-head, and "chips," contained 13

* The constitution of the alloy changes, not only in the cooling but in the melting, by the continual reduction of the quantity of tin, which oxidizes much faster than the copper, though the latter be present in so much greater mass. Dussausoy found that gun metal, having the proportions of 100 copper and 11 tin by weight, had the following constitutions after each of six consecutive meltings, indicating the rapidity with which oxidation of the tin occurs:

	RESULTING CONSTITUTION OF ALLOY.		
Fusions.	Copper.	Tin.	
1	100.3	10.7	
2	100.7	10.3	
3	101.8	9.2	
4	103.0	8.0	
5	104.0	7.0	
6	105.5	5.5	*Vide* Mallet, Const. of Art'y, p. 87.

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per cent. of tin, and the remainder the same as the body of the gun—10 per cent., less amount lost by oxidation, &c.

This loss from oxidation was disregarded, since the allowance of 13 per cent, of tin to the upper parts of sinking-head was probably slightly in excess of the true amount.*

In making up the charges of "bronze" to be added to a casting a certain percentage was taken from each "class."

The contract specified that a specimen from the sinking-head of each gun should be subjected to mechanical tests, and the dimensions of the specimens were prescribed by an attached drawing (Fig. 1, Plate V). It was particularly desirable that this standard as regards dimensions should have been maintained, in order to properly compare the results with those obtained in the very careful experiments of Mr. C. B. Richards, at the Colt's manufactory.

In testing specimens from 1 to 12 (excepting No. 7) the fracture took place close to the upper shoulder, and the surface of the specimens showed no indication of being elsewhere strained at all.

To ascertain to what extent the portions of the specimen more remote from the surface of the sinking-head shared the weakness exhibited at the shoulder, two specimens were taken from each sinking-head of several castings, one turned as prescribed, and the other preserving the total length of specimen, but diminishing the distance between shoulders to 3 inches by extending the upper shoulder toward the center of the specimen. (Plate V, Fig. 2.) This would oblige the fracture to occur in a part of the specimen more nearly assimilating to the character of the metal in the gun.

The difference in results was so marked that it seemed unjust to require the foundry to abide by an agreement which, perhaps unjustly, was condemning gun after gun. This idea was strengthened by the following experiments:

1. The sinking-head having been sufficiently increased in length, two specimens were taken from the head of No. 22, the one directly above the other, and while the upper gave a tenacity of 43,286, the lower gave 46,335.

2. Gun No. 21 was condemned on a tenacity obtained from the sinking-head of 34,555; but a specimen taken afterward from the breech gave a tenacity of 43,286. Another fact considered was that the specimens tested by Mr. Richards were taken from guns cast with the breech up, whose sinking-heads were consequently of greater size and density than those here. The machine in use here for testing was so arranged that the first strain which could be recorded was about 10,000 pounds to the square inch. Consequently, no delay occurring up to that point, the specimen was quickly subjected to this strain, and, crude appliances rendering very nice work impracticable, was probably broken in less than a quarter of the time occupied by Mr. Richards in attaining the same end. This alone would account for very decided differences in tenacity and extension, and render comparison between the two results unsatisfactory. Consequently I recommended to Lieutenant Lyle that the foundry be allowed to change the shape of the specimens. [Inconvenience was then found in consequence of the extension, which was frequently so great as to necessitate the lowering of the beam during the operation.]

Guns were being cast at the rate of six and seven a day, and none could be touched until specimens from their sinking-heads had been

* *Vide* Mallet, p. 94.

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broken and the density determined. One-half of the time allowed by the contract had been expended, and, to save time, permission was consequently given to reduce the total length of specimens to 4 inches, preserving 3 inches between shoulders. All specimens after No. 46 were turned to these dimensions.

Gun No. 17 and all following (except No. 18, cast under pressure) were cast with a sand-head, whose interior diameter was larger than that of the body of the gun, for the purpose of securing for the sinking-head a large amount of metal which might remain a considerable time in a liquid state. While the sinking-head was inclosed, together with the rest of the casting, in the chill-mold, it hardened with the same rapidity as the rest, and to a great extent failed to perform the important function of supplying to the body of the gun the metal required to replace the shrinkage.

An attempt was made to secure accuracy in the weight of the two ingredients of the alloy, but in consequence of an inability to personally superintend the operation and the haste with which the work was prosecuted the success was but partial.

Comparing guns Nos. 25 and 26, both were apparently treated alike, and the molder, aware of the good results obtained with a specimen from No. 25, expected equally good from No. 26. Upon investigation it was found that the "heads" added to the charge for No. 26 came solely from the upper parts of different heads in which the percentage of tin was considerably greater than the mixture called for.

	Pounds.	Copper.	Tin
The mixture used for gun No. 25 was....	161 copper.....	=161	
	151 heads (10 per cent. tin)=	135.9	15.1
	5 chips (13 per cent. tin)=	4.3	0.7
	18 tin.....	= 0.0	18.0
Total weight.....	335	301.2	33.8
The mixture used for gun No. 26 was...	152 copper.....	=152	
	153 heads (10 per cent. tin)=	137.7	15.3
	4 chips (13 per cent. tin)=	3.48	0.52
	17 tin.....	= 0.00	17.00
Total weight.....	326	293.18	32.82
But under the supposition that the "heads" contained 13 per cent. tin the proportions became.....		152	
		133.11	19.89
		3.48	0.52
		0.	17.00
Total.....		288.59	37.41

making the mixture contain 11½ per cent. tin. The appearance of the fracture of the specimen as well as the low tenacity had suggested at once that the percentage of tin was too great; and in gun No. 44 the same peculiarities led to an investigation which ultimately disclosed the fact that a double charge had accidentally been added to the copper, in spite of the presence of an attendant specially employed to watch every process in the casting.

Guns Nos. 177 and 178 were condemned because an unknown brand of tin had been used, which was discovered in the same way as the defects in Nos. 26 and 44.

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Although Banca tin* was prescribed by the contract, a brand of English tin ("the Lamb and Flag") was allowed to be used to a great extent, both because it had been recommended by Mr. Davis as the tin almost exclusively used by the Navy in their gun constructions, and because at times Banca tin could not be obtained in the quantities and at the time required.

In Lieutenant Lyle's report of the fabrication of his experimental guns at South Boston he speaks (Report Chief of Ordnance for 1878, p. 221) of castings condemned on account of defective trunnions. The same difficulty was met with here, and was similarly remedied by cutting away the metal in the chill so as to increase the size of the trunnions in the casting. Before this, however, guns Nos. 27, 31, and 35 had been condemned at an early stage of fabrication for this defect, and when the first lot were offered for final inspection many more of the guns among those first cast suffered a like fate. To save these guns, which were otherwise satisfactory, P., K. & Co. asked authority to "burn on" new trunnions, a process which consisted simply in replacing the imperfect portions of the trunnions with new metal. Before granting permission the following experiment was tried, for the purpose of testing the intimacy of union between the old and new metals which the process could guarantee: A cylinder 3 inches long and 1.5-inch diameter, cut from the sinking-head of one of the guns, had new metal burned on to it until its length was doubled. The cylinder was then turned down to the shape of an ordinary specimen, in such manner as to leave the joint between the two metals at a distance of 1 inch from the shoulder. It was then broken in the machine. The fracture took place in the old metal, and at a distance of about 1 inch from the point of union. The specimen stood about 40,000 pounds to the square inch, and the surface, after fracture, presented a curious appearance. (Plate V, Fig. 4.) The old or original metal showed the ordinary blistered, flattened appearance exhibited by good bronze under such circumstances, but the surface of the new metal was scarred and striated in the direction of its length, and resembled more a piece of tough wrought iron after strain.

Permission was then given to try the experiment on guns Nos. 27, 31, and 35 (which had not yet received their powder proof), which was conducted as follows:

The imperfect portion of one trunnion was turned off in a lathe so as to leave as much metal as possible untouched in the vicinity of the rim-bases. It was rarely necessary to turn off more than one-tenth of an inch, except at times, from the face of the trunnion. The gun was then buried in sand, the axis of the trunnions vertical, the trunnion to be

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*The purest tin in the market comes from the islands of Banca and Billotin, in the Malayan archipelago, and is sold once or twice a year at Amsterdam and Rotterdam. In Whitney's *Metallic Wealth of the United States*, published in 1854, is given the following analysis of Banca tin:

Tin	99.961
Iron	.019
Lead	.014
Copper	.006
	100.000

English "refined" tin, from the Cornish mines, stands next as regards purity, and is followed by, 1st. English tin (which includes "Lamb and Flag"); 2d. Straits tin, from the Malayan peninsula; 3d. Australian tin.

The following are some of the prominent brands of Lake Superior copper, a preference being given to the first two: "Minnesota," "Quincy," "Central," "Calumet and Hecla," "Copper Falls."

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repaired uppermost. A mold was then formed in the sand about and above this trunnion and slightly larger than it in diameter. (Plate II, Fig. 2.) A ladle of melted bronze was then poured very slowly into the mold, which, soon overflowing, ran into a receptacle prepared for it in the vicinity. The molten metal gradually melted that portion of the casting with which it came in contact, and when this fact was assured (by feeling the face of the trunnion with an iron rod) the pouring was stopped. In a few minutes the gun was taken from the sand and transferred to the trunnion lathe. But one trunnion was prepared for this process at a time, in order to have the assistance of one finished trunnion in centering the other for turning. After being repaired, these three guns were subjected to the usual firing proof, and having stood it satisfactorily, all other guns possessing this but no other defect were similarly repaired.

PROOF.

According to the contract each gun was to be "proved by firing three rounds, the proof-charge to be 12 ounces Hazard's Navy cannon-powder, * * * and a cylindrical bolt or projectile to weigh not less than 18 pounds; * * * the powder proof to be applied with 'rough boring' before 'finishing reaming,' diameter of rough bore to be from 2.25 inches to 2.3 inches; one gun from the first lot finished to be put to extreme proof by continuous firing with heavy charges."

Guns Nos. 7, 10, and 14 were fired as prescribed, mounted upon a carriage which was made to recoil up a sand slope. The effects on these guns were somewhat disastrous. They were excessively enlarged both on the interior and exterior, and the trunnions were badly bent. Upon consultation with Lieutenant Lyle it was agreed that, since 8 ounces would be the maximum service-charge for the guns under ordinary circumstances, the proof-charge could be diminished to that amount. As an additional precaution the carriage was lightened so as to reduce it in weight to 86 pounds, and two trunnion rings or sleeves (first made of bronze, afterwards of steel) were made to slip over the trunnions to prevent them from being bruised during the proof firing. Three small pins were subsequently attached to the outer surface of the sleeves, which, fitting into a groove cut in the trunnion bed-plate, prevented any outward motion. When first used these rings occasionally slipped outward slightly after the first fire, and, being unobserved, the strain at the next fire was thrown on a point of the trunnions removed from the rimbases and the trunnions consequently bent slightly to the front. Excepting this mishap, no effect was produced upon any gun during proof after the 8-ounce charge had been adopted.

It has been stated that the contract required one gun of the lot first finished to be subjected to extreme proof. Gun No. 18 had been originally condemned on account of the weakness of the metal, as shown by the specimen from the sinking-head, although the appearance of the fracture showed (what most of the early guns lacked) a fair mixture of the metals. By accident this gun was offered for and subjected to proof, after which it was discovered that it had been condemned. An offer was made to P., K. & Co. and accepted, that this gun should be finished for extreme proof, with the understanding that if it failed they were to replace it and stand the expenses of its proof.

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Firing record of gun No. 18, subjected to extreme proof.

Number of rounds.	Weight of charge.	Weight of projectile.	Remarks.
	Oz.	*Lbs.*	
3	8	18.5	First proof no noticeable effect. (Gun bored to 2.3 inches.)
200	8	18.5	Greatest enlargement of bore (midway between vent and trunnions) 0.0115 inch, approximate. Greatest enlargement of bore at muzzle, 0.001 inch. Enlargement of first reinforce 3.5 inches; in front of vent 0.0115 inch. Vent unscrewed and found to be in perfect condition. Enlargement of chase at muzzle 0.005 inch.
10	9	18.5	Enlargement of first reinforce 0.022 inch. Enlargement of chase 0.0115 inch.
10	10	18.5	Enlargement of first reinforce 0.05 inch, point of greatest enlargement moving toward trunnions. Enlargement of chase 0.022 inch, point of greatest enlargement midway between face and trunnions.
10	11	18.5	Enlargement of first reinforce 0.065 inch. Enlargement of chase 0.050 inch.
10	12	18.5	Enlargement of first reinforce 0.080 inch. Enlargement of chase 0.060 inch.
10	13	18.5	Enlargement of first reinforce 0.102 inch. Enlargement of chase 0.0663 inch.
10	14	18.5	Enlargement of first reinforce 0.106 inch. Enlargement of chase 0.068 inch.
10	15	18.5	Enlargement of first reinforce 0.121 inch. Enlargement of chase 0.090 inch.
10	16	18.5	Enlargement of first reinforce 0.121 inch. Enlargement of chase 0.101 inch.
10	17	18.5	Enlargement of first reinforce 0.129 inch. Enlargement of chase 0.112 inch.
10	18	18.5	Enlargement of first reinforce 0.138 inch. Enlargement of chase 0.120 inch.
303	.....	.....	

After commencing to fire with 13 ounces the trunnions were found to be slightly bent to the front, and after the third round a slight fracture was observed in rear of the trunnions and at their junction with the rimbases. This was a natural consequence of the bending of the trunnions, and as they bent the more to the front (for which an overtaxed carriage was greatly responsible), the more, but to a slight extent, the fracture extended.

After completing the 10 rounds with 15 ounces the axis of the trunnions was found to be at its face out of its true position 0.18 inch. Toward the close of the proof, gas escaped about the vent piece.

Three hundred and three rounds had now been fired from gun No. 18, and it was considered that its endurance was sufficiently proved. It was therefore placed in a lathe and first cut into two parts through a plane perpendicular to the axis of the gun and in front of the vent, and the forward part afterward cut into two parts through a plane at right angles to the axis of the trunnions. Serious defects were found to exist in the shape of holes extending from the bore toward either trunnion, two of which were about 0.5 inch deep. It can only be surmised that, as this gun was cast under pressure, the cinder, which under ordinary circumstances of casting has a tendency to rise to the surface, may have been retained in the gun, more especially as the means used for skimming the metal was, when this gun was made, very imperfect.

Plate VI shows the ultimate enlargement of this gun, and, for the sake of comparison, of gun No. 7, both cast under pressure, after proof-firing with three rounds with 12 ounces of powder. To an extent it corroborates the opinion, entertained at the time it was suggested changing

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the proof-charge from 12 to 8 ounces, that the more moderate charge would the better enable the gun to subsequently stand the heavier.

INSPECTION.

All principal dimensions were verified by specially constructed gauges, and proved the work to have been performed with great care.

The workmen had been provided with a 2.5-inch Whitworth gauge, which they tried in the bore of every gun before it left the boring-lathe; nevertheless the bores of about one-tenth of all guns, when offered for inspection, were found to be slightly small and had to be rebored. This was due to the fact that the gauge had occasionally been tried in the guns while still warm, and consequently enlarged, from the effect of the boring tool.

TABLES.

Table No. 1 contains the records of mechanical tests of specimens taken from the sinking-heads of guns Nos. 239 and 227. The situation of the former in the sinking-head is shown in Fig. 5, Plate V. Specimens 4 and 5 were taken from positions in No. 227, corresponding to C and A of same plate. Nos. 6 and 7 were radial specimens from the same head.

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Number of gun.	Number of specimen.	Length.		Diameter.		Specific gravity.	Tensile strength per square inch.	Elastic limit.	Extension per inch at rupture.	Hardness.	Reduction of diameter at point of rupture.	Original area.	Area after rupture.	Remarks.
		Original between shoulders.	After rupture.	Original.	After rupture.									
		Inches.	*Inches.*	*Inches.*	*Inches.*		*Lbs.*	*Lbs.*	*Inches.*		*Inches.*	*Sq. inches.*	*Sq. inches.*	
239	1	3.000	4.661	0.559	0.390	8.7912	49,000	16,000	0.562	5.06	0.169	0.24542	0.11945	See C, fig. 5, plate. Tested by Lieut. C. S. Smith, at United States ordnance agency.
239	2	3.000	4.094	0.801	0.699	.....	49,731	.....	0.364	.....	0.102	0.50391	0.38474	See B, fig. 5, plate. Tested at West Point foundry.
239	3	3.000	4.392	0.803	0.662	8.8387	35,289	.....	0.461	.....	0.141	0.50643	0.34419	See A, fig. 5, plate. Tested at West Point foundry.
227	4	3.000	4.285	0.559	0.445	.....	48,000	19,000	0.428	4.57	0.114	0.24542	0.15553	Tested by Lieut. C. S. Smith, at United States ordnance agency.
227	5	3.000	3.465	0.799	0.740	8.6639	39,898	.....	0.155	.....	0.059	0.5014	0.43008	Tested at West Point foundry.
227	6	3.000	3.444	0.800	0.748	.....	36,208	.....	0.648	.....	0.052	0.50625	0.43943	Radial specimen. Tested at West Point foundry.
227	7	3.000	3.186	0.800	0.780	.....	27,255	.....	0.062	.....	0.020	0.50625	0.47783	Radial specimen. Tested at West Point foundry.

All specimens were taken as near as possible to the surface of the casting.

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Manufacture of 2.5-inch bronze guns at the West Point Foundry, 1878.

Castings.			Metal used.								Time.			Test of samples.			Remarks.
Date.	Foundry number.	Register number.	Weight of copper.	Brand of copper.	Bronze. Heads.	Bronze. Chips.	Weight of tin.	Brand of tin.	Per cent. of tin.	Total weight.	Melting copper.	From adding tin to casting.	Between pouring and removing casting.	Specific gravity.	Tenacity.	Extension per inch at rupture.	
			Lbs.		*Lbs.*	*Lbs.*	*Lbs.*			*Lbs.*	*H. M.*	*M.*	*H. M.*		*Lbs.*	*Inches.*	
Oct. 16	1	.....	270	Quincy....	.....	.....	28	Banca...	9.4	298	.....	....	.....	8.494	34,996	0.105	Condemned. Chill heated, then surrounded by running water during casting; chill cracked.
Oct. 16	2	.....	270	....do	.....	.....	28	...do	9.4	298	.....	....	.....	.....	23,900	0.03	Condemned. Chill heated; water thrown upon it after casting.
Oct. 16	3	.....	270	....do	.....	.....	28	...do	9.4	298	.....	....	.....	.....	.....	.....	Condemned on account of cavities. Chill cooled as preceding.
Oct. 18	4	.....	240	....do	30	.....	25	...do	9.5	295	.....	....	.....	8.2764	26,457	0.04	Condemned. Chill cooled as preceding, but less water used.
Oct. 18	5	.....	240	....do	30	.....	25	...do	9.5	295	.....	....	.....	.....	.....	.....	Condemned on account of cavities. Chill cooled as preceding.
Oct. 18	6	.....	240	....do	30	.....	25	...do	9.5	295	.....	....	.....	8.4357	29,957	0.049	Condemned. Chill cooled without water.
Oct. 19	7	200	128	....do	90	8	$14\frac{1}{2}$	...do	10.2	240.5	.....	....	.....	8.5535	44,099	0.153	Cast under pressure.
Oct. 21	8	.....	131	....do	96	8	$14\frac{3}{4}$	...do	10.1	249.75	.....	....	.....	8.6586	35,720	0.068	Condemned.
Oct. 21	9	.....	131	....do	90	5	$14\frac{3}{4}$	...do	10.1	240.75	.....	....	.....	8.7674	37,227	0.069	Condemned.
Oct. 21	10	91	97	....do	118	12	11	...do	10.2	238	.....	....	.....	8.5028	37,134	.....	
Oct. 25	11	.....	$132\frac{1}{2}$	....do	90	12	15	...do	10.3	249.5	3 0	5	1 45	8.5812	31,984	0.054	Condemned. Cast under pressure.
Oct. 25	12	.....	185	....do	73	11	$18\frac{1}{2}$	...do	9.5	287.5	3 0	7	.....	8.5847	33,189	0.09	Condemned. Cast under pressure.
Oct. 26	13	32	128	....do	128	4	$12\frac{3}{4}$	...do	9.6	272.75	2 30	20	.....	8.5815	38,205	0.156	Cast under pressure.
Oct. 26	14	15	158	....do	100	7	$15\frac{3}{4}$	...do	9.5	280.75	3 15	20	.....	8.6836	47,311	0.287	Cast under pressure.
Oct. 28	15	.....	158	....do	103	8	$15\frac{3}{4}$	...do	9.5	284.75	1 35	10	20	8.7174	40,170	0.152	Condemned for cavities detected in boring. Cast under pressure.
Oct. 28	16	14	158	....do	79	$15\frac{7}{8}$	$15\frac{7}{8}$	...do	9.6	268.75	2 10	30	35	8.6741	37,537	0.106	Cast under pressure.
Oct. 29	17	2	224	....do	80	20	$24\frac{3}{4}$	...do	10.2	348.88	2 30	15	40	8.8103	53,314	0.328	Mold lengthened 12 inches by addition of sand head.
Oct. 30	18	.....	192	....do	121	3	$21\frac{1}{4}$	...do	10	337.25	1 50	15	45	8.6303	35,671	0.144	Condemned. Subject to extreme proof. Cast under pressure.
Oct. 30	19	152	143	....do	141	4	$15\frac{3}{4}$	...do	10	303.75	1 50	18	1 10	8.8047	44,207	0.149	
Oct. 30	20	34	201	....do	90	3	22	...do	9.9	316	2 30	15	35	8.7649	43,729	0.151	
Oct. 31	21	.....	160	....do	107	15	$17\frac{3}{4}$	...do	10.2	299.75	1 10	18	40	8.6117	34,555	0.07	Condemned. Specimen taken from breech, s. g., 8.7394; tenacity, 43,286; extension, 0″.2.
Oct. 31	22	95	213	....do	100	16	$23\frac{1}{4}$	...do	10.3	352.25	1 10	15	45	8.7681	46,335	0.212	

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Nov.	1	23	143	185	Quincy....	115	7	20½	Banca...	10	327.5	1	15	15	40	8.8130	44,771	0.172	
Nov.	1	24	27	200	....do	99	4	22	...do	9.9	325	2	0	12	1 0	8.7989	49,980	0.243	
Nov.	1	25	.....	161	....do	151	5	18	...do	10.8	335	1	20	14	45	8.8116	52,330	0.29	Condemned, after proof, for defects in gun.
Nov.	1	26	198	152	....do	153	4	17	.....	10	326	1	45	15	30	8.659	39,393	0.123	The bronze "heads" used should really have been classed chips, giving 11.5 per cent. tin.
Nov.	2	27	176	199	....do	138	5	14	Banca...	8	356	1	45	16	35	8.8366	51,350	0.38	
Nov.	2	28	41	163	....do	157	4	16½	...do	9.5	340.25	.....		12	40	8.7580	44,253	0.215	
Nov.	2	29	.....	177	....do	154	5	17½	...do	9.6	353.75	1	40	20	45	8.7972	50,406	0.280	Condemned, after proof, for defects in body of gun.
Nov.	4	30	166	199	....do	129	4	20	...do	9.5	352	1	20	15	40	8.6965	42,651	0.137	New chill.
Nov.	4	31	178	215	....do	100	3	21½	...do	9.4	339.5	1	30	15	35	8.8215	51,795	0.32	
Nov.	4	32	182	222	....do	110	2	21½	...do	9.2	355.25	.....		15	35	8.6780	43,696	0.18	
Nov.	4	33	180	217	....do	93	4	21½	...do	9.4	335.75	.....		16	40	8.8280	53,184	0.30	
Nov.	4	34	122	206	....do	85	3	22	...do	9.8	316	1	20	15	30	8.7830	46,990	0.25	
Nov.	4	35	.....	225	....do	70	2	22½	...do	9.3	319.5	1	10	12	35	8.8195	53,960	0.43	Condemned, after proof, for defects in body of gun.
Nov.	5	36	94	217	....do	130	3	21½	L. & F...	9.5	371.5	1	40	15	35	8.8226	50,154	0.345	
Nov.	5	37	173	211	....do	127	4	20	...do	9.2	362	1	10	12	35	8.8120	43,980	0.207	
Nov.	5	38	43	261	....do	71	3	26	...do	9.3	361	1	20	12	35	8.7876	50,332	0.344	
Nov.	5	39	149	318	....do	.....	2	35½	...do	10	355.5	1	5	15	35	8.8955	46,369	0.41	
Nov.	5	40	63	326	....do	.....	3	36½	...do ...	10	365.25	1	30	12	25	8.8368	54,806	0.429	
Nov.	5	41	119	210	....do	105	.....	23½	...do	9.9	338.26	1		12	30	8.72	56,727	0.41	
Nov.	6	42	84	198	....do	105	4	19¾	...do	9.6	321.75	1	10	15	35	8.8124	51,809	0.319	
Nov.	6	43	40	204	....do	105	.....	20¼	...do	9.4	329.25	1	10	12	30	8.8386	46,254	0.19	
Nov.	6	44	.....	194	....do	105	.....	39½	...do	14.3	338	1	15	10	35	8.5551	34,246	0.079	Condemned. Double charge found to have been accidentally added.
Nov.	6	45	120	188	....do	115	3	18¾	...do	9.5	324.75	1	10	8	28	8.7877	51,084	0.319	
Nov.	6	46	64	197	....do	107	2	19¾	...do	9.4	325.75		55	10	30	8.7717	42,361	0.181	
Nov.	6	47	184	192	....do	111	3	19¼	...do	9.5	325.75	1	5	8	35	8.8133	52,656	0.328	
Nov.	7	48	58	195	....do	114	2	19¼	...do	9.5	330.5	1		6	28	8.7280	39,097	0.135	
Nov.	7	49	121	196	....do	109	4	19½	...do	9.4	328.5	1	10	8	35	8.7705	52,460	0.339	
Nov.	7	50	.....	194	....do	116	4	19¼	...do	9.4	333.25	1	15	8	35	8.6277	42,573	0.246	Condemned after proof, for hole in chase.
Nov.	7	51	79	195	....do	114	3	19½	...do	9.5	331.5	1	10	8	30	8.7651	48,247	0.293	
Nov.	7	52	50	186	....do	117	2	18¾	...do	9.4	323.5	.....		.....	35	8.8279	53,969	0.399	
Nov.	7	53	75	189	....do	115	3	19	...do	9.5	326	1	15	10	30	8.7984	49,413	0.399	
Nov.	8	54	77	172	....do	100	4	17¾	...do	9.6	293.75	1	5	8	35	8.7691	46,369	0.293	
Nov.	8	55	47	175	....do	102	3	17¾	...do	9.5	297.5	1	10	10	30	8.7813	44,294	0.258	
Nov.	8	56	46	173	....do	119	3	17½	...do	9.5	312.25	1	15	15	35	8.5934	45,440	0.338	
Nov.	8	57	.....	174	....do	108	2	17½	...do	9.4	301.25	1	15	12	35	.....	.....	.....	Condemned. Imperfect casting.
Nov.	8	58	62	179	....do	113	2	18	...do	9.5	312	1		16	35	8.7131	40,469	0.179	
Nov.	8	59	.....	177	....do	114	3	17¾	...do	9.5	311.75	1	5	10	30	8.3621	35,169	0.154	Condemned.
Nov.	9	60	81	178	....do	114	4	17¾	...do	9.5	313.75		45	14	30	8.4383	41,850	0.151	
Nov.	9	61	13	177	....do	110	3	17¾	...do	9.5	307.75	1	5	10	25	8.5344	38,117	0.204	
Nov.	9	62	35	175	....do	108	2	17½	...do	9.4	302.5	1		10	35	8.5461	38,307	0.164	
Nov.	9	63	.....	175	....do	115	4	17½	...do	9.5	311.5	1	5	10	30	8.6241	40,771	0.181	Condemned. Imperfect casting.
Nov.	9	64	52	173	....do	113	3	17½	...do	9.4	306.25	1	5	12	28	8.7802	45,444	0.220	
Nov.	9	65	38	176	....do	108	2	17¾	...do	9.4	303.5	1	15	10	25	8.7406	43,152	0.201	
Nov.	11	66	.....	176	....do	108	.....	17¾	Banca...	9.4	301.5	1	15	10	30	7.6244	33,029	0.216	Condemned after proof. Cavity in bore of gun.

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Manufacture of 2.5-inch bronze guns ta the West Point Foundry, 1878—Continued.

Castings.			Metal used.								Time.			Test of samples.			Remarks.
Date.	Foundery number.	Register number.	Weight of copper.	Brand of copper.	Bronze. Heads.	Bronze. Chips.	Weight of tin.	Brand of tin.	Per cent. of tin.	Total weight.	Melting copper.	From adding tin to casting.	Between pouring and removing casting.	Specific gravity.	Tenacity.	Extension per inch at rupture.	
			Lbs.		*Lbs.*	*Lbs.*	*Lbs.*			*Lbs.*	*H. M.*	*M.*	*H. M.*		*Lbs.*	*Inches.*	
Nov. 11	67	26	167	Quincy....	112	.....	16¾	L. & F ..	9.4	295.75	1 15	10	35	8.7538	44,601	0.246	
Nov. 11	68	.....	175	....do	110	.....	17½	...do ...	9.4	302.5	1	10	30	8.5284	41,653	0.255	Condemned. Imperfect casting.
Nov. 11	69	89	176	....do	107	3	17½	...do	9.4	303.5	.....	10	35	8.8388	50,762	0.324	
Nov. 11	70	.....	192	....do	96	.....	19⅛	...do	9.3	307.1	1	15	45	8.6004	39,198	0.133	Condemned after proof. Defects in chase.
Nov. 11	71	17	196	....do	91	2	19⅛	...do	9.3	308.5	1 10	....	40	8.7714	44,686	0.218	
Nov. 12	72	.....	176	....do	107	.....	17¾	...do	9.4	300.75	1 15	15	30	.....	.....	.....	Condemned. Imperfect casting; honey-combed on each side along longitudinal joint of chill.
Nov. 12	73	.....	189	....do	106	.....	19	...do	9.4	314	1 15	15	35	.....	.....	.....	Condemned. Imperfect casting; honey-combed on each side along longitudinal joint of chill.
Nov. 12	74	.....	185	....do	107	.....	18½	...do	9.4	310.5	1 5	10	30	.....	.....	.....	Condemned. Imperfect casting; honey-combed on each side along longitudinal joint of chill.
Nov. 12	75	100	188	....do	104	3	18¾	...do	9.4	313.75	1 10	15	35	8.7225	45,470	0.307	Small cracks had formed in chill, more especially where two sections united. These were hammered smooth before this casting.
Nov. 12	76	.....	190	....do	105	.....	19	...do	9.4	314	1 15	15	35	8.7389	43,225	0.212	Condemned. Imperfect casting.
Nov. 12	77	28	180	....do	105	.....	18	...do	9.4	303	.....	....	35	8.5545	41,158	0.182	
Nov. 12	78	.....	177	....do	109	3	17½	...do	9.4	306.5	.....	....	35	8.5601	42,361	0.250	Condemned. Imperfect casting.
Nov. 12	79	.....	191	....do	110	.....	19	L. & F ..	9.4	320	1	10	30	8.4839	39,295	0.203	Condemned after proof. Defect in body.
Nov. 13	80	29	191	....do	110	3	19	...do	9.4	323	1 10	15	35	8.7095	50,154	0.363	
Nov. 13	81	56	181	....do	105	.....	18	...do	9.4	304	1 15	10	30	8.5610	42,956	0.260	
Nov. 13	82	.....	180	....do	107	.....	17½	Banca...	9.2	304.5	40	8	25	.....	.....	.....	Condemned. Imperfect casting
Nov. 13	83	44	176	....do	111	4	17½	...do	9.5	308.5	1	10	30	8.6588	49,905	0.363	
Nov. 13	84	96	177	....do	109	.....	17½	...do ...	9.5	303.5	1	10	25	8.4562	41,166	0.182	
Nov. 14	85	83	191	....do	108	.....	19	...do	9.4	318	1	10	25	8.6888	48,137	0.349	
Nov. 14	86	57	185	....do	109	4	18½	...do	9.5	316.5	1 10	12	30	8.7736	45,218	0.236	
Nov. 14	87	37	176	....do	108	8	17⅛	...do	9.5	309.5	.....	10	30	8.5103	47,548	0.376	
Nov. 14	88	39	178	....do	110	3	17½	...do	9.4	308.75	.....	10	30	8.5732	42,939	0.215	
Nov. 14	89	55	182	....do	109	3	18	...do	9.4	312	1 15	5	35	8.6841	49,119	0.361	

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Nov.	14	90	199	179	....do	108	.....	17⅞	...do	9.4	304.8	1	20	10	25	8.6941	46,878	0.304		
Nov.	14	91	45	180	....do	109	2	18	...do	9.4	309	1		8	40	8.6128	44,908	0.248		
Nov.	15	92	123	178	....do	112	.....	17⅞	...do	9.4	307.75	1	5	5	30	8.7879	52,393	0.408		
Nov.	15	93	73	178	....do	112	3	17¼	...do	9.4	310.5	1	10	15	25	8.6501	48,214	0.370		
Nov.	15	94	36	178	....do	114	.....	17¼	...do	9.4	309.75	1		12	30	8.5149	42,467	0.281		
Nov.	15	95	164	183	....do	114	.....	18⅛	...do	9.4	315.25	1	5	10	30	8.5627	43,062	0.233		
Nov.	15	96	54	178	....do	112	4	17¾	...do	9.5	311.75	1		10	40	8.4547	48,727	0.372		
Nov.	15	97	51	180	... do	122	3	18	...do	9.5	323	1	5	10	30	8.5384	43,046	0.231		
Nov.	15	98	16	175	....do	116	2	17⅛	...do	9.5	310.5	1	5	10	25	8.3416	39,900	0.222		
Nov.	16	99	48	175	....do	116	.....	17⅛	...do	9.4	308.5	1	10	10	25	8.6632	50,423	0.375		
Nov.	16	100	49	178	....do	110	3	17¼	...do	9.4	308.75	1		10	30	8.6910	49,119	0.324		
Nov.	16	101	101	170	....do	123	.....	17	...do	9.4	310	1	5	10	25	8.5325	42,545	0.256		
Nov.	16	102	61	175	....do	111	2	17⅛	...do	9.1	315.5	1		5	25	8.6219	44,011	0.260		
Nov.	16	103	24	177	....do	116	.....	17¾	...do	9.4	310.75	1	10	10	30	8.7477	45,976	0.232		
Nov.	16	104	76	180	....do	112	3	18	...do	9.5	313	1		10	30	8.4784	43,823	0.232		
Nov.	18	105	18	183	....do	112	.....	18⅛	...do	9.4	313.25	1	15	10	25	8.6637	40,462	0.145		
Nov.	18	106	33	174	....do	112	3	17¼	...do	9.4	306.25	1		5	25	8.7320	41,569	0.145		
Nov.	18	107	.....	186	....do	104	.....	18⅛	.. do	9.2	308.2	1	5	5	30	8.4509	40,483	0.171	Condemned after proof; defects in gun.	
Nov.	18	108	1	186	....do	104	3	18⅛	...do	9.4	311.5	1	10	10	25	8.6290	40,575	0.169		
Nov.	18	109	42	177	....do	113	3	17⅞	...do	9.5	310.75	1	10	10	25	8.6363	44,797	0.240		
Nov.	18	110	.....	183	....do	109	.....	18⅛	...do	9.4	310.25	1	15	15	30	.....	.....	.....	Condemned. Imperfect casting.	
Nov.	18	111	30	190	....do	110	.....	19	...do	9.4	319	1	15	12	30	8.5883	46,320	0.290		
Nov.	19	112	53	186	....do	112	3	18⅛	...do	9.4	319.5	1	15	10	25	8.7548	52,525	0.365		
Nov.	19	113	20	184	....do	112	.....	18⅛	...do	9.4	314.25	1	0	10	30	8.7482	44,799	0.231		
Nov.	19	114	21	183	....do	111	2	18⅛	...do	9.4	314.25	1	10	12	28	8.5397	47,272	0.345		
Nov.	19	115	92	186	....do	109	.....	18⅛	...do	9.4	313.5	1	0	10	30	8.6863	44,452	0.227		
Nov.	19	116	181	187	....do	108	3	18⅛	...do	9.4	316.5	1	5	15	25	8.4734	43,225	0.232		
Nov.	19	117	.....	178	....do	113	2	17¾	...do	9.4	310.75	1	10	15	25	8.3630	37,424	0.116	Condemned.	
Nov.	19	118	19	180	....do	99	.....	18	...do	9.4	297	1	15	10	30	8.8044	51,596	0.285		
Nov.	20	119	114	182	....do	110	2	18⅛	...do	9.4	312.2	1	20	15	35	8.6086	40,676	0.223		
Nov.	20	120	106	182	....do	110	.....	18	...do	9.4	310	1	10	15	30	8.7752	49,092	0.288		
Nov.	20	121	74	173	....do	116	.....	17½	...do	9.4	306.25	1	0	15	25	8.7483	56,333	0.485		
Nov.	20	122	90	174	....do	116	.....	17½	...do	9.4	307.25	1	5	15	25	8.5505	43,441	0.191		
Nov.	20	123	97	179	....do	112	3	18	...do	9.5	312	1	10	10	30	8.7312	44,294	0.222		
Nov.	20	124	22	177	....do	115	.....	17⅞	...do	9.4	309.75	1	20	15	30	8.6883	50,962	0.350		
Nov.	20	125	5	185	....do	102	4	18⅛	...do	9.4	309.5	1	20	15	30	8.7950	52,250	0.331		
Nov.	21	126	12	176	....do	112	3	17⅛	...do	9.4	308.5	1	20	10	30	8.7588	49,242	0.328		
Nov.	21	127	23	171	....do	118	.....	17	...do	9.4	306	1	25	15	25	8.7606	53,569	0.393		
Nov.	21	128	60	177	....do	114	.....	17⅛	...do	9.3	309.5	1	20	10	25	8.8227	52,656	0.376		
Nov.	21	129	88	174	....do	112	1	17⅛	...do	9.2	314.5	1	15	15	30	8.7795	50,424	0.325		
Nov.	21	130	25	173	....do	128	3	17½	...do	9.5	321.25	1	20	10	28	8.8035	53,245	0.425		
Nov.	21	131	59	178	....do	119	.....	17¾	...do	9.4	314.75	1	25	12	30	8.6211	47,941	0.430		
Nov.	21	132	.....	178	....do	119	2	17⅛	...do	9.4	316.5	1	20	20	.....	8.6112	44,797	0.282	Condemned after proof—defective.	
Nov.	22	133	98	144	....do	136	2	14½	...do	9.5	296.25	1	30	15	25	8.7221	42,545	0.172		
Nov.	22	134	86	179	....do	118	.....	18	...do	9.5	315	1	15	15	25	8.4358	41,363	0.166		
Nov.	22	135	130	194	....do	100	2	19½	...do	9.4	315.25	1	20	10	25	8.7732	50,549	0.314		
Nov.	22	136	11	189	....do	116	3	18⅞	L. & F ..	9.4	326.8	.....		10	30	8.6413	44,515	0.229		
Nov.	23	137	162	180	....do	116	.....	18	...do	9.4	314	.....		10	30	8.7857	50,424	0.319		
Nov.	23	138	126	180	....do	116	.....	18	...do	9.4	314	1	10	10	25	8.7079	41,174	0.133		
Nov.	23	139	7	180	....do	116	.....	18	...do	9.4	314	1	15	15	25	8.5965	40,474	0.158		
Nov.	23	140	6	180	....do	116	5	18	...do	9.5	319	1	10	12	25	8.7272	48,454	0.326		
Nov.	23	141	9	174	....do	116	3	17¼	...do	9.4	310.25	1	0	15	30	8.6759	44,437	0.267		

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Manufacture of **2.5-inch bronze guns at the West Point Foundry,** 1878—Continued.

