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U.S. TREASURY DEPARTMENT
COAST GUARD

INSTRUCTIONS
FOR
UNITED STATES
COAST GUARD STATIONS

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Washington, June 27, 1934.

The following instructions for Coast Guard stations are promulgated for the government of those concerned, and shall be strictly observed.

STEPHEN B. GIBBONS,
Assistant Secretary.

is to provide no necessary supplies needed for the operation of a station. It is the duty of the commanding officer to see that all supplies required for the operation of the station are available at all times.

INSTRUCTIONS FOR COAST GUARD STATIONS

GENERAL INSTRUCTIONS

1. The "Instructions for Coast Guard Stations" shall have the force and effect of regulations.

2. The officer in charge and the crew shall reside at a station and shall not absent themselves therefrom except when on duty, leave, liberty, or other authorized absence.

3. The officer in charge of a Coast Guard station shall have command and control of the enlisted and other persons attached to his station, whether on duty, on leave, or on liberty, and shall be responsible for the drilling, discipline, and efficiency of his crew. He shall have a thorough knowledge of his duties as prescribed by the Regulations, United States Coast Guard.

4. He shall keep on hand sufficient quantities of gasoline and lubricating oils for the station power boats and motor vehicles in order that they may be ready at all times for instant and prolonged service. No excuse for a failure to have this equipment available owing to the lack of these essentials will be accepted. He is enjoined to use economy in the expenditure of gasoline, but no restriction is placed upon such expenditure if the interests of the public service would suffer thereby.

5. He shall anticipate the need of repair and replacement parts for all motors, making a careful personal check of their condition from time to time. Should replacement or spare parts be needed, they shall be obtained as provided for by Coast Guard Regulations.

6. He shall report in writing to Headquarters through official channels any serious accident to the station buildings, equipment, boats, vehicles, and motors, or any explosion of gasoline about the station premises or in any power boat, whether or not the same results in injury to any person, either connected with the Coast Guard or outside of it, or in damage to any boat or other property, private or public, setting forth the facts in detail, and shall make an entry of all such matters in the log.

7. He shall organize his crew by assigning to each member a watch number. The senior petty officers, by reason of their ratings, shall have the first numbers. The other members of the crew shall be assigned numbers in the order of their merit.

8. Should additional assistance become necessary on occasion of a wreck, he is authorized to employ such additional number of competent men as are absolutely needed, who shall be entitled to receive such compensation as their services are reasonably worth, the period and value of their services to be stated and certified to by the officer in charge.

9. (1) When necessary to facilitate the rendering of assistance, the officer in charge is authorized to secure the use of tugs, motor boats, vehicles, horses, etc., for the services of which reasonable compensation will be allowed. Where practicable, the officer in charge shall make arrangements with owners of such facilities and equipment for their use at reasonable rates when required.

(2) When such expense has been incurred, he shall prepare vouchers in favor of the persons or firms performing the service, to which he shall attach a statement setting forth fully the necessity for and extent of the service rendered. A bill for the services of a tug shall not include a charge for efforts to float a stranded vessel, lightering cargo, or other service performed at the request of the master or owners of the vessel.

10. The officer in charge shall make a full report on form 2631 of every case of resuscitation or attempted resuscitation of a person apparently drowned or insensible from other causes, answering specifically every question on the blank and adding any other pertinent information. Should a physician be present, he shall be requested to append to the report any remarks and observations that he may consider in the interest of medical science.

11. The officer in charge shall make a full report to Headquarters of any property cast ashore and recovered by his crew that is of a distinctly personal character or bears identifying marks by which the owner may be traced. Members of station crews have no right of ownership in property recovered from the sea or found on the beach. All such property for which no rightful owner can be found shall be disposed of as directed by Headquarters.

12. The officer in charge shall not, except in cases of emergency, transfer any article of permanent equipment, such as a boat or beach wagon, to another station for any period without previous authorization. When any article of equipment or supply is transferred to another station, the officer delivering it shall prepare invoices as required by regulations. The transfer shall be entered in the log and in the "Record of public property" of each station, giving dates of transfer and authority. The temporary transfer of small quantities of expendable supplies which it is intended to return shall be entered in the log only, and no receipts need be taken. The temporary transfer and use of service vehicles for service purposes shall be entered in the log only.

13. The officer in charge shall be polite and courteous to visitors, but shall not permit them to handle any gear or apparatus nor deface or damage any station property by writing, carving, scratching, or other means. He shall detail a member or members of the crew to show visitors about the station, but shall not take or permit others to take visitors out in a station boat without authority from a superior officer.

14. Enlisted men shall not be required to perform any personal services for the officer in charge.

15. A bookrack or bookcase shall be provided in the living quarters at all stations and shall contain the books and publications used for instruction and drill. The crew shall have free access to these books and the officer in charge shall see that they are kept current.

16. The officer in charge shall post personnel instructions and circulars which contain information relative to promotion and other matters of which the men should have knowledge.

17. The officer in charge shall comply strictly with the instructions contained in Coast Guard regulations relative to the keeping of the station log and other official records.

LAW ENFORCEMENT DUTIES OF THE OFFICER IN CHARGE

18. The officer in charge of a Coast Guard station shall exercise his power as an inspector of customs with reference to merchandise, presumably of foreign origin, cast ashore from wrecks, or forming the cargo of vessels stranded or operating illegally within the scope of operations of his station. (See duties of officer in charge as outlined in regulations).

19. He shall promptly notify the district commander of any casualty to a vessel with merchandise presumably of foreign origin, and exercise supervision over the cargo until a regular customs officer arrives, or until he is relieved by proper authority.

20. He shall exercise a watchful care over such portions of the cargo as may be landed or come on shore from stranded vessels, in order to preserve the same, as far as possible, for the owners thereof, as well as to protect the revenue; with this in view, dutiable goods and valuable merchandise, other than combustibles or explosives, may, for security, be stored within the station, but the boat room must not be encumbered with articles which might prevent the instant availability of the apparatus.

21. He shall keep a close watch over motor boats and other small craft, to prevent violations of the motor boat, navigation, and customs laws. For this purpose he shall, when practicable, board and examine such craft, to ascertain whether they are properly documented and whether they have smuggled or contraband goods on board.

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22. He shall advise the district commander promptly in regard to all matters of consequence pertaining to smuggling.

23. He shall exercise every precaution to prevent the illegal entry of aliens, and shall promptly report to proper authorities any violations of the immigration laws which may come within his knowledge.

24. In the enforcement of the quarantine laws, the health of persons removed from wrecked vessels shall receive careful scrutiny in order that any communicable disease may be reported to the proper authorities. Special precautions should be taken where the vessel has cleared from a foreign port.

ACTION AT WRECKS

25. Officers in charge of adjacent stations, when called upon, shall at once proceed to render assistance, unless actually engaged with another disaster or about to be so engaged. If their assistance is not requested, they shall keep themselves in readiness to respond promptly to any subsequent call from the officer in charge of the station nearest the wreck.

26. The officer in charge of the station nearest to which a wreck or other marine casualty occurs shall immediately notify the officers in charge of adjacent stations and other Coast Guard units of the circumstance and, if necessary, request their assistance.

27. The officer in charge of a station who first arrives at a wreck with his boat or apparatus shall at once proceed to land the persons on board, if necessary and possible, unless the conditions are such that the assistance of another crew is indispensable. If two or more units of the Coast Guard are at the scene of a disaster, the senior officer present shall have charge of the operations.

28. In attempting a rescue, the officer in charge of a station shall select such apparatus—boat, breeches buoy, or life car—as in his judgment is best suited to cope effectively with prevailing conditions. If the device first selected fails after such trial as satisfies him that further attempts with it are useless, he shall resort to another, and shall not desist from his efforts until by actual trial the impossibility of effecting a rescue with any of the means at hand is demonstrated. The statement of the officer in charge that he did not try to use the boat because the sea or surf was too heavy will not be accepted; attempts to launch must be actually made, unless the conformation of the coast—as bluffs, precipitous banks, etc.—is such as unquestionably to preclude the use of a boat.

29. On arriving at a wreck the preservation of life shall be the first consideration of the officer in charge and he shall on no account take aboard goods or merchandise which may endanger the safety of his boat or the lives of those intrusted to his charge. Should

anything be put into the boat against his orders, he is authorized to throw it overboard.

30. In establishing communication with a wreck by means of a gun throwing a line-carrying projectile, the larger sized shot lines shall be used when the distance and other conditions permit. When it is found necessary to use a no. 4 line, a larger line shall be sent out by it for use in hauling off the whip; and if a no. 7 line has been successfully thrown to a vessel judged to be 300 yards or more from the shore, a no. 9 or other stronger line shall be sent out to carry the whip.

31. The standard charge of powder for the Lyle gun in practice or drill with the beach apparatus is 2 ounces. In actual service 4 to 6 ounces of powder may be used for a no. 4 or no. 7 line and 5 to 6 ounces for a no. 9 line. The maximum charge of 6 ounces shall not be exceeded except under extraordinary circumstances, nor until at least two trials with that charge have failed to carry the line the required distance. In such cases charges of 7 or 8 ounces, but in no case more than 8 ounces, may be used.

32. If, upon boarding a stranded vessel, there is found to be no immediate danger of loss of life and the conditions of sea and weather warrant an attempt to float the vessel, the officer in charge shall render the master every assistance in his power to that end, bearing in mind that the lines and gear belonging to the beach apparatus are to be used only in landing imperiled passengers or crews.

33. When the master of a stranded vessel contracts or bargains with any person or company to get her afloat or dismantle her, or sells her or turns her over to the wreck commissioner or to any agent of the owner or underwriters, the responsibility of the officer in charge of the station as regards the property shall cease, except as to customs duties on the cargo, etc., unless the services of the crew are required by subsequent danger or casualty.

34. While the saving of property is an important function of the Coast Guard, second only to the saving of human life, and officers in charge are required to make every reasonable effort to that end, they shall not neglect the regular duties of their stations, particularly the patrols and watches, in order to perform labor on board a stranded vessel not in immediate danger of total loss when such labor can be performed by her crew or by other persons available for hire; and the master's neglect or refusal to secure such assistance at the earliest opportunity shall be deemed to relieve the station crew from further responsibility. In no case shall a station crew or portion thereof remain on board a vessel, when removed from station limits, to man the pumps, lighter cargo, etc., unless, in the judgment of the officer in charge of the station, the crew of the vessel, with the aid of such other help as is procurable, is unable to keep her afloat. In case

the vessel can be kept afloat without their aid, they shall return to the station and resume their regular duties as soon as possible.

35. When a working party is employed on board of a wreck, the officer in charge shall, on the approach of bad weather, exercise the same vigilance for saving life as in the case of a vessel just stranded.

36. The bodies of drowned persons found in the surf, on the beach, or on a wrecked vessel shall be properly cared for until they can be turned over to friends or to the proper local authorities. If they cannot be positively identified, a description, as complete in detail as possible, shall be entered in the log, and a copy immediately sent through the proper channel to Headquarters, with any information obtainable as to the possible identity of the drowned person. A station crew shall aid in recovering the bodies of drowned persons when, in the opinion of the officer in charge, such work will not interfere with more important duty.

37. Each Coast Guard station shall be provided with body-dragging equipment which shall be suitable for use in the locality adjacent to the station.

38. If articles of value, trinkets, or anything else that may assist in its identification are found upon a body, they shall be carefully preserved and turned over to the coroner or other proper civil officer and duplicate receipts taken therefor, one of which shall be retained by the officer in charge of the station and the other forwarded to Headquarters through official channels.

PATROLS AND LOOKOUTS

39. Where patrols are maintained in two directions, the patrol for the second half of the period shall ordinarily be made in a direction opposite to that in which it was made during the first half. When practicable, the watch and patrol bill shall be so arranged that the same person shall not make the patrol in the same direction on successive nights.

40. The lookout shall be stood at or in the watch house, station lookout, or other place where the best view of the coast and surrounding waters may be obtained. This place shall be designated by the officer in charge of the station, with the approval of the district commander. The lookout shall not leave his post for meals or other purposes until properly relieved, except when necessary to give an alarm of a wreck or other casualty.

41. When two or more stations are within communicating distance, patrols covering the same or similar periods of time shall be made in the same direction from each of those stations. Where the distances to be covered are short, two or more patrols each way may be required in each watch.

42. On those portions of the coast where the limits of the patrol cannot be seen from the station, the beach shall be considered sufficiently patrolled during daylight if the limits are brought in sight at least three times. Where a telephone is provided at the patrol limit, the patrolman shall report his arrival by this means in addition to indenting the dial of the time detector.

43. A complete record of patrols and lookouts shall be made by means of time detectors, or by such other means as may be prescribed by Headquarters.

44. When a man has made his regular patrol and his time has not expired, he shall continue to patrol the beach until it is time to call his relief. Should any person fail to return at the expiration of his patrol, the next patrolman shall notify the officer in charge of this fact and depart. The officer in charge of the station shall immediately investigate the failure of the patrolman to return on time.

45. (1) A man on lookout watch shall make impressions on the dial of the time detector or watchman's clock at intervals of 30 minutes. Where an outside platform is provided on lookout tower, indenting key shall be located on the platform rail at the furthermost point from the door in a seaward direction.

(2) A man on patrol shall make impressions upon the dial of the time detector with keys located at such points as the officer in charge may determine, with the approval of the district commander. If two or more points are to be visited by the patrol, a different key shall be placed at each and used in turn.

46. Where the entire beach between two stations is not covered by the patrols, a key post shall be placed at the limit of each prescribed patrol; and the patrolmen shall, by use of watchmen's clocks, make records of their visits thereto.

47. No man shall have in his possession any unauthorized time-detector key. Should the officer in charge discover any unauthorized time-detector key in the possession of any member of the crew, he shall immediately report all the circumstances to the district commander.

48. When not in use, the time detectors and keys therefor shall remain in a place accessible only to the officer in charge or, in his absence, the person in charge. He shall not show the keys nor communicate the numbers of those in use to any person other than a commissioned officer. He shall frequently visit the key posts, station lookout, and watch house, and shall change the keys at least once a week at irregular intervals, and oftener if deemed necessary to insure the integrity of the patrol. The dates of such visits and the condition of the posts and keys shall be noted in the log, but not the fact of exchange or the number of keys exchanged. On each visit he shall carefully inspect the watch house, posts, safes, chains, keys, and seals;

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if any be found broken, mutilated, or tampered with, he shall immediately report all ascertainable facts to the district commander. He shall make every effort to discover the offender and obtain proof of his guilt. Only one key for each clock shall be kept in a key post safe, lookout, or watch house at a time, and two keys bearing the same number or making identical impressions shall not be in use at the same time at any one station. Twelve-hour time detectors shall not be used at Coast Guard stations.

49. At 4 p.m. each day the officer in charge shall open the time detectors in the following manner: Remove the old dial, place red circles around indentations which have previously been made by him and, thoroughly examine to see that the required impressions have been made by lookouts or patrols. He will prepare a new dial, heading it with the name of the station, date (for example, Jan. 1-2, 1934), and affix his signature. This dial will then be inserted, the clock locked, and proper indentations made, using one of the keys in his possession. Before locking, an examination of the perforating and locking devices will be made for the purpose of detecting defects or signs of tampering. On Tuesday of each week he shall forward all the dials that have been used, with the transcripts of the log for the corresponding week, to the district commander.

50. If upon examination the officer in charge discovers any discrepancy in the record of lookouts and patrols, as shown by the impressions on a dial, not properly accounted for by the man immediately upon its occurrence or upon his return from patrol, he shall enter all the facts connected therewith in the log, and if the failure was, in his judgment, due to fault or negligence, shall impose punishment in conformity with the regulations. He shall report all the circumstances to the district commander.

51. Each officer and each man shall be accountable for the care and preservation of the patrol clocks in his possession. The man on lookout or patrol shall at all times protect the clock from dampness, carrying it under his coat, if necessary, and shall avoid jarring or striking it against any object and prevent sand entering the keyholes. Upon each man's visit to a key post he shall carefully inspect the post, key, safe, and all fastenings, and if any is found broken, mutilated, or tampered with, he shall report the fact to the officer in charge immediately by telephone or upon his return to the station. The stopping of a patrol clock, or any observed irregularity in or damage to it shall likewise be reported promptly to the officer in charge.

52. A man on patrol shall not deviate from the prescribed route along the beach, except when necessary for his personal safety, and he shall endeavor to retain an unobstructed view to seaward. All patrols shall be made on foot unless otherwise authorized by the district commander.

53. At the expiration of patrol or watch periods men will not leave their post of duty or retire until they have been properly relieved. In the case of the patrolman his relief must be ready to take the patrol. In the case of the lookout watch the relief must present himself at the watch tower or other designated place where the watch is maintained. Both watch and patrol reliefs should be called at least 15 minutes before time for going on duty.

54. Each man on patrol shall carry a time detector, a signal holder, three red pyrotechnic signals in good condition, a signal flashlight provided with two spare bulbs, a supply of matches carefully protected from dampness, and such other articles as may be prescribed.

55. The officer in charge shall designate the uniform to be worn on patrol. Only distinctive uniform clothing shall be worn by a man on patrol and watch duty.

56. When a man on patrol at night discovers a wrecked or stranded vessel, he shall fire a red pyrotechnic signal and shall immediately notify his station by the quickest means of communication. The station lookout shall acknowledge by firing a red pyrotechnic signal, unless quicker response can be made by other means. A man on patrol receiving no answer to his signal or call shall hasten to the station to give the alarm and to assist with the boat or other apparatus.