Date.	Foundry number.	Register number.	Metal used.									Time.			Test of samples.			Remarks.
			Weight of copper.	Brand of copper.	Bronze. Heads.	Bronze. Chips.	Weight of tin.	Brand of tin.	Per cent. of tin.	Total weight.		Melting copper.	From adding tin to casting.	Between pouring and removing casting.	Specific gravity.	Tenacity.	Extension per inch at rupture.	
			Lbs.		*Lbs.*	*Lbs.*	*Lbs.*			*Lbs.*		*H. M.*	*M.*	*H. M.*		*Lbs.*	*Inches.*	
Nov. 23	142	169	177	Quincy	113	.....	$17\frac{3}{4}$	L. & F.	9.4	307.75		1 0	15	30	8.7276	42,674	0.180	
Nov 23	143	82	181	....do	114	.....	18	...do	9.4	313		1 0	10	25	8.7206	47,941	0.292	
Nov. 25	144	170	186	C. F. M. Co.	114	2	18	...do	9.2	320		1 0	10	25	8.7254	44,737	0.233	
Nov. 25	145	185	178	....do	114	.....	$17\frac{3}{4}$	...do	9.4	309.75		1 10	15	30	8.6985	40,778	0.154	
Nov. 25	146	142	160	....do	126	4	16	...do	9.5	306		1 5	10	25	8.7250	43,153	0.200	
Nov. 25	147	71	156	....do	130	2	$15\frac{3}{4}$	...do	9.5	303.5		1 0	15	25	8.7782	53,051	0.386	
Nov. 26	148	65	176	....do	118	.....	$17\frac{1}{4}$	...do	9.4	311.5		1 5	10	25	8.8144	40,415	0.213	
Nov. 26	149	85	175	....do	117	3	$17\frac{1}{2}$	...do	9.5	312.5		1 10	15	25	8.7199	44,797	0.219	
Nov. 26	150	3	171	....do	120	.....	17	...do	9.4	308		1 10	15	25	8.7870	52,514	0.364	
Nov. 26	151	72	172	....do	120	2	$17\frac{1}{4}$	...do	9.5	311.25		1 5	10	20	8.6076	40,969	0.180	
Nov. 26	152	10	171	....do	120	.....	17	...do	9.4	308		1 0	10	25	8.8096	50,549	0.338	
Nov. 26	153	124	171	....do	120	2	17	...do	9.4	310		1 5	15	25	8.4557	39,393	0.194	
Nov. 26	154	110	168	....do	125	.....	$16\frac{3}{4}$	...do	9.4	309.75		1 10	10	20	8.7371	40,082	0.158	
Nov. 27	155	31	170	....do	124	.....	17	...do	9.5	311		1 15	15	30	8.8166	43,549	0.173	
Nov. 27	156	70	170	....do	124	.....	17	...do	9.5	311		1 20	15	25	8.7729	49,092	0.210	
Nov. 27	157	167	172	....do	120	3	$17\frac{1}{2}$	...do	9.5	312.2		1 0	15	30	8.7365	44,625	0.219	
Nov. 27	158	87	170	....do	122	.....	17	...do	9.4	309		1 10	12	25	8.7305	42,832	0.164	
Nov. 27	159	147	160	....do	130	2	16	...do	9.5	308		1 10	10	25	8.7887	45,302	0.216	
Nov. 27	160	134	160	....do	130	3	16	...do	9.5	309		1 15	12	25	8.4808	43,046	0.250	
Nov. 27	161	161	170	....do	130	.....	17	...do	9.5	317		1 10	15	25	8.4227	40,181	0.192	
Nov. 29	162	179	171	....do	130	2	17	...do	9.5	320		1 10	15	25	8.5424	41,158	0.180	
Nov. 29	163	66	170	....do	121	.....	17	...do	9.4	308		1 15	10	25	8.6397	42,939	0.198	
Nov. 29	164	93	170	... do	122	2	17	...do	9.5	311		1 10	15	20	8.7397	43,618	0.264	
Nov. 29	165	78	170	....do	121	3	17	...do	9.5	311		1 10	12	25	8.7630	44,011	0.236	
Nov. 29	166	67	170	....do	126	.....	17	...do	9.5	313		1 5	15	20	8.5859	42,046	0.208	
Nov. 29	167	127	170	....do	120	.....	17	...do	9.4	307		1 0	10	25	8.5977	41,570	0.172	
Nov. 30	168	4	169	....do	126	3	17	...do	9.5	315		1 10	15	30	8.6354	41,370	0.146	
Nov. 30	169	8	165	....do	129	2	$16\frac{1}{2}$	... do	9.5	312.5		1 5	15	25	8.7004	43,333	0.200	
Nov. 30	170	68	154	....do	143	.....	$15\frac{1}{2}$	...do	9.5	312.5		1 10	12	30	8.7267	42,758	0.200	
Nov. 30	171	137	171	....do	130	4	17	...do	9.5	322		1 0	15	20	8.7923	44,515	0.229	
Nov. 30	172	80	159	....do	131	.....	16	...do	9.5	306		1 10	12	25	8.6240	41,570	0.180	
Nov. 30	173	112	155	....do	139	3	$15\frac{1}{2}$	...do	9.5	312.5		1 15	15	25	8.6228	41,466	0.180	
Nov. 30	174	171	168	....do	132	.....	$16\frac{3}{4}$	...do	9.5	316.75		1 0	10	30	8.6049	43,902	0.296	
Dec. 2	175	108	157	Quincy	126	.....	$15\frac{1}{4}$	Banca ..	9.4	298.5		1 5	15	25	8.6801	43,333	0.172	

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Dec.	2	176	125	170	....do	127	3	17	...do	9.5	317	1	5	15	25	8.5498	42,832	0.178	
Dec.	2	177	.....	173	....do	124	.....	.....	Unkn'n	.....	.....	1	20	15	20	.....	.....	.....	Condemned.
Dec.	2	178	.....	160	....do	140	.....	16	...do	9.5	316	.....		15	25	.....	.....	.....	Condemned.
Dec.	3	179	113	167	....do	124	.....	16¾	L. & F..	9.5	307.75	1	15	15	25	8.6605	38,510	0.126	
Dec.	3	180	163	162	....do	129	4	16½	...do	9.5	311.25	1	20	12	25	8.5354	36,938	0.148	
Dec.	3	181	69	163	....do	130	.....	16¾	...do	9.5	313.25	.....		10	25	8.5762	40,796	0.188	
Dec.	3	182	.....	166	....do	126	3	16¾	...do	9.5	311.5	1	10	10	30	8.3618	37,424	0.138	Condemned.
Dec.	3	183	99	190	....do	102	.....	19	...do	9.4	311	1	5	10	30	8.6128	39,491	0.132	
Dec.	3	184	146	170	....do	108	.....	17	...do	9.4	295	1	5	12	25	8.6970	44,515	0.264	
Dec.	3	185	190	168	....do	120	.....	14	...do	8.6	302	1	10	15	30	8.7887	54,300	0.371	
Dec.	4	186	159	162	....do	130	3	14	...do	8.9	309	1	10	15	25	8.6824	40,081	0.183	
Dec.	4	187	141	162	....do	130	2	14	...do	8.9	308	1	20	15	25	8.6692	42,151	0.211	
Dec.	4	188	168	160	....do	130	3	14¼	...do	8.9	307.5	1	15	15	25	8.7647	42,439	0.222	
Dec.	4	189	138	164	....do	129	2	14	...do	8.0	309	1	0	15	25	8.7387	48,940	0.333	
Dec.	4	190	136	162	....do	129	.....	14¼	...do	9.0	305.5	1	15	15	25	8.4416	39,393	0.146	
Dec.	5	191	129	162	....do	129	3	14	...do ...	8.8	308	1	0	10	25	8.5772	39,987	0.151	
Dec.	5	192	148	164	....do	125	.....	14¼	...do	8.9	303.5	1	5	15	25	8.7583	46,669	0.250	
Dec.	5	193	196	162	....do	130	3	14¼	...do	8.9	309.25	1	0	12	25	8.5663	40,969	0.211	
Dec.	5	194	172	160	....do	130	.....	14	...do	8.9	304	1	0	15	25	8.4807	39,492	0.169	
Dec.	5	195	158	160	....do	130	2	14	...do ...	8.9	306	1	5	10	25	8.6055	40,575	0.222	
Dec.	5	196	145	178	....do	116	.....	14¾	...do	8.5	308.75	1	5	15	30	8.4646	39,492	0.189	
Dec.	5	197	156	160	....do	131	3	14	...do	8.9	308	1	20	15	25	8.5266	40,778	0.153	
Dec.	6	198	187	160	....do	130	.....	14	...do	8.9	304	1	0	15	30	8.5636	42,151	0.250	
Dec.	6	199	109	160	....do	130	3	14	...do	8.9	307	1	20	15	25	8.6656	42,545	0.246	
Dec.	6	200	103	160	....do	130	.....	14	...do	8.9	304	1	10	15	35	8.4069	39,198	0.141	
Dec.	6	201	104	168	....do	122	.....	14	...do	8.6	304	1	0	15	35	8.6499	42,334	0.250	
Dec.	7	202	140	164	....do	128	3	14¼	...do	8.5	309.2	1	15	15	30	8.4934	39,393	0.187	
Dec.	7	203	111	164	....do	129	.....	14¼	...do	8.8	307.2	1	5	10	30	8.7978	50,930	0.370	
Dec.	7	204	191	167	....do	128	.....	14¼	...do	8.7	309.25	1	10	10	30	8.7237	48,069	0.370	
Dec.	7	205	151	160	....do	130	.....	14	...do	8.9	304	1	15	15	25	8.7097	45,976	0.243	
Dec.	7	206	165	164	....do	130	3	14¼	...do	8.9	311.2	1	5	15	25	8.7359	47,272	0.305	
Dec.	7	207	107	160	....do	130	.....	14	...do	8.9	304	1	10	10	25	8.5671	41,260	0.216	
Dec.	7	208	128	166	....do	128	.....	14½	...do ...	8.8	308.25	1	15	20	30	8.3233	39,296	0.245	
Dec.	9	209	131	160	....do	130	3	14	...do ...	8.9	307	1	20	16	35	8.7097	41,277	0.201	
Dec.	9	210	174	160	....do	130	.....	14	...do ...	8.9	304	1	20	15	25	8.7660	48,144	0.347	
Dec.	9	211	118	160	....do	130	.....	14	...do	8.9	304	1	10	10	40	8.6034	40,281	0.188	
Dec.	9	212	105	160	....do	130	2	14	...do	8.9	306	1	5	15	30	8.7798	50,154	0.347	
Dec.	9	213	195	165	....do	130	.....	14¼	...do	8.9	309.5	1	10	10	40	8.6282	45,020	0.324	
Dec.	9	214	115	160	....do	130	3	14	...do	8.9	307	1	15	15	35	8.6839	48,696	0.388	
Dec.	9	215	144	160	....do	130	.....	14	...do	9.0	304	1	5	20	20	8.8307	51,071	0.361	
Dec.	10	216	154	164	....do	130	.....	14¼	...do	9.0	308.5	1	20	15	25	8.6078	42,439	0.250	
Dec.	10	217	150	161	...do	130	3	14	...do	9.0	308	1	10	15	25	8.6874	48,180	0.387	
Dec.	10	218	194	160	....do	130	.....	14	...do	8.9	304	1	10	20	25	8.6416	44,908	0.267	
Dec.	10	219	155	160	....do	130	3	14	...do	8.9	307	1	10	12	25	8.7089	42,545	0.239	
Dec.	11	220	197	160	....do	130	2	14	...do	8.9	306	1	10	15	30	8.7318	46,091	0.272	
Dec.	11	221	102	160	....do	130	3	14	...do	8.9	307	1	20	20	35	8.6743	42,545	0.225	
Dec.	11	222	189	160	....do	130	.....	14	...do	8.9	304	1	20	15	30	8.7300	45,415	0.250	
Dec.	11	223	116	160	....do	130	3	14	...do	8.9	304	1	10	15	35	8.7765	48,060	0.333	
Dec.	11	224	192	160	....do	130	3	14	...do	8.9	307	1	5	15	35	8.8458	50,296	0.356	
Dec.	11	225	160	160	....do	130	.....	14	...do	8.9	304	1	15	20	25	8.5799	42,256	0.255	
Dec.	11	226	.....	160	....do	130	3	14	...do	8.9	307	1	5	15	25	8.7840	50,556	0.382	Condemned—imperfect casting.
Dec.	12	227	177	160	....do	130	.....	14	...do	8.9	304	1	10	12	28	8.6639	39,898	0.155	

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Manufacture of 2.5-inch bronze guns at the West Point Foundry, 1878—Continued.

Castings.			Metal used.								Time.			Test of samples.			Remarks.
Date.	Foundry number.	Register number.	Weight of copper.	Brand of copper.	Bronze. Heads.	Bronze. Chips.	Weight of tin.	Brand of tin.	Per cent of tin.	Total weight.	Melting copper.	From adding tin to casting.	Between pouring and removing casting.	Specific gravity.	Tenacity.	Extension per inch at rupture.	
			Lbs.		*Lbs.*	*Lbs.*	*Lbs.*			*Lbs.*	*H. M.*	*M.*	*H. M.*		*Lbs.*	*Inches.*	
Dec. 12	228	175	160	Quincy....	130	3	14	L. & F.	8.9	307	1 15	10	30	8.6682	48,696	0.384	
Dec. 12	229	188	160	....do	130	.....	14	...do	8.9	304	1 5	10	35	8.6212	41,653	0.269	
Dec. 12	230	117	160	....do	130	2	14	...do	8.9	306	1 20	20	35	8.6744	48,300	0.345	
Dec. 12	231	139	152	....do	135	.....	14	...do	9.0	301	1 10	15	30	8.5956	46,369	0.333	
Dec. 12	232	153	160	....do	130	3	14	...do	8.9	307	1 25	15	35	8.7250	50,675	0.379	
Dec. 12	233	132	160	....do	130	.....	14	...do	8.9	304	1 10	15	25	8.7039	50,424	0.403	
Dec. 13	234	183	160	....do	130	3	14	...do	8.9	307	1 20	15	30	8.7262	42,046	0.228	
Dec. 13	235	157	160	....do	130	.....	14	...do	8.9	304	1 10	15	30	8.5909	44,452	0.342	
Dec. 13	236	135	160	....do	130	3	14	...do	8.9	307	1 15	10	25	8.7288	42,757	0.208	
Dec. 13	237	193	160	....do	130	.....	14	...do	8.9	304	1 5	10	20	8.8382	50,424	0.390	
Dec. 13	238	133	160	....do	130	.....	14	...do	8.9	304	1 10	15	30	8.6966	41,363	0.208	
Dec. 13	239	186	160	....do	130	.....	14	...do	8.9	304	1 15	....	25	8.8387	55,289	0.461	

[redacted] Weight of finished gun, 113 pounds.
[redacted] The percentage of tin was calculated on the supposition that the "heads" contained 10 per cent., which will be seen to have been frequently too great an amount.

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A feature incidental to the casting, but which is not shown in the records on account of the meagerness and uncertainty of the information obtained, was the extreme variations of temperature and fluidity in the different crucibles of melted copper designed for a charge. During personal observation of many castings, on no occasion could even an unskilled witness fail to notice the differences between the contents of the two ladles. Sometimes the metal in one crucible would be exceedingly liquid, while the other was almost pasty; sometimes both crucibles were very hot, though to an unequal extent; at other times both quite dull. The defects or differences resulting from this irregularity, whatever may have been their extent, might have been corrected had the charges been melted in a furnace.

Attached to this report are extracts from a publication by Lieut. Michael Levitzky, of the Russian navy, upon the fabrication of bronze guns, which have been taken from the *Revue d'Artillerie*, October, 1876:

* * * The most complete experiments and the greatest success in the improvements applied to the fabrication of guns are due to Col. Alexander Lavrov, of the artillery. His works commenced by a very complete study upon bronze guns cast in accordance with a series of tests made in 1868 at Liége, in the presence of experienced artillerists. These experiments refer to the temperature of the metal when poured, the rapidity of cooling, the effect of annealing, and the proportion of the ingredients.

The following are some of the principal results obtained by Colonel Lavrov:

Number of bars.	The metal fused.	The metal cooled.	Annealing.	Specific gravity.		Resistance to rupture.	Elastic limits.
				Turnings.	Bars.		
						Pounds.	*Pounds.*
4-5	Rapidly	Rapidly	Without	8.841	8.740	70,106	47,729
21-19	Slowly	do	do	8.855	8.563	54,367	43,332
6-7	Rapidly	do	With	8.863	8.726	62,758	46,629
16-47	Slowly	do	Without	8.805	8.649	50,293	42,723
15-13	do	Slowly	do	8.837	8.583	49,777	41,503

These results prove among other things that it is best to cool the metal rapidly while it is in the liquid state, and to hasten the cooling even after solidification.

This suggested to Colonel Lavrov the idea of discarding in future the method of casting in sand molds, and of using iron molds instead. Such molds, which produce a sudden chilling of the metal, impart to it considerable strength, and moreover have the advantage of possessing an invariable shape. The metal consequently solidifies into a volume the size of which has been accurately calculated in advance. Another modification was designed with the intention of assuring uniformity in the shrinkage, so as to supply from the liquid metal that diminution of volume which occurs while passing from the liquid to the solid state.

To this end Colonel Lavrov so designed the interior profile of the mold that each of the transverse sections should be at least equal to the lowest section, so that, solidification commencing at the bottom, the liquid metal might feed the lower parts as fast as and to the extent that the solidification occurred.

The old mode of casting with the breech down was then discarded, and from that time the chase formed the lower part of the mold. Moreover, there is another advantage derived from this mode of casting. During the first moments of cooling, the gun may be considered a vessel with thin walls filled with a very heavy liquid. This will contract as it cools, and, if the breech be down, will be suspended by means of the trunnions, which consequently have to sustain the entire weight of the gun. This may also be the cause, due to the unequal shrinking of the different parts, of producing numerous small cracks in such weak spots as the rear of the trunnions, which are filled with white metal, the fusibility of which keeps it liquid longer than the rest of the mass.

In order to assure the mixture of the upper parts of the casting a sinking-head is placed above the breech. Its cooling is retarded by a sand-head placed on top of the

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mold proper. This part of the mold, inclosed in sand, forms a reservoir of fluid metal, which supplies the space produced by the contraction as fast as it occurs.

The trunnions when cast have the shape of trapezoidal prisms. With this form they have the advantage of being able to descend freely with the rest of the casting during the contraction of the mass. This, however, refers to small castings. For large calibers it is far preferable to cast the trunnions separately attached to a ring, which is subsequently heated, slipped over the gun, and shrunk into place. * * *

We can now pass to an examination of some of the details in the fabrication of cannon; such as has been proposed by Colonel Lavrov, and such as he has actually tried at the arsenal at St. Petersburg.

The mold in which the guns are cast is composed of three or four cast-iron flasks, each of which is formed in two parts, connected together by bolts, and provided with trunnions or handles to facilitate the manipulation of the mold and its disposition in the pit.

The assembling of the mold is commenced by laying a cast-iron bed-plate, covered by a mixture of two parts of broken fire-brick and one part of black refractory sand. * * * Upon this bed-plate is placed the muzzle section of the mold (A, Figs. 1, 2, and 14, Plate VII), forming on the exterior the frustum of a right pyramid, and on the interior a truncated cavity, divided into two parts and united together by six bolts. As this part, after the solidification of the casting, is only lifted when laid horizontally, it is not furnished with trunnions like the other sections of the mold. The following section (B) contains the trunnions of the gun. It is also divided into two parts, connected together by four bolts, and furnished with handles. The position of the trunnions is marked by two deep prismatic recesses, which are symmetrically divided by the plane of union of the two parts of the flask.

These recesses commence at a height of 3 or 4 inches above the trunnions and reach almost to the bottom of the flask A. Toward each end the recesses gradually diminish in depth, and their surfaces as gradually coincide with that of the interior of the mold. The breech section C differs only from section B in the absence of the recesses for the trunnions and by an enlargement made in the upper part of the mold.

Sometimes, as in guns larger than 9-pounders, the flask C is replaced by two flasks, the lower of which is made with thick, the upper with thin, walls. Finally, the mold of the sinking-head D is so made as to secure a gradual cooling of the metal. This accounts for its being made in the old-fashioned way of sand. The entire interior of the mold is then painted with coke-wash, and afterwards with a heavy coat of the same, until the surface assumes a bright metallic appearance.

Figs. 3, 4, and 5 represent the plan of the muzzle part of the flask, the section of the part for the trunnions and the section of the part for the sinking-head.

Trunnions for mortars are cast separately in special flasks, Figs. 6 and 7. * * *

The different sections of the flask are assembled in the pit of the foundry on the cast-iron bed-plate, which rests on the cylinder of an hydraulic press.

In order to support the mold, the upper sections of the flask are held by two chains fastened into the walls of the pit, and the bottom of the section for the chase is secured by means of an especial frame (Fig. 14, E, and Fig. 8), the upper plate of which is cut to the contour of the flask and the lower pierced through the center with a round orifice. The use to which this is put will be further explained.

Above that portion of the mold which contains the sinking-head is placed the cap F (Fig. 9), which is united to the bed-plate by four rods (G, Fig. 14), always kept in a state of tension by means of the springs H pressing against the heads of bolts U at the ends of the rods and against the under surface of the bed-plate R.

Within the cap is inserted an earthen tube, *r* (Fig. 10), and above it a cast-iron tube of the same dimensions, but connected with a rectangular trough L (Fig. 11), which in its turn is surmounted by the compressor-block M (Fig. 12).

A conical projection, *m*, is attached to the under surface of the block, which is pierced at its four corners with holes, through which pass the uprights N (Fig. 14), which reach to the bottom of the pit, where they hold suspended a thick cast-iron plate, O, upon which is applied the piston of an hydraulic jack.

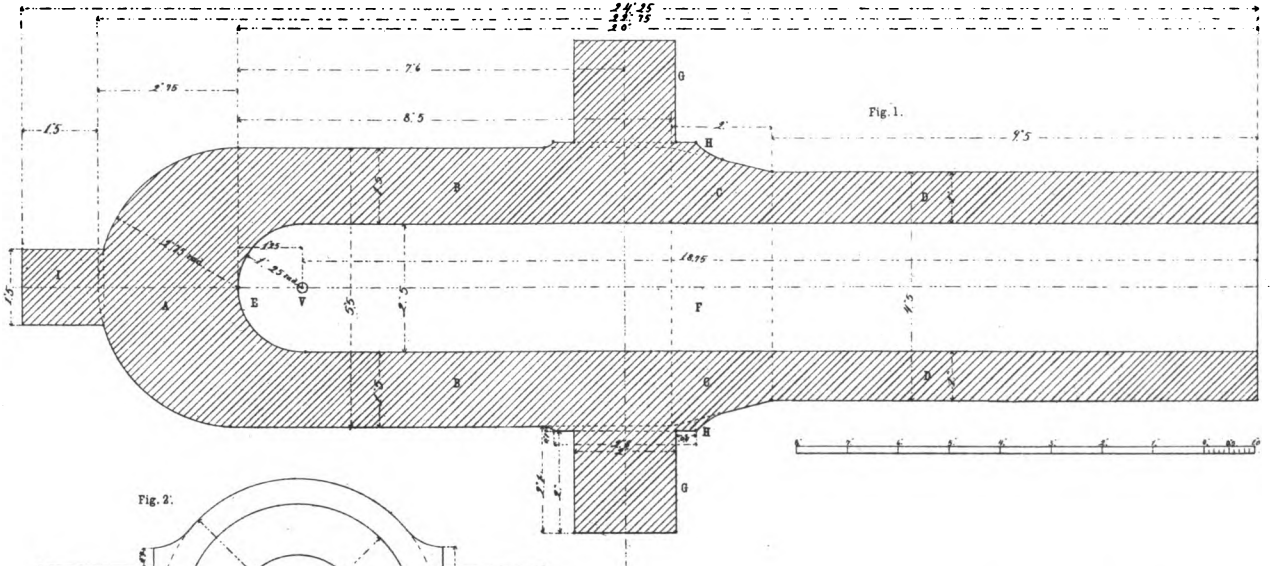
At the moment of casting, the entire arrangement, M, N, O, is suspended from a crane, and the extremity of the conical projection is from 2 to 2.5 inches above the upper orifice of the tube *l*. But hardly is the mold filled with metal when the chain of the crane is lowered and the hydraulic pressure applied.

The piston Q presses firmly against the plate O, which, by means of the uprights N, pulls down the compressor-block M. The conical projection *m* closes the upper orifice of the tube *l*, and the tube *r* is forced into the liquid metal some 20 inches (50 c. m.).

In order that the metal may not escape from below, the lower opening of the section of the flask for the chase is closed by means of a disk (Fig. 13) about 3.5 inches thick, 0.5 inch of this thickness fitting into the flask and the remainder into a recess cut in the center of the inner plate of the frame E (Fig. 8). The whole is carefully daubed with sand in such manner as to prevent all possible escape of metal.

* * * * * * *

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LIFE-SAVING APPARATUS.

BRONZE GUN,

2¼ Inch, Smooth Bore.

DESIGNED BY

Lieut. D. A. LYLE, Ordnance Department, U. S. Army.

AUGUST 14, 1877.

PLATE I.

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Chill No. 1.

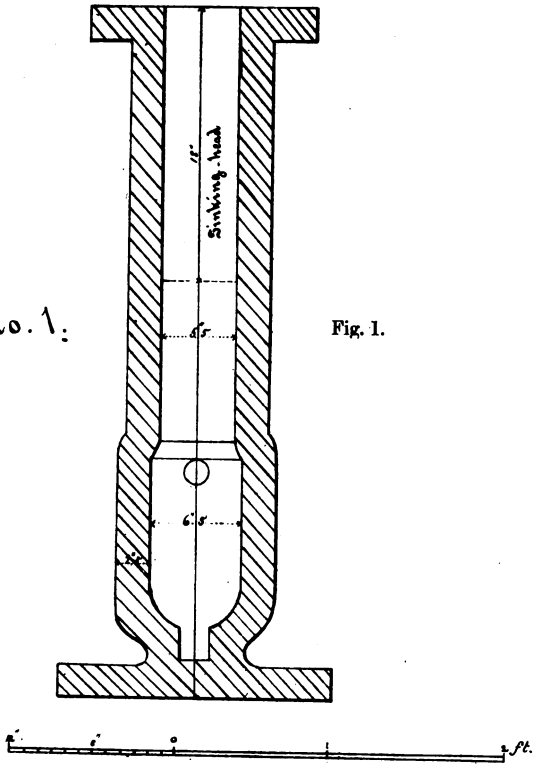
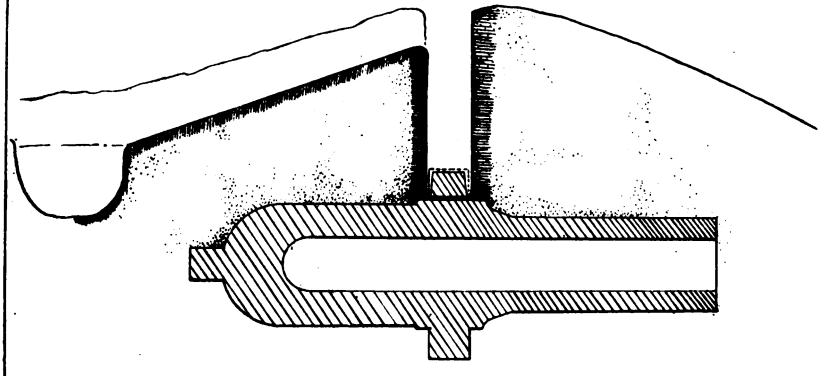


Fig. 1.

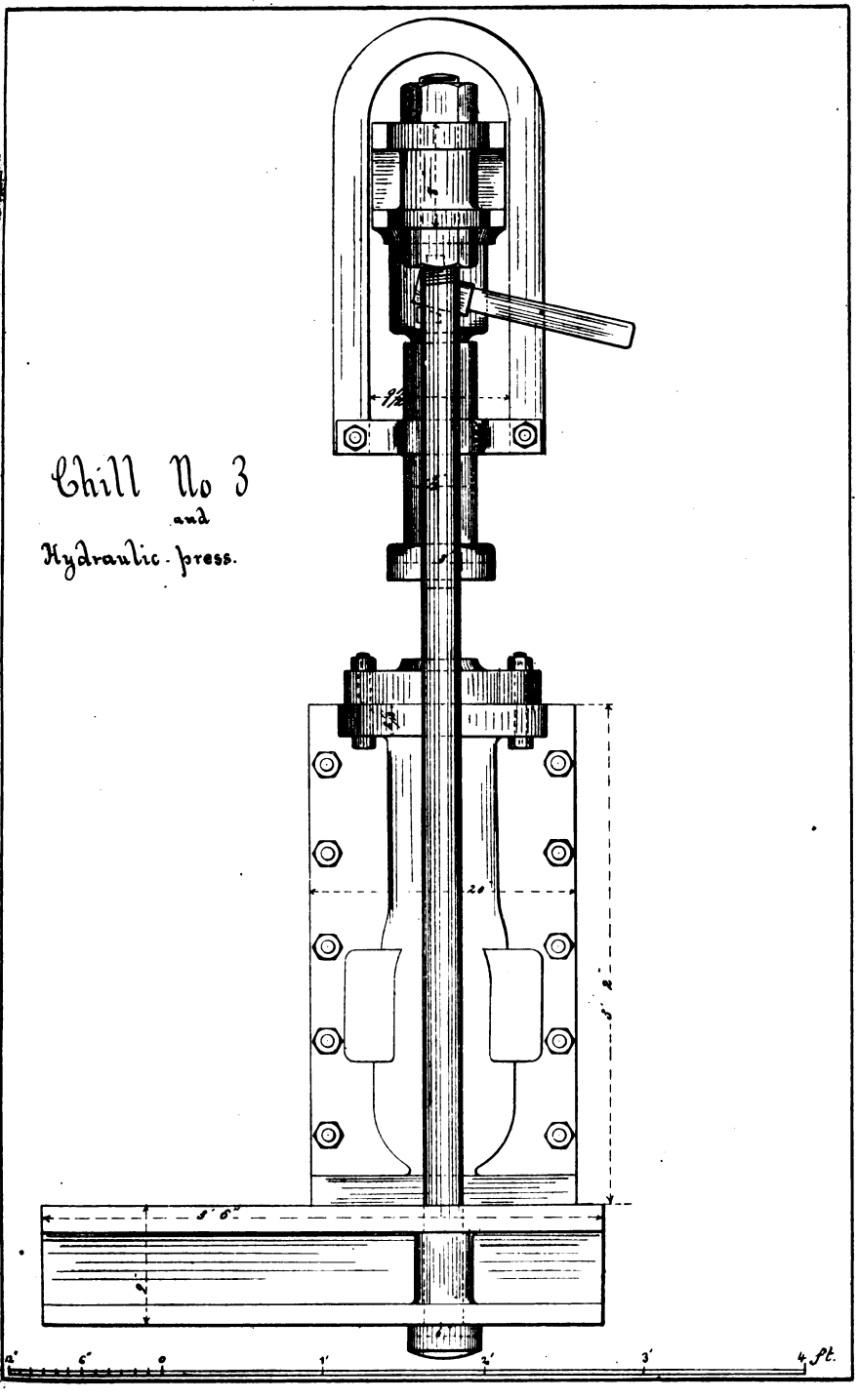
Fig. 2.

Burning on new trunnion



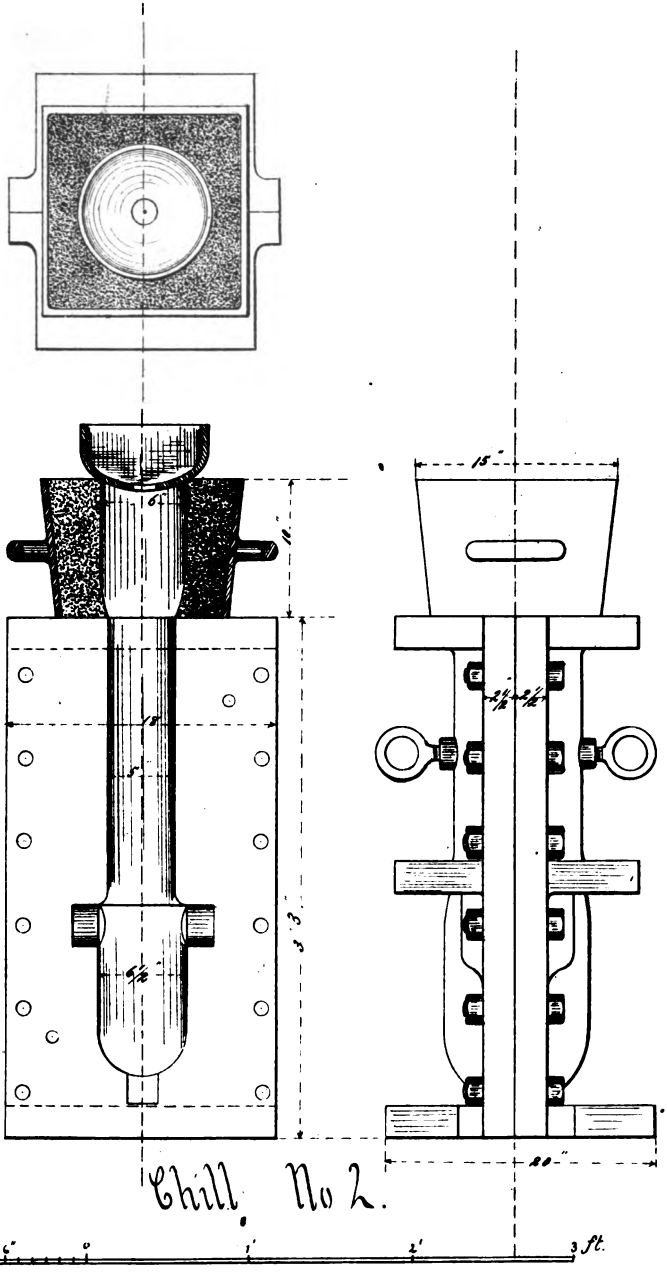
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Chill. No 2.

12" 6" 0 1' 2' 3 ft.

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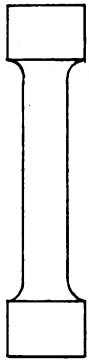


Fig. 1.

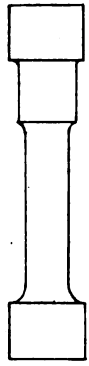


Fig. 2.

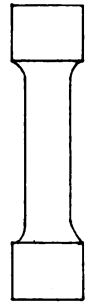


Fig. 3.

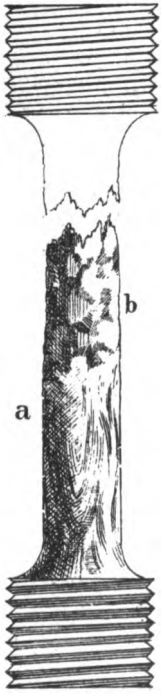


Fig. 4.

Sinking-head of gun No. 239.

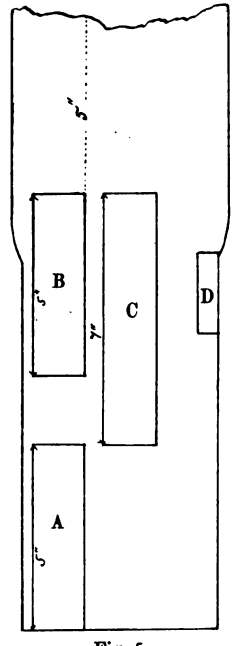


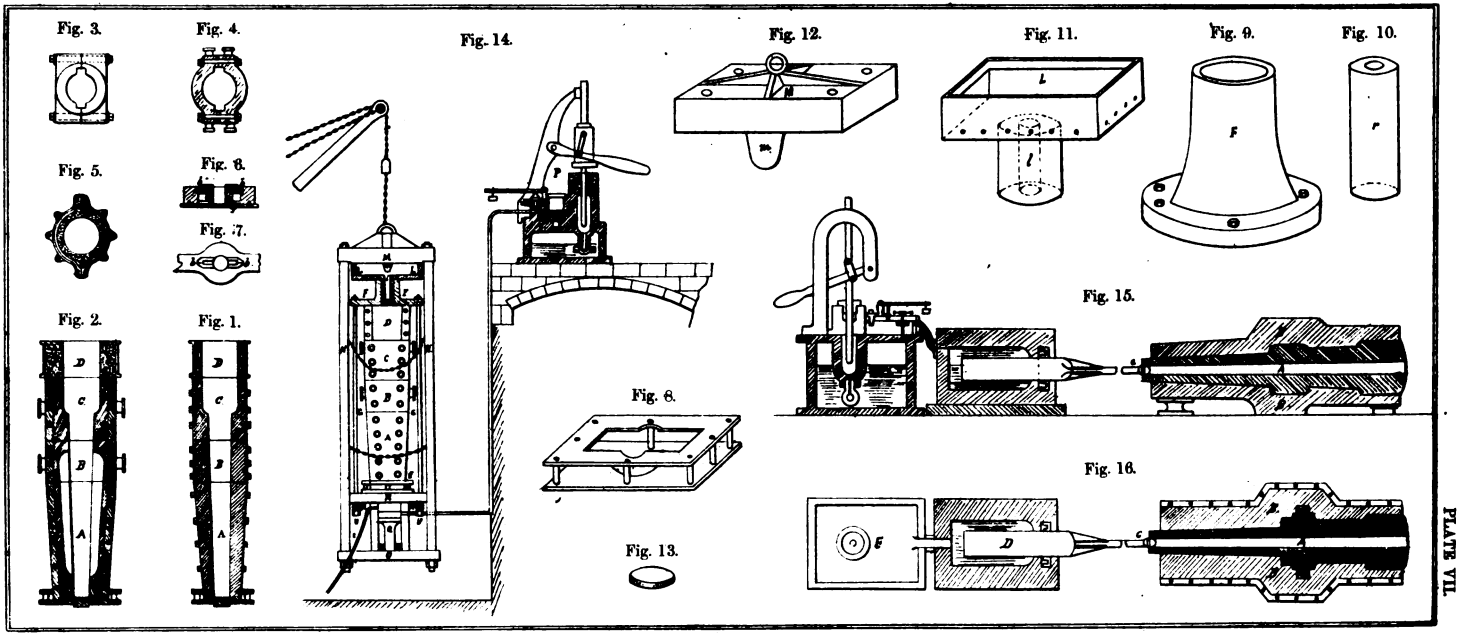
Fig. 5.

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REPORTS

OF THE

BOARD ON WRECK ORDNANCE.

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REPORTS OF BOARD ON WRECK ORDNANCE.

LETTER OF THE SECRETARY OF THE TREASURY CONSTITUTING THE BOARD ON WRECK ORDNANCE.

TREASURY DEPARTMENT,
OFFICE OF THE SECRETARY,
Washington, D. C., May 27, 1879.

Capt. J. H. MERRYMAN,
Inspector Life-Saving Stations;
Lieut. D. A. LYLE,
Ordnance Department, U. S. A.;
Lieut. T. D. WALKER,
Assistant Inspector Life-Saving Stations;
D. P. DOBBINS, Esq.,
Superintendent Ninth Life-Saving District;
FRANKLIN C. JESSUP, Esq.,
Keeper Station No. 17, Third Life-Saving District:

GENTLEMEN: Upon the request and recommendation of the General Superintendent of the Life-Saving Service, with a view to compliance with the terms of section 7 of the act of June 18, 1878, entitled "An act to organize the Life-Saving Service," which makes it a part of his duty "to cause to be properly investigated all plans, devices, and inventions for the improvement of life-saving apparatus for use at the stations, which may appear to be meritorious and available," you are hereby constituted a board, whose duty it shall be to examine and test, so far as practicable, all such plans, devices, and inventions as may be submitted to it from time to time by the General Superintendent, and to make detailed reports of the results of its investigations, accompanied with recommendations, for his information and assistance, in determining the proper action to be taken in each case.

The scope of the board will contemplate action upon all plans, devices, and inventions for wreck ordnance to be used at the life-saving stations, embracing mortars, guns and their appurtenances, rockets, line-carrying projectiles, shot-lines, faking boxes, and powder.

It is understood that the duties of the board will not include action upon plans, devices, or inventions to be used on shipboard for effecting communication with the shore, these being the province of another branch of the government.

While no compensation for the services rendered by the board can be made, all traveling and other expenses necessarily incurred under authority previously obtained from the General Superintendent will be reimbursed.

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It is important that the first meeting of the board shall take place at as early a date as convenient, as there are already on hand several matters to be referred to it, and the president of the board is hereby authorized to convene its members as soon as practicable, giving the General Superintendent early notice of the time and place of assembly.

At this meeting the first business of the board will be to formulate rules and regulations for its own government, and for the government of parties whose plans and devices may be presented to it, which rules will be submitted to the General Superintendent for approval.

Captain Merryman will act as president of the board, and Lieutenant Walker as recorder.

Very respectfully,

JOHN SHERMAN,
Secretary.

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LETTER OF TRANSMITTAL.

OFFICE OF INSPECTOR OF U. S. LIFE-SAVING SERVICE,
No. 16 *Broadway, New York, June* 24, 1880.

SUMNER I. KIMBALL, Esq.,
General Superintendent United States Life-Saving Service:

SIR: I have the honor to transmit herewith report of the Board on Wreck Ordnance, &c., constituted by department letter, dated May 27, 1879, together with accompanying papers.

Very respectfully, your obedient servant,

J. H. MERRYMAN,
Captain U. S. R. M., Inspector Life-Saving Service,
President of the Board.

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REPORT.

BOARD ON WRECK ORDNANCE,
NO. 16 BROADWAY, NEW YORK,
June 24, 1880.

I.—PREAMBLE.

A board for the examination of devices and apparatus relating to wreck ordnance, &c., consisting of Capt. J. H. Merryman, U. S. R. M., Inspector U. S. Life-Saving Service, president; Lieut. D. A. Lyle, Ordnance Department, U. S. Army; Lieut. T. D. Walker, U. S. R. M., Assistant Inspector U. S. Life-Saving Service, recorder; Superintendent D. P. Dobbins, U. S. Life-Saving Service, ninth district, and Keeper F. C. Jessup, Life-Saving Station No. 17, third district, was constituted by the honorable Secretary of the Treasury, upon the request and recommendation of the General Superintendent of the Life-Saving Service, under department letter of May 27, 1879, for the purpose of examining and testing, so far as practicable, all such plans, devices, and inventions as may be submitted from time to time by the General Superintendent. On September 9, 1879, Keeper F. C. Jessup was transferred from the board, and Keeper John C. Patterson was detailed in his stead by the Secretary of the Treasury.

II.—DOCKET.

1. Captain Butler's line-carrying projectile.
2. Capt. J. H. Meyers' "movable kedger rocket apparatus and swinging line-boxes."
3. Charles Smith's grapple shot and safety hammock, to be used from stranded vessels.
4. Lyle-Emery grapple shot.

III.—REGULAR TESTS.

The only apparatus in the above list submitted to the board for actual trial was the Lyle-Emery grapple shot. This shot was tested at Sandy Hook with service-charge of six ounces of powder, and with less charges over a buoy-line carried out to sea by a life-boat. The shot were fired from the 2.5-inch Lyle gun.

IV.—AMMUNITION.

"Life-Saving Service" powder and friction primers.

V.—PRESENCE OF EXHIBITORS.

Inventors and exhibitors were allowed to be present, under the restrictions given in the general regulations adopted by the board. Copy appended hereto marked No. V.

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VI.—Results.

1. *Captain Butler's line-carrying projectile.*—Samples of this projectile were not submitted as required by the board; therefore no trials were made.

The board, from an examination of the drawings accompanying Captain Butler's letter, is of the opinion that the projectile and appurtenances are more complicated than the system now in use, and as no marked advantage in regard to cost, accuracy, and range is shown, no further action appears to be necessary at this time. The papers are herewith returned.

2. *Captain J. H. Meyer's "movable kedger-rocket apparatus and swinging-line-boxes."*—This apparatus is intended for use on steamers, sailing vessels, tugs, and life-boats. The use on life-boats is the only case that comes within the province of this board.

After careful consideration, and with a knowledge of the uncertainty of the action of rockets and their erratic flight, together with their cost and liability to deterioration when stored at sea-coast stations, the board is of the opinion that this apparatus is not adapted to the nature of this service on our coast.

3. *Charles Smith's grapple shot and safety hammock to be used from stranded vessels.*—The intended use, as stated by the inventor, removes this device from the consideration of the board.

The pencil drawings submitted by the inventor are crude and unfinished, but exhibit a complexity of construction that would be very expensive and of doubtful utility when completed. The papers accompany this report.

4. *Lyle-Emery grapple shot.*—Samples of this shot were submitted to and tested by the board. The trials proved satisfactory. A full description and instructions for the use of these projectiles are embodied in the reports of Lieut. D. A. Lyle, Ordnance Department, U. S. A., and Keeper John C. Patterson, jr., appended hereto, marked No. III.

VII.—Opinion.

The board is of the opinion that the Lyle-Emery projectile is adapted to the needs of the service.

VII.—Selection.

The grapple shot marked No. 1, as described in Lieutenant Lyle's reports, is the one preferred by the board.

IX.—Recommendation.

The board respectfully recommends that the General Superintendent of the Life-Saving Service procure for that service at least one thousand of the Lyle-Emery grapple shot, or five for each of two hundred stations.

ADDENDA.

I. Daily record of proceedings of board.

II. Letter of Capt. J. G. Butler, Ordnance Department, U. S. A., describing his line-carrying projectile.

Plate illustrating Captain Butler's line-carrying projectile.

III. Reports of Lieut. D. A. Lyle and Keeper John C. Patterson, de-

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scribing the Lyle-Emery grapple shot and method of use and giving synopsis of trials, with accompanying drawings.

IV. Correspondence and documentary exhibits in relation to Captain Butler's projectile, Captain Meyers' rocket apparatus, and Charles Smith's grapple shot.

V. General regulations.

J. H. MERRYMAN,
Captain U. S. Rev. Marine, President of the Board.
D. A. LYLE,
First Lieut., Ordnance Department, U. S. Army.
THOMAS D. WALKER,
Second Lieut., U. S. Rev. Marine,
Assistant-Inspector Life-Saving Stations.
D. P. DOBBINS,
Superintendent Ninth Life-Saving District.
JOHN C. PATTERSON, JR.,
Keeper Station No. 1, Fourth Life-Saving District.

There being no further business before it, the board adjourned, subject to the call of the president.

J. H. MERRYMAN,
Captain U. S. Rev. Marine, President of the Board.

THOMAS D. WALKER,
Second Lieut., U. S. Rev. Marine, Recorder.

ADDENDA.

I.

JOURNAL OF THE BOARD FOR THE EXAMINATION OF DEVICES AND INVENTIONS RELATING TO WRECK ORDNANCE DESIGNED FOR USE AT UNITED STATES LIFE-SAVING STATIONS.

No. 16 BROADWAY, NEW YORK,
June 18, 1879.

In conformity with an order of the Secretary of the Treasury, dated May 27, 1879 (S. I. K.), constituting a board for the examination and testing, as far as practicable, of such mortars, guns, and their appurtenances, rockets, line-carrying projectiles, shot-lines, faking-boxes, powder, equipments, implements, &c., connected with wreck ordnance, and such other matters as may be referred to the board by the General Superintendent of the United States Life-Saving Service, with a view of determining the applicability of same to the uses of the Life-Saving Service in establishing communication from the shore with stranded vessels, the said board, consisting of Capt. J. H. Merryman, inspector of life-saving stations (president); Lieut. D. A. Lyle, Ordnance Department, U. S. Army; Lieut. Thomas D. Walker, assistant inspector life-saving stations (recorder); Superintendent David P. Dobbins, of the Ninth district U. S. Life-Saving Service, and Keeper Franklin C. Jessup, of Station No. 17, in the Third district, assembled at No. 16 Broadway, New York, at 11 o'clock a. m. on the 18th day of June, 1879, pursuant to call of the president, dated June 11, 1879.

The board convened at the hour named, Captain Merryman in the chair, the General Superintendent of the Life-Saving Service being also

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present; Superintendent Dobbins absent when the meeting was called to order, being delayed on the road. A telegram was received from him at Albany, explaining cause of his detention.

The president read the order of the Secretary of the Treasury constituting the board, and announced that the consideration of rules, &c., to govern the future action of the board would now be in order.

Lieutenant Lyle submitted a synopsis of rules and regulations for the government of the board in its deliberations, &c., and offered the same for adoption, together with an abstract or form of report on such devices as may come under consideration.

The proposed rules were discussed section by section, and adopted by the unanimous vote of the board, as follows:

GENERAL REGULATIONS.

I. No person will be admitted to the meetings of the board, or to the firing ground, except the agents or inventors of the apparatus under discussion or trial.

II. All experiments and trials will be conducted under the immediate supervision of the board, and by its employés alone.

Inventors or exhibitors may have the privilege of displaying their apparatus, if desired, and of having the performance of the same noted in the record.

Any gun, rocket, or device in which explosives are used, to be first fired with at least three rounds of the maximum charge, by its exhibitor, as a safety test, before submission to the board.

III. The handling of apparatus by agents or inventors at any time after being submitted to the board is forbidden, except in the case of the display test above noted.

IV. Any apparatus which has been submitted to the board and entered upon the record will remain in the possession of the board for such time as may be necessary for completion of the trials and the final report upon the same.

V. All persons desiring to submit devices or inventions for the action of the board will be required to forward their applications to the General Superintendent in writing, embracing in detail the following points, in the order named:

First. Name or designation of device to be submitted.

Second. Whether or not covered by caveat or letters patent.

Third. Nomenclature of each separate part of the device, stated in list form, with reference letters corresponding to letters on accompanying drawings.

Fourth. Detailed description of device.

Fifth. Kinds and qualities of materials used.

Sixth. Dimensions of all parts.

Seventh. Weights of principal parts, and total weight of apparatus.

Eighth. Price at which device or apparatus will be furnished to the government.

Ninth. Construction, stating method of manufacture or fabrication of each device in detail.

Tenth. Description of method of using the apparatus in actual service.

Eleventh. Describe action of projectiles and lines when used.

Twelfth. Accurate drawings must accompany all applications. Full-sized drawings preferred, but drawings to scale of very large parts will be accepted.

Thirteenth. Claims of inventors or exhibitors for their devices will be set forth specifically in full, and in numerical order.

Fourteenth. Letter of transmittal addressed to the General Superintendent of the Life-Saving Service, Treasury Department, Washington, D. C., will accompany above descriptions, drawings, &c.

VI. All apparatus connected with any device or invention will be delivered at the expense of the agent or inventor of same at such point, and at such time, as the board may direct, and returned at the expense of said agent or inventor when no longer required by the board.

VII. It is to be understood that the government is to incur no expense for ammunition or other articles used in the actual trials or tests of any apparatus presented for consideration.

After the adoption of the rules for the government of the board, the president read a letter from General Superintendent S. I. Kimball, dated June 17, inclosing a communication from Capt. J. G. Butler, U. S. A., dated May 19, 1879, submitting specifications and drawings of a certain line-carrying projectile, and a communication from Charles

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Smith, dated March 12, 1879, relative to a device for an anchor shot; also, for a safety hammock.

It was ordered that copies of the rules, &c., when printed, be sent to each of the above-named persons.

The president appointed Lieutenant Lyle and Keeper Jessup a committee to examine and report upon the merits of such line-carrying rockets and shot as may be presented for consideration; also, on an anchor or a grapple-shot in course of manufacture at Springfield, Mass.

At 1 o'clock p. m. the board adjourned, subject to the call of the president.

THOMAS D. WALKER, *Recorder.*

NOTE.—Superintendent Dobbins arrived at about the time of adjournment, the train on which he traveled having met with an accident, and was detained some hours for repairs.

No. 16 BROADWAY, NEW YORK,
June 23, 1880.

Pursuant to the call of the president, dated the 15th instant, the board assembled at the office of the Inspector of Life-Saving Stations, No. 16 Broadway, New York City, on the 23d day of June, 1880, at 10.30 a. m.

Present: Capt. J. H. Merryman, U. S. R. M.; Lieut. D. A. Lyle, U. S. A.; Lieut. T. D. Walker, U. S. R. M.; Superintendent D. P. Dobbins, U. S. Life-Saving Service; Keeper John C. Patterson, jr., U. S. Life-Saving Service.

The minutes of the meeting held on June 18, 1879, were read and approved.

The president of the board announced that having received a letter from the General Superintendent, dated September 9, notifying him that Keeper F. C. Jessup had been transferred from duty as a member of the board for the examination of wreck ordnance to that upon life-saving apparatus, presided over by R. B. Forbes, esq., and that Keeper John C. Patterson, jr., of Station No. 1, in the Fourth District, had been transferred from the latter board to serve in Keeper Jessup's place he had directed Keeper Patterson to act in conjunction with Lieutenant Lyle on the committee to examine and report upon the devices referred to said committee at the previous meeting of the board.

Under the call for the report of the committee appointed at the last meeting, Lieutenant Lyle submitted a preliminary report upon the results obtained with the Lyle-Emery grapple shot by himself and Keeper Patterson at Sandy Hook, N. J., and requested leave to present a full report at a later period before the adjournment of the board.

The request was granted, and the subject laid over.

Lieutenant Lyle made a preliminary verbal report of his experiments, in company with Keeper Patterson, with the Hooper and other foreign line-carrying rockets, and stated that a written report would be presented at the next meeting of the board,* sufficient data not having as yet been obtained to enable the committee to report in full at this meeting.

EXAMINATION OF NEW APPARATUS.

The president read a letter from the General Superintendent, dated June 15, 1880, inclosing for the consideration of the board drawings and

*The report of the committee was filed in the office of the General Superintendent. The president telegraphed a request to the General Superintendent for its transmission by mail.

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specifications of certain life-saving devices submitted by L. W. Spencer, of New York, and Capt. J. H. Meyer, of Amsterdam, Holland, respectively, and samples of cotton cordage intended for shot lines, hauling lines, hawsers, &c., from Thomas H. Dunham, of Boston, who desires that they be examined and tested by the board.

Mr. Spencer appeared in person and explained the nature of his invention and his expectation of the results to be obtained from same. The device consisted of a breech-loading cannon of 2″. 8 caliber.

The board, at 1 p. m., took a recess until 2 p. m., for the purpose of examining the Spencer gun, at No. 27 Water street, New York.

Upon the statement of Mr. Spencer that he had not complied with the regulations of the board, requiring inventors of guns presented for consideration to test the same with the maximum charge at least three times as a precautionary measure before submitting it to a firing test in the presence of the board, it was determined, upon reassembly at 2 p. m., to direct the president to notify Mr. Spencer in writing that such rule must be observed by him before the regular firing test will be authorized.

The board then proceeded to the consideration of the "Butler line-carrying projectile."

As a model or sample of the Butler projectile was not submitted, the only information at hand was a letter from its inventor, Capt. J. G. Butler, Ordnance Department, United States Army, accompanied by drawings of the projectile.

The board, after carefully examining the drawings, &c., arrived at the conclusion that Captain Butler's invention is more complicated than the system now in use in the Life-Saving Service, and therefore decided that its further consideration at this time appears unnecessary.

J. H. MEYER'S MOVABLE KEDGER-ROCKET APPARATUS AND SWINGING LINE-BOXES.

The descriptive letter accompanying the drawings of the above-named apparatus was then read by Lieutenant Lyle, after which the president declared the device open to the discussion of the board.

As it appears from the claims of the inventor that it is designed for use on steamers, sailing vessels, tugs, and life-boats, its use on the latter is the only instance that would bring it before the board for consideration.

The subject was carefully discussed, and, upon a vote being taken on the question of the adaptability of the invention to the uses of the Life-Saving Service, the board decided adversely on the subject, and declined recommending its introduction into the service.

CHARLES SMITH'S GRAPPLE SHOT AND SAFETY HAMMOCK.

The letter of Mr. Smith was read. He claimed for his device that it is to be used from stranded vessels in establishing communication with the shore.

As the object for which the board was constituted does not contemplate the consideration of inventions to be used on shipboard, they coming properly within the province of another bureau of the Treasury Department (the Steamboat Inspection Service), no discussion was had on this device, and the papers were ordered to be returned to the General Superintendent of the Life-Saving Service.

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THOMAS H. DUNHAM'S COTTON YARNS, PROPOSED FOR SHOT-LINES, HAULING LINES, HAWSERS, ETC.

The consideration of this subject was deferred at the suggestion of Lieutenant Lyle, who moved its reference to a committee of two members of the board, with instructions to report at the next meeting.

The motion was carried and the committee named, as follows: Capt. J. H. Merryman and Lieut. Thomas D. Walker.

The board discussed the subject of procuring a firing ground for the purpose of testing life-saving apparatus, and the president of the board was directed to confer with the General Superintendent in reference to the same, and also in regard to a storehouse, the necessary platforms, and plank walks pertaining to said project.

The board adjourned at 4.30 p. m., to meet at 10 a. m. June 24.

No. 16 BROADWAY, NEW YORK,
Thursday, June 24, 1880.

The board convened this day at 10 a. m.

Present: Capt. J. H. Merryman, U. S. R. M.; Lieut. D. A. Lyle, U. S. A.; Lieut. T. D. Walker, U. S. R. M.; Superintendent D. P. Dobbins, U. S. Life-Saving Service; Keeper J. C. Patterson, jr., U. S. Life-Saving Service.

The General Superintendent of the Life-Saving Service being present, was invited to a seat in the board room.

Under the call for report of committee on the Lyle-Emery grapple shot, Lieutenant Lyle submitted a detailed report on that device as prepared by himself and Keeper Patterson, accompanied by an itemized estimate, furnished by the master armorer of Springfield Armory, of the probable cost of manufacturing the shot.

After some discussion of the merits of this projectile, and its applicability to the needs of the Life-Saving Service, it was moved and seconded that the report be received, approved, and referred to the General Superintendent of the Life-Saving Service, with the recommendation that each station of said service be furnished with, say, not less than five grapple shot of the size denominated No. 1 in the committee's report.

The motion was carried unanimously.

Action having been taken upon all subjects referred to the meeting, the board now entered upon the preparation of its report on the devices thus far tested or considered.

The report was adopted and signed by all the members, and at 4 p. m. the board adjourned, subject to the call of the president.

THOMAS D. WALKER,
Recorder.

II.

CAPTAIN BUTLER'S LINE-CARRYING PROJECTILE.

WATERVLIET ARSENAL, *May* 19, 1879.

The Hon. the SECRETARY OF THE TREASURY,
Washington, D. C.:

SIR: Observing that a board has been recently constituted under your authority "for the investigation of projects and inventions concerning life-saving apparatus," I avail myself of the opportunity to bring

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to your notice certain improvements in this direction, which I trust may prove worthy of consideration.

In the drawing which I have the honor to submit there is an absence of all unnecessary detail, and it includes only the prominent features to which I desire to call attention at the present time, and presents on a scale of half size a 2½-inch life-saving mortar of Lieutenant Lyle's design, to which the proposed improvements are adapted.

The careful experiments of Lieutenant Lyle having apparently shown the impossibility of successfully (that is, without frequent failures) discharging a projectile point foremost with a line attached to the base and led out of the gun, he was obliged to sacrifice all the advantages of this natural position of the projectile on account of the many evils encountered and to adopt the plan of loading the projectile point downward upon the charge, discharging it base foremost, and trust to the final righting of the projectile during its flight. By this plan both range and accuracy are probably sacrificed, but experience would seem to have shown thus far that this choice of evils was a wise and necessary one.

I believe that a line-carrying projectile can be discharged point foremost without encountering the difficulties heretofore accompanying such attempts.

Referring to the attached drawing, Fig. 1 represents a life-saving mortar with my projectile in position for firing. This projectile consists of a cast-iron or steel cylinder of proper length, slotted throughout most of its cylindrical length in a plane containing the longer axis. Through this slot an annealed wire loop or ring is passed, which works freely back and forth, and to this loop the short line is attached. The base of the projectile is fitted with a gas check of suitable design. Fig. 2 is a longitudinal section through this projectile in the plane of the slot. In both figures *p* is the projectile, *a b* the slot, *k* the gas-check, *l* the wire ring, and *s* is the shot line.

The operation of the system is as follows: Upon discharging the piece, the gas check on the base of the projectile is expanded against the walls of the bore, shutting off all escape of gas to the front, and utilizing the full effect of the powder charge. The projectile darts forward, and as it does so the metallic loop L slips back toward the base of the projectile until it is brought up against the bottom of the slot, when, owing to the superior velocity of the projectile (for friction and "blast" may start the line), the inertia developed in the ring and line causes the ring to straighten out, and ring and line assume the position with respect to the projectile shown in Fig. 3, a position most favorable for the accurate flight and maximum range of the latter. At the same time the change of form of the wire loop L from round or oval to the shape shown in Fig. 3, eases the initial strain upon the shot-line and diminishes the chances of a break. Although these wire rings are represented as continuous in the drawings, in practice they need not be so, and indeed would probably be wires looped at the ends, bent into proper shape, and hooked on to the line. Experiment can best determine an advantageous form. (See Fig. 7.)

Any suitable form of gas-check may be used, and Fig. 4 shows an alternative design.

In order to still further relieve the shot-line from strain it is quite practicable to employ several of these annealed wire rings linked together as a chain, in which case it is thought they will assume upon discharge the position shown in the small Fig. 5, and if it be desirable to still further lessen this strain upon the line, the usual coiled wire may be attached to the loops, although I should prefer the form shown at F in Fig. 6 as less liable to break, as the wire will not be twisted.

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I am induced to believe that this system gives fair promise of possessing the following advantages:

I. Over other projectiles discharged point foremost.

1st. The line not being led out alongside of the projectile in the bore, it will not be burned off by the gases nor cut by the shot, nor (if wire be used) cause the projectile to jam.

2d. A gas-check can be conveniently and successfully used, utilizing the full effect of the discharge and preventing the cutting action of the gases on the line.

3d. The yielding of the wire rings or links will prevent the too sudden strain upon the line.

II. Over the present adopted plan of firing base foremost—

1st. The projectile leaves the gun point foremost, and it is believed will continue so during its entire flight, instead of tumbling over in the air several times, and for some time afterward continuing to "wabble," whereby much air resistance must be encountered and both range and accuracy be impaired.

2d. The proposed projectile can be made much sharper at the point, thus still further reducing the resistance of the air.

3d. The gas operates upon the flat base of the projectile instead of against the point, and consequently the cutting tendency of the gas over windage reduced even if no gas-check were used, while it is also probable that the velocity and range will be somewhat increased by the more direct action of the gases upon the more favorable (flat) surface of the projectile, and possibly the bore conserved.

4th. The use of a gas-check permanently attached to and forming part of the projectile further utilizes the full effect of the discharge and prevents all escape of gas over the projectile, completely obviating what I understand to be a serious difficulty in other systems.

5th. In order to reduce this gas escape to the lowest practicable limit, I believe the present service projectiles have been made a very close fit to the bore, and the necessity of keeping them very clean impressed upon the men. It is thought that even if rust is effectually guarded against on the sea-coast, a slight bruise or dent in projectile or mortar, or fouling, or sand drifting in a high wind, might cause a projectile to stick in the bore and thus disable the gun at a critical moment. However serious this objection may be, it is completely obviated in the plan proposed, since the use of a gas-check will allow of a windage sufficiently generous to guard against such accidents, and the projectiles may even be lacquered or painted to prevent rust.

6th. The usually sudden strain upon the shot-line will, it is thought, be obviated by the ring or links of annealed wire, as has been described.

7th. And by reason of the foregoing features, it is probable that heavy charges can be successfully used, especially important, doubtless, in compensating for a wet line.

How far these views may be realized in practice, it might be bold to predict. The plan, although conceived some months ago, I have had no opportunity of testing, and it is probable that experience may suggest some modifications. In my judgment, however, the plan promises so well that I have deemed it my duty to present it.

Very respectfully, your obedient servant,

JOHN G. BUTLER,
Captain of Ordnance.

(Through Gen. P. V. Hagner, commanding, and the Chief of Ordnance, U. S. A.)

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Respectfully forwarded by request of Captain Butler.

P. V. HAGNER,
Brv't Brig. Gen., Colonel of Ordnance, Commanding Arsenal.

WATERVLIET ARSENAL, *May* 20, 1879.

[Indorsement.]

ORDNANCE OFFICE, WAR DEPARTMENT,
Washington, May 22, 1879.

Respectfully referrred to S. I. Kimball, Superintendent United States Life-Saving Service, Treasury Department.

S. V. BENÉT,
Brigadier-General, Chief of Ordnance.

III.

REPORT ON THE LYLE-EMERY GRAPPLE SHOT.

By Lieut. D. A. LYLE, Ordnance Department.

(Seven plates.)

This projectile was devised by Lieut. D. A. Lyle, Ordnance Department, U. S. A., and Mr. C. E. Emery, draughtsman at the National Armory. It is intended for use in connection with the 2½-inch Lyle gun for life-saving purposes.

DESCRIPTION.

Shot No. 1, *Plate I, marked "A* 1."

This is an elongated, solid, cast-iron, smooth-bore projectile, with a wrought-iron base and shank. In form the shot is cylindro-ogival. The radius of the ogival head is equal to the diameter of the projectile. An axial cavity, 1.25 inches (3.175 centimeters) deep is bored in the rear end of the shot, upon whose interior cylindrical surface is cut a female screw-thread to engage the screw on the wrought-iron base. The base has a cylindrical axial cavity drilled through it, with a rounded groove on one side to accommodate the stop and stop-spring. The front end of this cavity is enlarged by counter-boring, to allow the necessary longitudinal play of the shank-head in opening and closing the flukes. The screw on this end fits that in the body of the shot. At the rear end of the base are cut five sectoral slots, equidistant circumferentially. These slots receive the heads of the flukes, which are fastened to the base of these points by rivets. Circular grooves are milled out between the slots to allow the insertion of the rivets. The shank is of forged wrought iron. The front end of this bolt has a screw-thread, upon which, after insertion in the axial cavity of the base, a nut is placed. This end of the bolt is riveted after screwing on the nut. A rectangular groove on one side of the shank receives the stop and spring. Five lugs, placed equidistantly around the shank near the forward end, serve as points of attachment for the links that extend the flukes. The rear end of the shank contains an eye-hole for attaching the line in firing. Each link is composed of two flat pieces of Troy steel, with holes at each end to receive the rivets that connect them with the shank and fluke. The flukes, five in number, are also made of Troy steel. Each fluke has a rounded notch

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near its upper or forward end to accommodate the corresponding lug on the shank when closed. All edges or angles are carefully rounded. The details of form and construction had to be such as would permit the use of the projectile in the 2½-inch gun already in the service, and prevent the entanglement of the line as much as possible in firing.

DIMENSIONS AND WEIGHT.

	Inches.	Centimeters.
Total length of body and base	13.50	= 34.289
Length of ogival head	2.17	= 5.5118
Radius of head	2.50	= 6.350
Length of cylindrical part	9.83	= 24.967
Diameter of cylindrical part	2.50	= 6.350
Axial cavity—Length	1.25	= 3.175
Diameter	1.50	= 3.810
Base—Total length	2.75	= 6.985
Body—Length	1.50	= 3.810
Diameter	2.50	= 6.350
Screw-thread—Length	1.25	= 3.175
Diameter	1.675	= 4.253
Axial cavity—Length	1.00	= 2.54
Diameter	0.625	= 1.587
Width of slot for stop	0.24	= 0.609
Counter-bore—Length	1.75	= 4.445
Diameter	1.125	= 2.857
Stop—Total length	2.10	= 5.334
Width	0.24	= 0.609
Greatest thickness	0.20	= 0.508
Least thickness	0.14	= 0.355
Height of shoulder	0.06	= 0.152
Distance of shoulder from rear end	1.25	= 3.175
Shank—Total length	13.25	= 33.654
Length of screw-thread	0.65	= 1.651
Diameter of screw-thread	0.625	= 1.587
Nut—Diameter	1.125	= 2.857
Thickness	0.625	= 1.587
Length from plane of base	10.50	= 26.670
Distance from base to center of eye-hole	10.00	= 25.400
Diameter of eye-hole	0.40	= 1.016
Width at eye	1.00	= 2.540
Thickness at eye	0.40	= 1.016
Diameter of neck	0.625	= 1.587
Stop slot—Length	2.10	= 5.334
Width	0.24	= 0.609
Depth	0.10	= 0.254
Lugs—Number of	Five.	Five.
Length	0.60	= 1.524
Height above axis of shank	0.875	= 2.222
Thickness	0.25	= 0.635
Diameter of eye	0.30	= 0.762
Links—Number of pieces	Ten.	Ten.
Length	2.10	= 5.334
Width	0.60	= 1.524
Thickness	0.125	= 0.317
Diameter of rivet holes	0.30	= 0.762
Distance between center and rivet holes	1.50	= 3.810
Flukes—Number of	Five.	Five.
Length	8.30	= 21.082
Greatest width	0.60	= 1.524
Lesser width	0.30	= 0.762
Width at point	0.10	= 0.254
Thickness	0.25	= 0.635
Diameter of rivet holes	0.30	= 0.762
Distance between rivet holes	2.05	= 5.206
Total length of shot and shank with flukes closed	23.50	= 59.689
Total length of shot and shank with flukes extended	24.60	= 62.483
Distance of center of gravity from base	5.00	= 12.700
Weight	18.218 + lbs.	= 8.264 kilos.

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ACTION.

The projectile is inserted in the gun point first, with the flukes closed and the line tied in the eye-hole of the shank. In this position the base of the shot is toward the muzzle of the gun; the flukes partially enter the bore while the shank extends beyond the muzzle. In firing, the projectile describes the first part of its trajectory base foremost; the strain upon the shank being toward the rear, the flukes are kept closed; but as soon as the projectile reverses the tension on the line draws out the shank to the limit of its *play* in the base, spreading the flukes to their full extent. When the head of the shank reaches the bottom of the counter-bore in the base of the shot, the stop is thrown out by the action of the stop-spring and a square shoulder catches on the base and prevents the closing of the flukes. The latter may be opened and closed readily by hand. To close the flukes press the thumb upon the stop until the shoulder is disengaged, and then push in the shank gently till its head strikes the front end of the counterbore.

USE.

When vessels are stranded the crews sometimes fasten a line or rope to a cask, spar, buoy, or raft, and heave it overboard, hoping that the wind and waves will throw it on the shore to be seized by persons there, thus establishing communication between the wreck and beach. It frequently occurs, however, that there is an inshore current that carries the floating object along parallel to the coast, in which case the object desired fails to be attained. This projectile was devised for the purpose of firing over the line thus paid out from the stranded vessel, so as to pass above that line at some point between the cask or buoy and the vessel, and then, by hauling in the attached shot-line, the flukes grapple the ship's line, and enable the life-saving crew on shore to land the buoy and secure the line from the vessel. There are other uses to which it may be put that will readily suggest themselves to those familiar with the service.

Shot No. 2, Plate II, marked "A 2."

This projectile only differs from No. 1 in having the body two inches shorter and the shank two inches longer than that shot, and in being of less weight. The details are given in the plate.

WEIGHT.

Weight	15.8125 lbs.	= 7.172 kilos.
Distance of center of gravity from base	3.875 inches	= 9.842 centimeters.

EXPLANATION OF PLATES.

PLATE I.

Fig. 1. Partial longitudinal section of grapple shot with the flukes closed.

Fig. 2. Same, opened.

Fig. 3. Shank, showing lugs, &c.

Fig. 4. Section of shank showing relative position of lugs and method of attaching links.

Fig. 5. Side and rear elevations of base.

Fig. 6. Plan and side elevation of stop and spring.

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Fig. 7. Plan and elevation of nut or shank-head.
Fig. 8. One of the pieces forming the link.
Fig. 9. Side and edge of fluke.

PLATE II.

See explanation of Plate I. The same figures are used in both to designate similar parts.

PLATE III.

The Lyle-Emery grapple shot closed.

PLATE IV.

The same shot open.

EXPERIMENTS.

The preliminary trial of this grapple shot took place at Sandy Hook, N. J., December 21, 1878.

Result.

Station: Sandy Hook, N. J.
Date: December 21, 1878.
Piece: 2.5-inch Lyle gun.
Projectile: Lyle-Emery grapple shot No. 1.
Powder: "Life-Saving Service" powder.
Shot-line: Silver Lake linen No. 7, water-proof.
Weight of powder charge: 6 ounces.
Weight of projectile: 18.218 pounds.
Elevation: 22°.
Wind: direction of, ↓ W; force of, light.
Drift of line at 300 yards, not measured (slight).
Range: 325 yards.
Time of flight: 6.5 seconds.
Action of line: Good.
Action of projectile: Good.

REMARKS.

The sand was frozen hard. The projectile in falling with the flukes spread out entered the frozen sand, breaking one of the flukes at the rivet hole, where the links embrace it. The shot was seen to rotate about its shorter axis but once. This was due to the light charge of powder and the heavy line. The stop and spring performed their functions satisfactorily. The breaking of one or more of the flukes was expected on account of the unfavorable condition of the ground.

In actual service such a breakage is not to be anticipated, as the shot will strike the water first, and then sink to the bottom. The shot was still serviceable, although one fluke was broken. The projectile was then repaired, and shot No. 2 made. Both were sent to Sandy Hook for trial.

A committee, consisting of Lieut. D. A. Lyle and Keeper John C. Patterson, jr., of Life-Saving Station No. 1, District No. 4, was appointed by the president of the Board on Wreck Ordnance, &c., to make trials with this projectile, and report the result to the board. This committee met at

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Sandy Hook, but finding the weather not favorable for the experiments, there being no "on shore" wind, nor "in-shore" current, the trials were postponed to await an occasion when the conditions were such as were desired. It being impracticable for Lieutenant Lyle to remain or be present at the proper moment on account of the remoteness of his station and the nature of his other duties, Captain Patterson and his crew were instructed in the use of the projectile, and directed to take advantage of the first favorable opportunity to make the trials. How carefully and faithfully Captain Patterson complied with his instructions, his admirable report, herewith inserted in full, will attest.

Report of Capt. John C. Patterson, jr.

LIFE-SAVING STATION No. 1, FOURTH DISTRICT,
Sandy Hook, N. J., February 13, 1880.

Lieut. D. A. LYLE:

DEAR SIR: I have been waiting a favorable opportunity (when other duties did not hinder) to test the "Lyle-Emery grapple shot" in the water, as requested by you when last at the "Hook."

The day being favorable (February 7), and having a moderately strong east wind, and, what was better, a strong "cut" or "current" running north along the shore, about 4 miles an hour, I ordered out surf-boat at 9.30 a. m. I had prepared a buoy (as rough sketch shows) [Plate V] with line attached; sent off surf-boat with two men; instructed them to proceed about one hundred and fifty yards (beyond the bar) and then to cast off buoy. Meantime, I had placed the gun on the beach out of the way of the surf (using the Lyle gun), gave it 15° elevation, being careful to level bed of gun; loaded with life-saving powder, using grapple shot No. 2 and part of an old No. 10 hemp worn line.

The buoy was cast off with about thirty-two fathoms of line; the end made fast in the boat, the men holding the boat steady with the oars.

The buoy started well for shore, coming in to within about seventy-five yards of the shore, when, striking the "cut" or "current," it started north. Having the gun ready, I aimed and fired; the shot passing about 35 feet astern of the boat, making a good shot, and laying the line well across the buoy line. I fired altogether three shots, with the following result as to powder, distance, &c.:

	Number of rounds.	Elevation, degrees.	Powder, Life-Saving.	Shot, Lyle-Emery.	Number of line.	Range, yards.	Wind, northeast.	Action of line.
February 7, 1880	1	15	2 ozs.	No. 2.	10	218	W.	Good.
February 7, 1880	2	15½	2 ozs.	No. 2.	10	190	W.	Do.
February 7, 1880	3	15	2 ozs.	No. 2.	10	196	W.	Do.

Wind about 16 miles an hour. The shot carried well each time. The line did not drift any. Hauled in the first shot; found that it had caught the line with three flukes; brought the buoy to shore, the boat making in close so as to allow us to land the buoy.

At the second shot, when hauling in the shot two flukes caught the line of buoy, and at the third shot three flukes caught the line. The strain on line is such that there is little danger of losing the buoy line. I found when hauling the shots on shore that it was all we could do to haul them, the flukes, as they are, having a tendency to settle deep into the solid sand bottom.

By an increase of charge of powder any distance could be obtained that the lines could be worked; and that it will bring any buoy line to shore, if it can be hauled, cannot be doubted. Its course is very direct, as I could lay the line almost where I chose to. I cleaned off shot (having oiled it well before firing) and oiled it well, and after allowing it to hang until yesterday, find that it works all clear, and find that none of the flukes are bent, but that the shot is in good order.

I trust you will allow me to suggest what I think would be an improvement on the shot.

1st. That it be made some lighter, as a lighter shot, I think, would carry all the distance required, and would haul ashore more easy.

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2d. That the flukes be turned in so as to just clear the shank of the shot, as they would have a tendency when opened to lighten the draught of shot through the sand and raise it.

3d. That a hollow metal buoy (as rough sketch) [Plates VI and VII] be placed on the shank just clearing the flukes; the shank would probably have to be lengthened to receive it (only about one inch, I think); by being hollow it would be lighter, and need only be of some strong metal, say ¼ inch thick, with each end strengthened, and a fine thread cut in, and then a thread cut on the shank as far as the buoy comes, before the eye of shank is turned. This, of course, is only from practice with it so far that I suggest the above. You will, from your experience in all such work, readily understand whether the suggestions are practical and will not hinder the effectiveness of the shot.

I send a rough sketch of the buoy used [Plate V], and also of the turned flukes and the buoy on the shank of the shot [Plates VI and VII].

Allow me to congratulate you on the grand work of the "Lyle gun" during the late hurricane storm on our coast. It did its work well, and when the mortar would not have answered at all, but would have failed.

I am, with respect,

JOHN C. PATTERSON, JR.,
Keeper No. 1 Life-Saving Station, District 4.

In regard to the suggestions of Captain Patterson, I have the honor to state:

1st. That the shot could doubtlessly be made lighter than "shot No. 2," provided that it was certain that very light charges of powder would always be used, and that the distances required would never be over 100 or 150 yards. If the shot be too light the line is more apt to be broken, due to the greater initial velocity for a given charge.

2d. That the flukes could be turned in a little if found desirable, but would increase cost of manufacture slightly. I think it is questionable whether the amount of curvature will do much good; the space is so limited that very little curve can be attained.

3d. The buoy on the shank, I think, would be of doubtful advantage. Its weight would be greater than the buoyancy of the imprisoned air; it would increase the cost, and would increase the resistance of the air on the projectile.

It must be remembered that in making this shot the designers were cramped for space.

The caliber of the gun had already been adopted, and the shot had to be made accordingly.

Two and one-half inches allow but a small space for complex actions. As it is, the shot is an expensive one, but appears to be as effective as can be made for the caliber.

Respectfully submitted.

D. A. LYLE,
Lieutenant of Ordnance.

Capt. J. H. MERRYMAN, U. S. R. M.,
President Board on Wreck Ordnance, 16 Broadway, N. Y.

NATIONAL ARMORY, *April* 1, 1880.

IV.

CAPTAIN MEYER'S KEDGER-ROCKET APPARATUS AND SWINGING LINE-BOXES.

DEPARTMENT OF STATE,
Washington, February 19, 1880.

Hon. JOHN SHERMAN,
Secretary of the Treasury:

SIR: I have the honor to transmit herewith a copy of a dispatch dated the 12th ultimo, and the original inclosures to which it refers,

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from the consul at Amsterdam, in relation to an invention by Capt. J. H. Meyer, of that city, designed for the purpose of rescuing shipwrecked persons.

It is suggested that the matter be brought to the knowledge of the Superintendent of Living-Saving Service, Revenue Marine, or that such other disposition be made of it as may be deemed expedient.

I have the honor to be, sir, your obedient servant,

WM. M. EVARTS.

[Inclosure.]

Mr. Eckstein to Mr. Hay, No. 84, January 12, 1880.

UNITED STATES CONSULATE,
Amsterdam, January 12, 1880.

Hon. JOHN HAY,
Assistant Secretary of State, Washington, D. C.:

SIR: The inclosures I have the honor herewith to transmit, and which consist of a printed pamphlet in the Dutch language and several drawings; a written English translation of the same, and a letter addressed by Capt. Johannes Hendrick Meyer, of this city, to the honorable Secretary of State, have been handed to me by Captain Meyer, with the request to forward them to their destination. They contain the description of a certain kedger-rocket apparatus and swinging line-boxes designed to establish communications, in all positions at sea, for the purpose of rescuing shipwrecked persons, the whole being represented to me as the invention of Captain Meyer, of the Dutch steamer "Castor." It is offered by him for the acceptance of the United States Government for whatever use the government may see fit to make of it, and no recompense is asked or expected for it.

It may be needless for me respectfully to suggest that the same be referred to the General Superintendent of Life-Saving Stations, Revenue Marine, for determining whether it really possesses the great merits claimed for it by the inventor.

If some recognition would be made to Captain Meyer by the department, in the form of a letter to him, expressing its thanks, and its appreciation of his seemingly disinterested and humane efforts to serve the public in so important a matter, I should be greatly pleased.

I am, sir, very respectfully, your obedient servant,

D. ECKSTEIN,
United States Consul.

[Inclosures.]

1. A pamphlet in the Dutch language, describing a certain invention.
2. An English translation of same.
3. Letter of Capt. J. H. Meyer to the honorable Secretary of State.

[Inclosure No. 2.]

DESCRIPTION OF THE MOVABLE KEDGER-ROCKET APPARATUS AND SWINGING LINE-BOXES, TO ESTABLISH COMMUNICATION IN ALL POSITIONS AT SEA TO RESCUE SHIPWRECKED PERSONS, BY J. H. MEYER.

[Plates omitted.]

OFFERED TO THE GOVERNMENT OF THE UNITED STATES OF NORTH AMERICA BY THE INVENTOR.

PREFACE.

When, after several trials, it was satisfactorily proved that the movable kedger-rocket apparatus and swinging line-boxes invented by me fully answered their destination, I wrote the following pages, and, in order to explain my system better, I added 4 drawings.

My efforts being quite disinterested and only meant for general benefit, I hope to have contributed somewhat to ameliorate the deplorable position in which shipwrecked

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persons very often unfortunately find themselves, and to give them more chance of being rescued.

With the greatest pleasure I shall always be prepared to give, if desired, further explanations about my system, or to assist in the manufacture of apparatus and line-boxes.

Amsterdam, September, 1879.

J. H. MEYER,

Capton of the Dutch S. S. "Castor," Kerkstraat b. d. Reguliersgracht 324.

[Copy of Captain Meyer's translation.]

A WORD ON THE IMPROVEMENT OF REMEDIES TO SAVE SHIPWRECKED PERSONS BY APPLYING THE KEDGER-ROCKET APPARATUS.

Very often I have read in different newspapers and periodicals that notwithstanding repeated but, alas, fruitless endeavors, a life-boat had been obliged to put back, at the moment that a wreck had nearly been reached, and thereby was forced to the painful necessity of leaving desperate mariners to the terrible fate of perishing in the waves after a long and vain struggle with unavoidable and terrible death. There may be many causes for a life-boat, by which she is forced to put back without getting her aim. Mostly it will be caused by too many and too heavy breakers around the stranded ship, or by too strong a current. It may also happen that one of the rowers, driven by humanity to go with, but not being accustomed to such awful circumstances, loses his presence of mind at the very moment that they reach the heaviest breakers, and thereby makes a missing stroke with his oar. By the momentary confusion which has hereby arisen among the other oars, the result, which was attained by exertion of the utmost power, is lost, after which the strength of the other rowers may fall short to renew their efforts. It is even possible that the life-boat capsizes, if by such a confusion among the oars she would come across the breakers. Whatever it may be, the poor shipwrecked persons are left to a most horrible fate, if the life-boat cannot reach them. Also, it may occur that on account of too heavy sea a tug-boat, notwithstanding the greatest exertion, cannot approach a vessel in danger or wanting assistance near enough to throw a line over, and, consequently, is obliged to leave her to the mercy of the furious elements. Sometimes it also happens that a vessel strands at a place where neither life-boat nor rocket apparatus exist, and the crew could have saved themselves if they would have had means to establish communication with the shore or rock they were stranded on.

Nor does it belong to the exceptions that, although the necessary saving apparatus exist at the place where the vessel is stranded, all efforts to communicate with the ship fail, for want of due command or sufficient precedent exercise of the persons to whom such saving apparatus are intrusted, whereby they cannot be, or at least are wrongly, used, but, in every case, deliver the poor helpless crew to an awful death.