57. A man who discovers a vessel dangerously near the shore or a shoal at night shall immediately burn a red pyrotechnic signal as a warning and shall endeavor to get in communication by means of signal light and inform her of the danger.

58. If a vessel be discovered dangerously near the shore or a shoal during the day, she shall be warned by hoisting the proper International Code signals. In order that all members of the crew may be thoroughly qualified to give such warnings, a study of the coast line, embraced within the patrol limits of the station, as shown by charts, shall be made. The data shown on charts should be verified by frequent soundings and by taking bearings of shoals, headlands, lighthouses, buoys, and other daymarks. Before sending a new man upon patrol, the officer in charge shall instruct him on what bearing or at what distance off shore an approaching vessel shall be warned of her danger.

GENERAL DUTIES OF LOOKOUT

59. (1) The lookout shall record in a rough log all movements of passing vessels or aircraft, noting the class, name (if possible to ascertain), time of passing, and direction in which proceeding. Official messages received or sent by the lookout shall be recorded. Weather data as required in the station log shall be recorded. He shall sign the rough log at the end of his watch. The lookout tower shall be provided with time clock, barometer, and thermometer to

permit the recording of weather data without the watchman leaving his post of duty.

(2) He shall stand an alert and efficient watch, keeping under close scrutiny all boats, aircraft, swimmers, and objects coming within his scope of vision.

(a) He shall allow no one to distract his attention from his duty.

(b) He shall not allow loitering in the lookout tower nor receive visitors of his own while on duty.

(c) He shall let nothing engage his attention on any other matter than that of keeping a proper lookout.

(d) He shall not sit down, lie down, nor sleep when on duty.

(e) He shall immediately report to the officer in charge any occurrence which involves, or may involve, danger to, or loss of life or property.

(f) He shall also immediately report to the officer in charge any unusual circumstances which may come within his vision or hearing and which he does not fully understand.

(g) He shall take every precaution to guard property against damage by fire.

SWIMMING QUALIFICATIONS

60. (1) It shall be the duty of all officers in charge of stations to see that every enlisted person attached, unless permanently excused by Headquarters, shall demonstrate his ability as a good swimmer by passing the following tests, each of which shall be performed as a single exercise and not separated into its component parts with intervals of rest between:

(a) To swim 100 yards, dive properly from the surface, and swim 50 yards on his back.

(b) To dive from the surface of the water and bring up a 10-pound object from a depth of at least 7 feet.

(c) To carry a supposedly drowning person, of at least his own weight, 20 yards.

(d) To jump into the water with shoes, trousers, and coat on and to remove those articles without touching bottom.

(2) The officer in charge will be expected to use proper discretion in conducting the tests, and shall not require men to undergo them under unfavorable conditions or to remain too long at a time in the water or in wet clothing. He shall not require any member of a crew to undergo all four tests in immediate succession, or in any one day, unless the person desires to do so and the officer in charge regards it as safe and expedient. The officer in charge may, however, require each applicant to undergo tests (a) and (b) at any one time.

(3) The crew of a station shall keep in good swimming practice. To this end the officer in charge shall conduct swimming practice at

least once each month during the summer season where the temperature of the water permits. Particular attention should be paid to the method which would be employed in saving drowning persons.

(4) Personnel instructions, United States Coast Guard, under the heading "Swimming Qualifications", furnish additional data concerning qualification of a good swimmer in reference to enlistment and reenlistment.

61. Encouragement and opportunity shall be given the personnel to engage in swimming, both for pleasure and practice, but officers in charge of units shall take suitable precautions to safeguard the lives of men under their command by prohibiting swimming immediately after meals, or in contaminated waters, and waters unsafe for diving. If practicable, a pulling boat equipped with ring buoy available for use, should be kept ready and manned in the vicinity of the swimmers.

CARE AND PRESERVATION OF PROPERTY

62. No unauthorized changes shall be made in any building at a station.

63. The officer in charge shall see that the station and equipment are painted in accordance with Painting Instructions for Coast Guard Stations.

64. The officer in charge shall, each month, make an examination of the foundations, skirting, etc., of all buildings, and shall see that sand is kept below the sills, or joists, if possible. He shall promptly renew any decayed material if the work can be accomplished with material and men at the station. Otherwise report should be made and repairs requested.

65. He shall see that gutters and down spouts are kept clear of trash, leaves, and sand. Any down spout leading to a drinking water cistern shall be fitted with suitable by-pass.

66. He shall see that the floors are kept clean and cared for as provided for in Painting Instructions for Stations.

67. He shall see that all sashes are kept in good operative condition, renewing sash cords when necessary, as well as broken or cracked window panes.

68. He shall see that all locks, knobs, and hardware generally are properly secured and work satisfactorily.

69. He shall see that all buildings are kept in good repair and thoroughly aired at frequent intervals. If defects are noted, they should be immediately corrected by the crew of the station. Defects or damages beyond his power to remedy shall be reported to the district commander. Watch houses shall be kept in good repair in the same manner as buildings on the reservation.

70. The officer in charge shall be responsible for the sanitary condition at his station in regards to privies, toilet facilities, septic

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tanks, and cesspools, and the drainage for same, and shall report any conditions of an unsanitary nature which are impracticable for him to correct.

71. He shall see that the boathouses, inclines, and launchways are kept clear of sand and other obstructions, and that the launching carriages, boat wagons, etc., are properly painted, and that all moving parts are thoroughly cleaned and oiled.

72. The officer in charge shall immediately report the loss, theft, or destruction of any article of value.

73. All new cordage of any kind upon being received at a station shall be stretched, all kinks worked out, and then measured and properly rolled or coiled, and their respective lengths entered in the record of public property. In stretching, care should be exercised to prevent damage to cordage.

74. The officer in charge shall see that the screens furnished for windows and doors of the station are kept in place and in good repair. He shall use every effort to keep kitchens, pantries, eating, living, and sleeping quarters free from flies, mosquitoes, roaches, and vermin.

75. When so requested by a field assistant, construction and repair, the officer in charge shall see that the members of his crew render such assistance as may be practicable to such field assistant in the prosecution of his work at the station, when it will not interfere with the regular station duties, wreck or rescue work, or with reasonable hours for rest.

76. He shall see that the beach apparatus and every part thereof is, after actual service or drill, thoroughly cleaned and restored to its proper place, in readiness for instant use; that all metallic parts are dried and wiped with an oiled cloth and all lines and hawsers thoroughly dried at the first opportunity; that lanterns and torches are filled and trimmed and that the proper number of signals, water lights, charges of powder, etc., are in their places.

77. When a station is placed in an inactive status or discontinued, detailed instructions will be issued by the district commander relative to the procedure to be followed.

GENERAL INSTRUCTIONS FOR THE CARE AND OPERATION OF MOTOR VEHICLES

78. Due to the number of different makes of motor vehicles in the Coast Guard, it is impracticable to formulate a uniform set of instructions that will be applicable in all minor details to each particular make of truck. These instructions cover only the major points, and if carefully carried out will appreciably lengthen the life of the vehicle. Should any of these rules conflict with those furnished by the manufacturer, the manufacturer's instructions shall be followed and the matter referred to the district commander.

*Ch. Set. 122: Directs to read
arts 78 - 106*

79. Vehicles operated on sandy beaches in proximity of salt water are subject to more severe service than those operated over improved roads and will require additional care. With proper upkeep, it should not be necessary to survey a motor truck that has been driven less than 75,000 miles or that is less than 5 years old.

80. Each station to which a motor truck is assigned shall, where practicable, construct a neat runway or stand of sufficient height to enable a man to get beneath the truck for the purpose of greasing, repairing, and inspection. When a new motor vehicle is furnished, it is customary to forward a copy of the proposal on which is contained the specifications under which the purchase was made. The officer in charge, upon receipt of the motor vehicle, shall carefully check the vehicle and see that no discrepancy exists between it and the written specifications. Special attention shall be given to the construction of the body and cab, painting, tires, and equipment. When the inspection has been completed and the vehicle has been found to meet the specifications in every particular, the received proposal shall be returned to Headquarters through the usual channels, noting any discrepancies.

81. Where conditions permit, each new truck shall be driven a distance of not less than 500 miles at a speed not in excess of 25 miles per hour on hard surfaced or improved roads before being placed in operation on the beach or loose sand. Upon receipt of a new truck in localities where salt water or salty atmospheric conditions are encountered, the entire underside parts (fenders, frame, guards, cross members, etc.) shall be treated with a coat of raw linseed oil over which clean, white beach sand shall be applied. This shall be repeated once each week until three coats have been applied, after which the procedure shall be repeated whenever necessary to keep the underside well coated.

82. The body, cab, hood, and fenders shall be polished at least once each week.

83. All motor vehicles shall be touched up or repainted whenever necessity demands; the color scheme to be followed shall be that designated in Painting Instructions.

84. Proper lubrication means having a thin film of clean oil between all moving parts in contact with each other. Excessive wear is the inevitable result when any machinery is not adequately lubricated.

85. A complete change of oil is required more frequently in winter than in summer by reason of crankcase dilution. Trucks operated over sandy beaches or under similar conditions shall have the oil changed every 500 miles, and those operated over hard-surfaced roads at least every 750 miles during the winter months and every 1,000 miles during summer. In case the oil loses its body or viscosity, more frequent changes shall be made.

86. The grade of lubricating oil recommended by the manufacturer of the motor vehicle will be used when possible. When this cannot be obtained, lubricating oil purchased under the Navy contract shall be used in trucks as follows:

- (a) *New trucks, first 1,000 miles.*—Navy symbol 2110 (S.A.E. 10).
- (b) *New trucks, after 1,000 miles, summer.*—Navy symbol 2190 (S.A.E. 30).
- (c) *New trucks, after 1,000 miles, winter.*—Navy symbol 2135 (S.A.E. 20). In extremely cold weather oil having Navy symbol 2110 (S.A.E. 10) may be found more suitable.
- (d) *Trucks driven over 10,000 miles, summer.*—Navy symbol 2250 (S.A.E. 40).
- (e) *Trucks driven over 10,000 miles, winter.*—Navy symbol 2190 (S.A.E. 30). In extremely cold weather oil having Navy symbol 2135 (S.A.E. 20) or Navy symbol 2110 (S.A.E. 10) may be found more suitable.
- (f) In the case of vehicles operated in southern latitudes appropriate adjustment must be made to the above schedule to the end that the correct oil may be used. Oils heavier than Navy symbol 2250 (S.A.E. 40) shall not be used.

87. All parts fitted with grease cups, oil cups, or high pressure fittings shall be lubricated every 500 miles. Springs and other underside working parts shall receive frequent oiling. This is efficiently accomplished by spraying with penetrating oil. Old crankcase oil may be applied with a paint brush if penetrating oil is not available.

88. Front-wheel bearings shall be cleaned and packed with cup grease at least every 10,000 miles. In the case of trucks operating on the beach, both front and rear wheels shall be removed every 2,000 miles and all rust on the inside of the brake drums removed, after which they shall be wiped thoroughly with an oiled rag. Care should be taken that surplus oil is not allowed to remain and run down the brake bands. Exposed brake rods, cables, cams, etc., under the truck shall be kept free from rust and treated with lubricating oil in order to permit proper operation.

89. The battery during winter shall be examined every 2 weeks and the distilled water maintained to a level one-half inch above the top of the plates. In cold weather, to prevent freezing, water, when necessary, should be added just before using the vehicle, as water will remain on top until mixed by the action of the battery. Weekly examination should be made during warm weather as more water is then required. This is also the case when long daylight runs are made. Terminals shall be kept tight and coated with vaseline or hard grease. Corrosion may be removed from the terminals with a solution of common baking soda and water.

90. Tires should be kept inflated to the pressure recommended by the manufacturer when driving on hard roads. The necessity of reducing the pressure when driving on the beach or soft sand is recognized, but care should be taken not to under-inflate the tire more than is necessary, as this results in breaking the fabric and shortens the life of the tire. When a vehicle equipped with pneumatic tires is not in routine use, it shall be blocked up in order to take the weight off the tires.

91. Rims shall be kept free from rust. Special care shall be given the inner side with which the tube comes in contact. Remove tires and paint rims with red lead every 3 months if conditions warrant.

92. Brakes require special attention and shall be kept in adjustment at all times. Accidents caused by faulty brakes are inexcusable. Service brake cams and the emergency brake operating shaft shall be kept free and well oiled at the points where they enter the brake shields.

93. Radiators shall be drained and flushed in the spring and fall or more often if necessary. Where running water is available, the radiator should be flushed and the water allowed to circulate through it for at least 10 minutes each time it is drained. Good results are often obtained by forcing the water into the bottom motor connection and allowing it to come out of the top connection. This is called "reverse flushing." Care should be taken when using this method to prevent spillage over the motor. This can be avoided by fitting a piece of hose over the top connection and leading it clear of the vehicle.

94. Alcohol in sufficient amounts shall be used as antifreeze solution in all vehicle radiators when danger of freezing exists. Drain and flush radiators before adding the alcohol at the beginning of cold weather. After freezing weather has passed, flush circulating system thoroughly to remove all alcohol.

95. During extreme cold weather the circulating water is often too cold to produce good results. There is no objection at such times to placing in front of the radiator, at the bottom, a piece of cardboard approximately 10 inches high. Covering the entire surface of the radiator is prohibited, except when the motor is not running or for the first few minutes when the motor is warming up when the vehicle is not in motion.

96. After starting the motor during cold weather, it shall be run very slowly until the oil is warmed and pressure becomes nearly normal. If this is not done and the engine is speeded, there is great danger of scoring the cylinders and burning the bearings, due to a lack of lubrication.

97. Whenever a part breaks or becomes worn, immediate action to repair the damage shall be taken. Do not wait until some other part

needs replacing, as a worn or broken part frequently causes excessive wear on another part.

98. A letter transmitting proposals covering major parts shall state the reason repairs are necessary, the number of miles the vehicle has run, together with the date and mileage on the vehicle when the last major repairs were made. This is intended for information purposes only and is not to be considered as discouraging repairs.

99. The ignition system shall be checked frequently and all necessary adjustments promptly made.

100. Carburetors with air cleaners shall be cleaned every 2,000 miles in the manner prescribed by the manufacturer.

101. Each truck shall always be equipped with a portable, hand-operated carbon-tetrachloride fire extinguisher, fully charged, and the blank form Driver's Report of Accident. (Standard form no. 26.)

TRACTORS

102. The motors in trucks and tractors are similar in design, and the instructions for the care of truck motors will, in general, apply to the motors in tractors. Before starting a new tractor engine, remove the spark plugs and pour about 1 ounce of lubricating oil into each cylinder; then replace the spark plugs and crank the engine to distribute the oil over the cylinder walls. During the first 100 hours of operation, mix 1 pint of lubricating oil with every 5 gallons of gasoline. Never run a new engine under full load. Work it easily until oil has reached all parts.

103. Most tractor motors are provided with two test plugs or test cocks for determining the quantity of lubricating oil in the crankcase. In motors so designed, the oil shall be drained off to the lower test-cock level and refilled to the upper test-cock level after 10 hours running. All oil shall be drained and the crankcase refilled with fresh oil after 60 hours running. The recommended motor oil for use is as follows:

(a) *For summer use.*—Navy symbol 2190 (S.A.E. 30), or Navy symbol 2250 (S.A.E. 40).

(b) *For winter use.*—Navy symbol 2135 (S.A.E. 20), or Navy symbol 2190 (S.A.E. 30).

104. The transmission and differential shall be checked frequently to see that the oil is kept at the proper level. Oil purchased under the Navy contract is recommended as follows:

(a) *For summer use.*—Navy symbol 5190 (S.A.E. 160).

(b) *For winter use.*—Navy symbol 3120 (S.A.E. 110).

Oil in the transmission shall be changed at least once each season.

105. The oil generally used in transmissions and differentials contains a small quantity of soap which serves to seal the gaskets. The Navy contract oil contains no soap. Therefore, should any difficulty

be encountered with leakage, a commercial oil of the same S.A.E. viscosity shall be purchased on proposals.

106. All grease and oil fittings on the track, or crawler assembly, shall be lubricated regularly, taking care that the moving parts in contact with each other have sufficient lubrication at all times. Do not apply oil to the track shoe hinge pins, as mixed with sand or dirt a grinding compound is likely to form and cause excessive wear on the track shoes and hinge pins.

BOATS, GENERAL, TYPES, ETC.

107. Boats attached to Coast Guard stations shall be classified as follows:

MOTOR LIFEBOAT

Type F.—52 feet; pointed stern; flush deck; Diesel engine; equipped with sails.

Type TR.—36 feet 8 inches; pointed stern; self-bailing and self-righting; freeing ports; gasoline engine; equipped with sails; one-man cockpit forward.

Type T.—36 feet 6 inches; general design similar to type TR.

Type HR.—36 feet; pointed stern; self-bailing and self-righting; freeing trunks; equipped with sails; cabin forward.

Type H.—36 feet; same as type HR; canvas canopy in place of cabin forward.

Type E.—34 or 36 feet; diagonal planked; engine compartment aft; canopy forward; equipped with sails.

MOTOR S-B SURFBOAT

Type SR.—25 feet 10 inches; balsa wood buoyancy block in lieu of side compartments; freeing ports; pointed stern; self-bailing; light construction for transportation on wagon and launching through surf.

Type S.—25 feet 10 inches; side compartments for buoyancy. Other characteristics similar to type SR.

Type H.—26 feet; side air cases; freeing trunks; other characteristics similar to type SR.

PULLING S-B SURFBOAT

Type SR.—25 feet 6 inches; hull characteristics same as motor S-B surfboat; machinery omitted.