After a long consideration whether it was not possible to improve the existing remedies for saving shipwrecked persons, I invented movable apparatus, with thereto belonging swinging boxes, by which, in any position at sea, from a boat, life, or tug-boat, vessel, or whatever craft, however she rolls or labors, or wherever she may be, a rocket with a line can be fired away.

Up to the present, shipwrecked persons had to rely only on their own boats, on the life-boats, or rocket apparatus from the shore if they existed at that place; but if my apparatus would be employed generally, the chance of rescue would be much improved, because the assistance could be expected from each boat, tug-boat, or vessel, which, although not being able to come alongside, could approach within some distance. If such an apparatus should be on board the stranded vessel, the crew would be able to put themselves in communication with the shore. As such an apparatus will be employed most always under unfavorable circumstances, it is of the greatest necessity that it can be used in the most difficult movements of a vessel or boat, even in the heaviest sea; and, also, that the line-boxes meet with all their swingings and movements, without any fear that the lines become out of order or entangled, even if the box should be filled with water. To answer this purpose I projected and constructed three different kedger-rocket apparatus, with thereto-belonging line-boxes, one for boats or life-boats, another for tug-boats, and a third one to be employed by large vessels or steamers. I had the honor to give public trials with these apparatus, in December, 1878, and the 5th of April, a. c., whose full success were published in the Dutch newspapers.

A life-boat provided with such an apparatus will be very often in a position to employ it usefully, either to put herself in communication with the vessel in distress or stranded, or to establish a communication between the wreck and the shore. For in-

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stance, the breakers around a stranded ship are too heavy, and render it nearly impossible or too difficult to come alongside, so that the life-boat is obliged to return; then, as a last attempt to save the shipwrecked persons by this apparatus, a kedger-rocket with line can be thrown on board of the stranded ship; after which the life-boat, all according to the circumstances, may put herself nearer in connection with the wreck, or, returning, establish a communication between the wreck and the shore; but in this case the lines must be long enough to reach the shore again from the place where ships generally strand. It may also occur that the life-boat approaching the wreck can not get her aim, and would pass by in consequence of the heavy current. In this case, by such an apparatus, a rocket with a line can be shot on board; and thus a communication is made, which afterwards, all according to the circumstances, can be improved. It also happens very often that a ship strands between rocks, and the life-boat cannot reach her at all unless running the greatest risk of being smashed. In such a case my apparatus will also be able to establish a communication. When the breakers around the stranded ship are so heavy that there is no chance at all to reach her with the life-boat, it would be useless and foolhardy to try it; but, in that case, the rocket with the line can be shot on board; still, before the life-boat comes, in the heaviest sea, and be rowed back to the shore, then, very probably, the shipwrecked persons will be saved quicker, because no time will be lost by fruitless efforts. The apparatus will also be easier directed, as when the life-boat is overwhelmed by the breakers. Then, all will be done quicker and handier; and what a value has not every minute for a mariner in extreme danger? Anxiously does he look out and long for help, fearing that every next approaching breaker will smash the ship or carry him away in the furious waves, where he has to struggle with an unavoidable death. If a life-boat is provided with such an apparatus, and the crew well exercised to manage it, then, according to my opinion, the chance of saving shipwrecked persons will be much improved, even if only six out of ten cases would have a good success.

On board of tug-boats my apparatus will also very often render the greatest service. Suppose that a tug-boat is prevented by too heavy sea to approach the vessel wanting her assistance or being in danger near enough to throw a line on board; this can be done already at a considerable distance with such an apparatus. For instance, when the German bark Greisswald came too much on lee of Ymrirden to sail in the harbor, and, in consequence thereof, stranded, had the tug-boat which went out to assist her been provided with such an apparatus, the line, which, under the actual circumstances, could not be thrown on board the bark, could have been shot to her, and, very probably, the bark, and also her crew, would have been saved. Besides this apparatus, a tug-boat could be provided with the further saving furnitures, viz. line, whipper, buoy, &c., to haul the shipwrecked persons from board at some distance. If the tug-boat at the Helder (Texel) had been provided with this apparatus when the Dutch brig Diewerke was lost at the Razende Bol, a whole hour should not have been uselessly lost in waiting before the life-boat was ready and manned, but she could have started at once, and very probably have arrived in proper time to save the crew, who now miserably drowned. So provided, the shipwrecked persons could be hauled from the wreck on board the tug-boat, if they are stranded at a steep bank, as the Razende Bol, the Goodwin, and so many others, because, after the line is shot on board, a further communication could be made by line, whipper, &c., in the same way as from the shore. For this purpose the tug-boat must go to anchor, or steam the line taut, along which the shipwrecked persons would be hauled from the wreck. Of course, it is very difficult to give fixed rules for such cases, as all depends upon the momentary and local circumstances, and also upon the valiance, prudence, and presence of mind of the captains. Also, it is not necessary to run the risk of being smashed against the ship, or to make average [*sic*] by coming too near. Even in a strong breeze, with this apparatus the tug-line can be thrown on board already at some distance, if it might be dangerous to approach the vessel calling a tug-boat's assistance near enough on account of too heavy seas.

According to my opinion the apparatus is indispensable on board of sea vessels, and principally on board of ships and steamers carrying passengers. For this purpose it is so constructed that at any place where the chest in which everything belonging to the apparatus is locked up can be transported, the rocket can be shot away even from the rigging, so that a rocket with a line of sufficient length can be shot at a distance of 300 to 400 meters from on board to a shore where no saving apparatus exist, or wherefrom vain efforts are made to reach the stranded ship, or to establish a communication with the shipwrecked persons.

It will also be much easier to fire the rocket from on board to the shore than from the shore to the wreck, because in most stranding cases the shore offers a large field whereto the rocket will be shot before the wind, whilst the ship, on the contrary, especially in strong winds or gales, by which it is easily driven out of its direction, offers from the shore only a relatively small point. But, above all, such an apparatus would render the greatest service when a vessel strands at a place where no saving means exist, and the crew could have saved themselves if they had been able to establish a communication with the shore.

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How often does not it occur that a boat sent from the stranded ship could not reach the shore, but is cast back again by the breakers and crushed on the rocks? If then, by firing a kedger-rocket with a line on shore there would have been made a communication, the men in the boat could have kept themselves on that line, climb in this way up to the rocks, and so they would have had more chance to save themselves and also their poor comrades.

In strandings there will be much chance for shipwrecked persons to be saved as soon as a communication between the stranded ship and the shore is established, even should it only be by a spun-yarn. Such was the case when the Dutch steamer Rhône stranded on the isle of Piana, at the entrance of the Bay of Tunis, in December, 1870. The boat, with two sailors, went from on board with a line, but, nearly on shore, was thrown back by the breakers and crushed on the rocks, and the two sailors drowned. Now all hope to communicate with the shore was gone. The steamer was totally crushed in a short time, and from the whole crew, only the captain and the second mate were, as by a wonder, driven on shore upon a couple of pieces of wood. If there had been a kedger-rocket on shore with a line thereupon, the sailors could have kept themselves in the terrible moment that the boat was thrown back by the breakers, and perhaps they would have climbed up the rocks, from where, by this first line, a further and better communication could have been made with the steamer. Also in many other cases such an apparatus would be very useful. In the night of the 14-15th of October, 1877, stranded during a hurricane an English bark on the breakwater of Plymouth, close to the light-house. It was such a terrible night that neither from the light-house the ship nor from the ship the light-house was seen. The ship broke immediately, and some wreck-wood floated over the breakwater. This wreck-wood, on which some of the crew had clamerbed, passed close to an English man-of-war, lying there at anchor. The screams of these unfortunates were heard on board, but, by the deep darkness, nothing could be distinguished, and it was, on account of the terrible gale, impossible to put a boat out. The cook of that man-of-war girded himself with a line, jumped courageously overboard, and, swimming in the direction of the screams, had the satisfaction to save one man, the only one who could tell what vessel she was. The next morning some dead bodies were found on shore, together with the wreck-wood, and among them that of the captain, whose hands filled with sea-weed proved that he was still alive when he came there. Most probably more of the crew were in the wreck-wood whence that one man was saved. If the man-of-war had been provided with a kedger-rocket apparatus, a kedger-rocket with a line could have been fired over the wreck-wood, by which it could have been pulled alongside, and the opportunity would have been given to save more lives.

What a comfort would it be for sailors, passengers and their families, if they knew that there was on board apparatus by which, in cases of distress, on places where otherwise no chance of rescue would exist, they would be able to establish a communication with the shore or another vessel and save themselves.

How often has it not occurred that from the coast the utmost was done to help shipwrecked persons or to establish communication with them? If, in such a case, there was a kedger-rocket apparatus on board the stranded ship, the desired communication could be established from there. How many lives could have been saved by this manner? Also, on shore some rockets could be provided with kedgers and long heads of cork-wood, to shoot into the rigging; if it goes overboard some of the crew could clamber thereon. The whole rigging could then be pulled on shore with the line, which is fastened to the rocket, and thus there would be much more chance for these men to be saved.

Description of Drawing No. 1.

[Drawing omitted.]

A DUTCH LIFE-BOAT ARRANGED WITH A KEDGER-ROCKET APPARATUS.

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In the beautiful, and, for our coast, in every respect, useful life-boats are six thwarts, from which, because the strokesman places himself on the second thwart, the sternmost remains free, so that there is some room left between the steerer and the strokesman, which is sufficient to arrange the apparatus and its appurtenances.

The chests, in which the line-boxes swing, can be placed on both sides of the sternthwart either upon or partly into the longitudinal air cases.

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The cover of these chests, which can be single or double, must fall flat upon the stern thwart, to serve always as a seat, even when the chest is opened.

The line-box, containing 140 to 160 meters line of $5\frac{1}{2}^{cm}$ diameter, swings with the taps in a square iron frame, and this again with taps in the chest, so that the line-

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box, as soon as the chest is opened, follows all the movements of the boat. But because it is desired that the line-box stand as much as possible in a rectangular position to the direction in which the rocket must be fired away, a brass or iron case of an octagonal form, containing a few small shots or some mercury, is fixed there below. By a pressure of the hand upon the side of the line-box, the shot or mercury will fall over to that side and give the box the necessary inclination, in which it will follow all the movements of the boat. In the bottom and through the case are four scupper-holes to let the water out which may be thrown into the box by the sea.

To prevent the twirling or entangling of the line, it is coiled in different tiers, bend for bend separated, round conical brass pins. Around inside the box are clamps which, according to the thickness of the line, stand in a mutual equal height and wideness above and after each other. Upon these clamps the conical pins are placed, so far from the next clamp that the line can easily pass behind at such a distance from each other that twice the line can be placed between them slant upon each other, and not higher above the clamps than is wanted to support the line. Each bend of the line lies on the preceding and under the following, also slant around the pins, so that one bend keeps down the other one, and of course no one can leave its pin before the preceding is gone. From all these pins the line follows the rocket in a straight line without any interruption, which is sufficiently proved by the several trials.

But because on our coast shipwrecks happen at a distance of more than 150 meters, it is required that the life-boat have on board two lines, each of sufficient length to reach the shore again after the rocket is fired on board the wreck, and establish in this way the communication between the wreck and the shore. The rest of the lines are hung on two rolls under the second thwart so that they will easily run down by rowing back to the shore.

From the roll, the line comes through the groove which goes through the side of the box and one angle of the clamps into the line-box, and goes then over to the first pin of the undermost tier.

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The upper end of the line must be fastened through another small groove outside the box, ready to be fastened to the rocket.

In front of the line-chests and next the two strokesmen, are the rocket chests.

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These rockets are provided with kedgers to hook in the rigging or elsewhere if the rocket just gets its aim, or to serve as support if it should be necessary to fire it from the boat or a vessel on shore. They have short tails, which are only so long that they come flush with the after end of the apparatus when the rocket is placed therein, so that they cannot impede the movements of the apparatus, as would be the case with the usual long tails. To establish the required equilibrium between the rocket and its tail, a piece of lead is put in the after end of the tail. The apparatus to fire the rocket away is principally manufactured of a malleable iron tube of 1 meter in length. The iron to be of 2^{mm} thickness.

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At the front end, on top of the apparatus, is an open groove in which the eyes of the rocket pass when it is placed in the apparatus; if the inner eye of the rocket rests against the under part of the groove, the mouth of the rocket must correspond exactly with the fire-channel. The tail remains outside on top of the apparatus with the broad part placed upon the cushion, so that the rocket will run freely away, independent of everything as soon as it has left the tube.

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The stanchions, each of 1 meter in length, turn the one on starboard and the other on port side upon a hinge against the longitudinal air-cases, so that the one can be raised to the port and the other one to the starboard side. They must be notched in the stern thwart, because if they laid upon the thwart they would obstruct the seat.

As the apparatus can be moved up and down in the turning half-round iron, and also a to-and-fro motion is obtained by the half-round iron turning upon the stanchion, the rocket can be fired away in any direction and during the most violent movements of the boat with one hand on the handle.

To ignite the rocket a small iron tube of 2^{cm} diameter is placed under the apparatus. In this tube moves a hammer with a rod, retained by a spiral spring. If the rod is put upon the point the hammer will be drawn back with the thumb of the hand which directs the apparatus; this rod can be lifted from the point by the lever, which is retained by the spring, and in consequence thereof the hammer will strike with force against the cartridge in the touch-hole. The cartridge is put from below into this touch-hole and shut by a turning cover. The fire-channel is a bent, small pipe screwed on the touch-hole.

Firing the rocket away, the first fire will escape through an opening in the after end of the apparatus, and to prevent the fire injuring the man, the moment that the rocket leaves the apparatus a funnel-shaped protecting plate is made on the front end of the tube.

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The apparatus must be managed by the two strokesmen. For instance, if it should be desired to fire the rocket away to the starboard side, the starboard strokesman has to raise the stanchion on that side, after which he takes the apparatus from its place under the stern thwart. At the same time the port strokesman opens the rocket-chest, takes a rocket, and then he opens the line-chest. By pressing with his hand upon the side of the line-box, he gives the box the necessary inclination, takes at the same time the upper end of the line, fastens it to the rocket, taking good care to put it into the hasps upon the outer eye of the rocket and upon the after end of the tail, and then puts it, assisted by the starboard strokesman, into the apparatus. Then the apparatus, with the rocket therein, must be placed in the turning half-round iron upon the stanchion. Now, at a favorable moment, the starboard strokesman can fire the rocket off with his right hand on the handle. As soon as the rocket has reached the wreck the apparatus can be put in its place or laid down in the boat. Afterwards they must act according to circumstances.

Before going to sea the cartridge must be put into the touch-hole with the hammer down, because this could only be done with great difficulty in a heavy working boat, especially during the night. The hammer must not be drawn back before the apparatus is placed upon the stanchion, to prevent its being fired by some unforeseen accident. Each of the strokesmen must be provided with some cartridges before going to sea.

Line chests and boxes for boats, life or tug boats, vessels, or whatever craft she may be, can all be constructed according to the above explained system, and all the lines are coiled in the same way, but the dimensions of the boxes and pins, the height and width of the clamps, the distance between the pins, &c., depend entirely on the length and diameter of the line and the place where and the purpose for which they are to be used.

All the apparatus may be constructed according to the same system, but the dimensions depend on the size of the rockets and the purpose for which they are used. The size of the rockets depends entirely on the distance to which they must be fired and on the weight of the line which they have to carry.

Description of Drawing No. II.

[Drawing omitted.]

An English life-boat arranged with a Kedger-rocket apparatus.

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As in an English life-boat the strokesmen place themselves upon the stern thwart, there is no sufficient place left aft, but the apparatus can be very well arranged in the front end.

The line-boxes, each containing 150 meters of line of 5½ millimeters diameter, swing on both sides in the frames and supports almost under the gunwale between the fore-thwart and the fore air compartment. These supports replace the chests in the Dutch life-boats.

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They are closed with overfalling loose covers, the sides of which fit exactly between the line-box and the frame, so that the box is fixed when closed. The cover to be fastened to the box with two screws.

The kedger-rocket chests are placed on both sides upon the longitudinal air cases between the fore and second thwart.

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The apparatus must be placed under the second thwart and the rolls for the rest of the lines on each side under the fore thwart. The stanchion to carry the apparatus turns upon a hinge in the middle of the fore air compartment bulkhead, and when down lies along the inside of the boat.

In front of the second thwart a plank is made to support the turning half-round iron. If raised, the stanchion is situated in the middle of the boat, fastened so that the apparatus, if placed thereon, can be used in every direction.

The management of the apparatus in these life-boats must be done by the two forward oars in the same manner as is laid down for the strokesmen in the Dutch life-boat.

As the English life-boat, which is most always launched in deep water, generally tries to approach the stranded vessel from the sea side, such an apparatus will be very often of the greatest use. The life-boat would not always be obliged to go alongside of the wreck, but, on the contrary, the communication with the shipwrecked persons could be established outside the breakers by which the vessel is surrounded when the

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vessel is stranded between rocks, and the life-boat, if approaching too near, would run the risk of being smashed thereupon.

The boats which are stationed near rocks and steep banks could with such an apparatus be provided with the other saving furnitures, viz, line, whipper, buoy, &c., to haul the shipwrecked persons from on board at some distance. By these means a great improvement could be made in the present remedies for saving life at sea, and more opportunity given to rescue shipwrecked persons.

Description of Drawing No. III.

[Drawing omitted.]

KEDGER-ROCKET APPARATUS TO BE USED BY TUG-BOATS.

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If the use of the apparatus on board of a tug-boat should be wanted, there will be always time enough to prepare it, and therefore anything belonging to it can be kept in a cupboard on deck, but so arranged that if wanted it can be used immediately.

The chest with the swinging line-box, containing 130 meters of line of $7\frac{1}{2}^{mm}$ diameter, can be placed in the midships on the after deck, so that the line can be used in every direction. The lines for tug-boats' use must be so much thicker than those for the life-boats as to haul the hawser on board. They are coiled up in the same way as is said before, but the under end rests about 3 meters outside the chest ready to be fastened to the hawser before the rocket is fired away. The upper end must be fastened in the eye on the cover ready to be fastened to the rocket. To repeat the shot if the first should fail, a tug-boat must have two or more reserve line-boxes, which can all be placed in the same swinging frame, and must have some reserve kedger-rockets. To fire the rocket, some sockets can be made in the rail, principally aft, in which a stanchion with turning half-round iron can be placed so that when the apparatus is placed upon this stanchion the rocket can be fired in any direction.

As has been stated for the life-boats, the cartridge must be put in the touch-hole with the hammer down before the rocket is laid in the apparatus.

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The portable kedger-rocket apparatus is better fitted for use where no stationary apparatus can be used. It is constructed like the others and can be made of any size, but instead of taps, it has underneath a movable bent support, from about 4 decimeters in length, with a fixed half-round iron, which is wide enough to be placed over the arm. Around this support, exactly above the bend, is a wooden handle.

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Description of Drawing No. IV.

[Drawing omitted.]

KEDGER-ROCKET APPARATUS TO BE USED BY LARGE VESSELS AND STEAMERS.

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An apparatus on board of sea vessels or steamers will not be used except in cases of distress.

As it is impossible to say where in such a case will be the best place on board from which to fire the rocket, it is necessary that the apparatus and its appurtenances be constructed in such a manner that they can be used anywhere and that nothing belonging to it can be forgotten. Therefore I made a chest in which is a swinging line-box containing 300 meters of line of $5\frac{1}{2}^{mm}$ diameter, besides a drawer which contains the apparatus, a clamp-stanchion, 5 kedger-rockets and their tails, cartridges, a thumb-screw, &c. This chest is only 1.108 meters long, 0.548 meter broad, and 0.300 meter high, so that it can be placed on board of any vessel. Making the chest 2 decimeters higher, there will be space enough to place two reserve line-boxes under the drawer. The lower portion of the line rests on the chest and must be fastened somewhere before the rocket is fired off to prevent its running away. The upper end is fastened in the eye on the cover ready to be fastened to the rocket.

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As soon as the chest is opened and the drawer pulled out, the necessary inclination can be given to the line-box, in which it will follow all the movements of the vessel.

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To place the apparatus, a clamp-stanchion must be used. On the top of this clamp-stanchion is the turning half-round iron, but on the under side is a clamp which can be fastened by the screw, so that the stanchion can be clamped and the rocket be fired from any convenient place on board, where the chest can be brought either from the davits, anchor stocks, or the rigging, &c. If necessary the stanchion can be kept in the hand.

The rockets for sea vessels must be provided with a long head of cork-wood, besides the cover which confines the charge, so that it will float and can be picked up by some one on shore, if it should reach the land. They also want a kedger to serve as a grapnel inshore if no one should be on the beach.

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It would be very difficult to give fixed rules how to manage this apparatus, because all depends on local circumstances, as well as on the valiance, prudence, and presence of mind of the captain, but it is necessary that the man who fires the rocket off should place himself to the windward of the apparatus. The chest must be placed if possible a little behind the apparatus on the lee side.

To work quickly and accurately in cases of distress, it is necessary that the crew be exercised now and then in the management of the apparatus, because the result of the shot depends also very much on the knowledge and readiness of the crew.

CONCLUSION.

It is not only that the apparatus can be used in cases of distress at sea, but also for many other purposes. They can render great service at any place where it is necessary to establish a communication, and where it could not be done by other means.

In the Navy and mercantile fleet it could also be used to land with boats on places where this would be difficult by reason of heavy currents, high coasts, or breakers, or upon roadsteads where in consequence of a heavy current the boat cannot reach the ship and would be driven to the open sea or on hostile coasts.

In armies and expeditions they can be employed to establish communication between one side of a river and the other, or with some unattainable point on steep mountains, &c.

Even if the underpart of a large building is on fire and there above are yet men, who are unattainable with the Kedger-rocket apparatus, a rocket and line can be fired to them, and a communication made which could afterwards be improved.

In general this system can be employed for any purpose where the establishment of a communication is necessary, but impossible by other means.

V.

TREASURY DEPARTMENT,
UNITED STATES LIFE-SAVING SERVICE.

RULES AND REGULATIONS ADOPTED BY THE BOARD FOR THE EXAMINATION OF DEVICES AND INVENTIONS RELATING TO WRECK-ORDNANCE DESIGNED FOR USE AT UNITED STATES LIFE-SAVING STATIONS.

MEMBERS OF THE BOARD.

Capt. J. H. MERRYMAN, United States Revenue Marine, inspector Life-Saving Service, president.

Lieut. D. A. LYLE, Ordnance Department, United States Army.

Lieut. T. D. WALKER, United States Revenue Marine, assistant inspector Life-Saving Service, recorder.

DAVID P. DOBBINS, superintendent ninth district, Life-Saving Service.

JOHN C. PATTERSON, keeper station No. 1, fourth district, Life-Saving Service.

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* *Subjects to be considered by the board.*

Mortars.
Guns and their appurtenances.
Rockets.
Line-carrying projectiles.
Shot-lines.
Faking-boxes, &c.
Powder and other ammunition.

Equipments, implements, &c., connected with wreck-ordnance, and such other matters as may be referred to the board by the General Superintendent of the United States Life-Saving Service.

The board will meet at the call of the president for examination and discussion of such devices or apparatus as may be referred to it by the General Superintendent of the Life-Saving Service. A majority of the board shall constitute a quorum at any properly-called meeting. The province of the board is to examine, test, and report upon such devices as may be referred to it by the general superintendent, and it will not enter into protracted discussions with inventors or their agents as to the principles involved in the devices for the examination of which the board is constituted, nor is it under obligations to suggest methods of improvement in plans submitted, or how defects may be remedied. Due notice of meetings of the board will be sent to persons whose inventions have been referred to it.

GENERAL REGULATIONS.

I. No person will be admitted to the meetings of the board, or to the firing-ground, except the agents or inventors of the apparatus under discussion or trial.

II. All experiments and trials will be conducted under the immediate supervision of the board, and by its employés alone.

Inventors or exhibitors may have the privilege of displaying their apparatus, if desired, and of having the performance of the same noted in the record.

Any gun, rocket, or device in which explosives are used, to be first fired with at least three rounds of the maximum charge, by its exhibitor, as a safety test, before submission to the board.

III. The handling of apparatus by agents or inventors at any time after being submitted to the board is forbidden, except in the case of the display test above noted.

IV. Any apparatus which has been submitted to the board, and entered upon the record, will remain in the possession of the board for such time as may be necessary for completion of the trials and the final report upon the same.

V. All persons desiring to submit devices or inventions for the action of the board will be required to forward their applications to the general superintendent in writing, embracing in detail the following points, in the order named:

First. Name or designation of device to be submitted.

Second. Whether or not covered by caveat or letters-patent.

Third. Nomenclature of each separate part of the device, stated in list

* Inventors will take notice that the duties of this board do not include action upon any life-saving plans, devices, or inventions to be used or carried on shipboard, the examination of these being the province of the Board of Supervising Inspectors of Steam Vessels.

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form, with reference letters corresponding to letters on accompanying drawings.

Fourth. Detailed description of device.

Fifth. Kinds and qualities of materials used.

Sixth. Dimensions of all parts.

Seventh. Weights of principal parts, and total weight of apparatus.

Eighth. Price at which device or apparatus will be furnished to the government.

Ninth. Construction, stating method of manufacture or fabrication of each device in detail.

Tenth. Description of method of using the apparatus in actual service.

Eleventh. Describe action of projectiles and line when used.

Twelfth. Accurate drawings must accompany all applications. Full-sized drawings preferred, but drawings to scale of very large parts will be accepted.

Thirteenth. Claims of inventors or exhibitors for their devices will be set forth specifically in full and in numerical order.

Fourteenth. Letter of transmittal addressed to the General Superintendent of the Life-Saving Service, Treasury Department, Washington, D. C., will accompany above descriptions, drawings, &c.

VI. All apparatus connected with any device or invention will be delivered at the expense of the agent or inventor of same at such point, and at such time, as the board may direct, and returned at the expense of said agent or inventor when no longer required by the board.

VII. It is to be understood that the government is to incur no expense for ammunition or other articles used in the actual trials or tests of any apparatus presented for consideration.

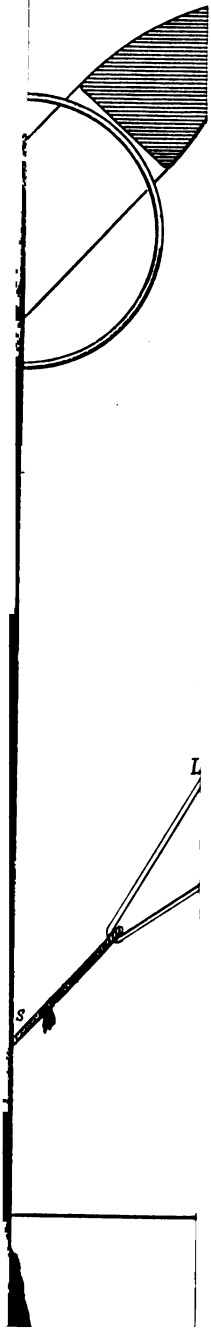
Adopted at a meeting of the board June 18, 1879.

J. H. MERRYMAN,
President.
T. D. WALKER,
Recorder.

Approved.
S. I. KIMBALL,
General Superintendent Life-Saving Service.

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Fig. 1.

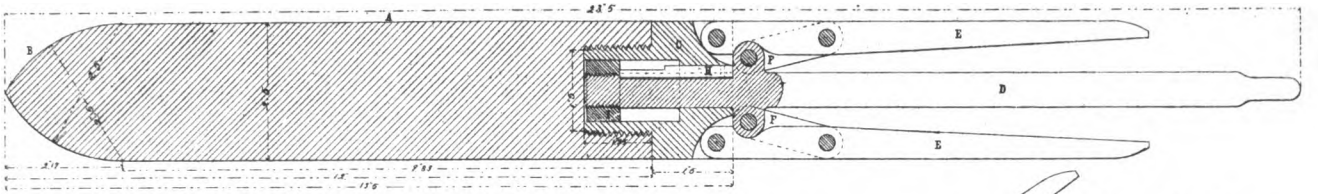


Fig. 4.

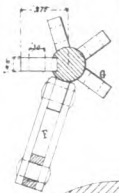


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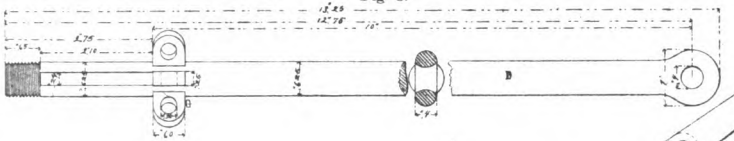


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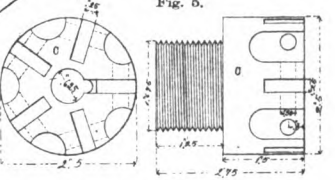


Fig. 2.

Fig. 6

Fig. 9.

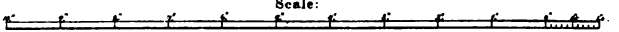
Fig. 7.

Fig. 8.

NOMENCLATURE.

A. **Body of shot,**
B. **Ogival head,**
C. **Base,**
D. **Shank,**
E. **Flukes,**
F. **Links,**
G. **Lugs on shank,**
H. **Stop and stop spring,**
I. **Nut, or shank-head.**

Scale:



LIFE-SAVING APPARATUS.

LYLE-EMERY GRAPPLE SHOT, No. 1.

2½ Inch, Smooth Bore.

October 3, 1878.

MARKS: A 1.

PLATE 1

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Fig. 1.

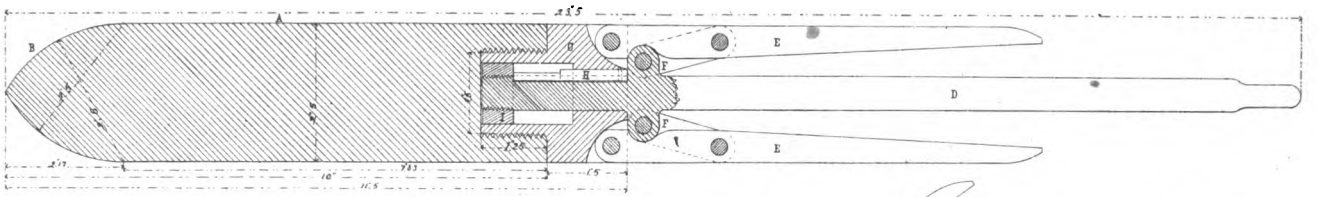


Fig. 4

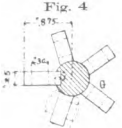


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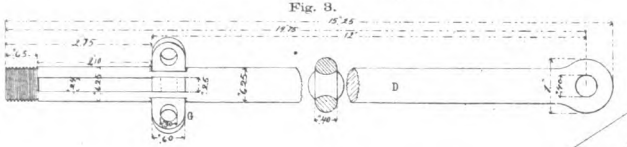


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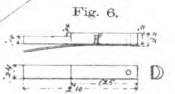


Fig. 5.

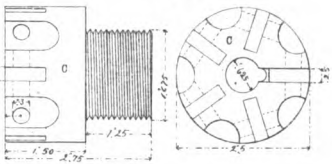


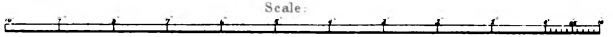
Fig. 2.

Fig. 7.

Fig. 9.

Fig. 8.

Scale:



LIFE-SAVING APPARATUS.

LYLE-EMERY GRAPPLE SHOT, No. 2.

2¼ Inch, Smooth Bore.

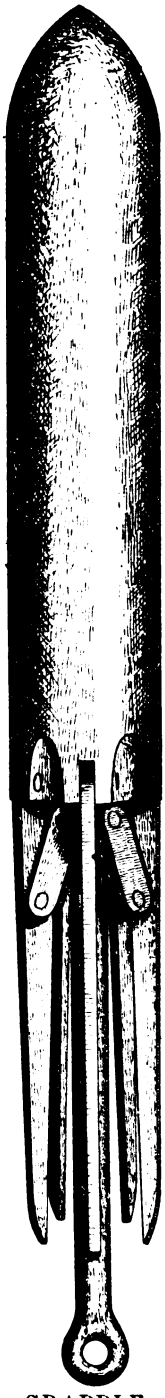
OCTOBER 3, 1878.

MARKS: A 2.

PLATE II.

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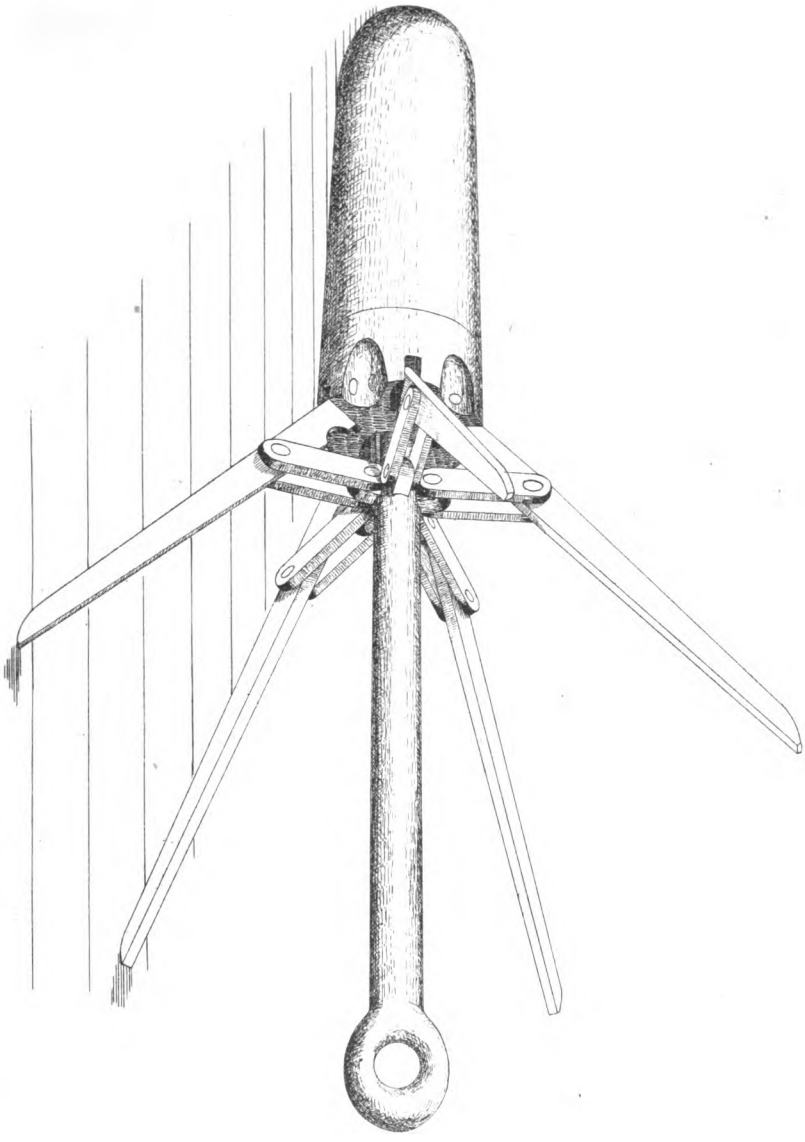
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LYLE-EMERY GRAPPLE SHOT,—CLOSED.

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LYLE-EMERY GRAPPLE SHOT,—OPEN.

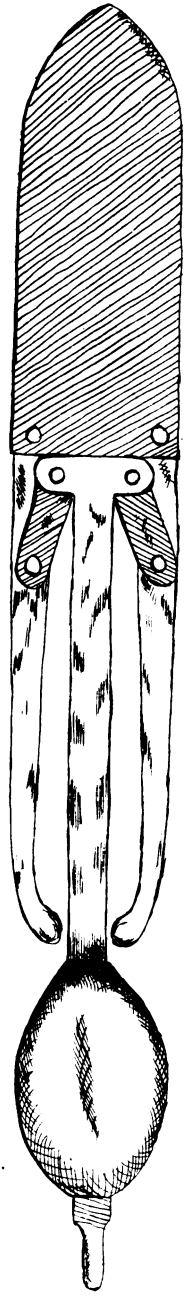
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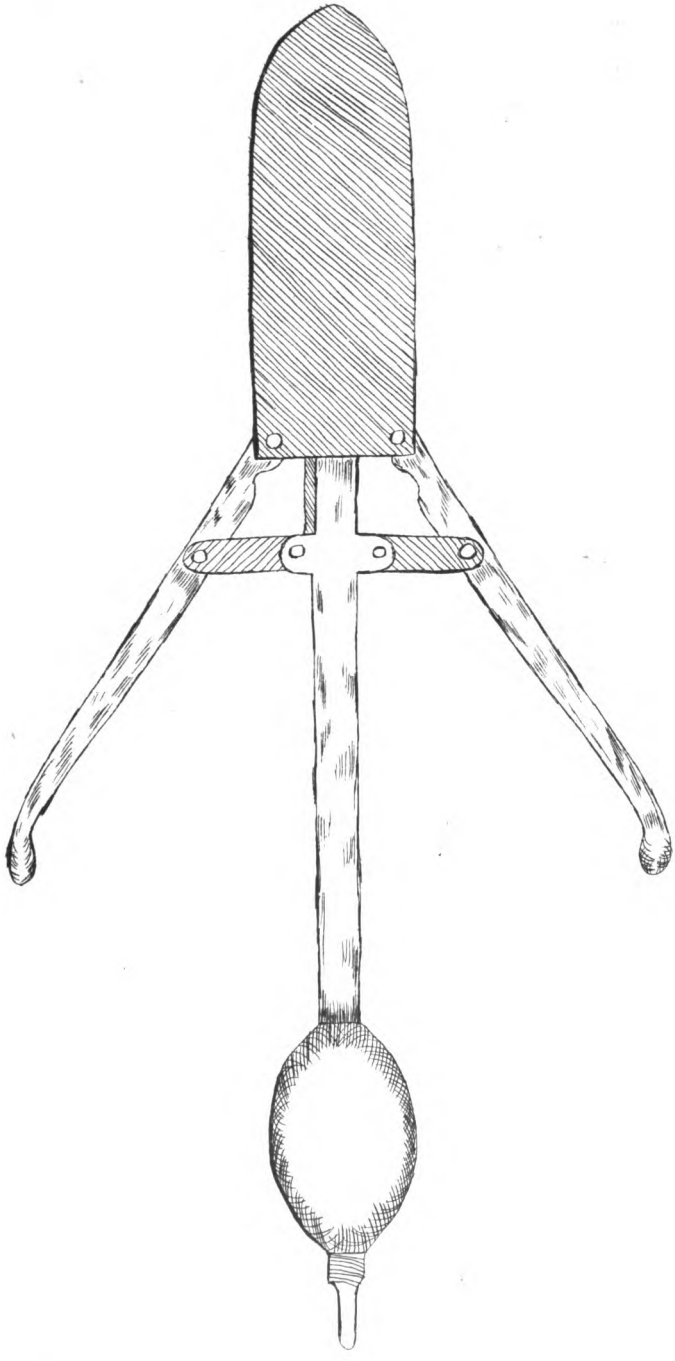
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REPORT OF BOARD

ON

WRECK ORDNANCE

UPON

FOREIGN LIFE-SAVING APPARATUS.

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LETTER OF TRANSMITTAL.

OFFICE OF INSPECTOR OF
UNITED STATES LIFE-SAVING STATIONS,
No. 16 BROADWAY, NEW YORK,
December 7, 1880.

SIR: I have the honor to transmit herewith report of the Board on Wreck Ordnance, &c., on the Russian, English, and German systems of life-saving rockets, and the German anchor rocket, together with accompanying papers.

Very respectfully, your obedient servant,

J. H. MERRYMAN,
Captain, U. S. R. M., President of the Board.

SUMNER I. KIMBALL, Esq.,
General Superintendent United States Life-Saving Service.

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REPORT.

No. 16 BROADWAY, NEW YORK,
November 20, 1880.

The board met pursuant to the call of the president.

Present: Captain J. H. Merryman, U. S. R. M., president; First Lieut. D. A. Lyle, Ordnance Department, U. S. A.; Second Lieut. Thomas D. Walker, U. S. R. M., recorder.

Absent: D. P. Dobbins, superintendent ninth life-saving district; John C. Patterson, jr., keeper life-saving station No. 1, district No. 4.

There being a quorum present, the board then proceeded to consider the report of the committee to which was referred the subject of foreign life-saving rocket apparatus. The report of said committee was accepted and is appended hereto, forming a part of this record.

For all details in connection with this subject, the board respectfully invites attention to the report of its committee, and to the descriptive report of Lieut. D. A. Lyle, Ordnance Department, U. S. A.

OPINION.

After mature consideration the board is of the opinion that the Russian and Hooper rocket systems are not adapted to the wants of our life-saving service; that the German and the English Boxer rockets have not been sufficiently tested to enable it to arrive at any definite conclusion in regard to them.

RECOMMENDATIONS.

The board would respectfully recommend that the English wreck-lights now on hand at Sandy Hook, N. J., be issued to some of the life-saving stations, together with their accompanying tripods, in order that their value may be tested in actual service. The board further recommends that the English Boxer rockets and the German 5^{cm} and 8^{cm}. life-saving rockets, and the 8^{cm}. anchor rockets, still in store, be expended in making more extended trials for the purpose of enabling the board to form an intelligent conclusion in regard to their efficiency and value.

REMARKS.

The board does not feel justified at this time in pronouncing definitely upon the value of rockets as line-carrying projectiles for the life-saving service. There are some grave objections to their use, such as their liability to deterioration when stored for any length of time, the uncertainty of their flight, and the expansion and contraction of the metallic cases, due to variations of temperature, causing the composition to be-

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come detached from the case, which permits the flame to envelop the composition, evolving more gas than the case can sustain.