Type S.—25 feet 6 inches; hull characteristics same as type SR except side air cases fitted in lieu of buoyancy blocks; machinery omitted.

Type H.—25 feet 6 inches; hull characteristics same as type S; water ballast tank, centerboard, and equipped with sails.

MISCELLANEOUS TYPES OF BOATS USED FOR VARIOUS PURPOSES AT COAST GUARD STATIONS

Open pulling surfboat.—Machinery and self-bailing features omitted.
Various types.

Motorboat.—Machinery-propelled boats such as picket boats, supply boats, etc.

Boat.—Miscellaneous types such as dories, skiffs, dinghies, lighters, etc.

EQUIPMENT OF BOATS

108. Fifty-two foot motor lifeboat.—Special equipment, a list of which shall be carried in the boat.

Motor lifeboats, type TR, carry the following equipment; the equipment of other types shall conform as closely as possible.

- 1 anchor, 100 pounds; kedge, galvanized, with 80 fathoms 3-inch manila line stowed in deck chests.
- 1 anchor, 55 pounds, Dirigo (folding) galvanized, with 25 fathoms $2\frac{1}{2}$ -inch manila line.
- 1 hand grapnel, 10 pound; folding, galvanized, equipped with 15-fathom $1\frac{1}{2}$ -inch manila line.
- 1 heaving line, 12 thread, 20 fathoms, tarred hemp.
- 1 hand lead, 9 pound, with 20 fathoms of line, marked.
- 4 rope fenders, 6-inch diameter by about 22 inches long with lanyards.
- 1 set of sails, 1 bag.
- 1 drogue, Hawthorne.
- 1 drogue, canvas; hauling and tripping lines; lifeboat size.
- 1 ring buoy, solid cork, 24-inch outside diameter.
- 1 water light connected to buoy with 4-foot lanyard and brass snap hook.
- 1 towing hawser.
- 1 bow and 1 stern line.
- 1 lantern, brass, oil.
- 1 signal torch, electric, hand.
- 1 boat hatchet.
- 1 ax, $3\frac{1}{4}$ pounds.
- 1 bucket, 12-quart, galvanized.
- 1 water container, 5-gallon.
- 1 binocular and case, mounted.
- 2 boat hooks, 10 feet.
- 6 red coston signals in brass case, mounted.
- 1 coston holder.
- 1 shoulder line-throwing gun, complete with accessories.
- 1 medical kit.
- 1 safety belt for wheelman.

- 1 megaphone, 18 inches.
 - 16 life preservers, Kapok jackets.
 - 1 Coast Guard ensign, no. 4, with bag.
 - 1 Coast Guard pennant, no. 7, with bag.
 - 1 national ensign, no. 11, with bag.
 - 1 wigwag flag, with 6-foot staff.
 - 2 semaphore flags (red and yellow).
 - 1 chart tube, copper, 6-inch diameter by 3 feet long (clamped to bulkhead and equipped with charts for locality).
 - 1 set parallel rulers.
 - 1 pair dividers.
 - 1 brass fog horn, small.
 - 2 copies Pilot Rules.
 - 1 flag staff.
 - 1 emergency tiller.
 - 1 portable trouble light (deck).
 - 2 portable trouble lights (engine compartment).
 - 1 portable stern light.
 - 1 canvas cover for binnacle.
 - 1 canvas cover for searchlight.
 - 1 canvas cover for forward cockpit.
 - 1 graduated gasoline measuring rod.
 - 12 spare bulbs, Mazda 68-G-6, 12-16-volt; 3 C.P.-D.C. Ediswan base.
 - 2 standard boat wrenches for drain plugs.
 - 3 spare fuses for lighting circuit, 125 volt-15 amp.-Edison screw base.
 - 3 spare searchlight bulbs.
 - 6 spare bulbs for hand signal torch.
 - 1 spare set of batteries for hand signal torch.
 - 1 tank of storm oil.
 - 1 copy each of manufacturers' instruction books for engine.
 - 1 Lux or CO₂ fire extinguishing equipment system.
 - 1 spring scale for weighing cylinders of fire-extinguishing system.
- Compass, signal horn, bell, searchlight, etc., are considered fixed equipment and are not included in the above list.

A list of motor spare parts and tools required for the engine installed shall be carried on board, this list to be kept with manufacturers' instruction books and properly protected from weather. The complete list for the type of motor may be obtained from Headquarters if not furnished when the boat was received.

1 More Pistol + kit.

109. Equipment for Types S and SR Motor S-B Surfboats.

Number required	Description	Location
6	Oars, 12 feet, ash.....	Lashed amidships, outboard, 3 port, 3 starboard.
7	Oar locks no. 2 with lanyard, 1 spare.....	Spare oar lock secured to clamp at after thwart.
2	Boat hooks, 10 feet long, ash.....	Amidships, outboard, 1 port, 1 starboard.
1	Water breaker, 3-gallon (metal).....	In after hold, lashed to stanchion.
1	Anchor, 55 pounds, folding galvanized and anchor line, 2½ inches, not less than 30-fathom manila line.....	On gasoline tank cover.
1	4-pound hand grapnel, 5-prong, 15-fathom, 1½-inch manila line.....	Below main deck, under forward scuttle (lash to stanchion).
1	Painter, 2½-inch manila line, 7-fathom.....	On side of boat above forward deck, port side, lashed.
1	Stern fast, 2-inch, 5-fathom.....	Aft on end deck, port side, lashed.
1	Heaving stick and heaving line, 6-thread manila, 20-fathom.....	On side of boat above forward deck, in bracket, starboard side.
1	Canvas drogue and fittings, medium size.....	8 spare jackets lashed on top of side seats, amidships.
1	Boat claw hatchet, 3½-cut (lanyard and brass bracket).....	Amidships starboard side lashed.
12	Life jackets, regulation kapok.....	On after deck, starboard side, lashed.
1	Wigwag flag, 2½-feet and cover.....	In after hold, lashed to stanchion.
2	Semaphore signal flags and cover.....	In leather strap on after bulkhead between bitts.
1	Galvanized 10-quart flat bottom bucket (with lanyard).....	Below main deck, under forward scuttle, lashed to stanchion.
1	Sheath knife, 5-inch blade.....	In forward locker.
1	Fog horn, 18-inch brass.....	On after deck, starboard side, lashed.
1	Mouth whistle, brass.....	On staff forward, stow in forward locker.
1	Water light and lanyard 15-fathom (6-thread manila).....	On flag staff aft, stow in forward locker.
1	Combination light, brass, class 1, fresnel lens.....	Below main deck, under forward scuttle, lashed to stanchion.
1	Stern light, brass.....	In stowage box below main deck, under forward scuttle.
1	Hand lantern, brass.....	Do.
1	Standard electric signal torch.....	Do.
1	Medical kit, canvas bag.....	Lashed to gunwale, port and starboard.
1	Coston holder and 3 signals.....	Made fast to gunwale clamps, 5 bights each side.
2	Fenders, cork, standard.....	Made fast to gunwale at ends of each thwart.
2	Life lines, 15-thread manila.....	Below main deck under forward scuttle.
8	Righting lines, 18-thread manila, each 3-fathom with floats.....	In stowage box.
1	Stowage box, with canvas cover.....	In forward locker.
2	Wrenches for drain plugs and deck pumps.....	Do.
2	Copies Pilot Rules.....	Aft, starboard side between 33 and 35 frames, mounted on board.
1	National ensign, small.....	On face of side compartment forward, no. 2 thwart port side.
1	Coast Guard ensign, small.....	
1	Flag staff.....	
1	Flag bag.....	
1	Compass.....	
1	Portable 4-pound CO ₂ fire extinguisher.....	
1	Carbon tetrachloride extinguisher (1 quart).....	
1	Copy each of manufacturers' instruction books for engine.....	

6 Motor S-B surfboats of similar design shall be equipped and stowed, insofar as possible, in conformity with the above list.

A list of motor spare parts and tools required for the engine installed shall be carried on board; this list to be kept with manufacturers' instruction books and properly protected from the weather. The complete list for the type of motor may be obtained from Headquarters, if not furnished when the boat was received.

110. Equipment for the type S pulling S-B surfboat.

Number required	Description	Location
10	Oars, 12 feet ash (2 spare)	Spare oars lashed amidships.
1	Sweep oar, 18 feet ash	
10	Oar locks no. 2, with lanyard (2 spar)	Spare locks secured to clamp at after thwart.
2	Boat hooks, 10 feet long, ash	Amidships, outboard.
1	Water breaker, 3-gallon (metal)	In after hold, lashed to stanchion.
1	Anchor, 55 pounds folding, galvanized, and anchor line, 2-inch, not less than 30-fathom, manila.	On deck under no. 3 thwart.
1	4-pound hand grapnel, 5-prong, and 15-fathom, 1½-inch manila line.	Below main deck under forward scuttle (lashed to stanchion).
1	Painter, 2½-inch manila, 7-fathom	On side of boat above forward deck, port side (lashed).
1	Stern fast, 2-inch 5-fathom	Aft on end deck, port side lashed.
1	Heaving stick and heaving line, 6-thread, manila, 20-fathom.	On side of boat, above forward deck, starboard side, in bracket.
1	Canvas drogue and fittings, medium size.	Spare jackets lashed to under side of thwarts.
1	Boat claw hatchet, 3½-inch cut (lanyard and brass bracket).	Amidships, starboard side, lashed.
17	Life jackets (8 spare) regulation kapok	On after deck, starboard side, lashed.
1	Wigwag flag, 2½-foot, and cover	In leather strap on after bulkhead between bitts.
2	Semaphore signal flags and cover	Below main deck, under forward scuttle, lashed to stanchion.
1	Galvanized bucket, 10-quart flat bottom, with lanyard.	On after deck, starboard side, lashed.
1	Sheath knife, 5-inch blade in leather strap.	In leather strap on after bulkhead between bitts.
1	Fog horn, 18-inch, brass	Below main deck, under forward scuttle, lashed to stanchion.
1	Water light and lanyard, 15-fathom (6-thread manila).	On after deck, starboard side, lashed.
1	Hand lantern, brass	Below main deck under forward scuttle, lashed to stanchion.
1	Standard electric signal torch	In stowage box below main deck under forward scuttle.
1	Medical kit, canvas bag	Do.
1	Coston holder and 3 signals	Do.
1	Fenders, cork, standard	Lashed to gunwale, port and starboard.
2	Life lines, 15-thread manila line	Made fast to gunwales, 5 bights each side.
8	Righting lines, 18-thread, manila (each 3 fathoms).	Made fast to gunwales at ends of each thwart.
1	Stowage box with canvas cover	Below main deck under forward scuttle.
2	Wrenches for drain plugs and deck pumps.	In stowage box.
1	National ensign, small	In canvas bag.
1	Coast Guard ensign, small	Do.
1	Standard flagstaff	Amidships, starboard side, lashed.
1	Flag bag	Do.
1	Compass	To be kept in boatroom for use if required.

Pulling S-B surfboats of similar design shall be equipped and stowed, insofar as possible, in conformity with the above list.

111. Equipment for open pulling surfboats.

1 oar for each oarsman	1 set of semaphore flags
2 spare oars	2 boat plugs secured with lanyard
1 steering oar	1 sheath knife
1 hand grapnel, small	2 buckets
2 boat hooks	1 fog horn
1 anchor and anchor line	1 coston holder
1 painter	3 coston signals, red
1 stern fast	1 medical kit
1 heaving stick and line	1 flagstaff
1 full set of oarlocks	1 flag bag
1 spare oarlock	1 national ensign, small
1 drogue	1 Coast Guard ensign, small
1 hatchet	1 flashlight
1 life preserver for each oarsman	1 lantern
6 spare life preservers	

A boat compass shall be kept available for use in pulling boats should circumstances warrant its use.

112. Miscellaneous boats.—To be equipped as directed by the district commander. In all cases the equipment for motor boats shall meet the requirements of the motor-boat laws for boats of their class.

GENERAL INSTRUCTIONS

113. All boats shall be kept clean, in good condition, and properly fitted with all necessary equipment for performing efficient service and securing the safety of their occupants. The full equipment of boats shall be kept in them at all times and neatly stowed, excepting boat covers and those tools and spare parts furnished for repairing machinery which could not ordinarily be used at sea. The equipment as listed above is the minimum for the type of boat designated, but additional equipment to meet local conditions may be added if found necessary.

114. Upon returning from service or drill, each boat and its equipment shall be thoroughly dried and put in order at the first opportunity. Deck hatches of self-bailing boats shall be kept open during daylight and the interiors thoroughly aired and dried while the boat is in the boathouse.

115. Boats at inactive stations which ordinarily are not used shall be protected from drying out by pouring several buckets of fresh water in the bilges once each week. The water will be allowed to remain in the boat as long as there are indications of leaking. During freezing weather this procedure will be eliminated.

116. Care shall be taken to see that all pumps, caps, vents, and other metal movable attachments are free from paint and corrosion and properly lubricated to allow free turning with the fingers. Pumps shall receive most careful consideration.

117. Care must be taken to prevent the accumulation of oil, gasoline, and water in the bottoms of all motor boats, and the bilges must be cleaned out frequently.

118. In the case of boats kept out of water and after the bilges are properly cleaned, some water may be left in the bilge if necessary to keep the boat tight.

119. Boats that are ordinarily kept in the water shall be carefully inspected each day and the water line kept free from marine growth.

120. Each man shall keep his life preserver on his thwart, properly marked as prescribed by regulations and ready to use.

121. The officer in charge and every other member of the crew, except the man operating the engine of a motor lifeboat, shall wear a life preserver on all occasions of drill or actual service in boats. The life preserver for the man operating the engine of a motor lifeboat shall be kept near at hand when not worn. If the men are required to work on board a wreck and the life preservers become impediments, they may be removed while on board but must be put on before entering the boat.

122. The after thwart of each boat shall be designated as no. 1, and the next forward thwart as no. 2, and so on. The odd-numbered men will take positions on the starboard side and even-numbered ones on the port side. The no. 1 and the no. 2 men shall pull on the after thwart.

123. The oars shall be numbered from aft forward, each stroke oar being numbered I, the oars for the thwart next forward II, and so on. The numbers shall be marked in roman numerals on the loom, 3 inches from the handle on each side, so that the number shall be up when the oar is lying flat on the blade. The oars for each side shall be kept on each outboard side of the thwarts, with the blades forward.

124. A boat shall never be left alongside a vessel or wreck without a boat keeper; in rough weather there shall be at least two boat keepers.

INSTRUCTIONS SELF-BAILING SURFBOAT WITH BOAT WAGON

125. The boat wagon, with the boat loaded upon it, shall be kept in the boat room with the bow toward the doors. Boats shall be secured to the boat wagons, using the means provided by the designer and also special instructions which are issued from time to time.

PAINTING BOATS

126. (1) All boats shall be painted in accordance with regulations and Painting Instructions, United States Coast Guard. Special care shall be given all boats kept afloat where marine borers are active.

(2) On boats having aerial identification numbers, care shall be exercised not to obscure the number.

127. *Boat number plates.*—Every Coast Guard boat under 40 feet in length shall bear a boat number plate. It shall be clearly visible and neatly screwed to the top of the after permanent thwart at its starboard end, or for a boat without thwarts to the bulkhead forming the after cockpit, the plate to be on the after side near the starboard cockpit coaming. Boat number plates shall not be painted.

128. All unpainted brass work in boats shall be kept bright and polished where practicable.

GASOLINE ENGINES FOR BOATS AND OTHER PURPOSES

129. Electric ignition, starting, and lighting systems shall be kept as clean and dry as possible. Magnets, dynamos, coils, ammeters, and similar apparatus should never be taken apart except by experienced men and then only under emergent circumstances. Care should be taken to prevent short circuiting of batteries or grounding of wires, as this may cause fire or explosion and may also ruin the battery. Keep switches turned off whenever current is not required in a circuit. The use of open type switches and nonwater-tight electric light fixtures is prohibited. Dry batteries should be stowed in a wooden box or rack and kept free from moisture. Only regulation fuses shall be used to protect the electrical system.

130. *Care of gasoline engines.*—(1) Gasoline engines, and all appurtenances, shall be kept in the highest possible state of efficiency and preservation. To this end, when not in use, they must be kept clean, covered in bad weather, thoroughly drained in cold weather to prevent freezing, and frequently examined to detect loosening of bolts and other connections.

(2) Every engine at stations in commission shall be started at least once each day to insure proper working order. Condition of motors shall be entered in the station log daily after test is made. When water jackets are empty, an engine shall not be allowed to run more than 30 seconds, and thereafter must be allowed to cool before running again, unless jackets have in the meantime been filled. Under no circumstances shall cylinders or pistons be overheated by running engines without water. Whenever conditions permit, arrangements should be made whereby water may be circulated in engines of boats out of water, thus making possible a longer running period than that prescribed above. A full supply of gasoline, oil, and grease

shall be kept in tanks and lubricating systems, so that power boats may at all times be ready for instant use. At stations in an inactive status it will be sufficient if engines of power boats, kept in condition for use, are turned by hand a full revolution once in two days.

(3) Gasoline tanks shall be kept full at all times as this retards corrosion inside, especially in the case of copper tanks. All gasoline lines should be disconnected at least once each year. Sediment, rust, or verdigris should be removed and tanks and gasoline lines thoroughly cleaned. Care should be taken to see that only clean gasoline is placed in the tanks, through a strainer.

(4) When underway, prompt attempt shall be made to remedy trouble if misfiring, pounding, or overheating occurs. Careful attention shall be given lubrication. Oil leaks should be prevented and engines kept wiped and as clean as possible when running, and thoroughly cleaned at end of each run. Oil pressure gage should be observed frequently. Motor should be stopped if oil pressure drops, in order to prevent injury to motor.

(5) Careful attention should be given to circulating water. (a)

(6) Instructions furnished by manufacturers or Headquarters for care and operation of specific makes of gasoline engines, including electrical and other apparatus, shall be strictly observed. Copies of these instructions shall be kept on hand and if lost additional copies shall be requested.

131. With the variation in types of engines now in use it is impracticable to give definite instructions for starting, running, and stopping which will apply in all cases. The following remarks, however, apply to all engines:

(a) Do not start on a trip without knowing the state of oil and gasoline supply.

(b) In cold weather, or when engine is cold, more gasoline is required than in warm weather or after engine has heated to normal running temperature.

(c) Never attempt to start a gasoline engine without first noting the position of the spark control; it *must* be in the retard position.

(d) Never allow an engine to race (run idle at speed greater than maximum load speed). Such practice is dangerous and liable to result in serious damage to the engine.

(e) It is better when stopping for a short time to cut off ignition rather than gasoline, as the first method leaves cylinder charged with an explosive mixture ready for the next start.

(f) Power boats left with no one on board should have gasoline shut off at tank and circulating water shut off at sea cock.

(g) Too rich a mixture results in overheating, loss of power, and waste of gasoline. It also causes black exhaust smoke.

(h) Too lean a mixture causes back firing.

- (i) Too much oil causes excessive carbon deposit in cylinders. It is usually indicated by white or light blue exhaust smoke.
- (j) Too great advance of spark causes pounding.
- (k) Insufficient advance of spark causes loss of power and overheating.
- (l) When laying up an engine, all bright parts should be covered with heavy oil or grease. Vaseline is excellent for this purpose. Half a pint of heavy lubricating oil should be poured in each cylinder on top of the piston, and the engine should be turned over a few times so as to spread it.

USE OF ETHER

132. Danger, as well as expense, attends the use of ether for priming gasoline motors to facilitate starting. Serious delay is sometimes experienced in starting motors in cold weather with low grades of gasoline. The use of ether will not be entirely prohibited, but shall be restricted as follows:

- (a) It shall *never* be used except in case of emergency when the boat is needed to answer an actual call for assistance, and then only after attempts to start the motor in the usual manner have failed.
- (b) The ether is to be mixed with at least four times its quantity of gasoline, and, thus diluted, introduced into cylinders. It shall not under any circumstances be placed in gasoline tanks.
- (c) The officer in charge shall have personal custody of ether furnished a station, shall see that it is safely kept in tightly closed bottles or cans, plainly labeled, and that extreme precaution, because of its highly volatile and inflammable properties, is exercised in handling. He shall be responsible for its proper use.

DRILLS

133. Drills shall be held at all Coast Guard stations as prescribed below:

Fire drill.—One each week. One drill to be held at night each month.

Boat drill—(a) *Pulling surfboats*.—Two each week. This drill shall consume at least 30 minutes afloat. When both self-bailing surfboats and open surfboats are attached to any one unit, drills shall be alternated.

(b) *Motor lifeboat*.—One each month. Shall consume 1 hour afloat and when in the vicinity of an inlet the boat shall proceed out of the inlet to sea and return.

(c) *Motor self-bailing surfboat*.—One each month. Shall consume 1 hour afloat.

(d) *Dory or other small pulling boat used in surf.*—One each 2 weeks. Shall consume 15 minutes afloat and the entire crew shall be drilled.

Signal drills.—One each week with each system used. Shall consume not less than 20 minutes each of actual drilling.

Resuscitation drill.—One each week. Shall consume at least one-half hour.

Beach apparatus drill.—Once each week.

Infantry drill.—Once each week; 30 minutes each.

Boarding duty, law enforcement, customs, navigation, and motor-boat laws.—Once each week. Shall consume at least 30 minutes.

Pilot rules and piloting.—Once each week. Shall consume not less than 30 minutes.

Regulations.—(Articles pertaining to Coast Guard stations, including honors and distinctions.) Once each week. Shall consume not less than 20 minutes.

134. No drills shall be held on Saturday, which shall be devoted to general cleaning about the station. When circumstances permit, Saturday afternoon shall be regarded as a half holiday. Drills shall be held between 8 a.m. and noon when practicable. The number designating the person engaged in a drill shall be the number shown in the watch and patrol bill.

135. If the weather on any day be unsuitable for any of the prescribed drills, the officer in charge may substitute others on the schedule, but the required number of each kind of drill must be held each week unless prevented by assistance duty, foggy or stormy weather, or in the case of boat drills, by high surf. Where drills are omitted and later made up or substituted for by other drills, or when less than the prescribed time is devoted to boat, signal, or resuscitation drill, an entry of the fact, and the cause thereof, shall be made in the log.

136. In certain cases two drills may be held at the same time: for instance, instructions in Pilot Rules and Piloting may be held in conjunction with boat drills.

137. Drills omitted on account of assistance duty need not be made up, but all other drills omitted shall be made up in the afternoon in the week in which the omission occurred, if possible.

138. If extensive work is necessary, authority to omit signal and recitation drills, until such time as the work is completed, may be requested from the district commander.

139. In general, the afternoons shall be devoted to the work of upkeep about the station premises.

FIRE DRILL

140. At fire drill each member of the crew shall at once repair to his station and quietly and rapidly perform his allotted duties. All unnecessary noise and confusion shall be avoided.

141. The signal for fire drill shall be the verbal alarm FIRE! This alarm will be given by the officer in charge, who shall designate the scene of the supposed fire immediately after giving the alarm. (In case of actual fire, the person discovering it shall at once give the alarm, designating its actual location.)

142. At fire drill and in case of actual fire the following duties shall be performed by the members of the crew, who are designated by their watch and patrol numbers:

The senior petty officer for the purpose of this drill will perform the duties of no. 1, his junior no. 2, etc. In case of absentees, the officer in charge will detail men to perform all duties of absent members as well as their own.

Officer in charge—Shall have general supervision at the scene of the fire; direct operations; see that each member of the crew performs his allotted duties; maintains order. He shall be provided with an ax.

No. 1.—Shall provide and attach nozzle to hose and tend nozzle; assist in leading out hose.

No. 2.—Lead out hose and attach to pump or hydrant; keep hose clear.

No. 3.—Provide fire extinguisher at scene of fire.

No. 4.—Lead out and attach suction hose; man brakes.

No. 5.—Remove powder from station; man brakes.

No. 6.—Place pump in position; assist to lead out and attach suction hose; man brakes.

No. 7.—Place pump in position; man brakes.

No. 8.—Provide blanket and fire extinguisher at scene of fire.

No. 9.—Assist to lead out and connect hose; provide fire extinguisher at scene of fire.

143. Where stationary pumps are installed, it will not be necessary to provide and attach the suction hose or place the pump in position, but the men assigned those duties shall at once man the brakes.

144. Where fire hydrants connected with city water mains are installed, the drill shall be modified accordingly upon approval of the district commander.

145. When the drill is over, the officer in charge shall give the command SECURE!, when each man shall return what he provided to its proper place. The crew shall then be mustered by the officer in charge and each man required to recite his duties at fire drill, after which the crew shall be dismissed.

Boat Drill

INSTRUCTIONS FOR COAST GUARD STATIONS

29

BOAT DRILL

146. Boat drills shall consist in launching and landing through the surf and exercise of the men in handling their oars, using the prescribed phraseology in giving commands for the various maneuvers. The drill shall include sailing when practicable. When the motor surfboat is used, the crew shall be exercised in pulling with the oars. Whenever practicable, exercise shall be had in the use of the drogue in order to instruct the crew in its proper use and to test its strength.

147. In all motor-boat drills gear shall be secured for sea the same as in actual service. Drill with motor boat shall include picking up an object or buoy thrown in the water and also anchoring, getting underway, and taking soundings by means of the lead.

148. At boat drills, after the officer in charge has exercised the crew sufficiently, he shall surrender the steering oar on alternate boat-drill days to each of the two senior men respectively, who shall, under his instruction, exercise the crew in the drill, including launching and landing through surf. At such times the officer in charge shall, when practicable, pull the oar of the man being instructed.

149. The crew of each station supplied with a self-bailing surfboat shall be exercised once each month, when the water is not too cold or the surf too high, in capsizing and righting the boat, leaving all unnecessary equipment on shore.

150. During the months of December, January, February, and March, one pulling surfboat drill in each week may be omitted at stations on the Atlantic coast north of Cape Henlopen and at stations on the Great Lakes.

DRILL WITH SELF-BAILING SURFBOAT ON BOAT WAGON

INSTRUCTIONS

151. Before unloading the boat from the wagon the officer in charge shall see that water-tight compartments are secured and that all vents and plugs are closed.

152. Unloading the boat from the wagon shall be practiced, so that it can be done quickly and easily. One minute is ample time in which to unload when the crew is properly drilled.

DRILL

(Crew of officer and 8 men)

153. (1) Leaving the station for drill or service.

Commands:

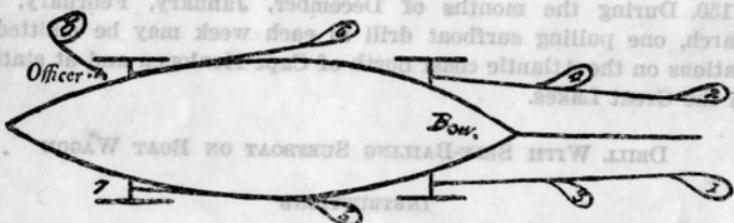
1. Man the surfboat.
2. Forward.
3. Halt—unload.
4. Take life preservers.
5. Take oars.
6. Go.
7. In bows.
8. Way enough.

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Man the surfboat Nos. 5 and 6 open and secure the boat-room doors. If the wagon pole be detached,

nos. 1 and 2 adjust it, no. 1 holding it in position while no. 2 inserts the bolt; the men fall into place with the drag ropes over their shoulders, as shown in the following diagram:



NOTE.—If a motor vehicle is used, the man detailed as operator shall proceed to bring it to scene for attachment. Under certain conditions it will be found more efficient for the proper safeguarding of the crew and boat to don life preservers prior to unloading the boat in order that the men may have the use of both hands to hold the boat in the surf after unloading.

COMMANDS

DUTIES

Forward----- The wagon is run out of the house to the most desirable place for launching, as near the water as possible, the boat's bow toward the surf. (If a motor vehicle is to be used the man operating it, assisted by one man on each side, makes the attachment to the boat wagon.)

Halt—unload----- The drag ropes are dropped (or the motor vehicle detached, and secured at a safe place); nos. 3 and 4 cast off the side lashings; nos. 1, 3, 5, and 7 on the starboard side and nos. 2, 4, 6, and 8 on the port side run the boat back over the rear axle as far as the wheels will allow; nos. 7 and 8 take turns with the check ropes around the bilge keels or grip streaks and tend them. Nos. 1 and 2 place lifting bars in position. Nos. 1, 3, and 5 on the starboard side and nos. 2, 4, 6, and 8 on the port side man the bars; the officer in charge removes the king bolt, the reach is lifted, the officer in charge removes the forward wheels, and the reach is then carefully lowered to the ground; nos. 7 and 8 slack the check ropes and the boat is slid down and off the reach; nos. 3, 4, and 5 then run the forward wheels and nos. 6, 7, and 8 the rear wheels up the beach out of the reach of the tide. Each man then takes his place on his proper side of the boat and abreast his thwart. This procedure may be modified to suit the type of boat wagon used.

Take life preservers----- At the command **Take**, each man lays hold of his own life preserver. At the command **Life preservers**, which is given shortly after the command **Take**, the life preservers are taken simultaneously, the men put them on and proceed to adjust them. Officer in charge inspects life preservers to see that they are properly adjusted and secured.

COMMANDS

DUTIES

Take oars. At the command Take, each man lays hold of his oar. At the word Oars, which is given after a short interval, the oars are raised simultaneously on end, blade up, and the men, governed by no. 1, drop them together into the rowlocks on their respective sides, the handles resting against the opposite air case. The oars will be kept on end long enough to insure uniform action, and will be dropped without orders. The officer in charge at the same time secures the steering oar in its lock or becket, its handle resting under the after thwart.

The boat is launched into the water; the two bowmen jump into the boat when it is water borne, take their oars and assist to keep the boat head to the sea; no. 1 at the stern assists the officer in charge.

Go. At this command, which the officer in charge gives at his discretion, the men give the boat all the headway possible, then, as it becomes water borne, the men amidships and the stroke oarsmen, in the order named, jump in, take their oars, and give way briskly together, the bow oarsmen steadyng the boat as long as the depth of the water or surf will permit, and the officer in charge jumping in when he deems it best to do so.

In bows. Given when the boat has sufficient way and while the blades are in the water. Bowmen complete the stroke, toss oars simultaneously to an angle of 45° , boat them together, and stand erect in the bow facing forward. If a landing is to be made, the Bowman next to the landing shall use his boat hook as needed, or stand by painter or heaving stick and line, or stand ready to catch a line as directed by the officer in charge.

COMMANDS

DUTIES

Way enough. Given when the boat has sufficient headway and while the blades are in the water at the beginning of the stroke. The men finish the stroke and, as the oars leave the water, toss them simultaneously to an angle of 45° and boat them quickly and quietly, placing the blades entirely inside the gunwale. The stroke oarsman next to the landing-place, if one, takes up his boat hook; each man unships his rowlock; bowman and stroke oarsman on side next the landing place check headway, keep boat clear, etc., as necessary.

NOTE.—When there are 6 or 7 men in the crew, the drill prescribed for 8 men will be followed as far as practicable. In actual service, as at wrecks or in rough waters, the officer in charge shall use his discretion about unshipping rowlocks.

(2) **Leaving a vessel for the beach.**

Commands:

1. Stand by the oars.
2. Shove off.
3. Out oars.
4. Give way together.
5. Way enough or boat oars amidships.

Stand by the oars. Every man except the inboard bowman unships his rowlock, seizes his oar by its handle, and sees the blade clear of the other oars. The oars should be shoved forward over the gunwale far enough to bring the handle in the proper position, and should be kept fore and aft.

Shove off. Inboard bowman shoves the bow smoothly off from the ship's side with boat hook, using handle end where damage to paint on vessel may result, at the same time shoving her a little ahead if possible; the officer sheers off with rudder or steering oar, assisted if necessary by the inboard stroke oar, who hauls ahead by any available means. Bowman places boat hook fore and aft amidships, seats himself, unships his rowlock and takes position of other men.

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Out oars ----- Given when the boat is clear of the ship's side. The crew throw the blades of the oars horizontally outward, allowing the leathers to fall into the rowlocks, place both hands on handle, and quickly trim blades flat and directly abeam. This is the position of **Oars**. Bowmen throw their oars out at the same time as the rest of the crew, if they are ready; otherwise they swing their oars out together, touching their blades forward to insure making the movement in unison, and bring them to the position of **Oars** or take up the stroke with the remainder of the crew, as the case may be.

Give way together ----- All the oarsmen take the full stroke, keeping accurate stroke with the starboard stroke oar and feathering the blades. The crew will pull a strong, steady stroke, always using their backs, and maintain silence.

Way enough, or boat oars amidships ----- When landing in smooth water and sufficiently near the beach, the command, **Way enough** may be given, in which case the oars are tossed together at an angle of 45° and laid entirely within the boat, blades forward, between the men and the rail, with as little noise as possible.

When landing in rough water on a steep beach where it is imperative that the men leave the boat quickly, the command **Boat oars amidships** may be given, in which case the oars are "tossed" and laid along the center line of the boat, blades forward.

(3) Going alongside a vessel, official occasion.

Stand by to toss. (Given instead of command

"**Way enough**") ----- **Stand by to toss**, the preparatory command, is given as a warning to the crew. The command **Toss** is given as the blades enter the water, and when the boat has sufficient headway to reach the gangway. The oarsmen complete the stroke and

COMMANDS

DUTIES

toss the oars to a vertical position by pressing smartly on the handle with the inboard hand, raising the oar with the outboard hand under the loom. Lower handle of oar to bottom boards and hold the oars in a vertical position with the blades fore and aft. The inboard stroke and the inboard bow oarsmen lay their oars in the boat quickly, after assuming the vertical position, seize their boat-hooks, assist to check headway and fend off and haul the boat alongside the gangway. The crew will remain at a toss until officers leave the boat; if it is then desirable to lay the oars in the boat it will be done by the command **Boat the oars**, at which each man lays his oar quickly and quietly in the boat, blade forward. (This command should not be given when there are overhanging obstructions from the ship which would be likely to foul the oars when they are in a vertical position.)

(4) Leaving a vessel after official visit, oars boated.

Commands:

1. Stand by the oars.
2. Up oars.
3. Shove off.
4. Let fall.
5. Give way together.
6. Way enough (or Boat oars amidships).

Stand by the oars _____ Same as explained in paragraph 2 of this article.

Up oars _____ The oars, except the two bow and the inboard stroke oars, are tossed quickly to a vertical position, blades fore and aft and in line with that of the stroke oar, handles of oars on bottom boards, outboard hand grasping loom of oar at height of chin, wrist of inboard arm resting on inboard thigh, and steadyng oar.

Shove off _____ This command is executed as described in paragraph 2 of this article. As soon as possible the inboard stroke oar lays aside his boat hook and gets up his oar without

COMMANDS

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- Let fall.----- Given as soon as the boat is clear of the boat carriage. Each man drops his oar smartly into the rowlock without noise, and takes the position of Oars.
- Give way.----- The crew give way as directed, the officer sheering the boat as he desires with the steering oar.