Again, the shocks received in transportation and handling, taken in connection with the expansion and contraction caused by variations of temperature, tend to crack the composition, allowing the flame to penetrate between the case and composition and producing the explosive effects noted in the firing records of the Russian rockets.

From the evidence now before it, the board is constrained to believe that the apparatus now in use in the service is, in addition to its undoubtedly greater economy, superior in efficiency to any system of rockets that has been tried.

J. H. MERRYMAN,
Captain, U. S. R. M., President.
D. A. LYLE,
First Lieutenant, Ord. Dept., U. S. Army.
THOMAS D. WALKER,
Second Lieutenant, U. S. R. M., Recorder.

There being no further business before the board, it adjourned to meet at the call of the president.

J. H. MERRYMAN,
Captain, U. S. R. M., President.

THOMAS D. WALKER,
Lieutenant, U. S. R. M., Recorder.

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COMMITTEE REPORT.

SANDY HOOK, N. J., *November* 17, 1880.

Capt. J. H. MERRYMAN,
President of Board on Wreck Ordnance:

SIR: Your committee has the honor to make the following report upon foreign life-saving rockets and rocket apparatus:

The different systems of rocket apparatus were placed in the hands of Lieut. D. A. Lyle, Ordnance Department, U. S. A., for examination and report, previously to the establishment of the Board on Wreck Ordnance by the honorable the Secretary of the Treasury. After the above-mentioned board was appointed, the whole subject was transferred to it, and the undersigned were appointed a committee to continue the trials and report the results to the board. The committee submits herewith the report of Lieut. D. A. Lyle, Ordnance Department, U. S. A., which contains descriptions of the various apparatus, together with inventories and the results of trials with the same.

RUSSIAN ROCKET SYSTEM.

The committee fired all but five of these rockets. The system has the merit of simplicity, but was found very unreliable.

GERMAN ROCKET SYSTEM.

These rockets were found to be well made and in good condition. A few only were fired. The results were very good. It is recommended that those now in store be fired in order to still further test their line-carrying capacity. The German stand gave perfect satisfaction.

THE BOXER SYSTEM.

The English Boxer system appears to be much more complicated than any of the others. There are too many separate articles to be looked after, and the rocket is more difficult to prepare for firing than any of the other foreign systems. The committee would respectfully recommend that further trials be made with those still in store, for the purpose of throwing further light upon the general subject of the "flight of rockets," and to determine more definitely the effects of wind upon them.

THE HOOPER SYSTEM.

This system is utterly unreliable and dangerous, as shown by the experiments made.

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ENGLISH WRECK-LIGHTS.

These lights were found to be excellent. It is suggested that the limited number on hand be issued to some of the life-saving stations for use in cases of wreck. The tripods or stands should accompany the lights.

Respectfully submitted.

D. A. LYLE,
First Lieutenant, Ordnance Department, U. S. A.,
JOHN C. PATTERSON, JR.,
Keeper Life-Saving Station No. 1, District No. 4,
Committee.

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REPORT

ON

FOREIGN LIFE-SAVING ROCKETS AND ROCKET APPARATUS,

By Lieut. D. A. LYLE, Ordnance Department.

(NINETEEN PLATES.)

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List of plates and photographs	337
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PART I.

Inventories.

I. Inventory A—Russian life-saving rockets and rocket apparatus.
II. Inventory B—German life-saving rockets and rocket apparatus.
III. Inventory C—Boxer life-saving rockets and rocket apparatus (English).
IV. Inventory D—Hooper life-saving rockets, &c.

PART II.

REPORT.

Russian life-saving apparatus.

I. Russian life-saving rockets.
    1. Description.
    2. Principal dimensions, weights, &c.
    3. Packing.
II. Russian life-saving rocket stand.
    1. Description.
    2. Principal dimensions, weights, &c.
    3. Packing case for rocket stand.
    4. Dimensions and weights of packing case, &c.
III. Portfire holder.
IV. Rocket chain.
V. Rocket line.
VI. Method of using.
VII. Action.
VIII. Record of firing with Russian life-saving rockets and rocket apparatus.
    1. Table of fires.
    2. Synoptical transcript of notes from the firing record.

PART III.

German life-saving rockets and rocket apparatus.

I. 5cm German life-saving rockets.
    1. Description.
    2. Principal dimensions and weights.
II. 8cm German life-saving rockets.
    1. Description.
    2. Principal dimensions and weights.
III. 8cm German anchor rockets.
    1. Description.
    2. Principal dimensions and weights.

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IV. German life-saving rocket stand.
1. Description.
2. Principal dimensions and weights.
V. Firing staff.
1. Description.
2. Dimensions and weight.
VI. Firing lock.
1. Description.
2. Stock.
3. Lock tube.
4. Firing bolt.
5. Firing lever.
6. Principal dimensions and weight.
7. Action.
8. Use.
VII. Pillenlichte.
1. Description.
2. Dimensions and weight.
VIII. Packing.
1. Description of packing boxes.
2. Dimensions of packing boxes.
a. For 5^{cm} life-saving rockets.
b. For 8^{cm} life-saving rockets.
c. For 8^{cm} anchor rockets.
3. Weights.
4. Packing box for rocket stand.
a. Dimensions and weight.
5. Rocket sticks and chains.
a. Description.
b. Weights.
IX. Date of manufacture.
X. German rocket line.
XI. German faking box.
1. Description.
XII. Method of using the German rocket apparatus.
XIII. Action.
XIV. Cost of German life-saving apparatus (1875).
XV. Record of firing with German life-saving rockets and rocket apparatus.
1. Table of fires.
2. Synoptical transcript of notes from the firing record.

PART IV.

English life-saving apparatus.

I. English life-saving rocket (Boxer).
1. Description.
2. Dimensions and weights.
II. Packing.
III. Date of manufacture.
IV. Paints.
V. Rocket stick.
1. Description.
2. Dimensions and weight.
VI. Washers.
1. Dimensions.
a. Brass washer.
b. India-rubber washer.
VII. English life-saving rocket stand.
1. Description.
2. Dimensions and weight.
VIII. Rocket fuse.
IX. Port fire.
1. Packing portfires.
2. Instructions, &c.
X. Rocket line.
XI. Faking box.
XII. Wreck light.
1. Description.
2. Weight, &c.

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XIII. Rocket carrying boxes.
XIV. Method of using.
XV. Action.
XVI. Record of firing with English life-saving rockets and rocket apparatus.
1. Table of fires.
2. Synoptical transcript of notes from the firing record.

PART V.

Hooper's life-saving rocket apparatus.

I. Hooper life-saving rocket.
1. Description.
2. Principal dimensions and weights.
II. Directions for use of Hooper's life-saving rocket and stand.
III. Description of Hooper's life-saving rocket and stand, as set forth in the specifications forming part of his letters patent.
IV. Experiments with Hooper's life-saving rockets.
1. Table of fires.
2. Synoptical transcript of notes from the firing record.

PART VI.

Conclusion.

I. Recapitulation of weights.
1. Russian life-saving apparatus.
2. 5cm German life-saving apparatus.
3. 8cm German life-saving apparatus.
4. 8cm German anchor-rocket apparatus.
5. English life-saving apparatus.
6. Hooper rocket system.
II. Russian rocket apparatus.
III. German rocket apparatus.
IV. English rocket apparatus.
V. Hooper's life-saving rockets.
VI. General remarks.

LIST OF PLATES.

EXPLANATION.

Plate I.

Fig. 1. Longitudinal section of Russian life-saving rocket.
H. Head.
C. Rocket case.
B. Base.
VV. Vents.
Fig. 2. Front elevation of rocket.
Fig. 3. Rear elevation of rocket.
Fig. 4. Side elevation of rocket stick, with a partial section of the rocket-stick at the front end.
Fig. 5. Rear elevation of rocket stick.
Fig. 6. Side elevation of Russian life-saving rocket, showing stick in position with cap over base of rocket.
Fig. 7. Rocket chain.

Plate II.

Fig. 1. Side elevation of Russian rocket stand.
T. Rocket tube.
F. Flanges.
E. Opening in sides.
C. Horizontal axis.
G. Slotted brass support
A. Clamp screw.
H. Tripod head.
S. Shoulder on support.
B. Lower clamp screw.

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Fig. 2. Front elevation of rocket tube, showing outline of rocket when in position.
Fig. 3. Rear elevation of rocket tube, showing flanges.
Fig. 4. Section of rocket tube and vertical support on line D C, Fig. 1.
Fig. 5. Plan of tripod head and legs.
Fig. 6. Leg of tripod.
Fig. 7. Portfire holder.

Plate III.

Fig. 1. Side elevation 5cm German life-saving rocket.
B. Base.
E F. Ribs.
C. Body or case.
H. Head.
Fig. 2. Longitudinal section of 5cm rocket.
D. Base ring.
Fig. 3. Cross-section through E F, Fig. 1.
Fig. 4. Rear elevation of rocket.
Fig. 5. Side elevation of loop for chain, with section of rear part of rocket stick.
Fig. 6. Rear elevation of rocket stick.
Fig. 7. Rocket chain.
Fig. 8. 5cm rocket and stick prepared for firing.

Plate IV.

Fig. 1. Side elevation of 8cm German life-saving rocket.
B. Base.
E F. Ribs.
C. Body or case.
H. Head.
Fig. 2. Longitudinal section of 8cm rocket.
D. Base ring.
B., C., H., E F. } Same as Fig. 1.
Fig. 3. Rear elevation of rocket without stick.
Fig. 4. Cross-section through E F, Fig. 1.
Fig. 5. 8cm rocket stick.
Fig. 6. Rear elevation of stick.
Fig. 7. Rocket chain.

Plate V.

Fig. 1. Side elevation of 8cm German anchor rocket for life-saving purposes.
A. Anchor head.
B. Base.
C. Case or body.
F F. Flukes.
Fig. 2. Rear elevation of same.
Fig. 3. Partial longitudinal section of 8cm anchor rocket.
Fig. 4. Partial longitudinal section of anchor rocket stick (sheet-metal tube), showing the rivets where edges lap together.
Fig. 5. Rear elevation of rocket stick.
Fig. 6. Rocket chain.

Plate VI.

Fig. 1. Side elevation of German rocket stand.
Fig. 2. Top view of rocket trough.
Fig. 3. Section in front of rear end of trough.
Fig. 4. Section at middle of trough.
Fig. 5. Section near front end of trough.
Fig. 6. Section of trough and front elevation of upper portions of the legs, showing horizontal axis and method of connecting.
Fig. 7. Firing staff, showing a *pillenlicht* in position in clamp.

Plate VII.

Fig. 1. Side elevation of German firing lock with the firing pin withdrawn ready for firing.
Fig. 2. Top view of firing lock with firing pin withdrawn.
Fig. 3. Longitudinal section of lock tube, showing interior construction.

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Fig. 4. Longitudinal section of tube after firing, showing *pillenlicht* and fulminate.
H. Stock.
I. Lock tube.
B. Firing bolt.
F. Bolt spring.
A. Bolt pin.
D. Firing pin.
T. Firing lever.
S. Firing-lever spring.
E. Bell-mouthed cavity.
P. *Pillenlicht.*
Fig. 5. German *pillenlicht*, side and end elevations.
Fig. 6. English portfire cylinder.
Fig. 7. English portfire.
Fig. 8. English rocket fuse.

Plate VIII.

Fig. 1. Front elevation of German faking box.
Fig. 2. Plan of top of German faking box.
Fig. 3. Rear elevation of German faking box.
Fig. 4. End elevation of German faking box.
Fig. 5. Side elevation of frame and faking pins.
Fig. 6. Plan of frame, showing holes for pins.

Plate IX.

Fig. 1. Side elevation English (Boxer) life-saving rocket and rocket stick, showing method of attachment of line, stick, and washers.
Fig. 2. Longitudinal section of Boxer life-saving rocket.
Fig. 3. View of rear end of rocket.
Fig. 4. View of front end of rocket.
Fig. 5. English rocket stick, showing method of attaching line.
A. Front cylinder.
B. Rear cylinder.
C. Head clip.
D. Base clip.
E. Clip pin.
F. Diaphragm.
G. Base plug.
H. Head.
I. Cavity in the rocket composition or "bore."
L. Rocket stick.
M. Rocket line.
N. Brass washer.
O. India-rubber washer.
V. Vent.

Plate X.

Fig. 1. Side elevation of English life-saving rocket stand "mark IV."
Fig. 2. Elevation of front part (right-hand side), showing graduated arc and plummet.
Fig. 3. Partial section, showing front view of horizontal axis and method of attaching legs.
Fig. 4. Cross-section of curved trough or pry pole.
Fig. 5. Cross-section of rectangular trough.
A. Rectangular trough or body.
B. Sockets for upper end of legs.
C. Horizontal axis.
D. Leg spikes and ground spike.
O. Openings for introducing portfire.
L. Legs.
P. Curved trough or pry pole.
S. Strap and buckle.

Plate XI.

Fig. 1. Side elevation of Hooper's life-saving rocket, showing swivel and part of chain.
Fig. 2. Longitudinal section of Hooper's rocket.

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Fig. 3. Rear view of rocket, showing vents and curved flanges.
Fig. 4. Rocket chain.
A. Rocket case or body.
B. Base.
H. Head.
V V. Vents.
S. Swivel.

Plate XII.

This plate is an enlarged copy of the drawings that accompanied the letters patent.
Fig. 1. Side elevation of Hooper's life-saving rocket.
Fig. 2. Longitudinal section of same.
Fig. 3. Cross section on A B, Fig. 2.
Fig. 4. Rear elevation of rocket, showing vents.
Fig. 5. Side elevation of Hooper rocket stand, showing a rocket in position for firing.
Fig. 6. Rear view of rocket stand, with rocket in position for firing.
NOTE.—The Hooper life-saving rocket is of English manufacture.

Plate XIII.

Fig. 1 shows deviation of Boxer life-saving rocket and rocket line from the plane of fire due to the effect of the wind.
Fig. 2 shows deviation of Boxer life-saving rocket and rocket line from the plane of fire due to a side wind.

Plate XIV.

Shows Russian rocket, rocket stand, and method of firing.

Plate XV.

Shows 5^{cm} German rocket, rocket stand, and method of firing.

Plate XVI.

Shows 8^{cm} German rocket, rocket stand, and method of firing.

Plate XVII.

Shows 8^{cm} German anchor rocket, rocket stand, and method of firing.

Plate XVIII.

Shows English life-saving rockets, rocket stand, method of firing, fuse box, portfire box, rocket-carrying box, faking box, and tripod for wreck light with light in position.

Plate XIX.

Shows Hooper's life-saving rocket on the German stand, also effect of firing on Hooper rockets—one having the head blown out and the other being ruptured longitudinally.

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D. A. LYLE,
Lieutenant of Ordnance.

NATIONAL ARMORY, *August* 25, 1880.

INTRODUCTORY NOTE.

In the spring of the year 1879, several lots of foreign life-saving rockets and rocket apparatus which had been consigned to Capt. J. H. Merryman, United States Revenue Marine, inspector of life saving stations, were sent by that officer to Sandy Hook, N. J., for examination and trial.

Instructions were given that inventories should be made of the apparatus, and that each article should be carefully inspected.

Lieut. D. A. Lyle, Ordnance Department U. S. A., was directed to

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make the inspection, and to familiarize himself with all the details of the several systems of apparatus. He was also directed to fire a few rockets of each kind in order to ascertain their condition as regards safety and efficiency.

It was deemed best to store these rockets in an ordinary building, open to sea-air for several months, in order to see what effect the salt air had upon the rocket cases.

In the latter part of the same year the examinations and trials were made.

The results with the Russian and Hooper life-saving rockets were so unsatisfactory that the firing with them was continued until the supply was exhausted.

It was decided that the other rockets should remain in store for at least another year, then to be examined and inspected.

Embodied in this report will be found descriptions of the different apparatus, together with the results of the experimental trials.

PART I.

INVENTORIES OF FOREIGN LIFE-SAVING ROCKET APPARATUS SENT TO SANDY HOOK, N. J., BY CAPT. J. H. MERRYMAN, UNITED STATES REVENUE MARINE, INSPECTOR UNITED STATES LIFE-SAVING STATIONS, FOR TRIAL AND EXPERIMENT.

I.—INVENTORY A.

Russian life-saving rockets and rocket apparatus.

No.	Name of article.
50	Russian life-saving rockets.
1	Rocket stand.
1	Port-fire holder.
1	Rocket chain.
1	Coil rocket line—loose twist—hemp.

II.—INVENTORY B.

German life-saving rockets and rocket apparatus.

No.	Name of article.
36	5^{cm} German life-saving rockets.
36	5^{cm} German life-saving rocket sticks and chains.
40	8^{cm} German life-saving rockets.
40	8^{cm} German life-saving rockets, sticks, and chains.
12	8^{cm} German anchor rockets.
12	8^{cm} German anchor sticks and chains.
4	German rocket stands.
4	German faking boxes and lines.
4	Firing staves or *pillenlichte* holders.
4	Firing locks.
100	*Pillenlichte.*

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III.—INVENTORY C.

Boxer life-saving rockets and rocket apparatus (English).

No.	Name of article.
216	Boxer 12-pounder life-saving rockets.
216	Boxer 12-pounder life-saving rocket sticks.
216	Iron pins for attaching rockets to sticks.
216	Brass washers.
216	India-rubber washers.
12	Rocket stands or machines, "Mark IV."
12	*Boxes, wood, for port-fires.
48	Boxes for carrying single rockets, with braces.
288	Port-fires in tin cylinders of 24 port-fires each.
1	Box rocket fuses.
36	Lights for illuminating wrecks.
12	Stands or tripods for lights illuminating wreck.

*Each of these boxes will carry 24 port-fires, 30 detonating primers in a small cylinder, and 2 port-fire holders. No primers or holders were sent with the apparatus.

IV.—INVENTORY D.

Hooper's life-saving rockets.

No.	Name of article.
24	Hooper life-saving rockets.
30	Pieces of slow match.

NOTE.—No stand was found with these rockets.

PART II.

RUSSIAN LIFE-SAVING APPARATUS.

I.—RUSSIAN LIFE-SAVING ROCKET.

(Plate I.)

1.—DESCRIPTION.

The Russian life-saving rocket is made of sheet iron, about one-tenth (0′.1) of an inch in thickness. The body is a cylindrical tube, closed at the front end by a metallic head, held in position by four short screws.

The rear end is closed by a diaphragm, which is perforated by six vents or fuse holes, equidistant circumferentially, whose centers are on the circumference of a circle concentric with the diaphragm.

An axial hole in the diaphragm has a female screw thread cut on its interior surface to engage the male thread on the rocket stick.

The body is fastened to the perforated disk by crimping and by short iron pins. The cylinder is filled with rocket composition.

The construction of the rocket stick is shown in Fig. 4. The body of the stick is made of light wood, cylindrical near the base and tapering

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to the front, forming the frustum of a cone. The front end of the stick, which screws into the rocket, is made of wrought iron, hollow at its base, for the insertion of the wooden body. The latter is held in place by screws. The rear end of the body is rounded, and on one side carries a strong iron hook, about five (5″) inches in length, with its point turned towards the front, and curved slightly outwards from the axis of the stick.

A curved steel spring is placed between the point of the hook and the shank strap, to prevent the egress of the ring of the rocket chain after firing. This hook is bolted to the wooden body of the rocket stick, as shown in the figure.

When prepared for packing, the rocket sticks are screwed into the rockets and the fuse holes or vents are covered by disks of water-proof tarred cloth.

The diameter of the disk is enough larger than that of the rocket to admit of its being folded over the end of the rocket and secured by several turns of twine, tied tightly around it.

The whole rocket, except the wooden body, is then treated with a coat of black paint.

The cap or disk must be cut away before firing, in order to expose the fuse holes.

2.—PRINCIPAL DIMENSIONS, WEIGHTS, ETC.

		Inches.	Centimeters.
Rocket body	Length	25.25	64.12
	Exterior diameter	3.2	8.13
	Interior diameter	3.0	7.62
Total length of rocket		27.2	69.08
Total length of rocket stick		29.2	74.16
Total length of rocket and stick		55.5	140.97
Length filled with composition		23.1	58.67
Maximum diameter of stick		2.8	7.11
Diameter of vents or fuse holes		0.6	1.52
Number of vents, six.			
		Pounds.	Kilos.
Average weight of rocket and stick		25.5	11.56

For detailed dimensions and method of construction, see Plate I.

3.—PACKING.

The rockets, with sticks attached, are packed in boxes containing five each. The boxes are very heavy, and are made of 2-inch plank.

Clamps are placed at each end of the box, and are notched to fit the rockets. A strip of felt is placed along the edge of each clamp above and below the rocket.

The lid has two hinges on one side, so that the box may be opened, the rockets used, and the box refilled. Screws hold the top securely to the sides in transportation.

An annealed iron wire passed through the side and top of the box on the edge opposite the hinges, has the ends drawn together and held firmly by a leaded seal, put on by the inspecting officers of the Imperial Russian Government. This prevents tampering with the contents without detection. The seal bears the date of packing (1876).

The boxes were covered with coarse felt, an inch or more in thickness, over which was a wrapping of gunny sacks and matting; the whole firmly bound with hemp cordage.

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II.—RUSSIAN LIFE-SAVING ROCKET STAND.

(Plate II.)

1.—DESCRIPTION.

This stand is a rectangular tube of sheet iron mounted upon a wooden tripod. The cross-section of the tube is a square with one of its diagonals situated in a vertical plane when the stand is in position for use. This hollow parallelopipedonal tube is formed from a single piece of sheet-iron. The longitudinal faces forming the lower edge do not join to complete the regular figure, except for two (2″) inches at the lower end, but are bent outwards from each other, forming two parallel flanges, Figs. 1 and 4. These flanges are 1″.7 wide, and have a space half an inch wide between them throughout their length.

The space between the flanges serves as a channel for the grappling hook on the under side of the rocket stick to slide in when the rocket is fired.

It is also necessary for the same purpose in placing the rocket in position before firing.

The rear end of the square tube is bound and strengthened by a band of strap iron 2″ wide and one-tenth (0″.1) of an inch thick.

The front end of the tube is re enforced in a similar manner, but with this difference: The band at its lower edge has a cylindrical tube (Figs. 1, 2) 1″.7 in diameter projecting to the front 2″.3, for the purpose of holding the ring of the rocket chain.

This short tube embraces the front ends of the flanges of the body, and has a longitudinal slot, corresponding in width to the space between the flanges along its upper surface to permit the passage of the rocket hook.

A rectangular notch 1″.1 deep is cut in the lower side to accommodate the upper link of the rocket chain when the ring is placed over the projecting tube.

Near the middle of the longitudinal bottom flange on the right-hand side of the body tube is attached a rectangular brass plate, 10″ long and 1″.6 wide, with a lug and eye hole projecting from its under edge near the middle. Through this eye hole passes the horizontal axis.

In a corresponding position on the left side is a semicircular brass plate attached to the other flange. The arc of this plate is graduated into degrees, in order to indicate the elevation of the axis of the main tube.

A lug and eye hole at the center of this arc admits of the insertion of the horizontal axis.

A slotted brass support (G, Figs. 1 and 4) with holes pierced through the upper ends of the vertical arms sustains the horizontal axis (C, Figs. 1 and 4) that carries the rocket tube (T, Figs. 1 and 4) and its graduated arc.

A clamp screw (A, Fig. 4) passes through this support from the right side and clamps the arc in any given position. All motion in altitude within the limits of the scale is governed by this screw. The lower end of the support (G, Fig. 4) terminates in a cylindrical tenon 3″.2 in length and 1″.2 in diameter, which fits in a corresponding hole in the tripod head (H, Fig. 5).

A shoulder (S, Fig. 4) on the support rests upon the top of the tripod head when the clamp screw (B, Figs. 1 and 5) is loosened.

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The tripod (Fig. 5) is composed of a head (H), three legs and a clamp screw (B).

The head is of brass. This piece is a hexagonal prism in form, with narrow longitudinal projections, or lugs, on the alternate faces for the attachment of the legs.

These projections are 120° apart. Opposite one of them is a rectangular seat through which the clamp screw (B, Fig. 5) passes that controls the motion in azimuth and the limited vertical motion of the support and its superincumbent weight.

The head is pierced longitudinally by an axial hole for the reception of the tenon of the support. The legs are made of wood, shod at their lower ends with pointed iron shoes, and encircled by narrow iron bands near their upper extremities.

The upper ends of the legs are slotted vertically to receive the projections on the *head*, to which they are fastened by iron pins.

Two elliptical openings (E, Figs. 1 and 2), opposite to each other, are made in the upper sides of the tube for the insertion of the port-fire to ignite the rocket composition.

2.—PRINCIPAL DIMENSIONS, WEIGHTS, ETC.

	Inches.	Centimeters.
Total length of rocket tube	53.3	135.38
Cross-section, square.. Exterior	4.3	10.92
Cross-section, square.. Interior	4.1	10.41
	Pounds.	**Kilograms.**
Weight of rocket stand	39.0	17.69
Weight of rocket chain	4.625	2.17
Weight of port-fire handle	0.5625	0.25
Total weight without packing box	44.1875	20.13
Weight of coil of rocket line	62.0	28.12

For other details, see Plate II.

3.—PACKING CASE FOR ROCKET STAND.

The rocket stand and port-fire holder are securely packed in a long box with a hinged lid, closed by a hasp. This box has a handle at each end for convenience in transportation.

4.—DIMENSIONS AND WEIGHTS.

	Inches.	Centimeters.
Exterior dimensions of box for rocket stand.. Length	69.0	175.26
Exterior dimensions of box for rocket stand.. Width	16.375	41.65
Exterior dimensions of box for rocket stand.. Depth	9.5	24.13
	Pounds.	**Kilograms.**
Total weight of box and stand	99	44.90
Weight of packing box	60	27.21

III.—PORT-FIRE HOLDER.

(Plate II, Fig. 7.)

A port-fire holder or firing staff accompanies the rocket stand. It is a simple wooden handle with a bent head of brass. The brass head is hollow and is slitted on the sides so as to form a rude clamp. The port-fire is inserted in the split end of the head and then ignited in the usual manner.

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IV.—Rocket chain.

(Plate I, Fig. 7.)

This is a hand-made iron chain, six (6′) feet in length, terminated at one end by a ring two (2″) inches in diameter. The ring is placed over the tubular projection on the front end of the rocket stand in firing. The other end of the chain is fastened to the end of the rocket line.

V.—Rocket line.

This is a loosely-twisted hemp line about the size of the No. 8 or No. 9 service lines. The Russian method of coiling or faking the line is unknown, as no instructions were received with the apparatus.

VI.—Method of using.

The rocket stand is taken from the box, the legs of the tripod extended, and the stand placed at the firing point. The index being clamped at zero on the graduated arc, the tripod is leveled by the eye by making the axis of the rocket tube horizontal. This can only be done approximately; then loosen the lower clamp screw and swing the stand around until it points in the desired direction. Clamp the vertical spindle and by turning the upper clamp screw to the left the required elevation may be given; after which the screw must be tightened, in order to retain the tube in place. Take a rocket from its box, tear off the cap over the vents, insert the rocket, base first, into the rectangular tube with the hook on the stick gliding down between the flanges on the lower side of the tube. When the hook strikes the band at the lower end of the rocket tube, the rocket is in position for firing. Place the fakes or faking box in front of the stand, put the ring of the chain over the cylindrical tubular projection on the front end of the stand, letting the chain attached to the line hang below. Stand clear of the line, and, with a port-fire inserted in the holder, advance and ignite the rocket by thrusting the port-fire gently through one of the elliptical openings in the rocket tube. Care must be taken not to disturb the aim.

VII.—Action.

An instant after the composition in the base of the rocket is ignited, the latter leaps forward guided by the rocket tube, and as it leaves the tube the hook engages the ring of the chain attached to the line and carries out the chain and line.

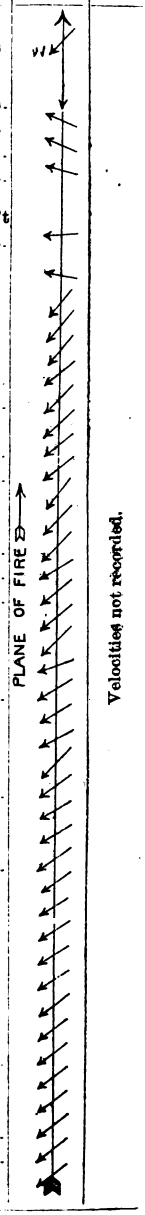
The chain should be fastened to the line in advance, before it is wanted for use.

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VIII.—Experiments with life-saving apparatus at Sandy Hook, N. J.

1.—Record of firings with Russian life-saving rockets and apparatus.

Date.	Number of fire.	Elevation.	Kind of rocket stand.	Rocket, kind of.	Primer.	With what fired.	Where fired.	Line attached or not.	Rocket exploded in air or not.	Wind: Direction.	Wind: Velocity.
1879.		°									
Oct. 18	1	32	Russian	Russian life-saving rocket.	None..	Port-fire (English).	Down beach	Yes	Yes		
18	2	35	...do	....do	..do ...	....do	Out to sea	No..	Yes.		
18	3	35	...do	....do	..do ...	....do	....do	No..	Yes		
18	4	30	...do	....do	..do ...	....do	....do	No..	No..		
20	5	43	.. do ..	... do	Quick-match.	....do	Down beach	No..	Yes.		
20	6	43	...do	....do	..do ...	No further record of this rock't					
22	7	35	...do	....do	..do ...	Port-fire (U. S.)	Out to sea.	No..	Yes.		
22	8	35	...do	.. do	..do ...	....do	....do	No..	Yes		
22	9	35	...do	... do	..do ...	....do . ..	Down beach	No..	Yes		
22	10	35	...do	.. do	..do ...	....do	....do	No..	Yes		
22	11	35	...do	.. do	..do ...	....do	....do	No..	Yes		
22	12	35	... do	.. do	..do ...	.. do	....do	No..	Yes		
22	13	35	...do	...do	..do ...	.. do	....do	No..	Yes.		
22	14	35	.. do	....do	..do ...	....do	....do	No..	Yes		
22	15	35	...do	....do	..do ...	....do	....do	No..	No..		
Nov. 14	16	30	German	....do	..do ...	....do	Out to sea	No..	Yes.		
14	17	25	...do	...do	..do ...	....do	....do	No..	Yes		
14	18	25	...do	....do	..do ...	....do	.. do	No..	Yes		
14	19	25	.. do ...	.. do	..do ...	.. do	.. do	No..	Yes.		
14	20	25	.. do	....do	..do ...	....do	....do	No..	Yes.		
14	21	25	.. do	....do	..do ...	....do	....do	No..	Yes.		
14	22	25	...do	...do	..do ...	....do	.. do	No..	Yes		
14	23	25	...do ..	....do	..do ...	....do	.. do	No..	Yes		
14	24	25	...do	....do	..do ...	.. do	....do	No..	Yes		
14	25	25	...do	....do	..do ...	....do	....do . ..	No..	Yes.		
14	26	25	...do	....do	..do ...	....do	...do	No..	Yes		
14	27	25	.. do	....do	..do ...	....do	.. do	No	Yes		
14	28	25	...do	....do	..do ...	....do	....do	No..	Yes		
14	29	25	...do	....do	..do ...	... do	....do	No..	Yes.		
14	30	25	.. do	....do	..do ...	....do	....do	No..	Yes		
14	31	25	...do	....do	..do ...	....do	.. do	No..	Yes		
14	32	25	...do	....do	..do ...	....do	....do	No..	Yes.		
14	33	25	...do	....do	..do ...	....do	....do	No..	Yes		
14	34	25	.. do	....do	..do ...	....do	....do	No..	Yes		
14	35	25	...do	....do	..do ...	... do	....do	No..	Yes		
14	36	25	...do	....do	..do ...	....do	....do	No..	Yes		
14	37	25	...do	...do	..do ...	....do	....do	No..	Yes		
14	38	25	...do ..	....do	..do ...	....do	....do	No..	Yes		
14	39	25	.. do ..	....do	..do ...	....do	....do	No..	Yes		
14	40	25	...do	....do	..do ...	....do	....do	No..	Yes		
14	41	25	...do ...	....do	..do ...	...do	....do	No..	Yes		
14	42	25	...do	....do	..do ...	....do	....do	No..	Yes		
14	43	25	...do	....do	..do ...	....do	....do	No..	Yes.		
14	44	25	.. do	...do	..do ...	....do	....do	No..	Yes.		
14	45	25	...do	...do	..do ...	....do	....do	No..	Yes		



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2.—SYNOPTICAL TRANSCRIPT OF NOTES FROM THE FIRING RECORD.

Russian life-saving rockets and stand.

Date.	No. of round.	
1879.		
Oct. 18	1	Italian hemp line No. 6. Line carried out 250 yards from firing point, when the rocket chain broke, freeing the rocket, which burst shortly afterwards. The fragments of the rocket and chain were found. The rear diaphragm, to which the rocket stick is attached, was found to have been blown out, the walls between the vents not being strong enough to withstand the pressure of the imprisoned gases. The ring of the rocket chain had a flaw in the material. The chain parted at that point. It is probable that the chain broke at the instant the composition took fire all around, giving a sudden increase of velocity.
18	2	Rocket exploded as before. Flight erratic; rocket ricocheted on the water before bursting.
18	3	Erratic trajectory. Rocket ricocheted on the water, turned to the right, *from* which direction the wind was blowing, and finally burst.
18	4	Struck the sand beach 60 yards from the stand, ricocheted and disappeared beneath the water.
20	5	Rocket exploded about 200 yards in front of stand. Used quick-match in the vents. Rocket shot out of tube almost the instant the port-fire was applied.
20	6	No remarks. By some mistake the record was left incomplete.
22	7	Exploded in the air. Time of flight, 4½ seconds.
22	8	Exploded in the air 2½ seconds from time of starting.
22	9	Exploded in the air 4 seconds from time of starting.
22	10	Exploded in the air about 280 yards from the stand; time lost.
22	11	Exploded in the air; no time taken.
22	12	Exploded in 1¾ seconds from time of starting.
22	13	Exploded in 2 seconds from time of starting.
22	14	Exploded in the air; no time taken.
22	15	Did not explode. Good line shot. Ricocheted two or three times on the sand.
Nov. 14	16	Exploded in the air.
14	17	Exploded in the air.
14	18	Exploded in the air.
14	19	Exploded in the air.
14	20	Exploded in the air.
14	21	Exploded in the air.
14	22	Exploded in the air.
14	23	Exploded in the air.
14	24	Exploded in the air.
14	25	Rocket exploded in the air.
14	26	Rocket exploded in the air.
14	27	Rocket exploded in the air.
14	28	Rocket exploded in the air.
14	29	Rocket exploded in the air.
14	30	Rocket exploded in the air.
14	31	Rocket exploded in the air.
14	32	Rocket exploded in the air.
14	33	Rocket exploded in the air.
14	34	Rocket exploded in the air
14	35	Rocket exploded in the air.
14	36	Rocket exploded in the air.
14	37	Rocket exploded in the air.
14	38	Rocket exploded in the air.
14	39	Rocket exploded in the air.
14	40	Rocket exploded in the air.
14	41	Rocket exploded in the air.
14	42	Rocket exploded in the air.
14	43	Rocket exploded in the air.
14	44	Rocket exploded in the air.
14	45	Rocket exploded in the air.

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PART III.

GERMAN LIFE-SAVING ROCKETS AND ROCKET APPARATUS.

I.—5^{cm} GERMAN LIFE-SAVING ROCKET.

(Plate III.)

1.—DESCRIPTION.

The 5-centimeter German life-saving rocket (5^{cm} Rettungsrakete) is composed essentially of a body, head, base, rocket stick and chain. The rocket case or body is cylindrical, made of sheet metal 0″.05 in thickness.

The head is ogival, with a shoulder that extends one-fourth of an inch beyond the case, and has a cylindrical tenon to fit the front end of the rocket case.

The latter is secured to the head by screws. The inside of the rear end of the case is reinforced for 1″.1 of its length by a cylindrical metallic ring, which serves as a seat for the screws that attach the base to the body.

The base extends to the rear, forming three ribs, placed triangularly, with all the metal removed from the axial portion to facilitate the escape of gas. These ribs conjoin at their posterior ends. An axial hole is drilled through this portion, having a female screw thread cut upon its interior surface to receive the screw on the end of the rocket stick.

When prepared and packed for service the composition is covered by a water-proof cap, from which projects a fuse, extending 2″.5 towards the rear. The fuse is steadied in its position by a strap of laboratory paper reaching to one of the ribs. The fuse and cap are covered with a coat of shellac varnish. Care must be taken in handling not to break off the fuse, which is more or less exposed.

The rocket stick is of wood, enveloped at the front end by a metallic frustum of a cone, whose larger base receives the end of the stick, and whose smaller base is penetrated by the shank of a screw, intended to enter the hole in the base of the rocket. The stick, frustum, and screw-shank are bound together, and held in place by two wrought-iron bolts of small diameter.

The rear end of the rocket stick is armed with an iron loop, with flattened arms, slightly curved to fit the outside of the stick. This loop serves as the point of connection for the rocket chain.

The diameter of the rocket stick is slightly greater in the middle than at either end.

All the metallic parts of this line-carrying projectile are painted black.

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2.—PRINCIPAL DIMENSIONS AND WEIGHTS.

	Inches.	Centimeters.
Total length of 5cm life-saving rocket	23.5	59.69
Case or body:		
Length	15.0	38.10
Exterior diameter	2.15	5.45
Interior diameter	2.05	5.20
Thickness of metal	0.05	0.13
Head:		
Total length	5.2	13.20
Point—		
Length of	3.6	91.44
Diameter of base	2.65	6.73
Tenon—		
Length	1.6	4.06
Diameter	2.05	5.20
Base-ring:		
Length	1.1	2.79
Exterior diameter	2.05	5.20
Interior diameter	1.65	4.19
Base:		
Total length	5.8	14.73
Diameter, front end	2.65	6.73
Diameter, rear end	1.25	3.17
Length, embracing case	0.9	2.28
Length of female screw in rear end	1.2	3.05
Diameter of screw hole	0.625	1.57
Depth of ribs at front end	0.45	1.14
Depth of ribs at rear end	0.40	1.01
Width of ribs	0.35	0.89
Number of ribs	Three	
Rocket-stick:		
Total length	39.4	100.07
Diameter at junction with rocket	1.2	3.05
Diameter at larger base of frustum	2.2	5.58
Diameter at middle	2.2	5.58
Diameter at rear end	2.0	5.08
Rocket-chain:		
Total length	87.0	220.98
Ring—		
Exterior diameter	1.5	3.81
Interior diameter	0.7	1.78
Thickness	0.4	1.01
Links—		
Length	1.5	3.81
Width	0.75	1.90
Thickness	0.20	0.51
Total length of rocket and stick	61.7	156.71
	Pounds.	Kilos.
Weight of rocket	10.0	4.53
Weight of rocket stick and chain	5.5	2.49
Total weight of rocket complete	15.5	7.02

For further details, see Plate III.

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II.—8cm GERMAN LIFE-SAVING ROCKET.

(Plate IV.)

1.—DESCRIPTION.

The form and construction of this life-saving rocket (8cm Rettungsrakete) is essentially the same as the 5-centimeter rocket, from which it differs only in dimensions and weight. The description of the 5cm rocket will answer for this one.

2.—PRINCIPAL DIMENSIONS AND WEIGHTS.

	Inches.	Centimeters.
Total length of 8cm life-saving rocket	34.5	87.63
Case or body:		
Length	10.5	26.67
Exterior diameter	3.22	8.17
Interior diameter	3.1	7.87
Thickness of metal	0.06	0.15
Head:		
Total length	8.75	22.21
Point—		
Length	7.25	18.40
Diameter of base	3.75	9.51
Tenon—		
Length	1.5	3.81
Diameter	3.1	7.87
Base ring:		
Length	1.35	3.42
Exterior diameter	3.1	7.87
Interior diameter	2.875	7.29
Base:		
Total length	8.3	21.08
Diameter of front end	3.75	9.51
Diameter of rear end	1.50	3.81
Length, embracing case	1.8	4.57
Length of female screw in rear end	1.6	4.06
Diameter of screw hole	0.625	1.58
Depth of ribs at front end	0.75	1.90
Depth of ribs at rear end	0.875	2.21
Width of ribs	0.75	1.90
Number of ribs	Three.	.....
Rocket stick:		
Total length	39.9	101.34
Diameter at junction with rocket	1.4	3.55
Diameter at larger base of frustum	2.0	5.08
Diameter at middle	2.3	5.84
Diameter at rear end	2.3	5.84
Rocket chain:		
Total length	122.5	310.64
Ring—		
Exterior diameter	1.7	4.31
Interior diameter	1.1	2.79
Thickness	0.3	0.76
Links—		
Length	1.3	3.30
Width	0.6	1.52
Thickness	0.2	0.50
Total length of rocket and stick	73.3	186.18
	Pounds.	Kilos.
Weight of rocket	35.0	15.98
Weight of rocket stick and chain	7.25	3.29
Total weight of rocket complete	42.25	19.27

For other details, see Plate IV.

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III.—8cm GERMAN ANCHOR ROCKET.

(Plate V.)

1.—DESCRIPTION.

The 8-centimeter anchor rocket (8cm Ankerrakete) for life-saving purposes is composed of a body, anchor-head, base, rocket stick, and chain.

The case, or rocket body, is made of sheet metal, 0″.06 in thickness.