(6) EXPLANATIONS AND PURPOSES OF SPECIAL COMMANDS

COMMANDS

EXPLANATIONS AND PURPOSES

- Oars.----- *Explanation.*—Given when the blades are in the water. Finish that stroke and assume the position **Oars** as described under **Out oars**.
- Purpose.*—(1) To stop pulling, keeping the oars out. (2) To salute.
- Trail.----- *Explanation.*—Given when blades are in the water. Finish the stroke, release the handle of the oar, allowing it to draw fore and aft and trail alongside. If no trailing lines are fitted, retain the handle of the oar in the hand.
- Purpose.*—(1) To salute. (2) To pass obstructions, for the latter, the oars of either side may be trailed independently.
- Face about—hold.----- *Explanation.*—The men face about, passing around the end of their oars and take seats on the next thwart aft, drop the blades of their oars into the water, and hold hard. The men on the after thwart kneel and hold hard. To get headway in the opposite direction, give the order **Give way**.
- Purpose.*—(1) To exert full power in checking headway and stopping boat. (2) To exert full power in drawing away from an object. (3) To avoid a dangerous breaker when it is impossible or inadvisable to turn the boat.
- Hold water.----- *Explanation.*—Given when blades are in the water. Cease pulling, drop the oars in the water, and hold the blades perpendicular to the keel line. With con-

COMMANDS

EXPLANATIONS AND PURPOSES

siderable way on, especially in a loaded boat, care in holding water is required to prevent carrying away the rowlock or the oar. Under these conditions drop the oars in the water with the upper edges of the blades inclined forward and gradually bring the blades vertical as way is lost. The oars on either side may hold water independently.

Purpose.—To check or stop headway or sternboard.

Stern all _____ *Explanation.*—Given from position of **Oars** or **Hold Water**. The oars are backed, keeping stroke and feathering as when pulling ahead. Should not be given when the boat has much headway. When the boat has headway the command **Stern all** should be preceded by **Oars** or **Hold water**.

Purpose.—To acquire sternboard.

Back starboard (or port) _____ *Explanation.*—Designated oars are backed as at **Stern all**. Should **Hold water** before backing if boat has much headway. If quicker action in turning is desired, the command **Face about port (or starboard), Give way together** should be given.

Purpose.—To turn.

Back starboard, give way _____ *Explanation.*—Given from the position of **Oars** or **Hold water**.

Purpose.—To turn quickly when boat has little or no headway.

Stand by to toss. Toss _____ *Explanation.*—Same as previously described.

Purpose.—(1) To salute. (2) In going alongside upon official visits to vessels.

Boat the oars _____ *Explanation.*—Given from the position of **Toss, Oars, or Trail**. Place the oars quietly and quickly fore and aft in the boat. This command may be given from any position.

Purpose.—To get the oars into the boat.

COMMANDS

EXPLANATIONS AND PURPOSES

Point the oars. *Explanation.*—Stand facing aft, point the blades of the oars forward and downward to the beach at an angle of 30°, ready to shove off at the command.

Purpose.—To shove off a grounded or beached boat.

Stand by to. *Purpose.*—When for any reason it may be desirable, the preparatory command **Stand by to** — may precede any command of execution given in a boat. The preparatory for Cars is **Stand by to lay on the oars.**

CAPSIZING AND RIGHTING DRILL

154. Being under oars, the officer in charge commands:

Capsize drill. Given as a warning.
In oars. The oars are boated and placed amidships, blades forward.

Lash oars. All pulling oars are lashed to the thwarts amidships, and the handle of the steering oar under the after thwart. Oar locks shall be unshipped.

Man starboard (or port) righting lines. The righting lines are led across the boat to the opposite side, the men on each thwart manning the line belonging to their respective thwart.

Capsize. The men stand erect on the rail, haul back on the righting lines, and capsize the boat. After the boat is capsized the men immediately climb up on the bottom, carrying the righting lines with them, stand erect, and brace their feet against the keel.

Right boat. The men haul on the righting lines and right the boat, all climbing in as soon as possible, and taking their places on their proper thwarts.

Unlash oars. The oars are unashed and placed on the outward sides of thwarts. The officer in charge ships steering oar.

Out oars. Executed as prescribed.

NOTE.—At each capsizing and righting drill the boat shall be capsized and righted several times.

~~DRILL FOR BOATS UNDER SAIL~~

155. The principles of boat sailing are the same for all rigs. The use of the lee oars in a pulling boat is dangerous when under sail; a slight gust of wind lowers the gunwale so as to prevent the oars being lifted from the water, thus "catching a crab", and the headway of the boat will cause the oars to fly violently fore and aft.

156. The officer in charge shall never permit anyone to climb the masts of a boat. If halyards, etc., are unrove, unstep the mast. No person shall be permitted to stand in a small boat under sail; this does not apply to the helmsman of a motor lifeboat under sail.

157. Going alongside under sail requires care, judgment, and experience. In the first place, it should not be attempted if a boat or other obstruction which the masts could touch, overhangs the gangway, nor in rough weather when the rolling motion of the boat would cause the masts to strike the ship. In such cases the masts should be unstepped and the boat brought alongside under oars.

158. If the ship is riding to a windward tide, approach the gangway from abaft the beam, tend all gear, and shorten sail when the boat has sufficient way to reach the gangway. The bow and stroke oarsmen tend boat hooks, and the other men perform their duties in shortening sail.

159. If the ship is riding to the wind, approach the gangway from about abeam, tend all gear, bow and stroke oarsmen stand by the boat hooks, when there is sufficient way to make the gangway, command: Stand by to shorten sail, Shorten sail (if but one mast). If two masts, command: In jib and foresail. The jib tack and sheet are let go, the jib is smothered into the foremast; lower the foresail, at the same time putting the tiller hard down, haul main sheet amidships or a little on the weather quarter. This throws the boat's head into the wind, and hauling the main sheet to windward deadens her headway when desirable. When alongside, command: In mainsail. Stow sails and unstep if desirable. The above is the surest and safest method, but with skillful handling all sails may be taken in together, the tiller put hard down, and the boat rounded up to the gangway. This requires more skill and judgment and should not ordinarily be attempted.

160. If there is any current, make allowance for it by heading for a point farther forward or aft, as the case may be.

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161.

MOTOR LIFEBOAT UNDER SAIL

COMMANDS

DUTIES

- Stand by to step----- Crew provide and place mast or masts in position for stepping.
- Step the mast (or masts).- Crew step mast or masts, secure clamps, cast off and set up shrouds.
- Loose sail----- Crew will cast off stops, bend on halyards, and lead out sheets.
- With starboard (or port) sheet. Make sail. Set and trim sails. The officer in charge will station the men to perform the various duties of getting the boat under sail, depending upon the rig of the boat.

The following commands are given based on a lifeboat or surfboat provided with two masts. In cases of boat equipped with only one mast, the commands should be modified accordingly.

- (1) To tack.
- Ready about----- Given as a warning for the crew to prepare for the evolution. Give the boat a good full, wait for a smooth time, then ease down the tiller. At the same time the man tending the main sheet hauls it amidships slowly.
- Ease off the jib sheet---- Given when jib begins to shiver.
- Let go foresheet----- Given when foresail ceases to draw. If boat seems inclined to stop head to wind, haul jib sheet to windward; the jib will be taken aback and pay her head around. If the boat gathers sternboard, shift the tiller.
- Shift over main sheet---- When wind is ahead, shift over the main sheet and stand by to haul it aft when well around on the new tack.
- Haul aft fore and jib sheets. As soon as the bow of the boat has passed the wind, haul aft fore and jib sheets, leaving the main sheet slack until boat is well around, then trim by the wind. If the boat falls off too far from the wind, haul aft main sheet and keep jib sheet flying until she is brought up by the foresail and the mainsail and the tiller. When nearly high enough, haul aft the jib sheet and trim her by the wind.

COMMANDS

DUTIES

(2) To wear.

- Stand by to wear ----- Given as a warning for the crew to prepare for the evolution. Put the tiller up when ready.
- Ease off main sheet ----- Given as the boat's head pays off, in order to get the maximum effect of the mainsail in increasing her headway. Keep fast the fore and jib sheets until wind is abeam, as they help pay her head off.
- Ease off fore and jib Given when wind is a little abaft the beam. sheets. Slack the sheets off gradually.
- In mainsail ----- Given when wind comes nearly aft. Haul down the mainsail.
- Shift over sheets ----- Given when wind is aft. Stand by to haul all sheets aft on the other side.
- Set mainsail ----- Given when wind is slightly on new weather quarter. Set mainsail and haul it flat aft. Leave other sheets flying, or smothered in to mast, so she will come up rapidly.
- Haul aft fore and jib Given as the boat comes by the wind on sheets. new tack. Haul both sheets flat aft.

NOTE.—If wearing in a light to gentle breeze, it is unnecessary to take in the mainsail, but in a moderate breeze, or anything stronger, it should always be done on account of the danger from gybing.

With a sprit rig, put tiller up and ease off sheets. When the wind is nearly aft, trim in main sheet to avoid danger from gybing violently. In anything stronger than a gentle breeze, sprit-rigged boats should always be tacked to avoid the danger. If absolutely necessary to gybe a sprit-rigged boat in a fresh breeze, the peak should be dropped in addition to hauling in the main sheet.

(3) To heave to.

Stand by to heave to ----- Given as a warning for the crew to prepare for the evolution. Bring boat by the wind and keep tiller a-lee.

Haul main sheet flat aft. These commands are given simultaneously, and are obeyed by the men at their various stations. In heavy weather the fore-sail shall be taken in; in light breezes the

COMMANDS	DUTIES
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- fore sheet may be simply slackened off. If the bow falls off, slack away jib sheet. The boat in this condition should lie dead in the water, wind about abeam.
- (4) To get under way from heave to.
Make sail Haul aft fore and jib sheets and set foresail, ease the tiller, and ease off the main sheet.
- (5) To reef sail.
Stand by to reef Given as a warning for the crew to prepare for the evolution. Tend fore and main halyards. Bring boat by the wind.
Slack down fore and main Officer in charge luffs slightly, but not enough to cause boat to lose headway. Fore and main halyards are slackened down about 18 inches.
- Reef sail Pass the reef earings from the reef cringles to the tack bands. The earings in the leeches should be tightly bound around the foot of the sails. Pass reef points around foot of sail.
- Hoist away Given when sails are reefed and all is ready. Men at halyards hoist sails and officer in charge lays boat on desired course. Always keep boat under control, if possible, while reefing. Reef whenever boat begins to take in water over lee rail. Never be afraid of reefing too soon.
- (6) To douse sail.
Stand by to shorten sail Given as a warning for the crew to stand by their stations. Tend all halyards.
Shorten sail Slack away all halyards until sails are lowered into boat. Men sit on the thwarts awaiting next command.
Furl sails Unbend halyards and tacks. Furl sails.
Prepare to unstep Unbend shrouds and secure them to masts.
Stand by; unstep Unclamp masts and lower them into boat.
- (7) General rules for small boats under sail.
 1. Never be afraid to reef in good time.
 2. Always see sails well set and trimmed according to the direction of the wind.
 3. See that sheets are never belayed.

4. See that crew is properly stationed for making and shortening sail, reefing, and tacking.
5. Trim boat by shifting crew or ballast as required.
6. Make the crew sit on the thwarts or bottom. In stepping and unstepping masts and making sail, no one will stand up, except when absolutely necessary, and even then only on bottom boards or deck of the boat.
7. Remember that a loaded boat carries more way than an empty one.
8. In going alongside, allow plenty of room for rounding to. Unstep the masts as soon as sail is lowered. If you are not likely to go alongside in a seamanlike fashion, tack or wear and try again.

MANAGEMENT OF BOATS IN A SURF, BEACHING THEM, ETC.

162. The following rules are published by the Royal National Life-boat Institution of Great Britain:

I. *Rowing to seaward*.—(1) As a general rule, speed must be given to a boat rowing against a heavy surf. Indeed, under some circumstances, her safety will depend upon the utmost possible speed being attained on meeting a sea. For if the sea be really heavy and the wind blowing a hard, onshore gale, an approaching heavy sea may carry the boat away on its front and turn it broadside on or upset it. A boat's only chance in such a case is to obtain such a way as shall enable her to pass end on through the crest of a sea and leave it as soon as possible behind her. If there be a rather heavy surf, but no wind, or if the wind is offshore and opposed to the surf, as is often the case, a boat may be propelled so rapidly through it that her bow would fall more suddenly and heavily after topping the sea than if her way had been checked; it may therefore be only when the sea is of such magnitude and the boat of such character that there may be chance of the former carrying her back before it that full speed should be given to her.

(2) It may also happen that by careful management a boat may be made to avoid the sea, so that each wave may break ahead of her, which may be the only chance of safety in a small boat, but if the shore be flat and the broken water extend to a great distance from it this will often be impossible.

The following general rules for rowing to seaward may be relied upon:

a. If sufficient command can be kept over a boat by the skill of those on board her, avoid the sea if possible, so as not to meet it at the moment of its breaking or curling over.

b. Against a head gale and a heavy surf, get all possible speed on a boat on the approach of every sea which cannot be avoided.

c. If more speed can be given to a boat than is sufficient to prevent her from being carried back by a surf, her way may be checked on its approach, which will give her an easier passage over it.

II. *Running before a broken sea, or surf, to the shore (flat beach).*—
(1) The one great danger when running before a broken sea is that of "broaching to." To that peculiar effect of the sea, so frequently destructive of human life, the utmost attention must be directed. The cause of a boat's broaching to when running before a broken sea or surf is that her own motion being in the same direction as that of the sea she opposes no resistance to it, but is carried before it. Thus, if a boat be running bow on to the shore and her stern is to the sea, the first effect of the surf or roller on its overtaking her is to throw up her stern and, as a consequence, to depress the bow; if she then have sufficient inertia (which will be proportional to weight) to allow the sea to pass her, she will in succession pass through the descending, the horizontal, and the ascending positions as the crest of the wave passes successively her stern, her midships, and her bow, in the reverse order in which the same positions occur in the boat propelled to seaward against the surf. This may be defined as the safe mode of running before a broken sea.

(2) But if a boat, on being overtaken by a heavy surf, has not sufficient inertia to allow it to pass her the first of the three positions alone occurs: Her stern is raised high in the air and the wave carries the boat before it, on its front or unsafe side, the bow deeply immersed in the hollow of the sea, where the water, being stationary, or comparatively so, offers a resistance; while the crest of the sea, having the actual motion which causes it to break, forces onward the rear end of the boat. A boat in this position will sometimes, aided by careful oar steerage, run a considerable distance until the wave has broken and expended itself. But it will often happen that, if the bow be low, it will be driven under water, when the buoyancy being lost forward, while the sea presses on the stern, the boat will be thrown end over end; or, if the bow be high or protected by a bow air chamber, so that it does not become submerged the resistance forward acting on one bow will slightly turn the boat's head, and the force of the surf being transferred to the opposite quarter she will in a moment be turned broadside to the sea and be thrown by it on her beam ends, or altogether capsized. It is in this manner that most boats are upset in a surf, especially on flat coasts.

(3) Hence it follows that the management of a boat, when landing through a heavy surf, must, as far as possible, be assimilated to that when proceeding to seaward against one, at least so far as to stop her progress shoreward at a moment of being overtaken by a heavy

sea and thus enabling it to pass her. There are different ways of effecting this object:

a. By turning a boat's head to sea before entering the broken water and then backing in, stern foremost, pulling a few strokes ahead to meet each heavy sea, and then again backing astern. If a sea be really heavy and a boat small this plan will be generally safest, as a boat can be kept more under command when the full force of the oars is used against a heavy surf than by backing them only.

b. If rowing to shore with the stern to seaward by backing all the oars on the approach of a heavy sea and rowing ahead again as soon as it has passed to the bow of the boat, thus rowing in on the back of the wave; or, as is practiced in some lifeboats, placing the after oarsmen with their faces forward and making them row back at each sea on its approach.

c. If rowed in bow foremost by towing astern a pig of ballast or a large stone, or a large basket, or a canvas bag termed a "drogue" or "drag", made for the purpose, the object of each being to hold the boat's stern back and prevent her being turned broadside to the sea or broaching to.

d. Heavy weights should be kept out of the extreme ends of the boat, but when rowing before a heavy sea the best trim is deepest by the stern, which prevents the stern being readily driven off by the sea.

e. When running before a sea a boat should be steered by an oar over the stern or on one quarter.

(4) General rules for running before, or attempting to land through, a heavy surf or broken water:

a. As far as possible avoid each sea by placing the boat where the sea will break ahead of her.

b. If the sea be very heavy, or if the boat be small, and especially if she has a square stern, bring her bow round to seaward and back her in, rowing ahead against each heavy surf sufficiently to allow it to pass the boat.

c. If it be considered safe to proceed to the shore bow foremost, back the oars against each sea on its approach, so as to stop the boat's way through the water as far as possible, and if there is a drag, or any other appliance in the boat which may be used as one, tow it astern to aid in keeping the boat stern-on to the sea, which is the chief object in view.

d. Bring the principal weight in the boat toward the end that is to seaward, but not to the extreme end.

e. If a boat worked by both sails and oars be running under sail for the land through a heavy sea, her crew should, unless the beach be quite steep, take down her sails and masts before entering the broken water, and take her to land under oars alone, as above de-

scribed. If she have sails only, her sails should be much reduced, a half-lowered foresail or other small headsail being sufficient.

III. Beaching or landing through a surf.—(1) The running before a surf or broken sea, and the beaching or landing of a boat, are two distinct operations; the management of boats, as above recommended, has exclusive reference to running before a surf where the shore is so flat that the broken water extends to some distance from the beach. On a very steep beach the first heavy fall of broken water will be on the beach itself, while on some very flat shores there will be broken water extending 4 or 5 miles from the land. The outermost line of broken water, on a flat shore, where the waves break in 3 or 4 fathoms of water, is the heaviest, and therefore the most dangerous; and when it has been passed through in safety the danger lessens as the water shoals, until on nearing the land its force is spent and its power is harmless. As the character of the sea is quite different on steep and flat shores, so is the customary management of boats on landing different in the two situations.

(2) On the flat shore, whether a boat be run or backed in, she is kept straight before or end-on to the sea until she is fairly aground, when each surf takes her farther in as it overtakes her, aided by the crew, who will then generally jump out to lighten her and drag her in by her sides. As above stated, sail will, in this case, have been previously taken in, if set, and the boat will have been rowed or backed in by the oars alone.

(3) On a steep beach it is the general practice, in a boat of any size, to sail right onto the beach, and in the act of landing, whether under oars or sail, to turn the boat's bow half around toward the direction in which the surf is running, so that she may be thrown on her broadside on the beach, where help is usually at hand to haul her as quickly as possible out of the reach of the sea. In such situations we believe it is nowhere the practice to back a boat in stern foremost under oars, but to row in under full speed, as above described.

LANDING IN A HEAVY SURF IN A MOTOR SURFBOAT

163. The following general rules may be relied on:

(a) That a motor surfboat should enter the surf at a moderate speed with the rudder unshipped, steering oar in place, and an oar out on each quarter to assist in steering. It is safest to stop the engine and land under oars, particularly if the surf is dangerous and is breaking close to the beach. Care should be taken to keep the boat's stern to the sea. If the sea gets on the quarter, there will be a tendency to broach to.

(b) That the drogue should be used in landing in a heavy surf, and that a long drogue rope is preferable to a short one, except when

working through broken water, as when on a shoal. The drogue should be tended by a man with a hatchet or knife, ready to cut the tripping line, and the drogue rope also, if circumstances warrant and the drogue rope is not long enough, if slackened off, to permit the boat to reach the beach. It sometimes happens, when a boat is running true, that the drogue, even when tripped, will hold the boat back at a time when she should go as far as possible on the sea selected for landing. A strain should be kept on the drogue rope, as a slack rope is likely to foul the propeller.

(c) Backing the engine in a surf is dangerous, as it will cause the stern to deviate from a right angle to the surf.

(d) Weights should be so distributed as to trim the boat by the stern.

(e) Oil will be found to be of great assistance in landing through a heavy surf. Fish oil is best for this purpose. Oakum or cotton waste saturated with it may be carried in the conical end of the drogue, or in an oil bag made fast near the drogue. The container should be pricked with a roping needle to permit the oil to escape.

THE DROGUE, OR DRAG

164. (1) *Purpose of.*—The drogue, or drag, is used to check a boat's way and keep her end-on to the sea. When running before a heavy sea, landing through a dangerous surf, or under certain conditions when being towed, it will prove of the greatest assistance. If caught in a gale in an open boat the drogue may be used as a sea anchor to keep the boat head-on to the sea. In such cases, if there is oil in the boat, secure a bag of it to the drogue.

(2) *Description.*—Drogues furnished Coast Guard stations are of three sizes, large, medium, and small.

(a) *Large-size.*—Twenty-eight-inch mouth; 5 feet long; cone shaped.

(b) *Medium-size.*—Twenty-two-inch mouth; 4 feet 6 inches long; cone shaped.

(c) *Small-size.*—Seventeen-inch mouth; 3 feet long; cone shaped.

NOTE.—In addition to the drogues described above, the Hawthorne drogue, which is constructed of wood and metal, forms part of the equipment of motor lifeboats of the later types.

165. The drogue-holding rope should be marked with a red rag tucked through the lay at the point where it is belayed.

166. *Use of the drogue.*—(1) When the drogue is used over the stern, the officer in charge designates the man or men to tend the drogue lines. Care should be taken that the holding and tripping lines do not foul each other.

167. *Use of the drogue over the bow.*—When the drogue is used over the bow, the officer in charge designates the man or men to tend the drogue lines. Care should be taken that the holding and tripping lines do not foul each other.

(2) To check the headway of the boat, the man (or men) designated keeps the lines clear and throws the drogue over when directed by the officer in charge (being careful that the lines do not foul the propeller when used in a motor boat). Slack out the holding line to the desired length and take a turn with it to a cleat on the quarter as near the sternpost as possible. Slack out the tripping line at the same time as the holding line, keeping it free from strain, and make fast the tripping line on the quarter opposite the holding line.

(3) If headway is desired, trip the drogue, towing it apex forward. Conversely, when it is desired to check headway, slack tripping line until the drogue is capsized and towed mouth forward by the holding line.

(4) Before entering a dangerous surf the drogue should be dropped overboard and towed apex forward if the officer in charge considers it necessary.

(5) If the drogue is used over the bow, it shall be handled in a similar manner.

BOARDING A VESSEL STRANDED OR AFLOAT IN A HEAVY SEA

167. (1) Whenever practicable, a vessel, whether stranded or afloat, should be boarded from to leeward, as the principal danger is that the boat may collide against the vessel or be swamped or upset by the rebound of the sea, and the greater violence of the sea on the weather side of the vessel renders such accidents more likely to occur on that side. The danger will be still further increased when the vessel is aground and the sea breaking over her.

(2) If a stranded vessel is broadside to the sea, the chief danger in boarding to leeward is the possible falling of the masts, or that the boat may be stove by the wreckage alongside, or a sea sweeping over the wreck and swamping the boat. Under such circumstances it may be necessary to take a wrecked crew into a lifeboat from the bow or stern of the wreck. In boarding a wreck that is stranded on a flat shore, lifeboats usually anchor to windward with a long scope of cable. The boat should be maneuvered to a position where a line can be sent aboard by heaving stick or shoulder gun. A sufficient length of line should be sent aboard the wreck in order that a ring buoy or life preserver may be secured in the center and hauled back and forth and thus provide means for the people to secure themselves at the buoy and jump overboard to be hauled to the boat. The greatest care, under these circumstances, must be taken to prevent actual contact between the boat and the ship. The greatest danger is in the anchor dragging or the cable breaking; to avoid this the strain must be relieved as much as possible by use of the oars or engine.

(3) In every case of boarding a wreck or a vessel at sea it is important that the lines by which the boat is made fast to the vessel should be of sufficient length to allow of her rising and falling freely with the sea, and every line should be kept in hand ready to cut or slip instantly if necessary. All crowding or rushing headlong into the boat should be prevented.

RESCUING PEOPLE FROM A DRIFTING WRECK AT SEA

168. (1) In rescuing people from a drifting wreck, approach from leeward, unless the drift of the wreck is greater than that of the rescuing boat or in case the wreck has a low freeboard with booms or wreckage over the side.

(2) If there is much wind and the sea is breaking over the wreck, it is advisable to send a good line on board, using the heaving stick or shoulder gun. The method of saving the people on board by using a buoy or life preserver in the center of a line is suggested, but existing circumstances may alter the method to be used. Nothing in these instructions shall be construed to prevent the exercise of good judgment and seamanship in effecting rescues.

(3) Should it become necessary to go alongside using a pulling boat, head bow-on for the lee side of the wreck, selecting an unobstructed part. Boat the bow oars and have the other men *Face about*, to keep the boat from touching the wreck. One Bowman will use his boat hook to keep the boat clear while the other will assist the people into the boat.

RULES TO PREVENT COLLISIONS—STEERING AND SAILING RULES

169. Rules for preventing collision, steering and sailing rules, etc., shall be studied from the Navigation Laws of the United States, part XXXII, or from the pamphlet Pilot Rules, both published by the Department of Commerce. Stations shall be provided with these publications and they shall be so placed as to be readily available for study by all members of the station crew.

170. All stations shall also be provided with the latest edition of Knight's Modern Seamanship. The color plates in this book showing lights displayed by different types of vessels under different conditions will be studied and the difference between International and Inland Rules of the Road will be noted.

171. The officer in charge during drill periods on these subjects shall make use of these books in questioning the crew to determine their proficiency.

Signals for a wreck

INSTRUCTIONS FOR COAST GUARD STATIONS

51

172. **SIGNALS**
International code----- Study and practice shall be from the International Code Book. Its completeness and simplicity permits this.

Wigwag----- Shall be practiced sending short and concise messages conveying intelligent information.

Flashing light----- Same as wigwag.
Semaphore----- Same as wigwag.

173. Instructions for signaling are found in the Visual Signal Manual which is provided for all stations. Procedure signs applicable to stations shall be used.

174. The primary object of signal instruction should be to make possible the sending and receipt of ordinary messages. While speed is necessary and desirable, it is second to accuracy, and drills should be held with this fact constantly in mind.

SIGNALS FOR USE AT WRECKS

175. The following signals shall be used as circumstances may require:

(a) Upon the discovery of a wreck by night, a red pyrotechnic light or red rocket will be burned to signify, "You are seen; assistance will be given as soon as possible."

(b) A red flag waved on shore by day, or a red light, red rocket, or red roman candle displayed by night will signify, "Haul away."

(c) A white flag waved on shore by day, or a white light slowly swung back and forth, or a white rocket or a white roman candle fired by night, will signify, "Slack away."

(d) Two flags, a white and a red, waved at the same time on shore by day or two lights, a white and a red, slowly swung at the same time, or a blue pyrotechnic light burned by night, will signify, "Do not attempt to land in your own boats; it is impossible."

(e) A man on shore beckoning by day, or two torches burning near together by night, will signify, "This is the best place to land."

176. Any of the signals specified in the preceding may be answered from the vessel as follows:

In the daytime by waving a flag, or handkerchief, a hat, or even the hand; at night by firing a rocket, a blue light, or a gun, or by showing a light over the ship's rail for a short time and then concealing it.

177. The officer in charge of every station shall see that there is a staff for each of the flags carried on the beach cart for use at wrecks. Each staff shall be 6 feet long, 1 inch in diameter at the butt, and

tapering to one-half inch at the top, where the flag shall be attached. The staffs shall be made of tough wood; a crooked or condemned oar may be used for this purpose. When properly fitted they shall be becketed under the beach cart, the flags being under the body of the cart to protect them from the weather.

178. The torches shall be secured to the headboard of the beach cart by the fixtures supplied with them. The pots shall be kept half filled with mineral oil and the boxes in the handles kept filled with matches. The torch staffs shall be becketed on the side of the cart. To extinguish the torch return it to the pot, letting the cover attached to the torch fall into its place on the pot. The extra cover, connected with a chain, is to cover the pot while the torch is burning during rain or snow.

179. When the two torches are used together, as directed in paragraph (e) above, they shall be attached to their staffs and, if possible, stuck in the ground about 10 feet apart in line with the beach.

180. One red and one white lantern (unlighted until required for signaling) shall be carried on the cart, one on each side, attached to the uprights. If a boat is to be used and the beach cart is not used, the necessary flags and lights to make the signals directed in paragraphs (a) and (e) shall be transferred from the cart to the boat and taken to the beach to be used, if necessary.

UNITED STATES STORM SIGNALS

181. Storm warnings are displayed by the United States Weather Bureau as follows:

EXPLANATION OF SMALL-CRAFT, STORM, AND HURRICANE WARNINGS

(1) *The small-craft warning.*—A red pennant indicates that moderately strong winds that will interfere with the safe operation of small craft are expected. No night display of small-craft warnings is made.

(2) *The northeast storm warning.*—A red pennant above a square red flag with black center displayed by day, or two red lanterns, one above the other, displayed by night, indicates the approach of a storm of marked violence, with winds beginning from the northeast.

(3) *The southeast storm warning.*—A red pennant below a square red flag with black center displayed by day, or one red lantern displayed by night, indicates the approach of a storm of marked violence, with winds beginning from the southeast.

(4) *The southwest storm warning.*—A white pennant below a square red flag with black center displayed by day, or a white lantern below a red lantern displayed by night, indicates the approach of a storm of marked violence, with winds beginning from the southwest.

	SIGNALS
172 International code.....	Study and practice shall be from the International Code Book. Its completeness and simplicity permits this.
Wigwag.....	Shall be practiced sending short and concise messages conveying intelligent information.
Flashing light.....	Same as wigwag.
Semaphore.....	Same as wigwag.

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(d) Two flags, a white and a red, waved at the same time on shore by day or two lights, a white and a red, slowly swung at the same time, or a blue pyrotechnic light burned by night, will signify, "Do not attempt to land in your own boats; it is impossible."

(e) A man on shore beckoning by day, or two torches burning near together by night, will signify, "This is the best place to land."

176. Any of the signals specified in the preceding may be answered from the vessel as follows:

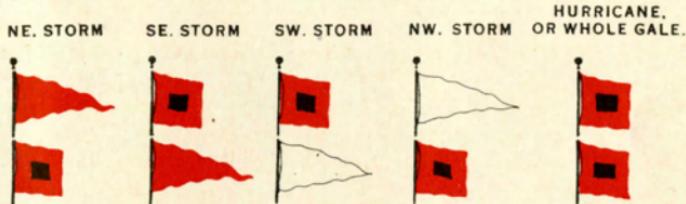
In the daytime by waving a flag, or handkerchief, a hat, or even the hand; at night by firing a rocket, a blue light, or a gun, or by showing a light over the ship's rail for a short time and then concealing it.

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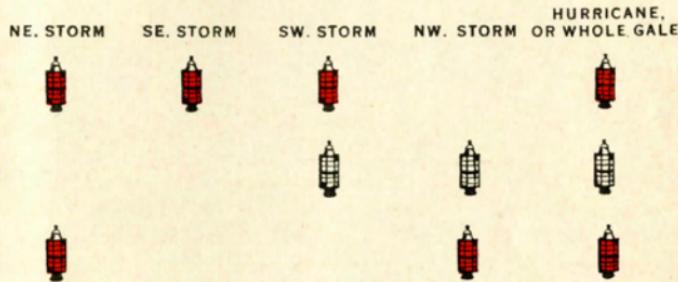
*Study color weather
Flags*

DAY SIGNALS

SMALL CRAFT



NIGHT SIGNALS



(5) *The northwest storm warning.*—A white pennant *above* a square red flag with black center displayed by day, or a white lantern *above* a red lantern displayed by night, indicates the approach of a storm of marked violence, with winds beginning from the northwest.

(6) *Hurricane or whole gale warning.*—Two square flags, red with black centers, one above the other, displayed by day, or two red lanterns, with a white lantern between, displayed by night, indicate the approach of a tropical hurricane or of one of the extremely severe and dangerous storms which occasionally occur.

SHIP AND AIRCRAFT DISTRESS SIGNALS

182. When a vessel or aircraft is in distress and requires assistance, the following are the signals to be used or displayed either together or separately:

IN THE DAYTIME

(1) A gun or other explosive signal, fired at intervals of about a minute (for vessels only).

(2) The International Code Signal NC, signifying: "I am in distress and require immediate assistance."

(3) A continuous sounding with any fog-signal apparatus; in the case of aircraft, sound apparatus.

(4) The signal SOS made by radiotelegraphy, or by any other distance signaling method.

(5) The distance signal, consisting of a square flag having either above or below it a ball or anything resembling a ball.

(6) The international distress call MAYDAY by radiotelephony.

(7) The signal consisting of a succession of white lights projected into the sky at short intervals (for aircraft only).

AT NIGHT

(1) A gun or other explosive signal, fired at intervals of about a minute (for vessels only).

(2) Flames on the vessel (as from a burning tar barrel, oil barrel, etc.) (for vessels only).

(3) Rockets or shells, throwing stars of any color or description, fired one at a time, at short intervals (for vessels only).

(4) A continuous sounding with any fog-signal apparatus; in the case of aircraft, sound apparatus.

(5) The signal SOS made by radiotelegraphy, or by any other distance signaling method.

(6) The international distress call MAYDAY by radiotelephony.

(7) The signal consisting of a succession of white lights projected into the sky at short intervals (for aircraft only).

NOTE.—A familiarity with important one and two-letter International signals pertaining to distress is required.

RESUSCITATION DRILL

183. Resuscitation drill shall be held once each week and shall be had with the whole crew when it consists of an officer in charge and six men or less. The officer in charge is not required to take the part of the patient. With more than six men present for the drill, the officer in charge shall direct the drill without taking part in it. Each member of the crew shall participate in the drill and be proficient in it.

184. One of the crew shall take the part of the patient and the others shall take position astride the patient's hips, at the arms, holding the tongue, rubbing the limbs, applying hot-water bottles, etc., and the position of "idle man." The position of "idle man", on the patient's right, when he is lying on his back, is designed to provide a breathing spell for the man astride the hips before he works with the arms, as these two positions are the most tiring in the drill.