The anchor head is made of iron. The front end is sub-spherical in form, connected with the convex curves of the arms by re-entrant tangent-curved surfaces.

The short shank in rear of the head forms a cylindrical tenon that fits the front end of the rocket case, to which it is secured by screws.

The arms and flukes are four in number. The former are triangular-prismoidal in outline, and are placed at right angles to each other.

The arms are furnished with the usual palmate flukes, which are well adapted for "holding."

The rear end of the rocket case is reinforced on the inside for 1″.5 of its length by a cylindrical iron ring. The latter furnishes a seat into which the screws that attach the base are turned.

The base is tripodal in form, the legs joining a cylindrical ring at the front end. The conjunction of the legs, or ribs, at the rear end forms a seat into which is screwed the rocket stick.

When prepared for use and ready for packing the rocket case is filled with composition and the rear end of the case closed with a water-proof cap to protect the contents from the effects of moisture.

This cap is placed 1″.3 towards the front from the rear edge of the basal ring. A fuse, 2″.7 in length and 0″.5 in diameter, passes through the cap and connects with the rocket composition.

The projecting fuse is liable to be broken off in handling, if great care is not exercised, as the operator will involuntarily thrust his hand between the ribs to grasp the rocket in picking it up or carrying it.

The fuse is steadied in its position by a strap of laboratory paper attached to one of the ribs in the same manner as in the 5cm rocket.

The fuse is coated with shellac varnish.

The rocket *stick*, technically so called, is in this case a hollow cylindrical tube of sheet metal, with a diameter about equal to that of the wooden stick for the 8cm life-saving rocket.

It is constructed by taking a strip of sheet metal of the necessary length and width, curving it and fastening the edges together with twenty-three iron rivets.

The front end is filled with an iron plug extended to the front as a frustum of a cone, 1″.125 in altitude, from which projects the male screw, 2″.25 long, that enters the base of the rocket when assembled for use. The rear end is furnished with an iron loop having flattened arms that are riveted to the tube. This loop serves as the point of attachment for the rocket chain.

The rocket chain is made of the best wrought iron.

The rocket case, base, and "stick" form the *shank* of the quadripalmate anchor.

The usual anchor *stock* is absent in this combination.

The anchor rocket, rocket stick, and chain are all painted black.

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2.—PRINCIPAL DIMENSIONS AND WEIGHTS.

	Inches.	Centimeters.
Total length 8cm anchor rocket	33.15	84.19
Rocket case:		
Length	20.15	51.17
Exterior diameter	3.22	8.17
Interior diameter	3.1	7.87
Thickness of metal	0.06	0.15
Anchor head:		
Total length	6.5	16.51
Diameter, excluding arms	3.35	8.50
Length of tenon shank	1.85	4.69
Diameter of tenon shank	3.1	7.87
Arms—		
Depth near shank	1.4	3.55
Width under side near shank	1.2	3.04
Depth near fluke	0.8	2.03
Width under side near fluke	0.8	2.03
Number of	Four	
Distance from front end of head to rear edge of arm*	4.65	11.80
Distance from front end of head to point of fluke*	7.55	19.17
Spread of flukes	15.5	39.36
Length of palms	3.75	9.51
Width of palms	3.75	9.51
Base ring:		
Length	1.5	3.81
Exterior diameter	3.1	7.87
Interior diameter	2.87	7.28
Base:		
Total length	9.4	23.87
Diameter, front end	3.75	9.51
Diameter, rear end	1.8	4.57
Length of, embracing case	1.4	3.55
Length of female-screw thread	2.0	5.08
Diameter of same	0.875	2.21
Depth of ribs, front end	6.75	1.90
Depth of ribs, rear end	0.80	2.03
Width of ribs	0.40	1.01
Number of ribs	Three	
Rocket stick:		
Total length	39.375	99.98
Length of screw	2.25	5.71
Diameter of screw	0.875	2.21
Number of rivets	23.0	58.41
Rocket chain:		
Total length	123.0	312.41
Ring—		
Exterior diameter	1.5	3.81
Interior diameter	0.7	1.77
Thickness	0.4	1.01
Links—		
Length	1.5	3.81
Width	0.75	1.90
Thickness	0.20	0.50
Total length of rocket and stick	70.275	178.47
	Pounds.	Kilos.
Average weight of anchor rocket	37.375	16.95
Average weight of rocket stick and chain	9.0	4.08
Total weight of anchor rocket complete	46.375	21.03

*Measured parallel to the axis of the rocket.

See Plate V for other dimensions.

IV.—GERMAN LIFE-SAVING ROCKET STAND.

(Plate VI.)

1.—DESCRIPTION.

The German rocket stand is trough-like in shape, and is supported by two legs near the front end and a curved iron foot or tang at the rear end.

The general outline may be seen by reference to the plate, Figs. 1 to 6.

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The trough-like body of the tube is made of sheet iron or steel, and is constructed from a single piece of metal, curved over a former of the required shape.

A longitudinal slot in the bottom, 10″.9 long and 1″ wide, extends from the front end to the first exterior rib (Fig. 2). This slot is for the reception of the rocket chain, which is led along the bottom of the trough under the rocket and stick, and allowed to pass downward through this slot.

The longitudinal edges of the trough are stiffened and strengthened by angle-pieces of iron running the whole length. These angle-pieces have one side riveted to the inside of the trough, forming the bearing surfaces for the rockets, and the other forming an exterior projecting flange.

A rolled iron bar, 1″ wide and 0″.3 thick, runs from the rear end of the longitudinal slot the whole length of the trough on the under side.

The lower or rear end of this metallic bar projects about 10″ beyond the frame, is decurved and pointed, to form the claw or tang for the support of this end of the trough.

A curved brass plate, 0″.7 wide and 0″.3 thick, arches over the rear end of the frame, forming an abutting surface for the rocket stick and binding the sides of the trough together.

Two six-inch braces, 0″.7 wide, extend backwards and downwards to the tang from the junctions of the brass plate with the sides of the trough.

The angle-pieces, bottom bar, brass plate, and braces give strength and rigidity to the rocket stand.

The stand is further strengthened by four nearly equi-distant exterior iron ribs, 1″ wide, and serve to bind the component parts together.

On the under side, below the first rib, is a lug which supports a horizontal axis.

The ends of this axis are slotted to receive the ends of the legs. The latter are held in position by metallic pins passing through their blade-like ends and the axis.

These projections from the legs are trapezoidal, the beveled ends abutting against side plates on the exterior of the trough when the stand is in use.

The side plates prevent the indentation of the thin metal of the trough by the upper ends of the legs.

The legs are of wood, ferruled with iron at each extremity to prevent splitting.

Decurved iron spikes in the lower ends enable them to be placed firmly in the hard or frozen soil to give stability to the stand.

The legs can be closed together and then folded to the rear until they lie parallel to the axis of the trough.

Notwithstanding the angle-irons, the longitudinal slot at the front end weakens the trough considerably; to remedy this, side plates, 10″.6 long, are placed one on each side under the forward rib to stiffen the sides.

The draughtsman has erred slightly in outlining the cross-section of the trough in Plate VI. As shown there it is nearly semi-circular in form, while it should have appeared almost trapezoidal with a rounded bottom.

The planes of the projecting flanges are represented as being coincident, whereas they should bend downwards slightly, forming an obtuse angle with each other. This rocket-stand is painted a lead-color.

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2.—PRINCIPAL DIMENSIONS AND WEIGHT.

	Inches.	Centimeters.
Trough:		
Total length	72.75	184.78
Total length with rear tang	82.75	210.18
Interior width at top	3.8	9.65
Interior width at bottom	1.0	2.54
Inside slant height of sides	2.8	7.11
Length of slot at front end	10.9	27.68
Width of slot at front end	1.0	2.54
Exterior ribs—		
Number of	Four.	
Width	1.0	2.54
Distance of horizontal axis from front end	15.5	39.36
Two legs:		
Total length	54.375	138.10
Diameter of upper end	1.3	3.30
Diameter of lower end	1.3	3.30
Length of spike in lower end	3.0	7.62
	Pounds.	Kilos.
Weight of rocket stand	35.0	15.98

For further particulars consult the drawings, Plate VI.

V.—FIRING STAFF.

(Plate VI, Fig. 7.)

1.—DESCRIPTION.

This is made of wood, shod at one end with a sharp-pointed steel socket and armed at the other with a hollow brass tube, bent and split to form a hinged clamp. The latter is actuated by a lever and spring.

This staff is used to hold the *pillenlichte* for igniting the rocket fuse.

The sharp-pointed socket is for convenience in thrusting it into the ground in an upright position.

If carelessly thrown aside, it is liable to be lost in the sand. The staff is painted the same color as the rocket stand.

The drawing shows a *pillenlicht in situ*.

2.—DIMENSIONS AND WEIGHT.

	Inches.	Centimeters.
Total length	72.0	182.88
Diameter	1.2	3.04
Length of pointed socket	10.0	25.40
	Pounds.	Kilos.
Weight	2	0.91

VI.—FIRING LOCK.

(Plate VII, Figs. 1–4.)

1.—DESCRIPTION.

The firing lock, or more properly the igniting lock (Zündschloss), is an instrument used for the purpose of igniting the primer in the end of the *pillenlicht* by percussion.

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The principal components are the stock, lock tube, firing bolt, bolt spring, bolt pin, firing pin, firing lever, and spring.

2.—STOCK.

The stock is made of hard wood, neatly finished. The lock tube is attached to the front end of the stock, on the under side of which is a curved projection to give a firm grip to the hand of the operator.

A hole is sometimes bored through the butt of the stock, through which a cord is passed for the purpose of attaching it to the belt of the surfman or to his wrist in order to prevent its loss.

3.—LOCK TUBE.

This is made of bronze (gun-metal), carefully turned and finished upon the exterior. The middle portion of the tube is cylindrical, expanding at the front end.

The rear portion is also cylindrical, greater in diameter than the middle part, to which it is joined by a projecting molding. This molding is slotted longitudinally on top to form a fulcrum seat for the firing lever.

The front end is countersunk to form a cavity whose interior surface is somewhat bell-mouthed in shape.

An axial hole is bored from the rear end nearly to the anterior cavity, and a small hole for the firing pin is drilled through to connect the two. The large hole is counterbored to within 0″.8 of the bottom in order to increase its diameter for the reception of the body of the firing bolt and its spiral spring.

A transverse slot, with circular ends, extends through the tube from side to side to allow longitudinal play for the bolt pin in cocking and firing.

On top of the tube, directly over the middle point of the transverse slot, is a square mortise through which the bolt catch on the firing lever passes.

A hole is drilled in the upper part of the molding for the fulcrum pin of the firing lever, and another near the rear end for the assembling pin that holds the tube and stock together.

4.—FIRING BOLT.

The firing bolt is cylindrical, with a round tenon in front of the body. The tenon fits closely the hole in the tube below the counterbore, and is armed at its front end with a needle or firing pin.

A transverse hole through the body receives the bolt pin of steel wire which projects on each side the tube.

The bolt is actuated by a spiral spring of steel wire. The spring is placed between the bolt head and a plug that fills the rear portion of the axial hole.

The firing pin or needle is made of steel wire driven into a hole in the front end of the bolt and then brought to a very sharp point.

5.—FIRING LEVER.

The firing-lever is made of steel and tempered. The rear end is flattened and bent slightly upwards to serve as a trigger.

At the front end is a rectangular bolt catch projecting at right angles from the under side of the lever.

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A flat steel spring under the rear end of the lever presses that end upwards and holds the bolt catch down on the bolt. This catch passes through the mortise in the tube.

6.—PRINCIPAL DIMENSIONS AND WEIGHT.

	Inches.	Centimeters.
Total length of firing lock	9.4	23.87
Length of lock tube	5.75	14.59
	Ounces.	Grams.
Weight of firing tube	11.25	318.93

7.—ACTION.

Seize the stock in the right hand, and with the thumb and index finger of the left compress the spiral bolt spring by pulling the transverse bolt pin A (Plate VII) to the rear until the bolt catch I drops off the body of the bolt B, and falls upon the tenon C.

The spring S will press up the rear end of the firing lever T and keep the bolt catch in place.

The angular shoulder of the bolt presses against the rear surface of the catch. In this position the firing pin D, or needle, is withdrawn into the lock tube, as shown in Fig. 3. The pressure of the thumb of the right hand upon the flattened end T (Fig. 2) of the lever compresses the spring S (Fig. 3), elevates the bolt catch I (Fig. 3) to the position I (Fig. 4), releases the bolt, and allows the spiral spring F (Fig. 3) to act.

The bolt springs forward, thrusting the firing-pin D out into the cavity E, where it strikes the fulminate in the end of the *pillenlicht* P and ignites the composition.

8.—USE.

The object of the firing lock is to furnish a ready means of igniting *pillenlichte* after they are inserted in the firing staff and clamped.

VII.—PILLENLICHTE.

(Plate VII, Fig. 5.)

1.—DESCRIPTION.

These are short cylindrical tubes of laboratory paper, filled with a composition resembling that in port fires. The exact ingredients and their proportions are unknown.

A countersink is formed in one end, at the bottom of which is placed a small disk of fulminate covered with a water-proof cap. The entire exterior is varnished.

A section of a *pillenlicht* is shown at P (Fig. 4, Plate VII). These are used to light the fuses of the life-saving and anchor rockets.

The *pillenlichte* are put up in packages of twenty (20) each.

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2.—DIMENSIONS AND WEIGHT.

	Inches.	Centimeters.
Total length	1.55	3.93
Exterior diameter	0.625	1.58
Depth of countersink in end	0.1	0.25
	Seconds.	
Time of burning	45	.....
	Grains.	
Weight	230	.....

VIII.—PACKING.

LIFE-SAVING ROCKETS.

1.—DESCRIPTION.

The German anchor and life-saving rockets are packed securely in tin-lined boxes. The boxes are made of hard pine, planed smooth on both sides, with the corners dovetailed. The bottom, sides, and ends are lined with tin. The top is not lined and is screwed to the sides and ends. A label on the inside of the cover of the box bears printed on its face a list of the contents of the box in the German language. A similar label is pasted on the end of the box. The rocket boxes are oiled but not painted. Bottom, middle, and top clamps at each end hold the rockets in place. A strip of felt separates the rockets from the clamps.

2.—DIMENSIONS OF PACKING BOXES.

a.—For 5cm life-saving rockets.

		Inches.	Centimeters.
Exterior dimensions	Length	26.75	67.93
	Width	9.5	24.13
	Depth	8.125	20.57
Number of rockets in each box		.....	Four.

b.—For 8cm life-saving rockets.

		Inches.	Centimeters.
Exterior dimensions	Length	37.25	94.10
	Width	12.5	31.74
	Depth	11.25	28.56
Number of rockets in each box		.....	Four.

c.—For 8cm anchor rockets.

		Inches.	Centimeters.
Exterior dimensions	Length	36.0	91.44
	Width	14.25	36.18
	Depth	20.5	52.06
Number of rockets in each box		.....	Two.

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3.—WEIGHTS.

	Pounds.	Kilogrammes.
Total weight of packing box containing four 5cm rockets	61.5	27.88
Total weight of packing box containing four 8cm rockets	195.5	88.67
Total weight of packing box containing two 8cm anchor rockets	151.0	68.49

4.—ROCKET STANDS.

The German rocket stands are packed in long narrow boxes, painted a lead color. The top is screwed to the sides and ends. Rope loops, two on each side near the ends, serve as handles for transportation. A firing staff is placed in each box.

a.—Dimensions and weight.

		Inches.	Centimeters.
Exterior dimensions	Length	86.0	218.44
	Width	8.0	20.32
	Depth	7.25	18.40
		Pounds.	Kilos.
Total weight of box with stand and staff		81.5	36.90

5.—ROCKET STICKS AND CHAINS.

1.—*Description.*

The sticks and chains for the 5-centimeter and 8-centimeter rockets are tied in bundles of 4 each.

The chains are doubled back and forth the length of the stick, and have the loops fastened to the ends of the stick by twine.

The anchor-rocket sticks are placed in bundles of two each.

2.—*Weights of bundles.*

	Pounds.	Kilogrammes.
For 5cm rockets, 4 sticks and chains	22.25	10.08
For 8cm rockets, 4 sticks and chains	29.0	13.15
For 8cm anchor rockets, 2 sticks and chains	18.0	8.16

IX.—DATE OF MANUFACTURE.

All the German life-saving rockets, 5-centimeter, 8-centimeter, and 8-centimeter anchor rockets were fabricated in 1877. The rockets were packed in December, 1877, as shown by the labels.

X.—GERMAN ROCKET LINE.

This rocket line is made of hemp. The line is twisted, and is made with three strands, each composed of four yarns. The diameter of this line is 0″.31, or a little greater than "No. 9 Silver Lake braided cord." The rocket line is stowed in the faking box in the usual manner. The combined weight of the faking box and line is 100 pounds, or 9.5 pounds greater than the United States service box A, with a No. 9 linen line.

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XI.—German faking box.

(Plate VIII.)

1.—Description.

These boxes contain the rocket lines, and are similar to those in use in our own service. They differ from the American box in being longer, a little less in width, and far more complicated in construction.

The top has three equidistant transverse cleats on the upper side to strengthen it. A lip at each end overhangs the end of the box. Iron straps attached to the lid and run inside of the box to form the hinges. These hinges are held in position and swing upon iron pins 5″.875 in length, having an eye at one end and a slot at the other. A leather thong is made fast in the eye-hole, and is long enough to pass through the slot in the other end of the pin. This pin is thrust throught the cylindrical heads of the hinge straps on the box and lid, and the thong is passed through the slot to secure the pin in position. This arrangement admits of the top or lid being removed entirely when desired. Two slotted straps or hasps attached to the front side of the lid engages the staples on the front of the box. The body of the box is rectangular in shape, open at the top and bottom, and of sufficient depth to contain the faking pins and line.

The staples on the front side of the box are seated upon iron plates 2″×1″.5. The plates are let into the wood a distance equal to their thickness, and are held in place by four short screws, one at each angle or corner. These are of one-fourth inch iron wire, bent to the required form, and passed through staples attached to thin iron plates 4″.5×2″.125 screwed to the box. Near the lower edges of the ends, midway between the sides, are two plates carrying the iron hooks that engage corresponding staples on the frame and attach the box to the frame.

The frame is made of 1″.25 lumber, and is 46″.5 in length by 17″.375 in width. The width of the side and end pieces is 4″.5. Holes are bored and tapped to fit the screw-thread tenons of the faking pins in both the side and end pieces. There are sixteen pins on each side and four at each end—forty in all. The false bottom is pierced with holes corresponding to the number of faking pins, and is permanently attached to the bottom of the faking box.

The corners of the body of the box are covered with sheet-iron angle-pieces. The corners of the lid are similarly protected.

The total weight of the faking box and rocket line is 100 pounds. The faking box is made of hard pine, and painted lead color.

For further details and dimensions, see Plate VIII.

XII.—Method of using the German rocket apparatus.

The apparatus is supposed to be at the firing point. First remove the rocket stand from its box, spread the legs, and place the stand with the axis of the trough pointing in the desired direction. Then give the proper elevation by raising or lowering the front end by means of the legs.

A quadrant or combination level is used to adjust the elevation. Place the faking box several feet in front of the stand, turn it upside down, remove the frame and pins. Incline the box to the front with its length in the direction of the line of fire, and place the frame transversely on edge beneath the rear end of the box, to preserve the proper

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inclination towards the front. Then screw a rocket stick into the base of one of the rockets, put the chain in the slot at the front end of the trough of the stand, and lead it along the bottom of the trough. Place the rocket in the trough over the chain, drawing the latter taut, and allow the end of the stick to abut against the plate at the lower end of the trough; carry the other end of the rocket chain to the front and tie the rocket line to the ring. The rocket is now ready to be fired.

Take a *pillenlicht* and put the square end in the clamp of the firing staff, which brings the end with the fulminating primer to the front. Next place the bell-shaped mouth of the firing lock, with the firing pin withdrawn, over the outer end of the *pillenlicht;* press the thumb upon the rear end of the firing lever. This action relieves the firing pin, the spiral spring throws it to the front, exploding the primer, which sets the composition on fire. Approach the rocket stand, extend the firing staff until the burning *pillenlicht* comes in contact with and ignites the fuse in the base of the rocket. After seeing that the fuse is properly ignited, stand clear of the apparatus.

XIII.—ACTION.

As soon as the fuse burns up to the base of the rocket, the composition takes fire, and the rocket, guided by the inclined trough of the stand, is launched to the front, carrying with it the stick, chain, and rocket-line. The object of the stick is to give steadiness to the flight, that of the chain to preserve the line from being burned off by the flames issuing from the rocket.

XIV.—COST OF GERMAN LIFE-SAVING APPARATUS (1875).

Articles.	Cost. German reichs-marks.	Cost. United States dollars.
Life saving rocket (8 centimeter) carrying line 1,400 feet	24.20	5.808
Life saving rocket (5 centimeter?) carrying line 1,000 feet	15.00	3.60
Anchor rocket, 1,400 feet	101.00	24.24
One shot line, 1,600 to 1,700 feet long (extra made)	60.00 70.00	14.40 16.80
Double hauling line	113.00	27.12
Large hawser, 1,000 feet long	216.00	51.84
Tongs or nippers for holding cartridge	6.00	1.44
Pistol for firing cartridge (firing lock)	6.66 7.50	1.5984 1.80
Quadrant	9.90	2.376
Iron support (or tripod) for rockets	40.00	9.60
Box for shot line (each)	36.00	8.64

The whole rocket apparatus, placed upon one wagon, with all necessary appurtenances except rockets, costs 4,400 marks = $1,056. Complete double wagon, with appurtenances, costs 3,730 marks = $895.20.

There are three reserve faking boxes for each rocket apparatus.

(N. B.—One German reichsmark = 24 cents, gold.)

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XV.—EXPERIMENTS WITH GERMAN LIFE-SAVING ROCKETS.

EXPERIMENTS WITH LIFE-SAVING APPARATUS AT SANDY HOOK, NEW JERSEY.

1.—RECORD OF FIRINGS WITH GERMAN LIFE-SAVING AND ANCHOR ROCKETS AND APPARATUS.

Date.	Number of fire.	Elevation.	Kind of rocket-stand.	Life-saving rocket.				With what fired.	Shot-line.				Range.	Deviation of rocket, right or left.	Drift of shot-line at 300-yard stake.	Wind.	
				Caliber, centimeters.	Kind.	Weight.	Total weight, rocket, stick, and chain.		Material.	Number of line.	Length.	Action.				Direction.	Velocity, miles per hour.
1879.		°	.			*Lbs.*	*Lbs.*				*Yds.*		*Yards.*	*Feet.*	*Feet.*		
Oct. 18	1	32.5	German...	5	German...	10	15.5	Port-fire, Eng.	Dark linen....	4	700	Good	404	87 R.....	56 R.	PLANE OF FIRE W	15.0
18	2	31	....do	5	....do	10	15.5	....do	Linen, W. P..	4½	700	....do	402⅛	103 L	99 L.		15.0
18	3	31	....do	8	....do	35	42 25	....do	...do	6	600	Broken	.....	Left	Left.		11.0
18	4	31	....do	8	....do	35	42 25	....do	....do	6	600	Good	545⅞	103 L.....	88 L.		16.0
20	5	31.5	....do	8	Anchor...	37	46	Pillenlicht....	Italian hemp..	9	600	Tangled and cut.	.....	.....	.....		12 to 8
20	6	31	....do	8	....do	37.75	46.75	....do	Linen.....	10	600	Good	350 to 400	Estimated	.....		12 to 8

NOTE.—The shot-lines used were the Silver Lake Company's braided lines.
Abbreviations: R. = right; L. = left; W. P. = water-proof.

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2.—SYNOPTICAL TRANSCRIPT OF NOTES FROM THE FIRING RECORD.

German life-saving and anchor rockets and stand.

Date.	No. of round.	
1879.		
Oct. 18	1	Service faking box used and placed 2 feet to right of stand, and to the rear, nearly the length of the rocket chain. Action of rocket, good.
18	2	Same remark. A larger line used.
18	3	8^{cm} rocket. Line broke. It is quite probable that the line in vibrating struck a sharp corner on the stand and was cut off, as the faking box was placed to the right and rear, as in the preceding shots. An examination of the frayed ends of the line gave no definite solution of the manner of severance. Spent rocket recovered about 900 yards from the firing point.
18	4	8^{cm} rocket. Used same line as before. Action of rocket, good.
20	5	8^{cm} anchor rocket. Fired out to sea. No. 9 line in loose coils as wound up around hand and elbow. Coils got caught and were carried out to sea in large bunches. The line was cut by drawing through a tangled knot. Range about 250 to 300 yards, estimated—a low estimate. Range much diminished by increased resistance of air due to the large "bunches" in the line.
20	6	8^{cm} anchor rocket. Fired out to sea. Used No. 10 linen line (Silver Lake), which was fired from the original coil. The line ran out well. In hauling in on the line it was estimated that the anchor slipped about 60 feet before it caught in the bottom and held. Life-boat of Station No. 1, District 4, New Jersey, was launched and hauled out to the anchor by the rocket line. The anchor rocket was hoisted into the boat and the latter hauled nearly to the shore by the line. The sea-water left the line stiff and difficult to handle; it could not be coiled easily.

NOTE.—In the German method of using the apparatus the rocket chain is laid along the bottom of the trough of the stand under the rocket, and then, falling downward, is led to the front, where the faking box and line are placed. In the above trials the box was placed to the rear and a little to one side, to see whether the stand interfered with the running out of the line. In this instance the chain had to be led to the rear.

PART IV.

ENGLISH LIFE-SAVING ROCKET APPARATUS.

I.—ENGLISH LIFE-SAVING ROCKET.

(Plate IX.)

1.—DESCRIPTION.

The 12-pounder rocket used by the English coast-guard service is the invention of Colonel (since General) Boxer, R. A. Three different patterns of these rockets have been made and issued. The one now in use is known as "Mark III."

The Boxer rocket is composed of a head, head clip, body, base clip, base plug, and diaphragm.

The head is hemispherical in form, with a cylindrical tenon that fits in the front end of the rocket case.

The head clip nearly envelops the front end of the rocket case, with its forward edge, coincident with the exterior junction of the case and head. On one side of the case the iron strap forming the head clip is bent outwards to form a short rectangular tube, whose axis is parallel to that of the rocket.

This short tube receives the front end of the rocket stick.

The body of this rocket consists of two cylinders of sheet metal (Bessemer). These cylinders are placed end to end with their axes coincident with the same straight line. The front cylinder is shorter than the other, to which and the inner diaphragm it is joined by screws passing through cases into the diaphragm.

The front cylinder is filled with rocket composition to within 0$''$ .4 of

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its front end. A conical-shaped cavity is left in the axial portion to furnish a large surface of inflammation.

The rear cylinder is filled in a similar manner with composition, leaving a solid portion of this composition at the front end between the two cavities 1″ .2 in thickness. The cavity or "bore" of the rear cylinder is also conical in shape. The base clip is analogous to that at the head, but is longer. It nearly surrounds the rear end of the rocket and has a rectangular tubular projection on one side in line with that of the head clip. The base plug closes the rear end of the cylinder and is pierced with an axial vent one inch in diameter, through which the gas escapes after the ignition of the composition.

The diaphragm is placed between and inside of the two body cylinders, and performs the same functions for the front cylinder that the base plug does for the rear one, and in addition serves as a seat for the assembling screws. A paper cap covers the vent, which must be broken before firing.

The rocket cases are protected on the inside from the action of the composition by a coat of anti-corrosive paint; the outside is protected and blackened by burning off oil. Since 1870 the exterior of the case is still further protected by two coats of red paint.

2.—DIMENSIONS AND WEIGHT.

Boxer rocket.

			Inches.	Centimeters.
Total length			25.0	63.50
Radius of head			1.5	3.81
Diameter of rocket case	Exterior		2.75	6.98
	Interior		2.6	6.6
Length of front cylinder			9.3	23.62
Length of rear cylinder			14.2	36.06
Head clip	Length		1.5	3.81
	Rectangular projection	Width	1.3	3.30
		Depth	1.2	3.05
Base clip	Length		2.5	6.35
	Rectangular projection	Width	1.5	3.81
		Depth	1.3	3.30
Length of clip pin			*0.85	2.15
Diameter of vent			1.0	2.64
			Pounds.	Kilograms.
Weight of rocket			14.25	6.46

*Length of clip pin before bending, 1″.2. Size of wire, No. 8 Birmingham wire gauge.

II.—PACKING.

The Boxer rockets are packed in rough lumber boxes containing six rockets each. The boxes are not painted.

III.—DATE OF MANUFACTURE.

The rockets presented for trial were made in 1877, and had the stamp of the royal laboratory at Woolwich on the packing boxes.

IV.—PAINTS.*

Red for outside of case of Boxer life-saving rocket.

	Pounds.	Ounces.
Lead, red	3	0
Lead, white	1	0
Litharge	0	4
Copperas	0	2
Oil, linseed, boiled	1 pint.	

*These were obtained from "Treatise on Ammunition, 1874," by Maj. W. R. Barlow, R. A., p. 298.

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Anti-corrosive paint for inside of Boxer life-saving rocket cases.

Copal varnish, pints	0.25
Gold size, pints	1.0
Turpentine, spirits, pints	1.25
Lead, white, dry, pounds	7.0

V.—ROCKET STICKS.

(Plate IX, Fig. 5.)

1.—DESCRIPTION.

These are made of pine and are 9 feet 6 inches in length. The portion of the stick that extends through the clips along one side of the rocket is square in cross-section with a groove on the side next to the rocket to fit the curvature of the case. The stick in rear of the rocket is octagonal in cross-section. The lower end of the stick is surrounded by an iron ferrule.

Two plates are placed, one at the upper end of the stick and the other at a distance from that end equal to the distance between the clips on the rocket. The lower plate has a small flange that brings up against the lower clip when the stick is inserted in position for firing; both plates are hollowed to fit the rocket case.

An iron clip pin, with the head bent at right angles, is inserted in a hole through the stick in front of the base clip, to prevent the withdrawal of the stick in firing.

The stick is partially surrounded for 18″ below the vent by a sheathing of tin to protect it from the burning gases.

Axial holes are bored in each end of the stick for the attachment of the line. These holes are curved outward from the axis until they reach the exterior of the stick on the same side. The holes are smoothed by passing a red-hot iron through them, charring the wood. The sticks are unpainted, and are packed in bundles of six (6) each.

2.—DIMENSIONS AND WEIGHTS.

	Inches.	Centimeters.
Length (9′ 6″)	114. 0	289. 55
Width	1. 25	3. 17
Thickness	1. 25	3. 17
Number in a bundle	Six.	
	Pounds.	Kilograms.
Average weight of stick	3. 16+	1. 43
Average weight of each bundle	19 to 19. 5	8. 61 to 8. 73

VI.—WASHERS.

Two kinds of washers are furnished with the Boxer rockets, brass and vulcanized India rubber. In firing, these are placed between the knot on the end of the rocket-line and the front end of the stick. The object of the washers is "to reduce the effect of the sudden jerk which is given to the line when the rocket is fired."

1.—DIMENSIONS.

		Inches.	Centimeters.
a. Brass washer	Diameter	1. 0	2. 54
	Thickness	0. 15	0. 38
	Diameter of hole in center	0. 5	1. 27
b. Rubber washer	Diameter	1. 0	2. 54
	Thickness	0. 7	1. 78
	Diameter of hole in center	0. 5	1. 27

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VII.—ENGLISH LIFE-SAVING ROCKET-STAND.

(Plate X.)

1.—DESCRIPTION.

This stand is known as the Boxer rocket machine or stand, "Mark IV." The material is sheet iron, except the legs, which are of wood. This stand is lighter and simpler in construction than the older forms.

The principal parts are an open rectangular trough or body, a curved trough, called by the English "a pry pole," a horizontal axis, two legs, and a graduated arc made of brass.

The rectangular trough or body receives the rocket. Its width is less than its depth. The front end is stiffened by a narrow iron strap around the outside. The upper edges are rolled over wire for the same purpose. Near the rear end, on each side, are cut sub-elliptical holes to admit the port fire in firing the rocket.

The body and pry pole are connected by pieces of wrought iron, rivets, and braces. There are two of the latter, one on each side. Two pieces of wrought iron project from the rear end of the rectangular trough and have holes bored to receive the horizontal transverse axis.

The long rounded trough or pry pole extends into the rear end of the body for a short distance. The upper edges of the pry pole are rolled over a large wire to stiffen them, and the trough is still further strengthened by a wrought-iron bar 0″.5 thick, running along the bottom the whole length.

The lower or rear end of this bar is decurved and pointed to form a ground spike or foot. A strap with a buckle on the end is riveted to the pry pole near the rear end, for the purpose of binding the legs to the pry pole when they are folded up for transportation.

The horizontal axis has a small swinging tablet below, through which are pierced two holes for rivets for the legs. The latter have a lateral motion upon these rivets as axes.

The legs are made of tough wood. They have wrought-iron heads or sockets with slotted projections to embrace the tablet pendent from the horizontal axis. Ferrules envelop the lower ends, which are armed with pointed spikes in order to secure a firm hold in the soil when placed in position.

On the right-hand side of the body, between the opening and the front end, is placed a sheet-brass quadrant (Fig. 2), graduated and marked from 0° to 35°. The limits of elevation that can be obtained with this stand, due to its construction, are from 17°.5 to 40°. At the center of this arc is a rivet with a projecting head, around which is fastened a short string with a minute pear-shaped plumb-bob dependent.

On the left-hand side of the body trough and parallel to its axis are the words "Life-Saving Apparatus," painted in white letters.

On the projection for the horizontal axis on the same side are painted the characters "IV," that designate the model of the stand.

Near the head of one of the legs is the date of fabrication, "1873."

The whole stand is painted lead color.

The rocket stand is packed for transportation in a long, narrow box, made of rough lumber.

The contents of the box are marked upon the exterior.

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2.—DIMENSIONS AND WEIGHTS.

			Inches.	Centimeters.
Total length of stand			116.0	294.63
Body	Length		27.75	70.45
	Width	Exterior	3.5	8.89
		Interior	3.	7.62
	Depth	Exterior	4.	10.16
		Interior	3.875	9.82
	Length of rear projections		1.7	4.32
	Size of openings in sides	Length	4.4	11.17
		Width	2.4	6.09
	Distance of front end of opening from rear end		7.25	18.41
	Distance from lower edge of opening to bottom		0.8	4.57
	Distance pry pole inserted from rear end		7.25	18.41
	Distance between bottom of pry pole and bottom of body		2.7	6.86
Pry pole	Length		95.5	241.42
	Interior width		1.5	3.81
	Depth	Exterior	2.	5.08
		Greatest interior	1.5	3.81
	Length of chord of ground spike		3.0	7.62
	Distance of strap and buckle from rear end		46.0	116.84
Axis and tablet	Length		3.5	8.89
	Depth		2.6	6.6
Legs	Total length		61.125	155.24
	Length of slotted projection		2.0	5.08
	Diameter of socket	Upper end	1.0	2.54
		Lower end	1.4	3.55
	Ferrule	Diameter	1.4	3.55
		Length	1.5	3.81
	Length of spike		3.125	7.92
Packing box	Length		121.0	307.83
	Width		6.0	15.24
	Depth		6.5	16.51
			Pounds.	Kilograms.
Weight of English rocket stand			30.0	13.6
Weight of English rocket stand and packing box			73.5	33.34

VIII.—ROCKET FUSE.

The life-saving rocket fuse is a frustum of a cone in shape, made of paper and covered with kamptulicon. It is 1″.5 long and fits the vent in the base of the rocket, which is 1″.0 in diameter. The fuse is covered with a paper cap tied on with twine.

The bore of the fuse is filled with about an inch of ordinary fuse composition and burns about five seconds. The paper cap may or may not be removed before firing. The fuse is ignited by means of a port fire.

IX.—PORT FIRE.

The Boxer port fire for life-saving apparatus has a total length of 9″.3, and is cylindrical in form. The exterior diameter of the case is 0″.7. One end is closed with a tin cap and a piece of kamptulicon; this cap is 0″.5 long and 0″.8 in exterior diameter.

On one side the tin band of the cap is perforated to admit a detonating primer that enters a small space under the kamptulicon, and fires the priming of mealed powder. The exterior surface of the port fire is painted flesh color. A circular black spot on the cap indicates the position of the hole for the detonating primer. The time of burning of this port fire is six minutes.

1.—PACKING PORT FIRES.

The port fires are packed in tin cylinders, containing 25 port fires each. These cylinders are 9″.6 in length and 4″.5 in diameter. A paper cylinder lines the inside of the tin one.

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A paper cap pasted on the upper end of the port-fire cylinder bears the following printed upon it: "25 Port Fires, Life-Saving Apparatus, Mark I. Not to be opened until required for use or special inspection." This is followed by the date, government mark, and place of manufacture, thus:

"8 | 9 | 77"
"R ↑ L"

2.—A label pasted upon the cylindrical surface has the following legend printed upon it:

"*To open the cylinder.*—Take hold of the overlapping unsoldered end of the tin band, and tear off the band by a sharp pull or jerk. The pull must be from left to right, with the bottom of the cylinder against the body."

X.—Rocket line.

The English rocket line is a loosely twisted Italian hemp line. No lines were sent with the apparatus received at Sandy Hook.

XI.—Faking box.

The faking-box used in the English service does not differ materially from our own. In fact, our service box was modeled after the English box. None of the latter accompanied the apparatus.

XII.—Wreck light.

1.—DESCRIPTION.

This light is used for illuminating the beach at night in the vicinity of a wreck. It is hung upon a tripod and burns from 24 to 30 minutes. The tripod is a simple affair, consisting of three wooden legs, 6′ 4″ in length, weighing 12.5 pounds. The legs are connected at the top by an iron wire with a hook attached for suspending the light by a wire loop at its upper extremity. Three iron rods hooked to two of the legs form an inclined rest for the light, so that it may "hang in a sloping direction—not vertically downward."

The case is made of six cylindrical lengths of about 4″.5 each, fitted end to end, and held by small tin bands half an inch in width. The joints are soldered. The case is filled with composition, and has the lower end primed with mealed powder and covered with kit plaster.

The method of hanging enables the light to clear itself of dross when burning. The heat of the burning composition successively melts the solder that holds the segments together, allowing the empty ones to fall to the ground, and prevents the partial obscuration of the light.

The following printed directions are pasted upon the exterior of each light:

This light must not be roughly handled or thrown about, as it is liable to be broken across at the junction of the segments. Care must be taken in removing the cap before lighting.

The case must be grasped firmly at the capped end, whilst the cap is torn off by means of the string loop. If there is any difficulty in removing the cap, it must be eased off around the edge by inserting the blade of a knife.

The lights are packed in rough lumber boxes containing three lights each.

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The lights sent to Sandy Hook for trial are known as "Mark II," and were packed in July, 1877.

2.—WEIGHTS.

	Pounds.	Kilos.
Weight of wreck light	11.5	5.18
Weight of box containing three (3) lights	61.0	27.67

Time of burning, 24 minutes and 10 seconds.

XIII.—ROCKET BOXES.

These are oblong rectangular boxes, beveled at the upper end and covered with tarred canvas to render them water-proof. The beveled top has a hinged lid fastened with a hasp, and has a projecting flap of tarred canvas hanging down over the edges to exclude the rain when carried in driving storms.

The capacity of each box is just sufficient to accommodate one rocket standing on end, without the stick. A set of cross belts or kind of harness enables the carrier to sling the box upon his back after the fashion of a knapsack. Four of these boxes accompany each set of rocket apparatus. The weight of the empty box with sling belts is 9 pounds.

XIV.—METHOD OF USING.

With the apparatus on the ground where it is to be used, place the rocket stand in position, giving the necessary elevation by means of the graduated arc on the side of the trough and the plummet.

Take a Boxer rocket, insert the stick through the clips, and drive in the clip pin. Then wet about 12 feet of the end of the line and insert the end through the hole in the bottom of the rocket stick, carry it along the stick to the hole near the upper end, draw it through and put on, first, a rubber washer, and then a brass one, and tie a knot in the end, drawing the whole down snugly upon the end of the stick. It is better to tie a knot in the line after passing it through the hole in the rear end of the stick, so that in case the line burns off between the rocket and lower end of the stick the knot will catch and the line still be carried out.

Remove the paper cap on the base of the rocket and insert a fuse. Place the rocket and stick in the trough of the stand, sliding them to the rear until the base of the rocket brings up against the front end of the curved trough or pry-pole. Put the faking box, slightly inclined to the front, in rear of the stand and a little to one side.

Insert a port-fire in the holder and ignite it with a detonating primer. Advance to the stand, insert the port-fire in the opening on the side opposite to that on which the faking box and line are placed, light the rocket fuse, and retire towards the rear.

XV.—ACTION.

As soon as the rocket composition is ignited and sufficient gas is evolved, the rocket starts, guided by the trough and the rocket stick.

After traversing a part of its trajectory, the composition in the rear cylinder is consumed, the solid part between the cylinders burns through and sets fire to the composition in the forward cylinder, giving a new impetus to the rocket and prolonging the range.

NOTE.—The writer would here acknowledge his obligations to the

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"Treatise on Ammunition, 1874," by Maj. W. R. Barlow, R. A., for much information in regard to the English life-saving rockets and rocket stores.

XVI.—EXPERIMENTS WITH LIFE-SAVING APPARATUS AT SANDY HOOK, N. J.

1.—RECORD OF FIRINGS WITH BOXER LIFE-SAVING ROCKETS AND APPARATUS (ENGLISH).