185. At the beginning of the drill the officer in charge shall be the first man at the chest movement, except when he directs the drill, as prescribed above; no. 1, the "idle man"; no. 2 at the arms; no. 3 at the tongue; no. 4 rubbing the left leg; and no. 5 rubbing the right leg. After about 2 minutes' practice each man shall move one place to the left, facing the patient, and continue the drill; thus the officer in charge will move into the position of "idle man"; no. 1 will go to the arms; no. 2 to the tongue; no. 3 to the left leg; no. 4 to the right leg; no. 5 will take position astride the body. After a further practice of about 2 minutes, each man shall, at the order "Shift", move one place to the left, as before, the crew continuing to rotate until each man has been drilled 2 minutes in each of the several positions. A new patient should be selected at intervals of 9 or 10 minutes. Care must be taken in rotating that the count is not interrupted or its cadence changed. After the crew as a whole has been exercised, each man shall perform the resuscitation of a patient without assistance, according to the prone pressure method, repeating all the rules necessary and indicating by motions the several steps as he proceeds.

186. The recitation in resuscitation shall embrace the rules, including the prone pressure method, "Treatment of frostbites", and "Saving persons from drowning by swimming to their relief."

187. At the close of resuscitation drill the officer in charge shall open the medicine chest and question each man on the uses of the remedies contained therein.

DIRECTIONS FOR RESTORING THE APPARENTLY DROWNED

188. The Howard method is here arranged for practice in combination with the Sylvester method, the latter producing deeper inspiration than any other known method, while the former effects the most complete expiration. The combination therefore tends to produce the most rapid oxygenation of the blood, the real object to be gained. The combination is prepared primarily for the use of Coast Guard crews where assistants are at hand. An adaptation of the Schafer (or prone pressure) method is published as a guide in cases where no assistants are at hand and one person is compelled to act alone. In all cases a physician shall be called as soon as possible.

RULE I. *Arouse the patient.*—Do not move the patient unless in danger of freezing; instantly expose the face to the air, toward the



FIGURE 1.—Expelling water from body. Turn the patient on his face, if there be wind, if there be any; wipe dry the mouth and nostrils; rip the clothing so as to expose the chest and waist; give 2 or 3 quick smarting slaps on the chest with the open hand. If the patient does not revive, proceed immediately as follows:

RULE II. *To expel water from the stomach and chest.* (See fig 1.)—Separate the jaws and keep them apart by placing between the teeth a cork or small bit of wood; turn the patient on his face, a large bundle of tightly rolled clothing being placed beneath the stomach; press heavily on the back over it for half a minute, or as long as fluid flows freely from the mouth.

RULE III. *To produce breathing.* (See figs. 2 and 3).—Clear the mouth and throat of mucus by introducing into the throat the corner

then suddenly let go with a final push, which will spring him back to his first position. This completes expiration (fig. 3). In the case of a child or delicate person, extreme care shall be exercised in applying pressure.

At the instant of his letting go, the man at the patient's head will again draw the arms steadily upward to the sides of the patient's head as before (the assistant holding the tongue again changing hands to let the arms pass if necessary); holding them there while he slowly counts 1, 2, 3, 4 (a period of 2 to 2½ seconds). This completes inspiration.

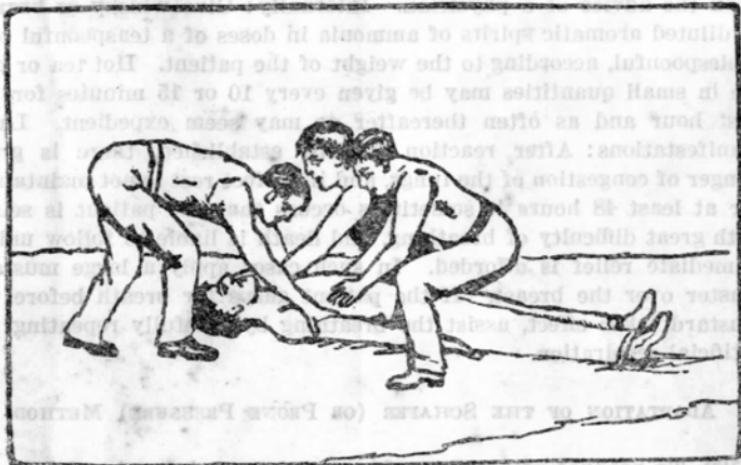


FIGURE 3.—Movements to produce expiration.

Repeat these movements deliberately and perseveringly 12 to 15 times in every minute, thus imitating the natural motions of breathing.

If natural breathing be not restored after a trial of the bellows movement for the space of about 4 minutes, then turn the patient a second time on the stomach, as directed in rule II, rolling the body in the opposite direction from that in which it was first turned for the purpose of freeing the air passage from any remaining water. Continue the artificial respiration from 1 to 4 hours, or until patient breathes, and for awhile after the appearances of returning life, carefully aid the first short gasps until deepened into full breaths, timing the movements to conform with the patient's breathing. Continue the drying and rubbing, which should have been unceasingly practiced from the beginning by assistants, taking care not to interfere with the means employed to produce breathing. Thus the limbs of the patient should be rubbed, always in an upward direction

toward the body, with firm-grasping pressure and energy, using the bare hands, dry flannels or handkerchiefs, and continuing the friction under the blankets or over the dry clothing. The warmth of the body can also be promoted by the application of hot flannels to the stomach and armpits, bottles of hot water, heated bricks, etc., to the limbs and soles of the feet.

RULE IV. After treatment.—Externally: As soon as breathing is established, let the patient be stripped of all wet clothing, wrapped in blankets only, put to bed comfortably warm, but with a free circulation of fresh air, and left to perfect rest. The patient should not be disturbed or moved from the bed except under emergent circumstances or upon the advice of a physician. Internally: Give ~~(whisky or brandy)~~ or diluted aromatic spirits of ammonia in doses of a teaspoonful to a tablespoonful, according to the weight of the patient. Hot tea or coffee in small quantities may be given every 10 or 15 minutes for the first hour and as often thereafter as may seem expedient. Later manifestations: After reaction is fully established, there is great danger of congestion of the lungs, and if perfect rest is not maintained for at least 48 hours it sometimes occurs that the patient is seized with great difficulty of breathing, and death is liable to follow unless immediate relief is afforded. In such cases apply a large mustard plaster over the breast. If the patient gasps for breath before the mustard takes effect, assist the breathing by carefully repeating the artificial respiration.

ADAPTATION OF THE SCHAFER (OR PRONE PRESSURE) METHOD

189. *To produce respiration.*—If no assistance be at hand and one person must work alone, turn the patient on his stomach, face downward, with the arms extended beyond the head in line with the body; examine and clear the mouth and throat of mucus and see that the air passages are not obstructed by foreign matter. Place the patient's head and arms in position, the side of the head resting on the ground, face toward the wind, and the tongue protruding, with the arms from the shoulder to the elbow extended sideways. Place the feet together. (See fig. 4.) When this is done, the operator will kneel, or squat, by the side or astride the patient and place his hands slightly above the small of the patient's back, one hand on each side of the backbone, with his thumbs about 1 inch apart and parallel with the backbone, the fingers well spread and extending toward the sides of the body, the little fingers being slightly above the floating ribs. (See fig. 5.) Then he will lean forward steadily, allowing his weight to fall evenly on both hands, arms straight, and without effort compress the body downward and slightly forward for a period of about 3 seconds, taking care that the hands do not slip backward and

To have air in the respiration tube forced up over the mouth and nostrils, the patient must be held in a position with his head well back so that the mouth and nostrils are exposed. The operator must then blow into the tube with all his power, and the patient will receive a large quantity of air. If the operator blows strongly, the patient will receive a large amount of air.

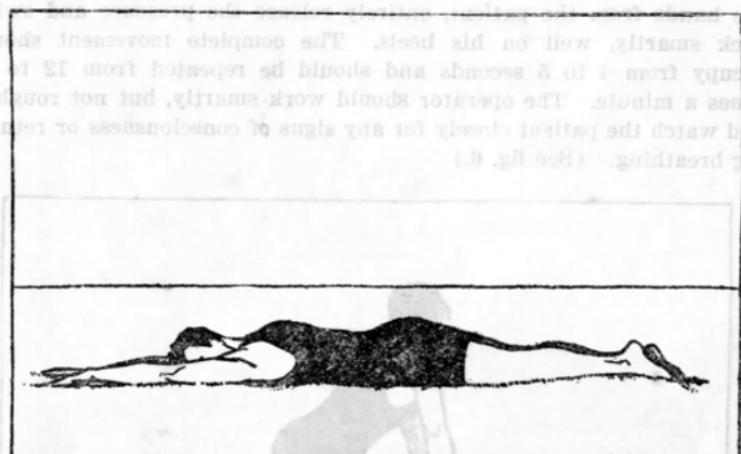


FIGURE 4.—Showing patient turned on stomach, arms and legs straight.

After the first blow has been given, the operator should continue to observe, and if the patient has stopped breathing or if the pulse is weak, the operator should blow again. The operator should blow until a strong, full breath is given.

When giving the second blow, the operator should blow until a strong, full breath is given. The operator should then stop breathing for a few seconds, and then give another blow.

The operator should continue to give the patient breaths until the patient begins to breathe on his own. The operator should then stop breathing for a few seconds, and then give another blow.

When giving the third blow, the operator should blow until a strong, full breath is given. The operator should then stop breathing for a few seconds, and then give another blow.

When giving the fourth blow, the operator should blow until a strong, full breath is given. The operator should then stop breathing for a few seconds, and then give another blow.

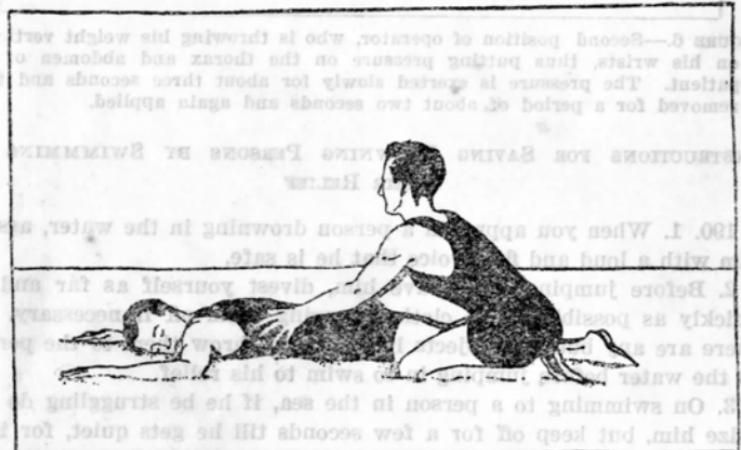


FIGURE 5.—First position of operator and patient in effecting artificial respiration by the "prone pressure method."

that the arms do not go beyond the perpendicular. At the end of this period he will, still keeping the arms straight and without lifting the hands from the patient, entirely release the pressure and swing back smartly, well on his heels. The complete movement should occupy from 4 to 5 seconds and should be repeated from 12 to 15 times a minute. The operator should work smartly, but not roughly, and watch the patient closely for any signs of consciousness or returning breathing. (See fig. 6.)

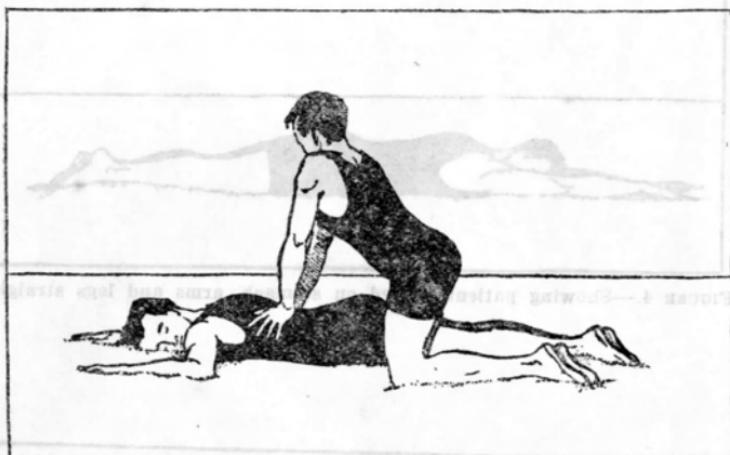


FIGURE 6.—Second position of operator, who is throwing his weight vertically on his wrists, thus putting pressure on the thorax and abdomen of the patient. The pressure is exerted slowly for about three seconds and then removed for a period of about two seconds and again applied.

INSTRUCTIONS FOR SAVING DROWNING PERSONS BY SWIMMING TO THEIR RELIEF

190. 1. When you approach a person drowning in the water, assure him with a loud and firm voice that he is safe.
2. Before jumping in to save him, divest yourself as far and as quickly as possible of all clothes, tearing them off if necessary. If there are any buoyant objects lying about, throw them to the person in the water before jumping in to swim to his relief.
3. On swimming to a person in the sea, if he be struggling do not seize him, but keep off for a few seconds till he gets quiet, for it is dangerous to take hold of a man when he is struggling in the water. It is important to avoid becoming excited or making a rash attempt to strike or subdue a person clutching or struggling violently. Keep at a safe distance until the person is nearly exhausted. Always endeavor to approach the person in the water from behind and take fast hold of the hair or the clothing at the neck and turn him as quickly as possible onto his back, give him a sudden pull, which will

cause him to float, then throw yourself on your back or side and swim for the shore. Care should be exercised to try and keep the person's head above the water.

4. If a person has sunk to the bottom and the water is smooth, the exact position where the body lies may be known by the air bubbles which will occasionally rise to the surface, allowance being of course made for the current. A body may be regained from the bottom, in sufficient time to restore life, by diving for it in the direction indicated by these bubbles, and if this fails the dragging equipment should be used immediately.

5. On rescuing a person by diving to the bottom, the hair of the head should be seized by one hand only, and the other used in conjunction with the feet in raising yourself and the drowning person to the surface.

6. It may sometimes be a great error to try to swim to land. If there is a strong off-shore current and you are swimming either by yourself or having hold of a person who cannot swim, then get on your back and float until assistance arrives.

EFFECTS OF COLD—FROSTBITE

191. (1) *Symptoms.*—The local effects of cold, according to their severity, usually are divided into three degrees.

(a) In the FIRST DEGREE the part is painful and the skin is of a dark-red hue. This condition is known as chilblain and occurs chiefly when children or poorly nourished persons are exposed to cold.

(b) In the SECOND DEGREE the skin is of a bright red or livid hue, and blisters form on its surface.

(c) In the THIRD DEGREE the part is pale, stiff, and brittle. Severe cold causes constriction of the blood vessels, and if the blood is completely cut off for a considerable time death of the tissue results.

(2) (a) If heat is applied to a part that has been slightly frost-bitten (FIRST DEGREE), a sensation of itching and tingling is experienced.

(b) In frostbites of the SECOND DEGREE heat causes pain and swelling; the skin may peel off and leave a raw surface.

(c) In the THIRD DEGREE, if the part is dead, no reaction takes place upon the application of heat; the dead portion turns black and a line of demarcation appears between it and the living tissue. If the heat is applied suddenly to a badly frozen part of the body, the likelihood of gangrene (death of the tissue) is increased on account of the intense reaction that takes place in the tissue that is still living.

(3) When the whole body is exposed to severe cold, the individual becomes benumbed, exertion is difficult, and drowsiness which cannot be resisted overtakes him; the eyesight fails, he totters as he walks, and then falls and becomes unconscious.

(4) *Prevention.*—All parts of the body should be kept as dry as possible, as dampness increases the tendency to frostbite. The shoes should be large. In extreme weather, in case of exposure, it is well to wear two pairs of stockings, a woolen pair over a cotton pair. The ears and face, except the eyes, nose, and mouth, should be well covered, especially if snow is falling or a brisk wind is blowing. Special care should be taken of the feet; they should be washed each day and clean stockings worn. Wet stockings should be changed for dry ones whenever practicable. The feet are less likely to become frostbitten if a person keeps moving. If he has to stand in one place, shoe strings should be loosened.

(5) *Treatment.*—If a physician is present, his instructions should be followed. If no physician is present, proceed as follows:

(a) If the frostbite is of the FIRST DEGREE, that is, if the tissue is only slightly frostbitten, the part should be rubbed gently and cloths wrung out of cold water applied. Snow may be rubbed on the affected part, but it is not as efficient as cold cloths. The rubbing and the applications should alternate, rubbing a few minutes and then applying cloths for a few minutes. The temperature of the water in which the cloths are soaked should be raised gradually until it is lukewarm.

(b) In frostbites of the SECOND DEGREE, that is, where the skin is of a livid hue and blisters have formed, rubbing should not be resorted to, as there is danger of increasing the ill effects. Cold cloths should be applied, but the cold treatment must not be kept up too long, as cold prolongs the cause of the injury. The temperature of the water should be raised gradually a degree or two every few minutes, using fresh cloths each time the temperature of the water is changed. It should be remembered that reaction takes place naturally as soon as the person is taken indoors out of the cold, even if he be treated in a cold room, and the object of treatment is to prevent this reaction from taking place too rapidly and at the same time not to retard unduly the restoration of vitality.

(c) In frostbites of the THIRD DEGREE, the same method should be followed in order to bring about a reaction as in those of the SECOND DEGREE; reaction, however, will not happen in a part that is dead, but the adjacent living tissue will react, and a red line will form between it and the dead portion.

(d) In some cases reaction has already taken place when the person is first seen. In these cases the above-described treatment is unnecessary. After reaction has occurred the patient should be moved into a warm room and an ointment composed of vaseline, 1 ounce; camphor, 6 grains; should be applied. The part should then be surrounded with absorbent cotton, or wrapped in flannel cloths. Boracic acid ointment may be used instead of the vaseline and camphor. Blisters that form should be pricked with a needle and the water

allowed to flow out, but the covering of the blisters should not be removed.

(e) If gangrene occurs, cloths wet with alcohol placed over the part will prevent infection and hasten the separation of the dead part from the living tissue.