Date.	Number of fire.	Elevation.	Kind of rocket-stand.	Live-saving rocket.				Primer.
				Caliber.	Kind.	Weight.	Total weight of rocket and stick.	
1879.		°				*Pounds.*	*Pounds.*	
Oct. 18	1	35	Boxer, Mark IV..	12-pounder....	Boxer, III ..	14.25	17.41	Fuse, Mark I.
18	2	35	....do	....do	....do	14.25	17.41	Do.
18	3	30	....do	....do	....do	14.25	17.41	Do.
18	4	30	....do	....do	....do	14.25	17.41	Do.
20	5	29	....do	....do	....do	14.25	17.41	Do.
21	6	30	....do	....do	....do	14.25	17.41	Do.

Date.	Number of fire.	Shot line.				With what fired.	Range.	Deviation of rocket right or left.	Drift of shot-line at 300-yard stake right or left.	Wind.	
		Material.	Number of line.	Length.	Action.					Direction.	Velocity.
1879.				*Yds.*			*Yds.*	*Feet.*	*Feet.*		*Miles per hr.*
Oct. 18	1	Italian hemp....	6	600	Good, but burned off.	Port-fire, English.	.....	.....	.....		15.9
18	2	Linen, W. P	6	600	Good.....	...do	.....	.....	.....		22.5
18	3	....do	6	600	Knotted and burned off.	...do	.....	.....	.....		20.0
18	4	....do	6	600	Good, two knots.	...do	540	241 R.	121 R.		18.0
20	5	Linen, W. P.; new line.	8	600	Good, one knot.	...do	511⅔	172 L.	126 L.		16.0
21	6	Hemp line, Russian rocket.	*8	600	Bad	...do	125	6 R.	.....		16.0



NOTE.—The rocket lines used were the Silver Lake Company's braided lines, except that used for last round. This was a Russian hemp-line, loosely "laid up;" weight, 62 pounds.
R.=Right; L.=Left; W. P.=Water-proof.
*Estimated.

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2.—SYNOPTICAL TRANSCRIPT OF NOTES FROM THE FIRING RECORD.

Boxer life-saving rockets and apparatus.

Date.	No. of round.	
1879.		
Oct. 18	1	End of line attached to rocket was left dry; line burned off.
18	2	Line dry; burned off between the knots; the second knot drew through the hole in the lower end of the rocket stick when the strain came upon the line.
18	3	End of line wet; still it was burned off by the escaping flame from the rocket.
18	4	Good shot; one rubber washer placed below lower knot to prevent cutting the line should the knot be drawn through the hole in the lower end of the rocket stick; when recovered the staff was found to be broken and badly charred; the velocity of the wind at ordnance office, near the firing point, was, at the beginning of the day's experiments, 16 miles per hour; at the close, 14.6 miles per hour; the direction was very changeable; at the last shot the wind along the first half of the trajectory was from the left and front, while it was blowing from the right and front in the farther half at the same time, as shown by the range flags that marked the line of fire.
20	5	No. 8 linen water-proof line used (new); fired from the original coil; rocket carried out all the line except six coils; wet the line below the end of the rocket stick; the line fouled once from the coils catching on each other; one knot formed; the original coil was placed 6 feet to the right of the stand (windward), inclined to the front and backed up by sand; the knot was 200 yards from the firing point; line drifted badly after passing the 200-yard stake, and followed the drift of the rocket closely; rocket stick charred by flame; every coil drawn out put one twist in line.
21	6	Russian rocket line, weight 62 pounds; line twisted, soft-laid, in original coil; many of the coils were loose and were expected to kink, and *did* kink badly; the whirl of the line caught the coil and carried it bodily 100 yards down the range; the second knot was drawn down into the lower end of the stick, splitting it nearly to the ferrule; the rubber washer placed between the second knot and the lower end of the staff probably saved the line from being cut; the short range is accounted for by the resistance due to carrying the whole coil.

PART V.

HOOPER'S LIFE-SAVING ROCKET APPARATUS.

I.—HOOPER'S LIFE-SAVING ROCKET.

(Plate XI.)

1.—DESCRIPTION.

This rocket is a modification of the Hale rocket. The body of the rocket is cylindrical in form, made of sheet metal 0″.165 thick. The point of the rocket or head is ogival in form, made of wood, and has a cylindrical tenon 1″.1 in length, which is inserted into the front end of the body. The head is held in position by several screws passing through the rocket case into the tenon. The rear end of the case is closed by a metallic base carrying a double swivel and perforated with five vents or gas escapes, each one half an inch in diameter. On one side of these vents are fluted projections extending 2″.3 towards the rear, so curved as to leave the opposite sides open for the unimpeded escape of the gases evolved by combustion. The object of this arrangement is to produce a motion of rotation about the longer axis of the rocket, and thus secure greater steadiness of flight. This cast-iron base is held in position by pins passing through the case.

To the swivel is attached a chain a little over 3 feet long, to which the line is made fast. The rocket is fired by breaking the paper covering of one or more of the vents, and inserting a piece of slow match and igniting the outer end.

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2.—PRINCIPAL DIMENSIONS AND WEIGHT.

		Inches.	Centimeters.
Length of body		14.5	36.82
Diameter of body	Exterior	3.75	9.40
	Interior	3.42	8.64
Head	Total length	3.6	9.14
	Length of ogival part	2.5	6.35
	Diameter	3.75	9.40
	Tenon: Length	1.1	2.79
	Tenon: Diameter	3.42	8.64
Length of base outside of case		2.7	6.86
Total length of rocket		19.7	50.03
Length filled with composition		12.0	30.48
Diameter of vents		0.5	1.27
Number of vents		Five.	
Length of chain and swivel		38".5	96.65
		Pounds.	Kilos.
Average weight of rocket and chain		19.25	8.73

For further details in regard to construction, action, and method of using, see Mr. Hooper's description appended below. In that description is included the rocket stand proposed by Mr. Hooper.

No rocket stand was furnished with these rockets, consequently the weight of that portion of the apparatus is unknown.

In the experiment with the Hooper rockets made by the writer, the German rocket stand was used throughout the trial.

II.—DIRECTIONS FOR THE USE OF J. SINGLETON HOOPER'S LIFE-SAVING ROCKET AND STAND.

1. The elevation required for the stand to be ascertained by means of a small quadrant; 25° will carry the line 300 yards with ease.

2. It is suggested, in order to save time, that every rocket line should be spliced to a spring swivel that it might *at once* be attached to the end of the rocket chain.

3. *In all cases three fathoms of the rocket line to be wetted before being attached to the chain.*

4. Place the rocket in the trough or stand with its shoulder against the small iron projection at its base, and the chain hanging down through the slot.

5. To fire the rocket: With a pointed stick break the oil paper covering each of the flange holes, insert into one of them a slow match, light and retire to an angle of 45° to the rear of the stand.

J. S. HOOPER, *R. N.*

(Copy of printed record.)

III.—IMPROVEMENT IN ROCKETS.

Specification forming part of letters patent No. 196019, *dated October* 19, 1877; *application filed May* 22, 1877.

(Plate XII.)

To all whom it may concern:

Be it known that I, James Humphrey Singleton Hooper, R. N., of Sunny Croft, Croxted Road, Dulwich, in the county of Surrey, England, have invented new and useful Improvements in Rockets for saving life and other useful purposes, and in the apparatus used in connection therewith, which improvements are fully set forth in the following specification, reference being had to the accompanying drawings.

This invention has reference to those rockets known as the "Hale rocket," and consists of improvements in the means and apparatus for adapting such rockets to life saving and other useful purposes.

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The object of these improvements is to more readily carry out a line to a shipwrecked or stranded vessel with certainty, and at any angle, according to the distance or height at which it is desired to throw the rocket, and may be used as a means of communication, and for other useful purposes.

To carry out my improvements I insert through the center of the flange or tail-piece of the Hale rocket a small iron, steel, or other metal spindle, with a head to it, the head being for the purpose of resting on a circular bearing, for the purpose of retaining the spindle in position, made in the interior of the flange or tail-piece. The action of the spindle working in this bearing is what I call my "first swivel." To the end of this pin or small spindle, which projects beyond the end of the flange of tail-piece, I attach a swivel bow or other mechanical equivalent being capable of rotation, and this I call the "second swivel," thus making a complete double swivel, to which is attached a short length of chain. The swivel and chain being both clear of the rear fire I can, without burning, attach any description of line.

And in order that my said invention may be properly understood and carried into effect, I will now proceed to describe the same, reference being had to the annexed drawings (Plate XII) and to the letters and figures marked thereon.

Figure 1 represents an external view of rocket known as a "Hale rocket," and shows my improvements attached thereto. Fig. 2 represents a longitudinal section of the same, and shows more fully the internal mechanism and my double swivel. Fig. 3 represents a transverse section of the rear end of the rocket, taken on the line A B. Fig. 4 represents a transverse section through the tail-piece or rotator on the line C D.

To carry out these improvements I insert (for about half its length) through the center or longitudinal axis of the tail-piece or rotator *j* a spindle or bolt, *n*, with a collar or head, *o*, at that end of it which is within the tail-piece or rotator *j*. This tail-piece or rotator is recessed to receive the collar or head of the spindle or bolt *n*, so that the under side of the collar, or head *o*, bears against the shoulder *p*, formed by the recess in the tail-piece or rotator *j*, by which arrangement, though the spindle or bolt *n* is retained in its position in rotator *j*, and securely held within the same by the collar or head *o*, so that it cannot be withdrawn, yet it is perfectly free to turn or rotate on its own axis (after the well-known manner of a journal in its bearing), and this I call, from its having such a rotary action about its axis, my "first swivel." Further, to that end of this same spindle or bolt *n* which projects beyond the tail-piece or rotator *j*, I attach an ordinary swivel bow or shackle, *g*, free to turn or rotate on the aforesaid bolt *n* but securely retained to the same by the nut *r* on the screwed end of the spindle or bolt *n*. This nut is also further secured from unscrewing by the cross-pin *s* passing through the same.

The second swivel (bow) works on the steel bolt in a recess, *g'*, cut in the rear of tail-piece. The swivel is, therefore, safely protected from the back fire injuring its working faces. This last-described swivel bow *g* (or shackle free to turn on its axis) I call my "second swivel," and to it is attached a small length of chain, *t*, to the end of which is fastened one end of the rope or cord to be carried out.

It will be seen by this combination of parts which I have adopted, the greatest liberty is given to the rocket to rotate on its axis free from any impeding action to such rotation by the rope attached as is experienced in the stick rocket at present in use, and to supersede which is one of the real objects of this invention; for in my method the whole

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of the parts, both of the rocket proper and also the double swivel, as well as the chain itself, is equally balanced about the axis of rotation, and therefore these parts do not impede the equal action of rotation, nor tend to cause the rocket to deviate from its true path of flight.

By the double-swivel action of my invention I effectually guard against the danger of one swivel not acting, for should one of them cease to act there is still the other swivel, which is perfectly capable of performing all that is required, so that the first or the second swivel may severally perform, apart from any assistance from the other, its proper office of permitting the rocket to rotate without itself or chain attachment and rope rotating; or they (the swivels) both may share more or less equally between them their functions, thus insuring in my case a perfect swivel-action between the rocket proper and the rope.

The cavity at the back of the head *o* of the bolt *n* is plugged with a plug, *u*, which protects the bolt from damage. This plug *u* is made parallel, and the head u^2 is coned, thereby diverting the fire into the flange holes more readily, and the shoulder under the head, in conjunction with the tight fit, when resting on a similar circular bearing to that on which the bolt-head *n* rests, effectually secures the head of the bolt *n* from damage while the combustion of the composition a^1 is going on in the case *a* during the flight of the rocket, the space between the two bearings being filled with tallow.

Fig. 5 represents a side elevation of the stand from which the rocket is fired, and Fig. 6 the back end view of the same to a larger scale.

This stand consists of two pieces, *v* and *v'*, of wood, iron, or other suitable material (when of the first-mentioned substance they are covered with thin sheet-iron), fastened together parallel to each other, with their upper surfaces inclined to one another about one hundred and sixty degrees, or thereabout. These pieces *v v'* are connected, at three or more places, by semicircular bands or hoops *w*, of iron or other suitable material, which bridge from the outside of one piece, *v*, to the outside of the other piece, *v'*. The near sides of these pieces, *v* and *v'*, are placed at such a distance apart that the chain *t* and rope *x*, connected to the tail of the rocket, may be able to freely pass between them without any danger of its being caught by the sides.

The stand is supported at the front end by two double-jointed legs, *y*, with spikes at their extremities or bases, and is supported at the rear end by two shorter legs, *z*, of iron or other material. There is a small projection, *z'*, on one of the pieces *v* and *v'*, for the rear end of the rocket to rest against when it is fired, which is performed by a slow match or fuse.

Another advantage of my invention is, that the improvements adopted are very light and portable, and require but a simple stand (already described) to fire from, thus doing away with the complicated machinery at present in use with the stick life-saving "boxer" or other rocket.

Having thus described the value and object of my said invention, I claim—

1. The combination, with the Hale rocket, of a swivel, to which the line is attached, secured to the tail-piece of said rocket, whereby the line is carried without being twisted by the rotation of the rocket, substantially as described.

2. The combination with the tail-piece *j*, of the bolt *n*, rotating freely in said tail-piece, and the swivel *g*, secured to the end of the said bolt, constructed and arranged substantially as described and shown.

3. The combination with the tail-piece *j* of the plug *u*, having a conical head, u^2, for protecting the swivel bolt and diverting the fire into

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the flange holes, constructed and arranged substantially as described and shown.

JAMES HUMPHREY SINGLETON HOOPER.

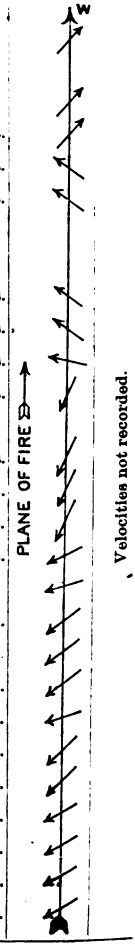
Witnesses:
GEO. DOWNING.
GEO. FORBES.

IV.—EXPERIMENTS WITH HOOPER'S LIFE-SAVING ROCKETS.

EXPERIMENTS WITH LIFE-SAVING APPARATUS AT SANDY HOOK, N. J.

1.—RECORD OF FIRINGS WITH THE HOOPER LIFE-SAVING ROCKET.

Date.	Number of fire.	Elevation, degrees.	Kind of rocket stand.	Rocket, kind of.	Primer.	With what fired.	Where fired.	Line attached or not.	Rocket exploded in air or not.	Wind. Direction.	Wind. Velocity.
1879.		°									
Oct. 20	1	26.5	German	Hooper life-saving.	Slow match.	German pillenlicht.	On beach.	Yes.	No.		
20	2	26.5	do	do	do	do	do	Yes.	No.		
20	3	26.5	do	do	do	do	do	Yes.	Yes.		
21	4	32	do	do	do	do	do	Yes.	Yes.		
21	5	32	do	do	Train quick match.	do	do	Yes.	Yes.		
21	6	32	do	do	do	do	do	Yes.	Yes.		
22	7	30	do	do	do	do	Out to sea.	No.	Yes.		
22	8	30	do	do	do	do	do	No.	Yes.		
22	9	30	do	do	do	Port-fire, U. S.	On beach.	No.	Yes.		
22	10	30	do	do	do	do	do	No.	Yes.		
22	11	30	do	do	do	do	do	No.	Yes.		
22	12	30	do	do	do	do	do	No.	Yes.		
Nov. 14	13	30	do	do	do	do	Out to sea.	No.	Yes.		
14	14	30	do	do	do	do	do	No.	No.		
14	15	30	do	do	do	do	do	No.	Yes.		
14	16	30	do	do	do	do	do	No.	Yes.		
14	17	30	do	do	do	do	do	No.	Yes.		
14	18	30	do	do	do	do	do	No.	Yes.		
14	19	30	do	do	do	do	do	No.	Yes.		
14	20	30	do	do	do	do	do	No.	Yes.		
14	21	30	do	do	do	do	do	No.	Yes.		
14	22	30	do	do	do	do	do	No.	Yes.		
14	23	30	do	do	do	do	do	No.	Yes.		
14	24	30	do	do	do	do	do	No.	Yes.		



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2.—SYNOPTICAL TRANSCRIPT OF NOTES FROM THE FIRING RECORD.

Hooper's life-saving rocket, using the German rocket stand.

Date.	No. of round.	
1879.		
Oct. 20	1	Italian hemp line, Silver Lake, No. 7. Rocket carried out about 300 yards of line, when it burned off the line near the chain. Rocket chain too short—length 37 inches. Faking box and line placed at the right of the rocket stand, and a little in rear of it. The position of the box and line appeared to change the direction of the rocket about 20° to the left of the line of fire. The line ran out beautifully until burned off, 300 yards away. No stand furnished with the Hooper rockets; had to use the German stand.
20	2	Same line, in coils, hauled in hand-over-hand. Line broke; probably fouled in the coils and cut by drawing through. Action of rocket good. Range of rocket over 700 yards at least.
20	3	No. 7 line. Line cut by sharp corners on legs of stand. Rocket carried away a piece of the line. Range unknown. Rocket burst in the air beyond the 400-yard stake.
21	4	No. 7 hemp line. Wet 10 feet of the line. Range 175 yards; deviation of rocket to left of line of fire 42 feet. Rocket exploded, blew out front end of the rocket, and dropped to the ground as soon as the explosion took place.
21	5	Same line hauled in hand-over-hand. Rocket blew up in the trough of the rocket stand. Head blew out and rocket fell backward out of the stand.
21	6	Same line. Rocket exploded in the air 150 yards from firing point; carried off piece of line; coils caught. Line cut by drawing through the coils. Range 280 yards. The line lay in loose coils as hauled in.
22	7	No line; rocket exploded in the air.
22	8	No line used from this time until end of experiments with this rocket. Rocket burst in the air 1½ seconds from instant of leaving trough.
22	9	Exploded in 1½ seconds after leaving trough.
22	10	Exploded in the trough ½ second after composition was lighted. The breech was blown out and the rocket-case ruptured from end to end. Gas and sand blown in face of firer, who had a narrow escape from being seriously injured.
22	11	Long trains of quick match used from this time out to enable firer to reach a safe distance. Rocket exploded about 300 yards out. Flight of rocket regular until it burst. Time lost.
22	12	Rocket exploded 20 yards in front of stand.
Nov. 14	13	Rocket exploded in the air.
14	14	Fired out to sea; good range. Rocket did not explode.
14	15	Burst immediately in front of stand.
14	16	Rocket burst 200 yards out.
14	17	Burst short distance in front of stand.
14	18	Burst 20 yards in front of stand.
14	19	Rocket burst 30 yards in front of stand.
14	20	Rocket exploded in front of stand.
14	21	Same remark.
14	22	Rocket exploded 50 yards in front.
14	23	Rocket exploded in the air.
14	24	Rocket exploded in the air.

PART VI.

CONCLUSION.

I.—RECAPITULATION OF WEIGHTS.

1.—*Russian life-saving rocket apparatus.*

	Pounds.	Kilos.
Weight of rocket and stick	25.5	11.56
Weight of rocket stand	39.0	17.69
Weight of rocket chain	4.625	2.19
Weight of portfire handle	.5625	0.25
Total weight	69.6875	31.69

2.—5^{cm} *German life-saving rocket apparatus.*

	Pounds.	Kilos.
Weight 5^{cm} rocket	10.	4.53
Weight of rocket stick and chain	5.5	2.49
Weight of rocket stand	35.	15.98
Weight of firing staff	2.	0.91
Total weight	52.5	23.91

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3.—8cm *German life-saving rocket apparatus.*

	Pounds.	Kilos.
Weight of 8cm rocket	35.0	15.98
Weight of rocket stick and chain	7.25	3.29
Weight of rocket stand	35.	15.98
Weight of firing staff	2.	0.91
Total weight	79.25	36.16

4.—8cm *German anchor-rocket apparatus.*

	Pounds.	Kilos.
Weight of 8cm anchor rocket	37.375	16.95
Weight of rocket stick and chain	9.	4.08
Weight of rocket stand	35.	15.98
Weight of firing staff	2.	0.91
Total weight	83.375	37.92

5.—*English life-saving rocket apparatus.*

	Pounds.	Kilos.
Weight of rocket	14.25	6.46
Weight of rocket stick	3.16	1.43
Weight of rocket stand	30.	13.60
Weight of rocket carrying box	9.	4.08
Total weight	56.41	25.57

6.—*Hooper life-saving rocket system.*

	Pounds.	Kilos.
Weight of rocket and chain	19.25	8.73

The other weights in this system are unknown.

A glance at the above figures will show that the great advantage of rocket systems lies in their small weight and extreme portability.

The faking boxes and lines have been omitted in the above comparison, as their weights would differ but little from each other in the several services, provided the same size faking line was used.

II.—Russian rocket apparatus.

The Russian system is the most unwieldy rocket apparatus that was tried. The stand is inconvenient to handle. The tube from its form is liable to be collapsed and disabled. The manner of attaching the chain to the line is objectionable, as it increases the weight of line (already a heavy one, 62 pounds) and faking box. The chains must be spliced to the lines in advance and kept ready for use. Again, the sudden jerk upon the chain as the hook on the rocket stick picks it up is very apt to break the chain, made, as it necessarily is, of a rigid material. The rockets themselves were very unsatisfactory, nearly all of them exploding. In general the case obtained relief from the pressure of the imprisoned gas by blowing out the base. The great number of vents surrounding the screw-hole in the base weakens this part by diminishing the thickness of the walls between the holes. The rupture usually took place through these vent partitions.

The firing record shows that this system is unreliable.

III.—The German rocket apparatus.

None of these rockets failed and the ranges obtained are good. The drift of the rocket from the plane of fire, due to the influence of the wind, is very marked. This is to be expected in any class of projectiles that are growing lighter all the time while describing their trajectories.

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The effect of the wind will be more generally noticeable in the falling branch of the trajectory when the composition is nearly or quite burned out and the rocket is rapidly losing its velocity.

The whole of the German apparatus bears evidences of that careful workmanship and painstaking in details which characterize their fabrications. Every part is substantial and is made of the best material.

The German rocket stand gave universal satisfaction, and was the favorite among the surfmen. These rockets are very expensive, and would make ordinary practice drills very costly affairs. The cost of the rockets is as follows:

5cm life-saving rocket	$3.60
8cm life-saving rocket	5.80
8cm anchor rocket	25.00

It will be seen from the above prices what would be the cost of a single shot with either of the rockets, forming quite a contrast with the ordinary practice shots in the United States life-saving service, which cost less than seven (7) cents each.

In the latter service old lines may be used for practice with light charges. In the case of rockets, where the charges cannot be reduced at will, good lines must be used for the exercises, as old or worn lines would be continually breaking.

It has been recommended that the German rockets be still further tested, which will be done at an early date. The German rockets being so strong and well made have inspired greater confidence in the surfmen of the upper Jersey coast than any of the other rockets. And even with these they prefer to insure safety by retiring to a distance after igniting the fuse.

IV.—English rocket apparatus.

The Boxer rocket is so well known as to require no special mention of its peculiarities. Like all rockets it is somewhat erratic in its flight, and the more so probably from the position of its stick upon the side. It has grave disadvantages in this, that should it, by the wind or from any other cause, veer slightly from its original direction when the second rocket in front ignites, it gives an impulse entirely in the wrong direction. Plate XIII shows the effect on two Boxer rockets arising from winds blowing from right to left. In the first case the rocket "ran up into the eye of the wind," in the second the rocket and line floated off bodily to the left with the wind. This apparatus appears to be too complicated. Too many detonating primers, fuses, portfires, holders, boxes, tin cylinders, washers, and clip pins to suit life-saving crews along our coast. As one surfman aptly remarked while working with it, "there is too much *tender* work about this thing." There is yet trouble in fixing the sticks to the rockets, though the clip-pin holes have been placed in front of the clip.

English officers have found fault with the keeping qualities of these rockets. The effect of storage on those at Sandy Hook will be rendered apparent at the next inspection and trial.

V.—Hooper life-saving rockets.

These rockets failed very badly. Nearly all of them exploded, some of them before leaving the trough of the rocket stand. Several of these

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were very dangerous. Captain Patterson was slightly injured by the explosion of one of these rockets. After that the men all retired to bomb-proofs, and the rockets were fired by trains of quick match.

The heads blew out frequently, but occasionally one was ruptured longitudinally. The chain is too short, allowing the line to be burned off.

These rockets appear to be very carelessly manufactured.

VI.—General remarks.

These trials have shown that life-saving rockets should not be handled by persons unacquainted with the necessity for avoiding jars and shocks. If, in transportation, the packing-boxes are roughly treated, the shocks communicated to the rockets cause more or less vibration, and gradually loosen the case from the composition. This effect is hastened by changes of temperature expanding and contracting the metal cases.

As soon as the composition gets a little loose in the case, cracks are liable to be found extending from the *bore* to the case. These openings allow the fire to penetrate between the rocket-case and composition enveloping the latter in flames, and evolving an amount of gas which the case is unable to sustain. With this violent pressure it is not strange that many of the rockets should burst explosively.

The liability to injury from corrosion where exposed to the moist sea air is always present, no matter what rocket system be used.

In short it may be said that with rockets one never knows what may happen, nor where they will go when fired.

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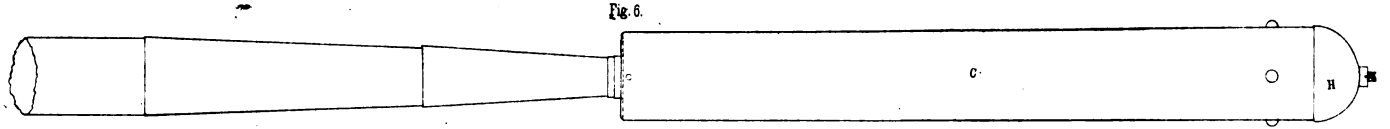


Fig. 6.

Fig. 2.

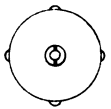


Fig. 3.



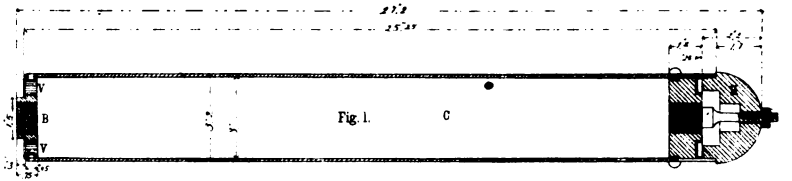
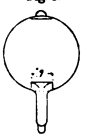


Fig. 1.

Fig. 5.



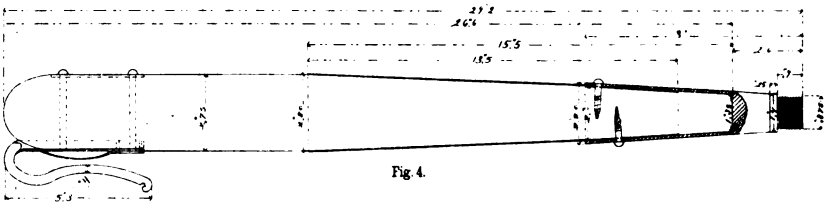


Fig. 4.

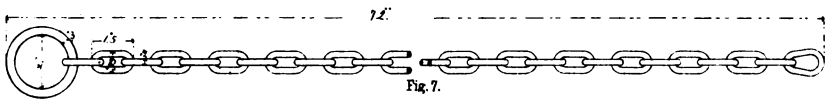
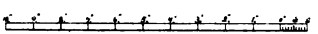


Fig. 7.



LIFE-SAVING APPARATUS.

RUSSIAN LIFE-SAVING ROCKET,

AND

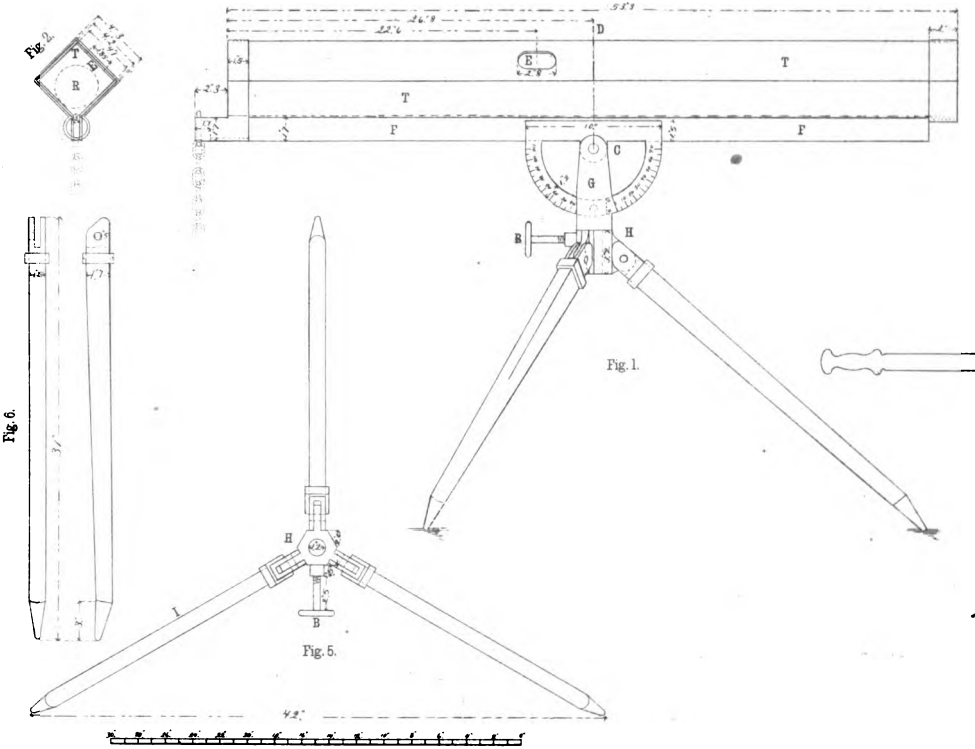
ROCKET CHAIN.

1880.

PLATE I.

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LIFE-SAVING APPARATUS.

RUSSIAN ROCKET STAND,

—AND—

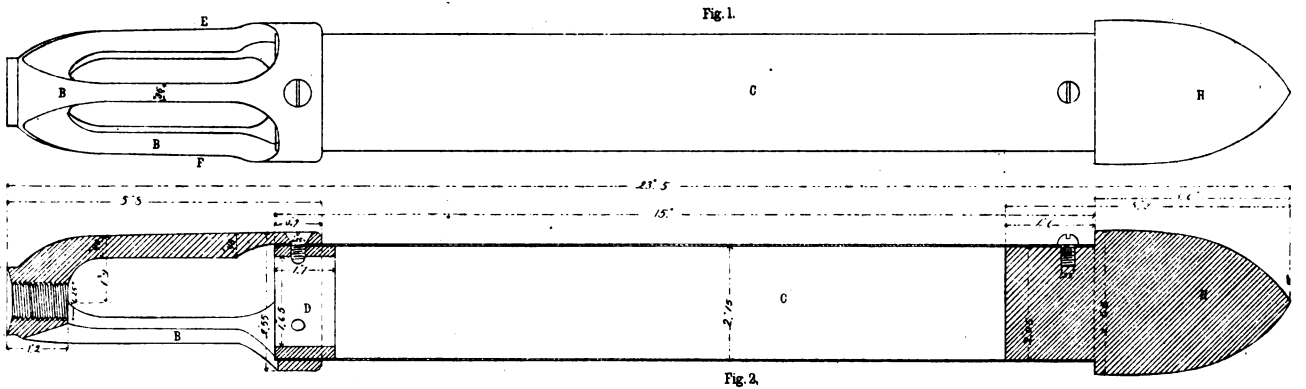
Port-fire Holder.

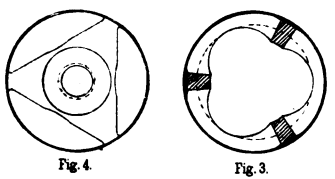
1880.

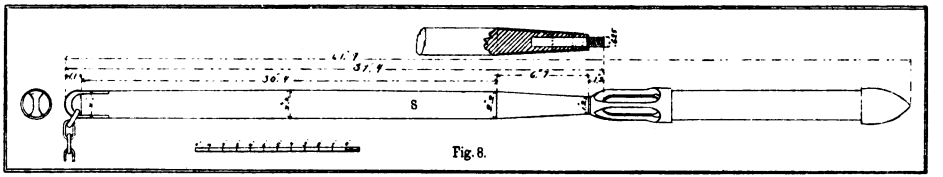
PLATE II.

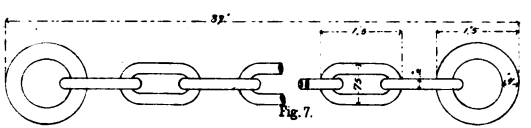
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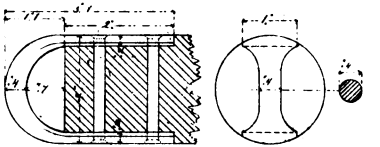
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LIFE-SAVING APPARATUS.

5-CENTIMETER

GERMAN LIFE-SAVING ROCKET,

—AND—

Rocket Stick and Chain.

1880.

PLATE III.

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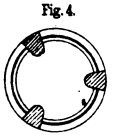


Fig. 4.

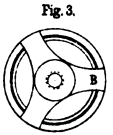


Fig. 3.

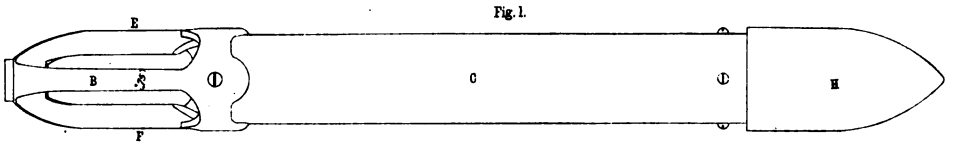


Fig. 1.

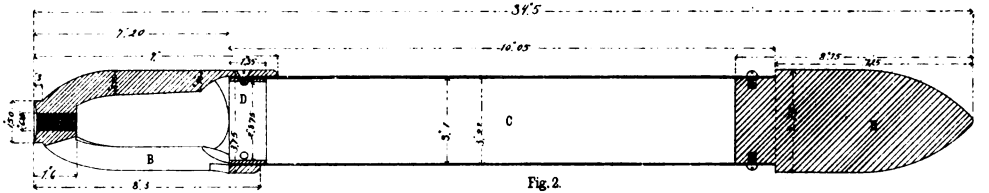


Fig. 2.

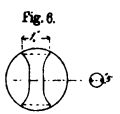


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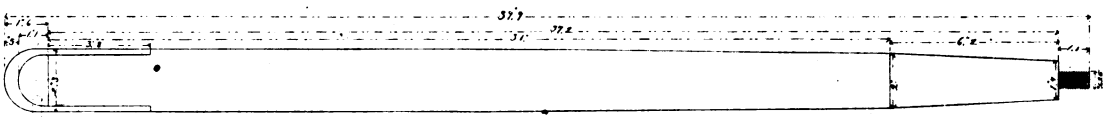


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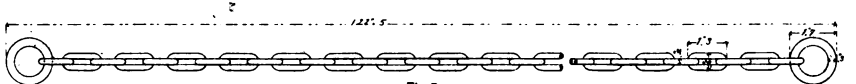


Fig. 7.



LIFE-SAVING APPARATUS.

8-CENTIMETER

GERMAN LIFE-SAVING ROCKET,

AND

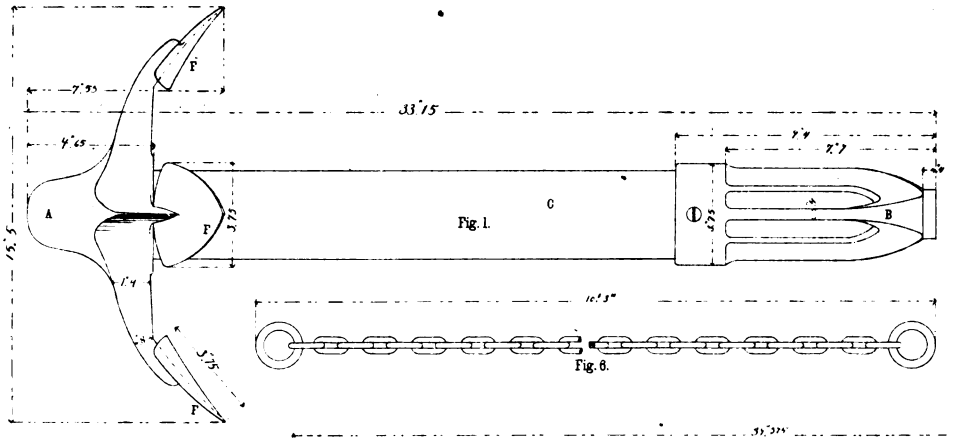
Rocket Stick and Chain.

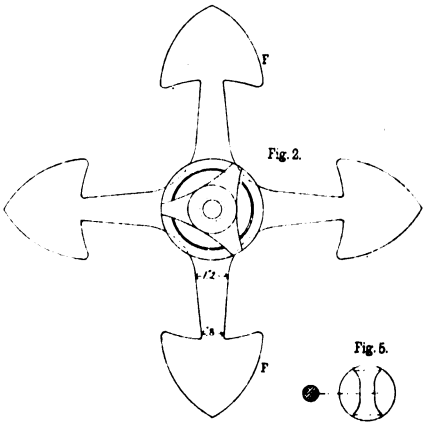
1880.

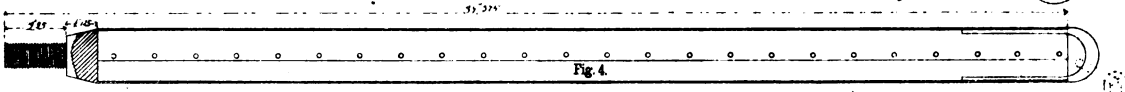
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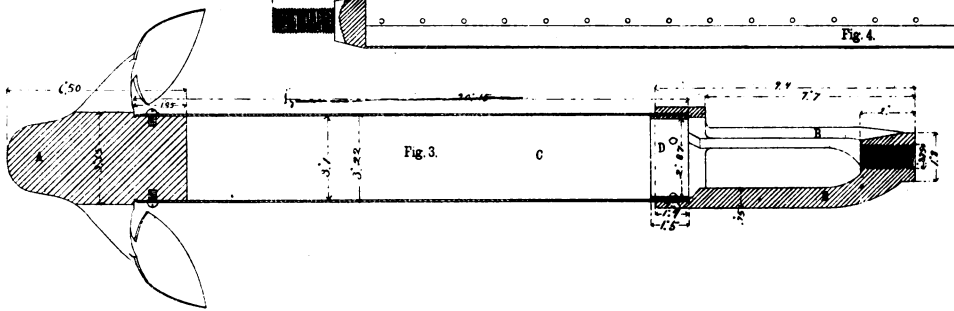
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LIFE-SAVING APPARATUS.

8-CENTIMETER

GERMAN ANCHOR ROCKET,

AND

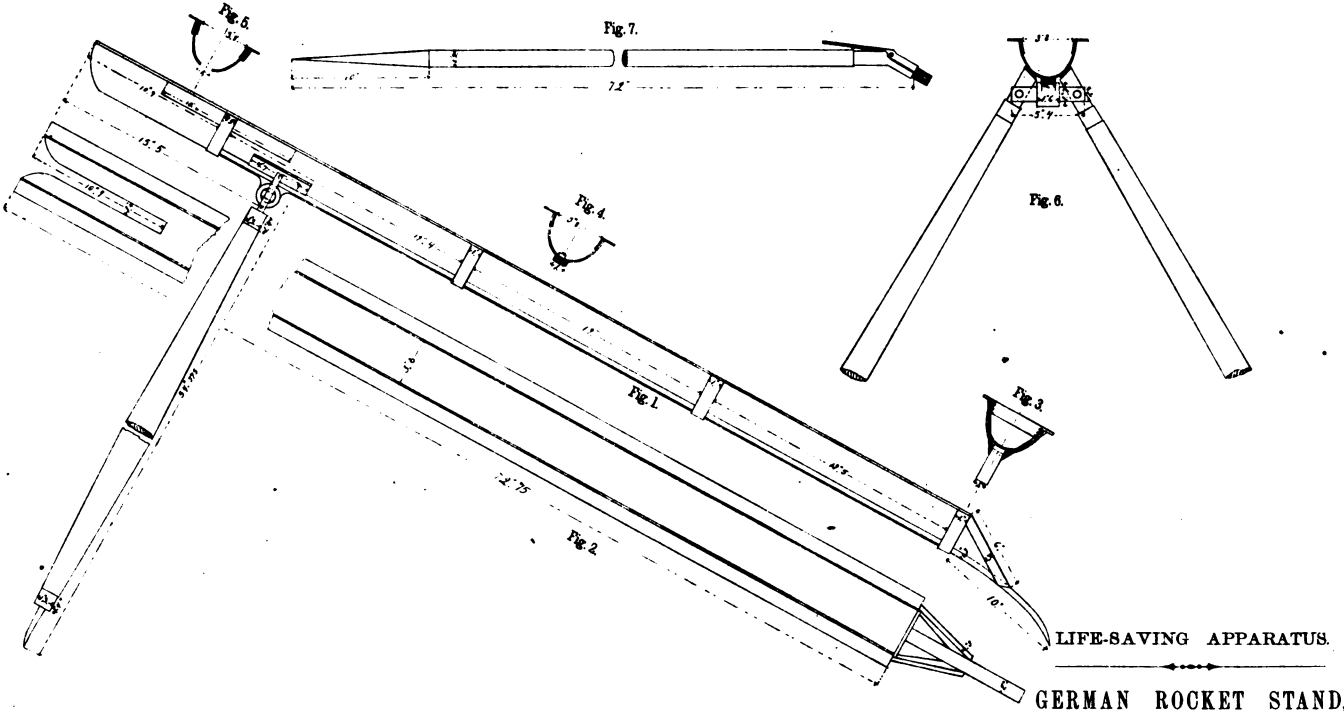
Rocket Stick and Chain.

1880.

PLATE V.

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LIFE-SAVING APPARATUS.

GERMAN ROCKET STAND,

AND

FIRING STAFF.

1880.

PLATE VI.

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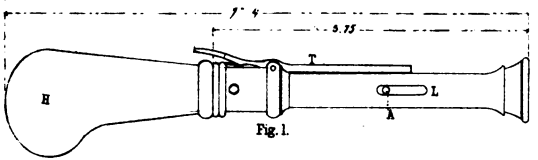


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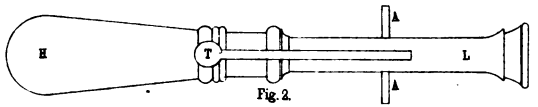


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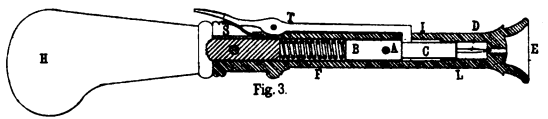


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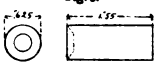


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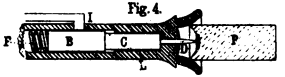


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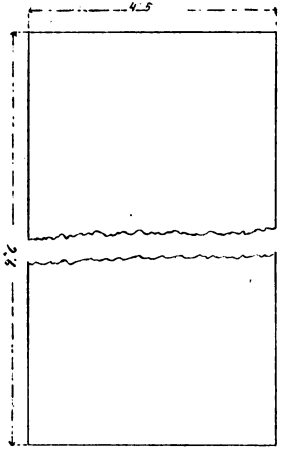


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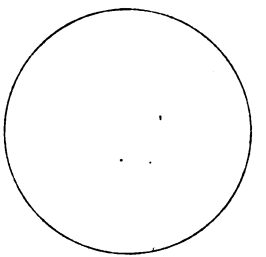




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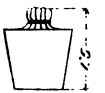
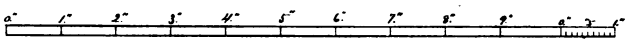


Fig. 8.



LIFE-SAVING APPARATUS.

GERMAN FIRING-LOCK AND PILLENLICHT,

AND

English Port-fire and Port-fire Cylinder.

1880.

PLATE VII.

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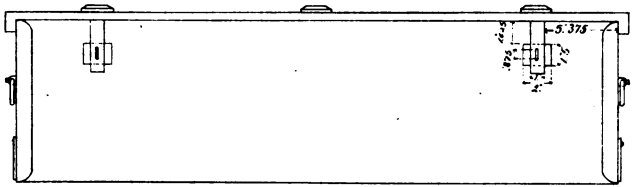


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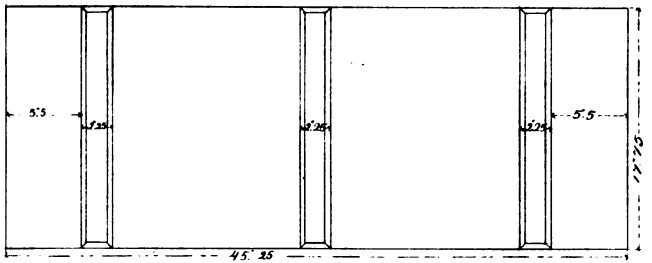


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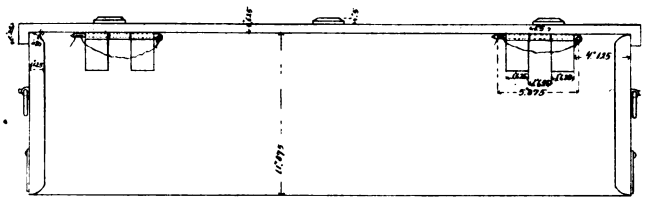


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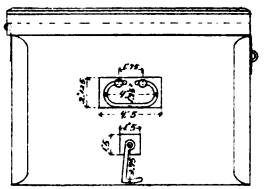


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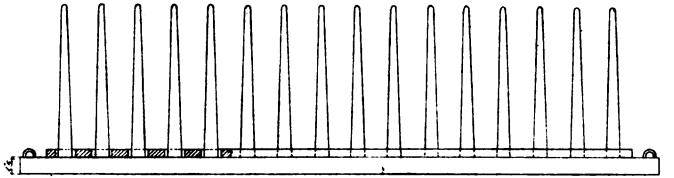


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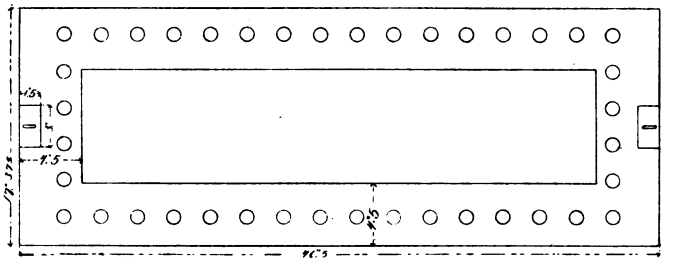


Fig. 6.

LIFE-SAVING APPARATUS.

GERMAN FAKING BOX,

SHOWING

Frame and Faking Pins.

1880.

PLATE VIII.

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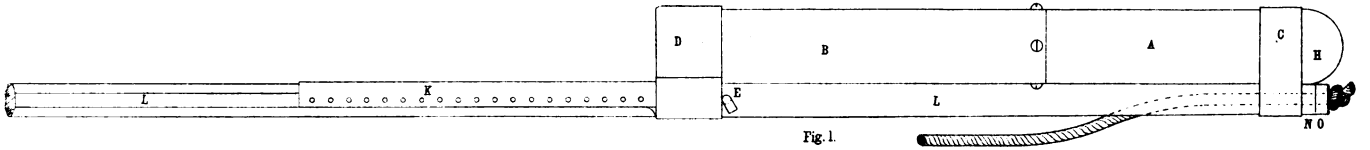


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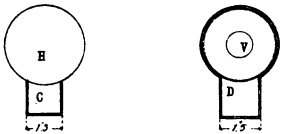


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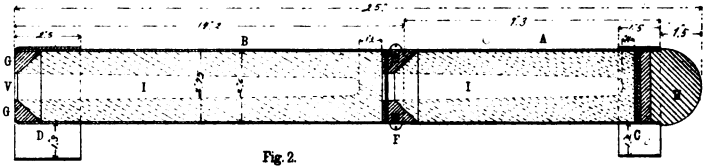


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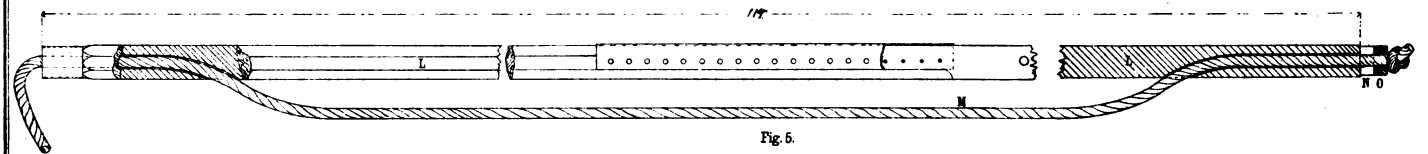


Fig. 5.

LIFE-SAVING APPARATUS.

ENGLISH LIFE-SAVING ROCKET,

AND

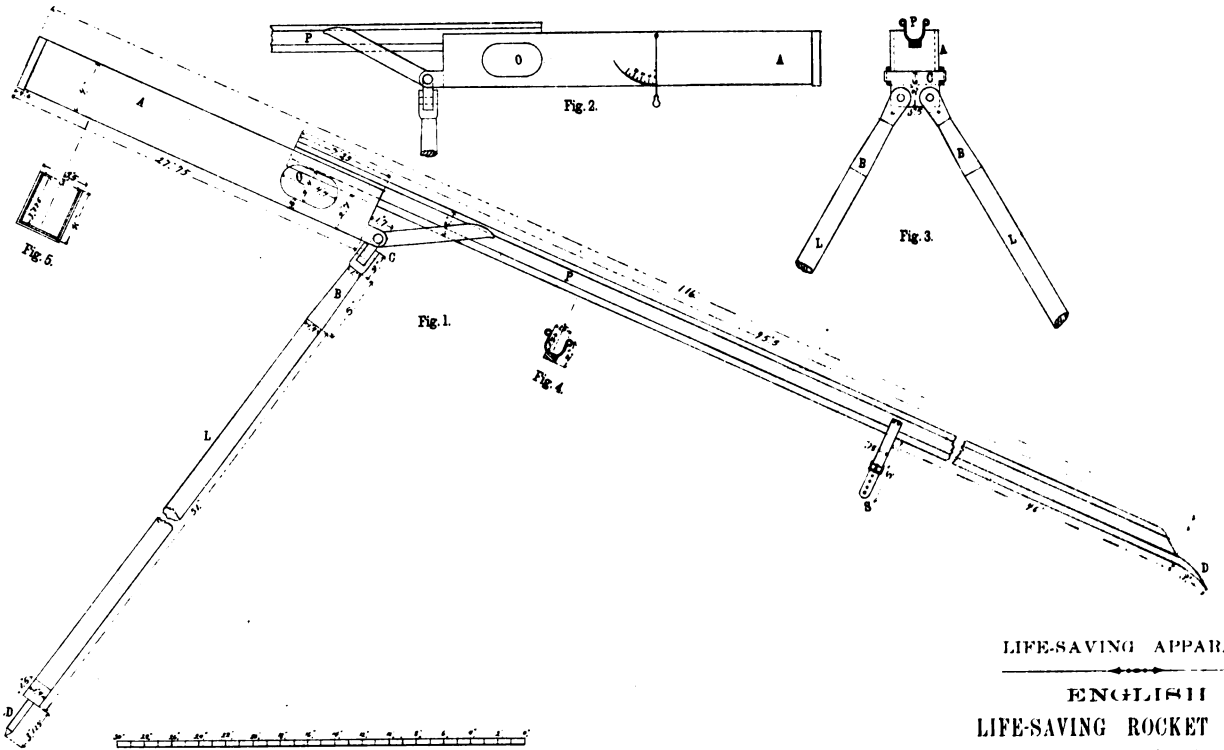
ROCKET STICK.

1880.

PLATE IX.

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LIFE-SAVING APPARATUS.

ENGLISH
LIFE-SAVING ROCKET STAND.

(Weight, 30 Pounds.)

1880.

PLATE X.

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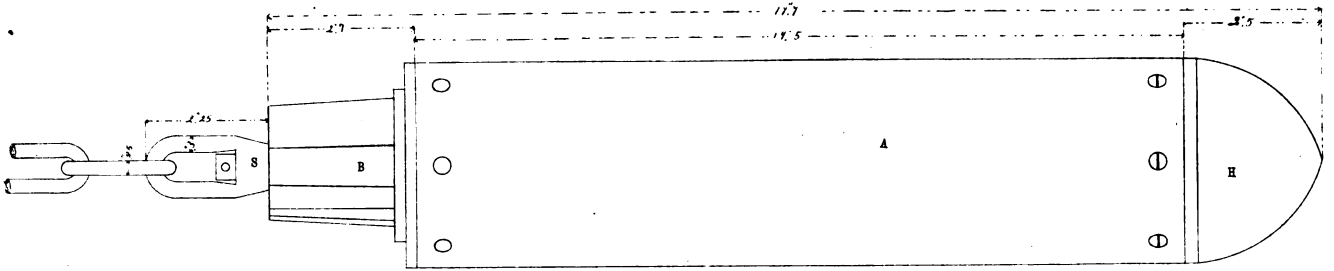


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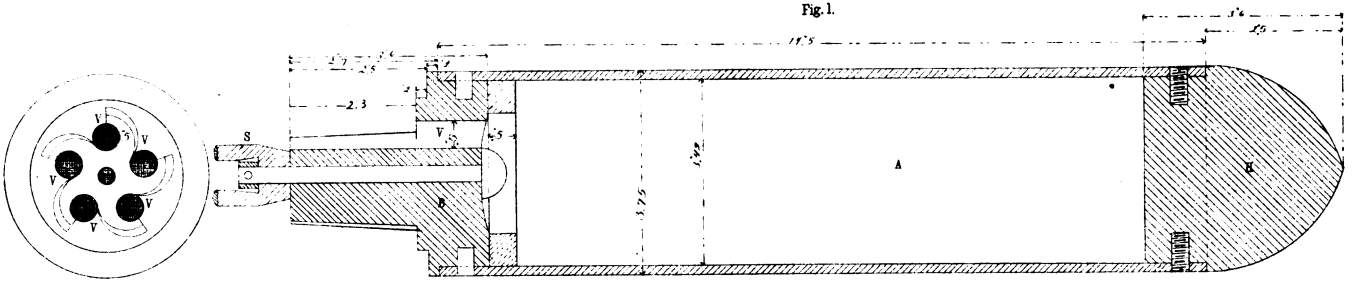


Fig. 3.

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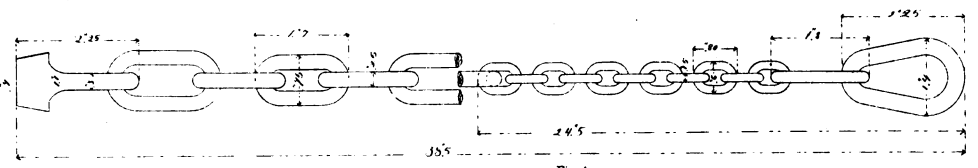


Fig. 4.

LIFE-SAVING APPARATUS.

HOOPER'S LIFE-SAVING ROCKET

And Chain, (English).

1880.

PLATE XI.

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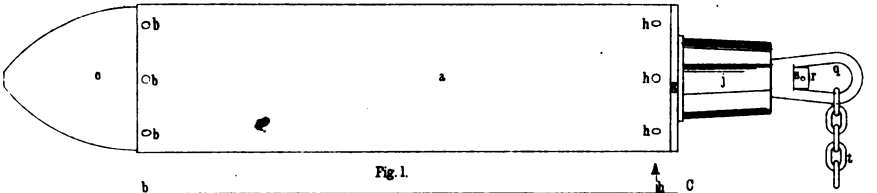


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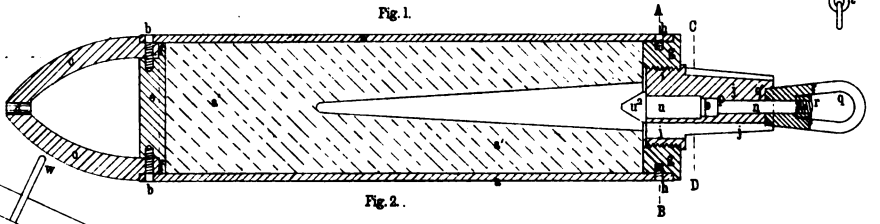


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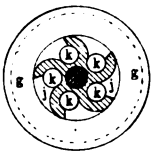


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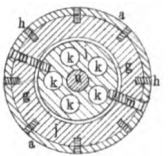


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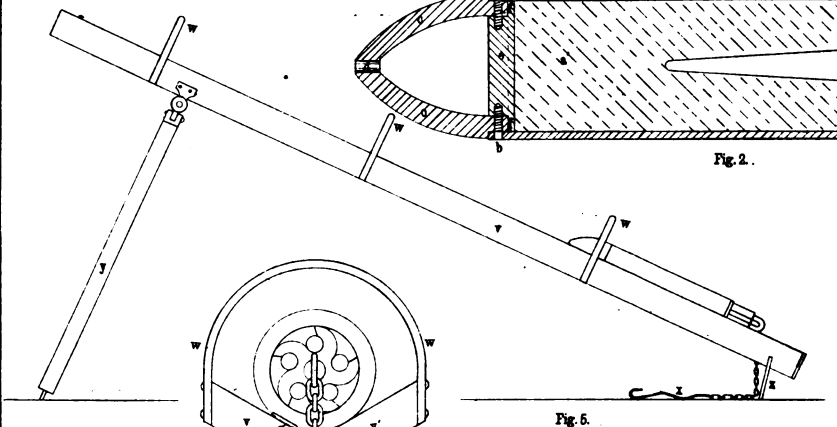


Fig. 5.

Fig. 6.

LIFE-SAVING APPARATUS.

HOOPER'S LIFE-SAVING ROCKET,

AND

Rocket Chain and Stand.

1880.

PLATE XII.

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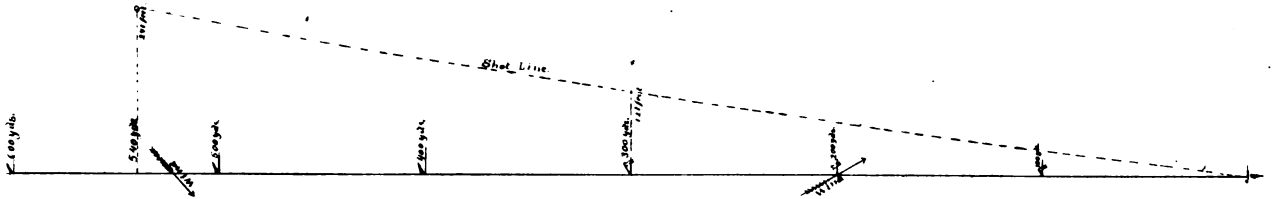


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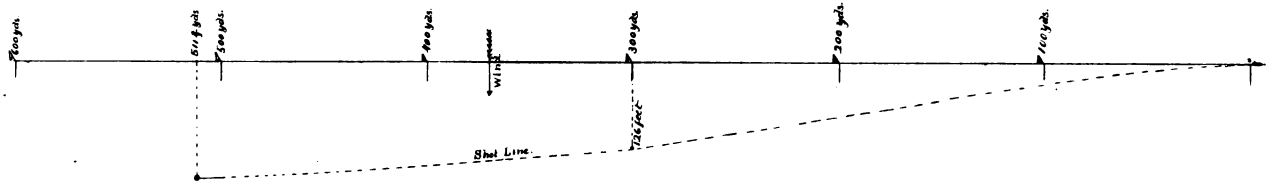


Fig. 2.

LIFE-SAVING APPARATUS.

DIAGRAMS

SHOWING

THE EFFECTS OF THE WIND

UPON THE

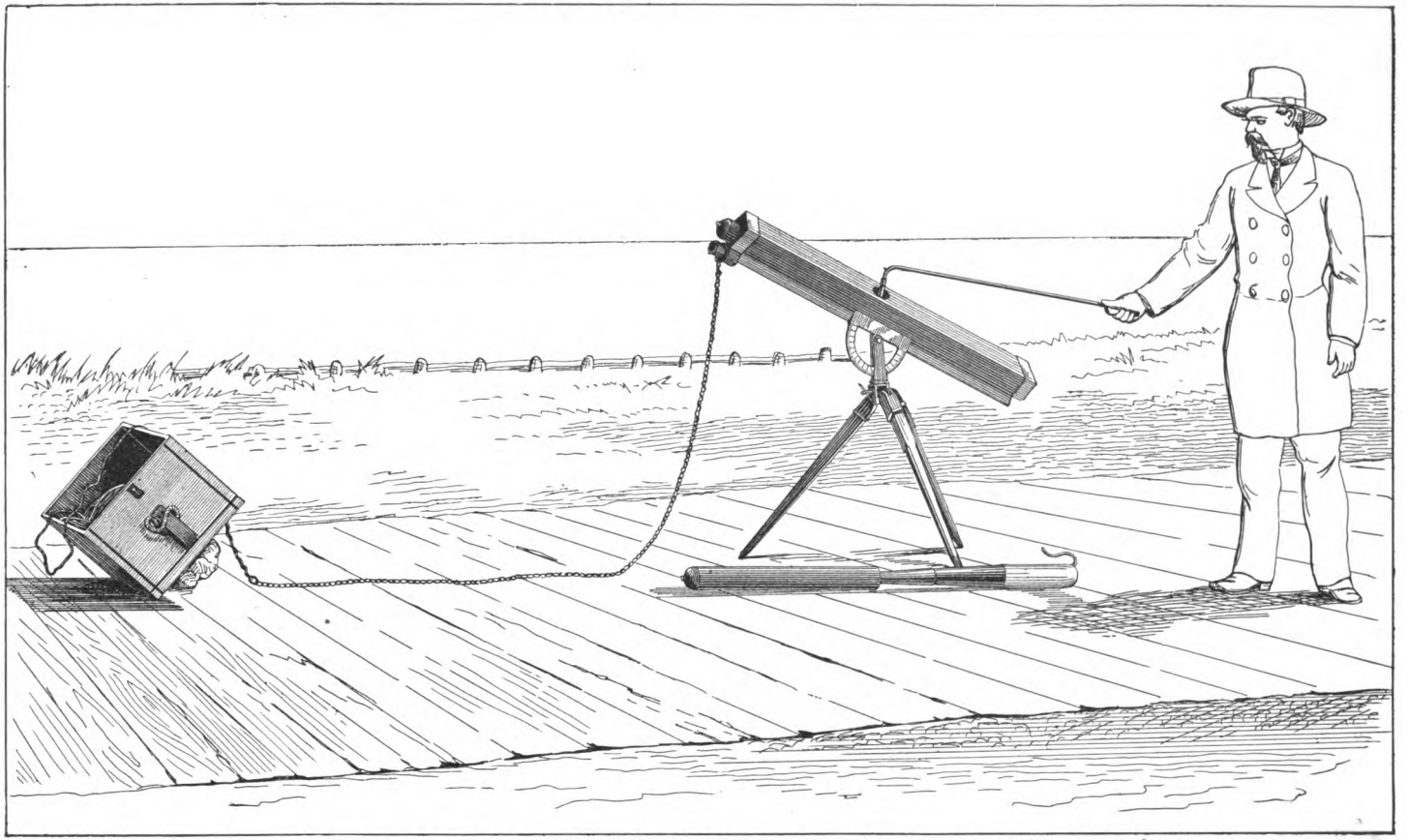
Trajectories of English Life-Saving Rockets.

1880.

PLATE XIII.

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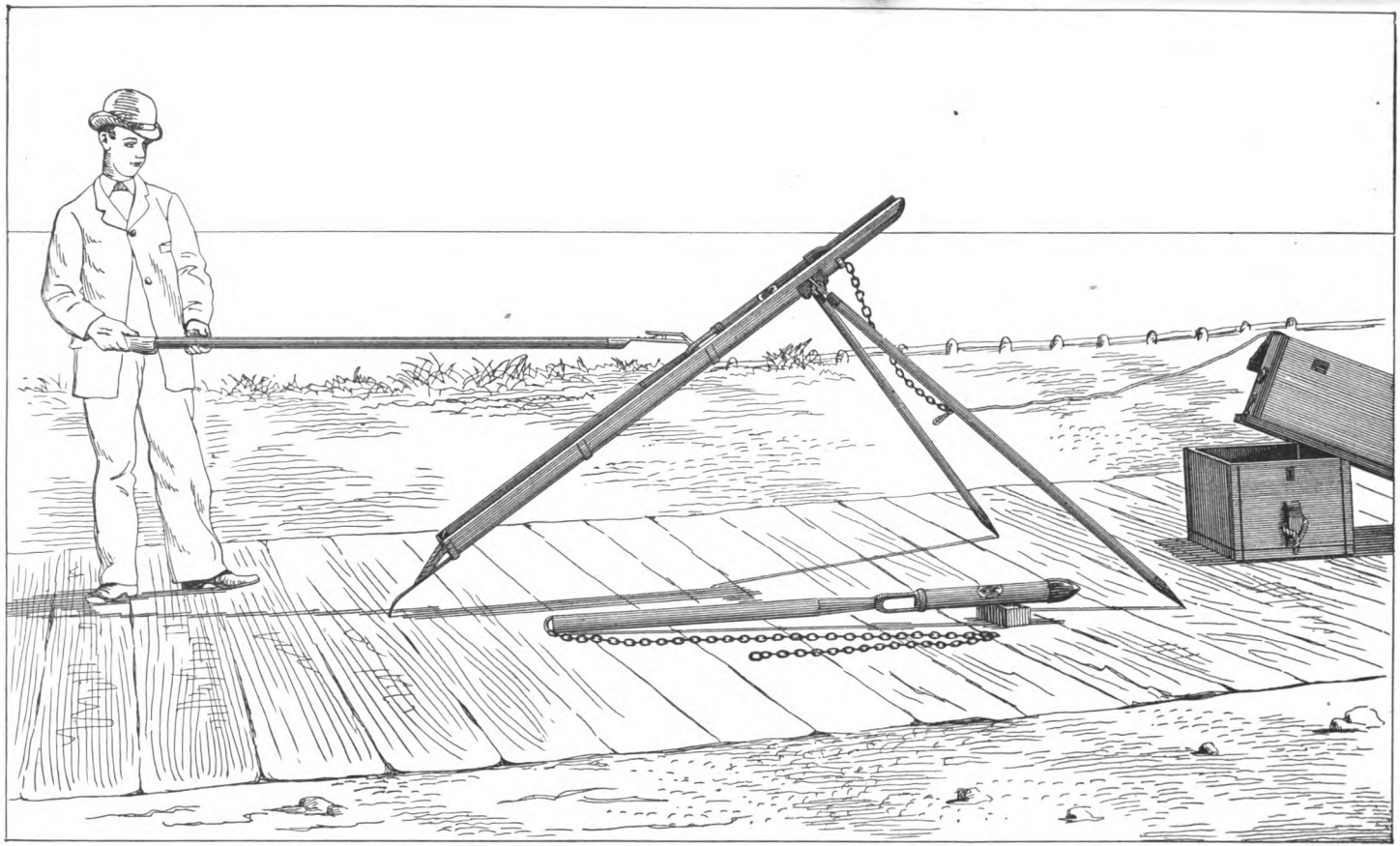


LIFE-SAVING APPARATUS.—Russian Rocket System.

PLATE XIV.

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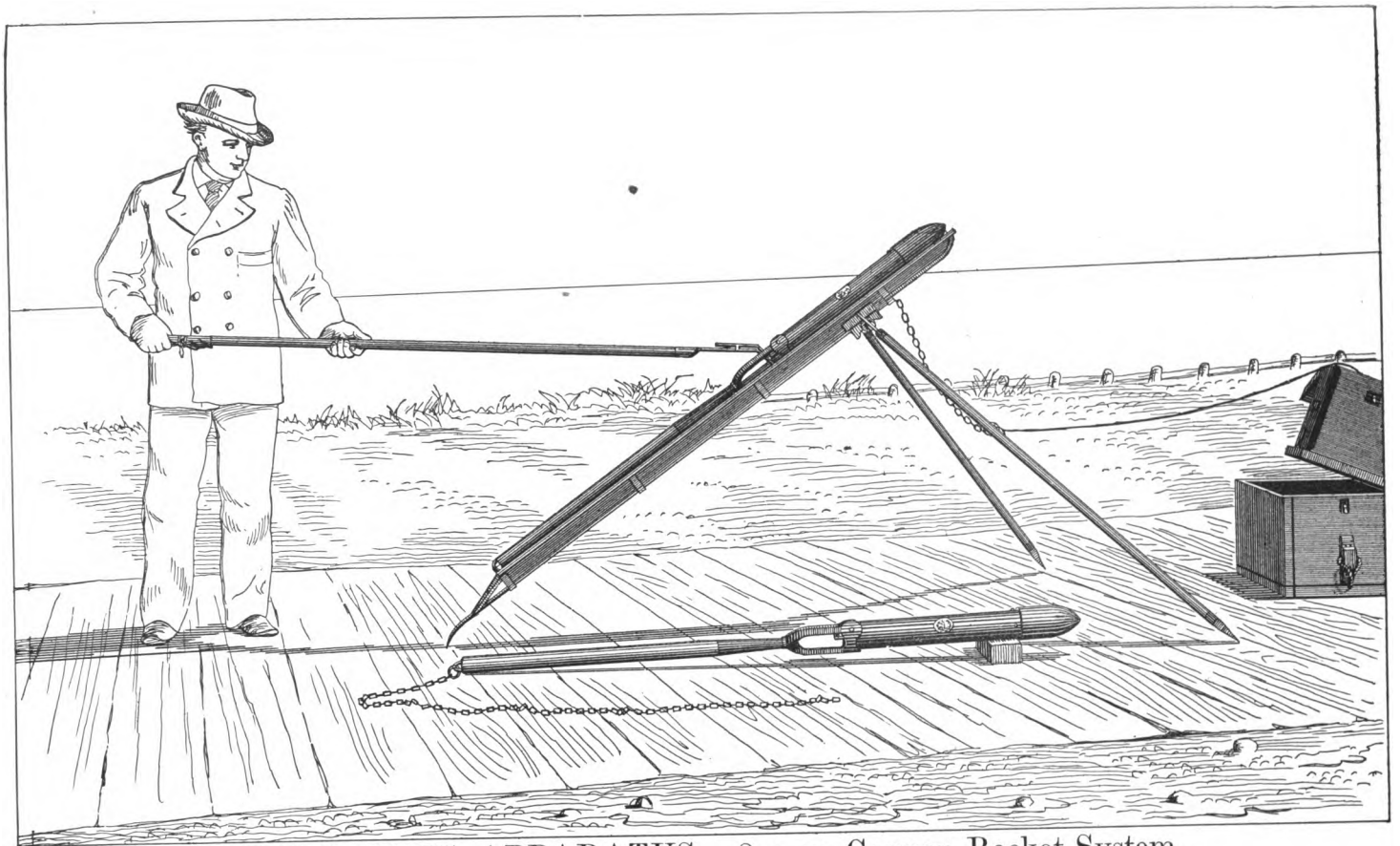


LIFE-SAVING APPARATUS.—5 c. m. German Rocket System.

PLATE XV.

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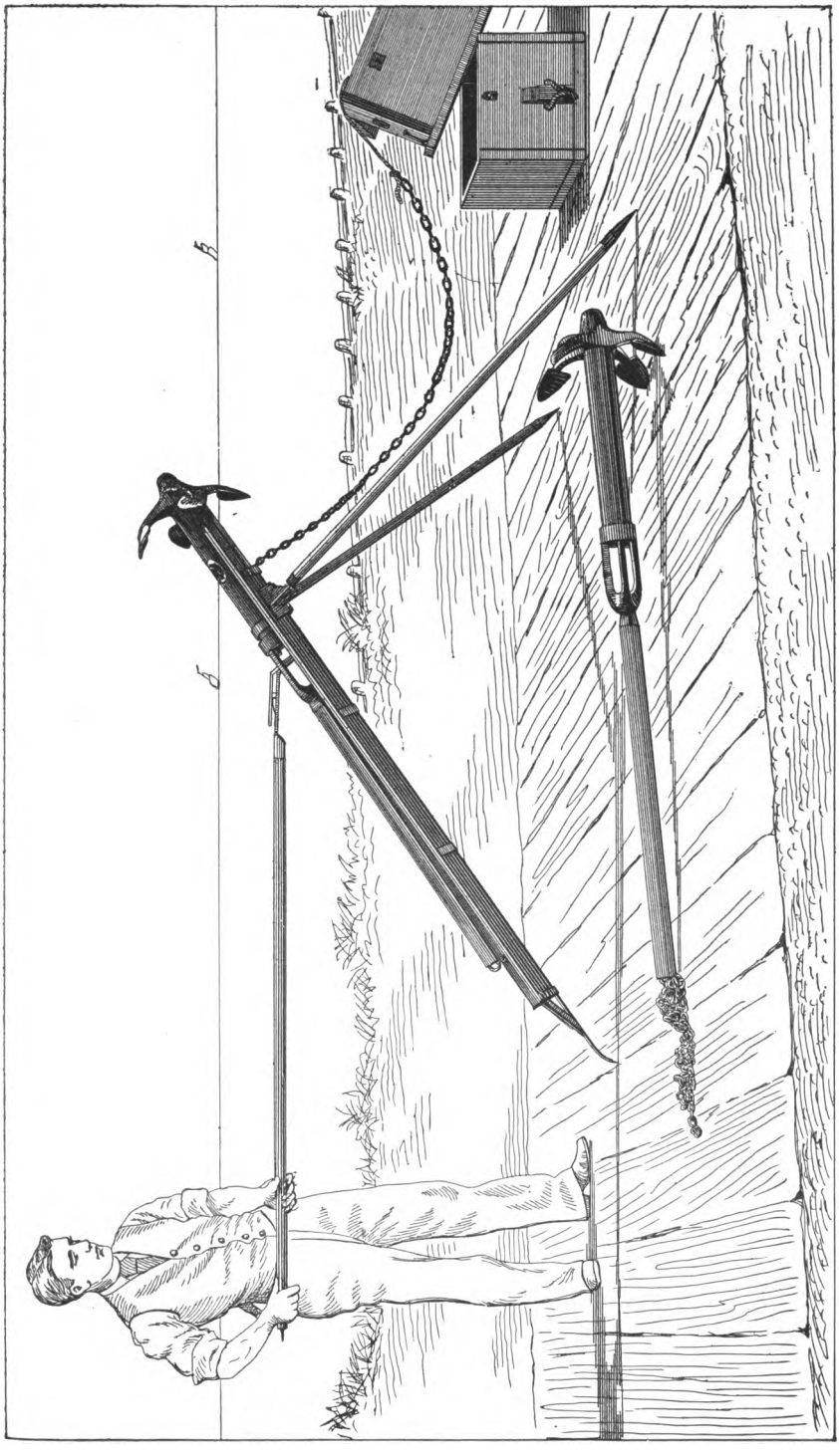


LIFE-SAVING APPARATUS.—8 c. m. German Rocket System.

PLATE XVI.

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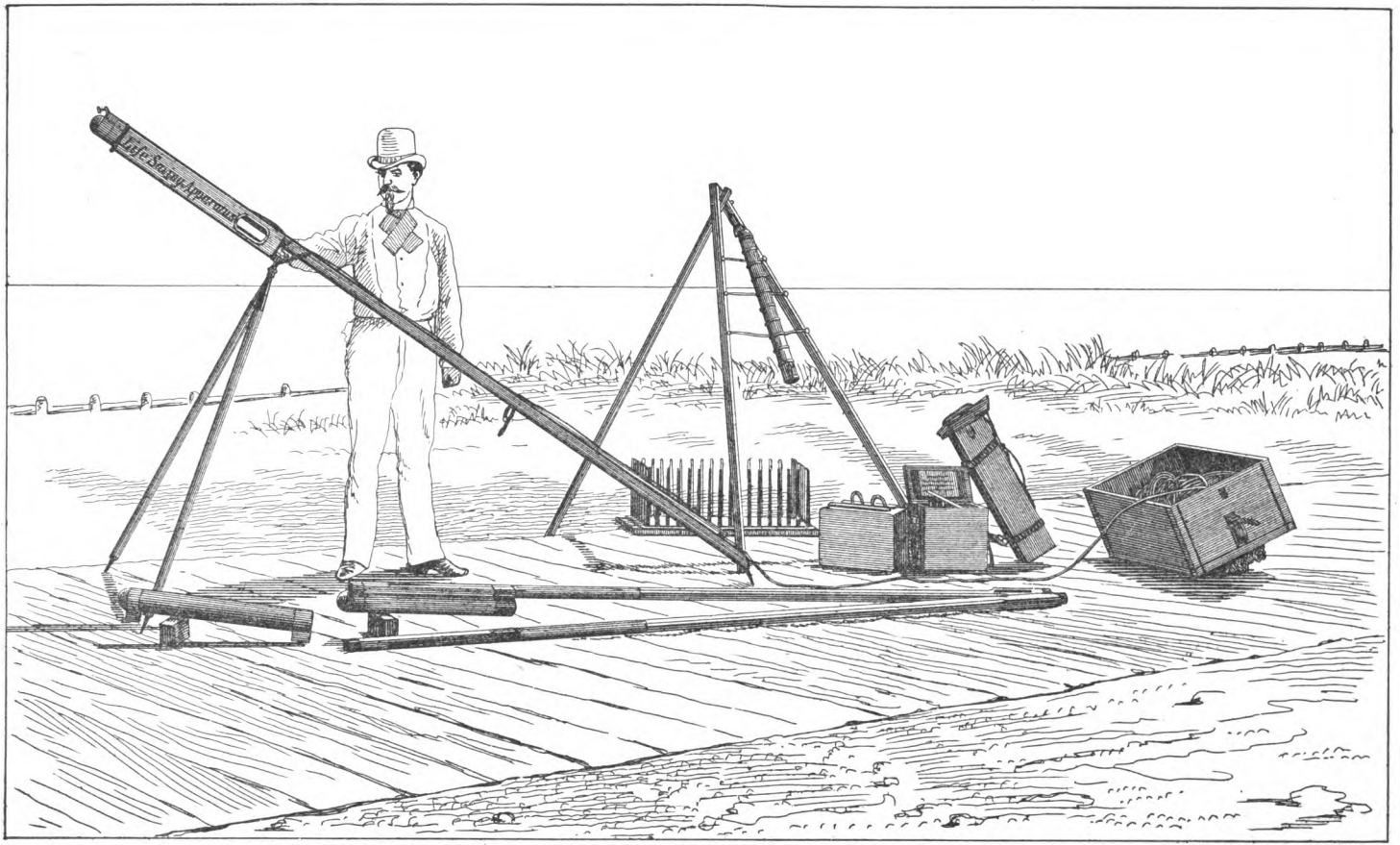
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LIFE-SAVING APPARATUS.—8 c. m. German Anchor System.

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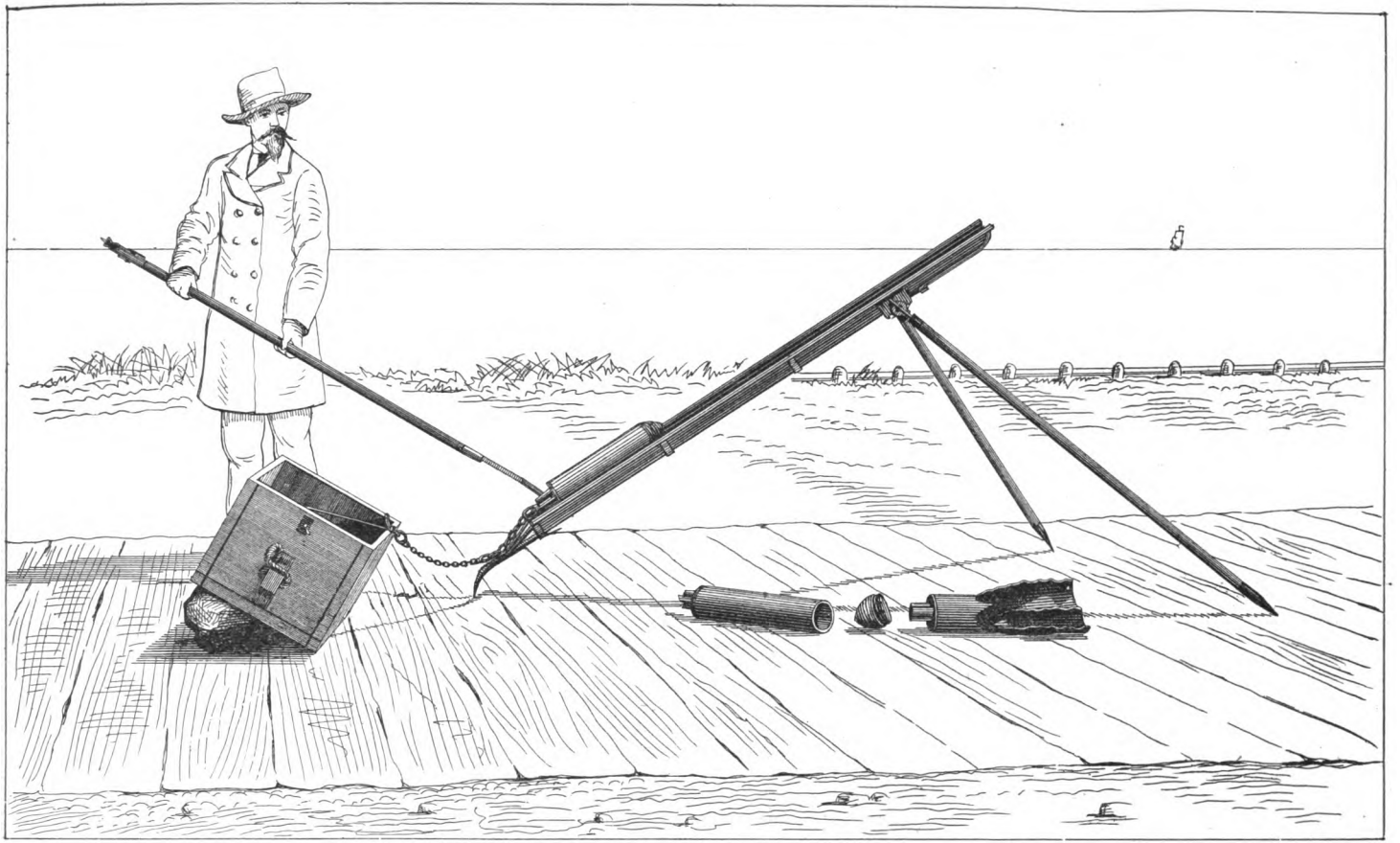


LIFE-SAVING APPARATUS.—English Rocket System.

PLATE XVIII.

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LIFE-SAVIVG APPARATUS.—Hooper Rocket.

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