(f) A person suffering from exposure to a low temperature, or from submersion in cold water, should be placed in a cold room and artificial respiration as practiced by the Coast Guard in the case of apparently drowned persons should be performed. The extremities should be rubbed with a solution composed of equal parts of alcohol and water.

(g) When the patient begins to react, the temperature of the room should be raised slowly and the patient given hot drinks, such as coffee, tea, or chocolate. If the patient is unable to swallow, a quart of lukewarm coffee or tea should be injected into the rectum. Efforts to restore animation should be continued for an hour or two.

BEACH APPARATUS DRILL

192. Beach apparatus drill shall be so far as practicable precisely the same as at a wreck, using the apparatus on the beach cart. The drill shall consist in the mustering of the crew, the recital by each member of his particular duties, the rigging of the gear over a distance of approximately 75 yards from the sand anchor to the wreck pole, and the carrying out of the drill as prescribed. Powder must be used in every case unless the supply on hand is reduced to 3 pounds, in which case the district commander shall be notified. The use of small practice gear is forbidden. A short whip and hawser of regulation size will be allowed, but in every other respect the gear shall be of service size and kind. When a practice shot line is used, it shall be removed from the pins and fired from the box precisely as in actual service. Once each quarter the regulation gear on the service beach cart shall be used. Where the size of the ground permits, the service gear will be set up occasionally over a distance of 125 yards. The sand anchor shall be securely buried at every drill and a man landed in the buoy. A post or ready-buried anchor shall not be used except where authorized by the district commander.

193. Beach apparatus drill shall be held twice each week during the first month after a station is placed in commission, and once each week thereafter. Where a life car is furnished it shall be substituted for that with the breeches buoy at least twice each year, the drill to be held across water. The car must be examined for leaks after each practice.

194. The hawser cutter shall be bent on ready for hauling off once each month, but the hawser shall not be cut. The officer in charge

shall, when advisable, demonstrate the use of the hawser cutter by bending it onto a condemned line or hawser and cutting it.

195. The no. 1 and no. 2 surfmen shall on alternate months conduct the drill once, taking the place of the officer in charge, the officer in charge falling out. When no. 1 conducts the drill, he performs his own duties and those of the officer in charge, assisted by no. 2; No. 2 performs his regular duties and assists no. 1. When no. 2 conducts the drill he performs the duties of the officer in charge and of no 1, assisted by no. 1; no. 1 performs the regular duties of no. 2 and assists no. 2. At such drills each of the other men will perform his regular duties.

196. At each drill the person in charge shall note the time elapsing from the moment the command *action* is given until the man is landed at the crotch. This time, and the distance of the sand anchor from the pole, together with any other facts worthy of note shall be entered in the log.

197. Words of command:

Man the beach cart

Forward

Halt

Action

Stand clear—ready—fire

Man weather whip—haul off hawser

Man fall—set up hawser

Belay fall—raise crotch

Man lee whip—haul off buoy

Man weather whip—haul ashore

198. (1) **Man the beach cart.**—Nos. 5 and 6 open and secure the boat-room doors. Designated man provides motor vehicle if used. If necessary to run the boat out, nos. 1 and 2 ship the pole or shafts of the boat wagon, no. 1 holding the pole, no. 2 inserting the bolt. The crew run out the boat, no. 1 and no. 2 guiding the pole. The men then take their stations at the beach cart, face to the front with the drag ropes over their shoulders, as shown in figure 1.

(2) The officer in charge, before giving the command *Forward!* will muster the crew; and each man, upon his number being called, will make the hand salute and recite his duties as given below.

Officer in charge.—Has general supervision; selects place to bury sand anchor and position for gun; places firing plank if one is used; places gun in position; provides cartridge, primer, and lanyard; loads and sights gun and determines elevation with the level; pricks cartridge, primes, and fires gun; signals the wreck to haul off whip; lights hawser to the surf; hitches whip around neck of buoy block and bends buoy bridle to whip; raises center of crotch.

(3) **No. 1.**—Assist officer in charge to place gun in position; provide shot and hold for no. 2 to bend shot line to, then insert shot in bore;

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(3) **No. 1.**—Assist officer in charge to place gun in position; provide shot and hold for no. 2 to bend shot line to, then insert shot in bore;

train gun; bend shot line to whip; attend left part of whip; if on lee side, bend whip to hawser; hold breeches buoy block while officer in charge bends on whip; man fall and left leg of crotch.

(4) No. 2.—Place shot-line box in position; bend shot line into shot; train gun; attend right part of whip; if on lee side, bend whip to hawser, hold breeches-buoy block while the officer in charge bends on whip; secure buoy on hawser if snatch block is used; man fall and right leg of crotch.

(5) No. 3.—Place shot-line box in position; stretch tackle (outer block); haul whip from reel while it is being hauled off to the wreck;

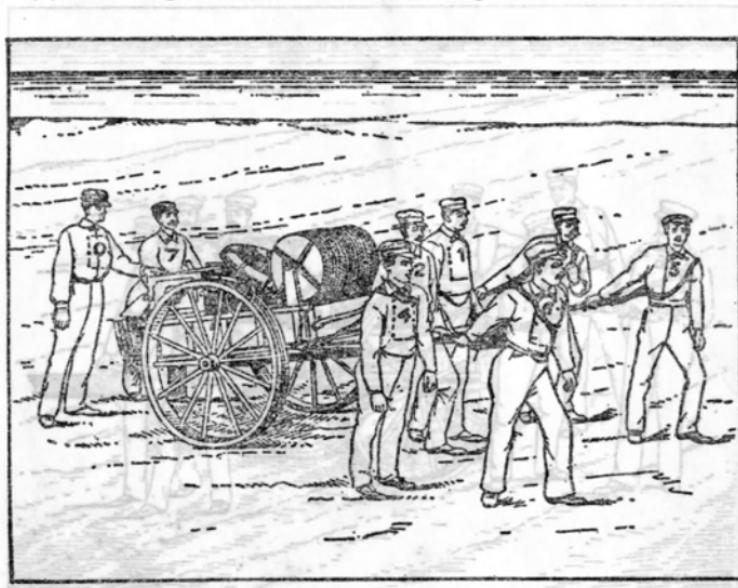


FIGURE 1.—Man the beach cart.

and if on lee side do the same while hawser is being hauled off; haul in slack of hawser; bend strap or chain tail for outer block of tackle; man fall and left leg of crotch; shifting man on whip.

(6) No. 4.—Unload buoy from cart; place crotch, hawser, and buoy in position; if closed breeches buoy block is used, reeve hawser through block; clear buoy sling; stretch tackle and hook inner block into sand-anchor pennant; haul whip from reel while it is being hauled off to the wreck, and if on lee side do the same while hawser is being hauled off; haul in slack of hawser; hook outer block of tackle; man fall and right leg of crotch; shifting man on whip.

(7) No. 5.—Open and secure boat-room doors; unload sand anchor, shovels, and pick, and bury sand anchor; man weather part of whip when hauling off hawser; haul in slack of hawser, hook inner block if pennant block is used; man and belay fall; shifting man on whip.

- (8) No. 6.—Open and secure boat-room doors; unload sand anchor, shovels, and pick, and bury sand anchor; man weather part of whip when hauling off hawser; haul in slack of hawser; snatch hawser and make cat's paw if pennant block is used; man fall and center of crotch; shifting man on whip.
- (9) No. 7.—In drill go to wreck pole; in service unload shovels and pick, and assist to bury sand anchor; man weather part of whip when hauling off hawser; haul in slack of hawser; man fall and center of crotch; shifting man on whip.

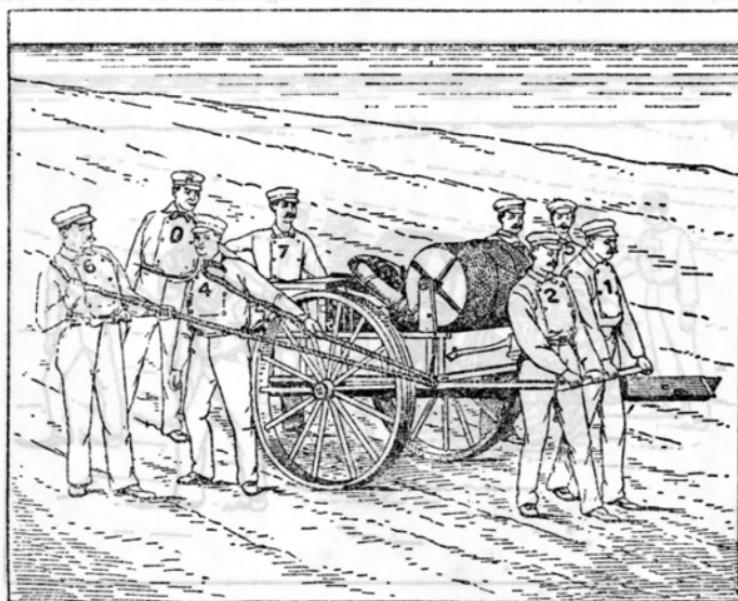


FIGURE 2.—Holding back.

- (10) No. 8.—If the crew consists of an officer and eight men, no. 8, at drill, will go to the wreck pole instead of no. 7; in service, his duties will be the same as those of no. 7.

Forward.—The beach cart will be hauled from the station to the wreck. When going down the skids or any steep grade, nos. 1 and 2 will guide the cart, while nos. 3, 4, 5, and 6 hold back on the drag ropes. (See fig. 2.) Where motor vehicle is used, care shall be exercised to protect the apparatus.

Halt.—The officer in charge will direct the cart to be placed between the surf and the spot he selects for the sand anchor and a few yards to windward (current), the cart facing the surf. (See fig. 3.)

199. (1) Action.—The relative positions assumed by the men for the purpose of placing the apparatus are shown by figure 4. The current is supposed to be running from the right, as shown by the arrow.

(2) Officer in charge puts on his haversack; no. 4 throws buoy off the cart; nos. 5, 6, and 7 unload the shovels, pick, and sand anchor,

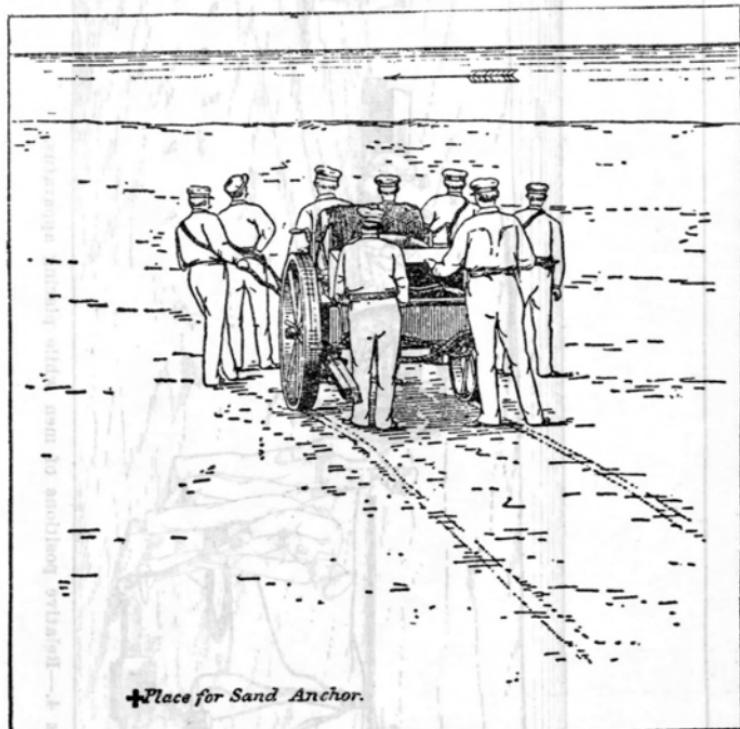


FIGURE 3.—Halt.

and proceed at once to bury the sand anchor where directed by the officer in charge. The sand anchor must be opened, its sides at right angles to each other, and buried upon its flat in a narrow cross trench of sufficient depth to eliminate the possibility of sand anchor pulling out under strain. Nos. 2 and 3 remove the shot-line box. The officer in charge and no. 1 remove the gun and place it in position 4 or 5 paces to windward of the cart; nos. 2 and 3 place the short-line box, inverted, on a line with the muzzle of the gun, and 3 feet to windward (wind), unless the wind is directly on shore, when they will place it to the right, and, after lifting the pins clear of the line, will cant the box in the direction of the wreck.

(3) If through carelessness the shot line has been faked too tightly upon the pins, it should not be forced off the pins by the bottom board, which is likely to split, but the frame should be raised and a few of

the fakes at the points of the pins removed with the hand until sufficiently loose.

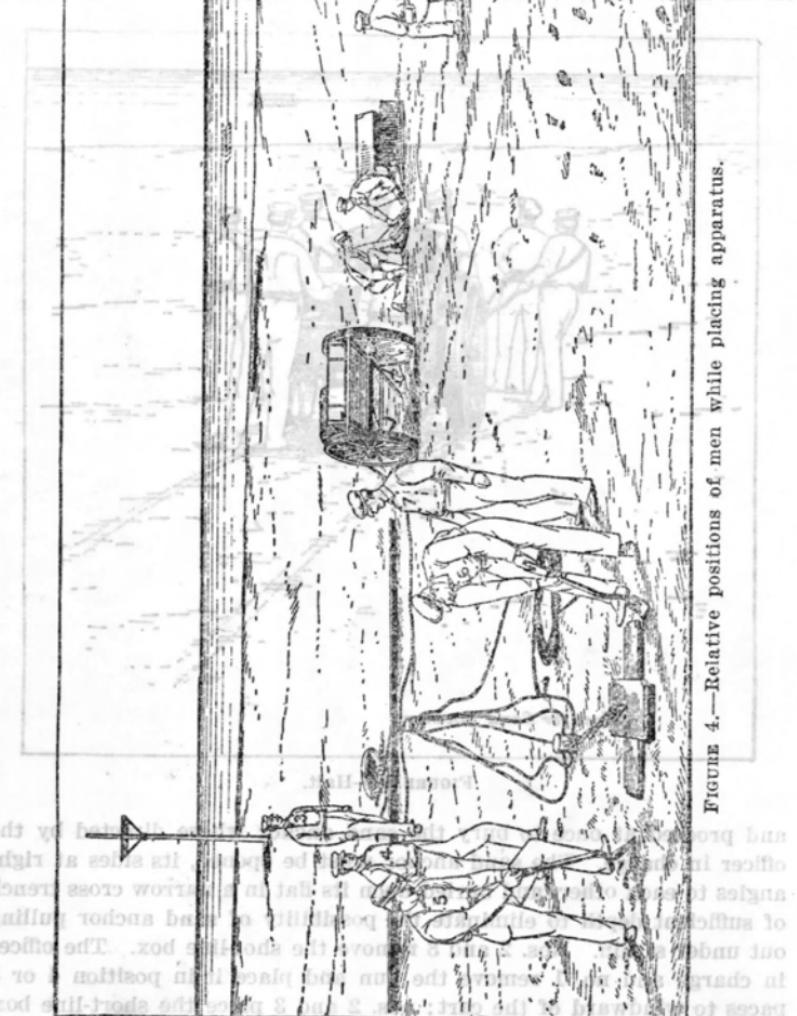


FIGURE 4.—Relative positions of men while placing apparatus.

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and bends it into the shank with three half hitches. No. 1 then inserts the shot into the bore, forcing it gently but firmly down upon the charge without disturbing the fakes and *without any slack line between the gun and the shot-line box.*

(5) Nos. 1 and 2 take position on their knees on the left and right side of the gun, respectively, and train the muzzle to the right or left by the rear handles, as directed by the officer in charge, who pricks the cartridge, leaving the priming wire in the vent, steps 2 or 3 yards to the rear, sights over the gun, and commands "Right", "Left", or "Well", as required, giving his orders in a sharp, distinct tone.

(6) The lateral training obtained, due allowance being made for the wind, the officer in charge, using the combination level, gives the gun the necessary elevation, withdraws the priming wire, inserts the primer, reeves the firing lanyard through the rear handle of the carriage and hooks it into the primer. In firing, give a sharp, strong pull of the lanyard below the level of the vent to avoid disturbing the elevation. When ready to fire, he gives the command, "Stand clear—ready—fire." Before the command "Fire" is given, the officer in charge will have assured himself that no person or object is within the danger area of the projectile or the recoil of the gun.

(7) In the meanwhile no. 4 unloads and carries the crotch to a point on a line between the sand anchor and wreck, at a suitable distance from the water, on the bluff of the bank, if possible, and opens it wide, span on the left, the legs forming a straight line parallel with the beach, and then carries the breeches buoy and end of the hawser to a point in front of the crotch, and as near the water as possible. If the wooden buoy block is used, he reeves the end of the hawser through it and attaches the tally board.

(8) Nos. 3 and 4 stretch the tackle from the sand anchor toward the crotch (3 at outer block, 4 at inner or white block), remove the straps, leaving it clear and ready to be placed upon the hawser.

(9) If a threefold tackle is used, no. 4 hooks the inner white block into the sand-anchor pennant.

(10) Communication being made with the wreck, no. 1 cuts the shot line and secures the end in the swivel eye of tail block with a round turn and two half hitches and places one or more half hitches of the shot line over the tail of whip block. Figure 5 shows the position of the men and apparatus at this stage.

(11) The officer in charge makes a signal to the wreck to haul on board; no. 1 tends to the left and no. 2 the right part of the whip, separating them a distance of 50 or more yards; nos. 3 and 4 haul the whip from the reel as fast as it is needed, no. 3 standing on the left, no. 4 on the right. (See fig. 6.)

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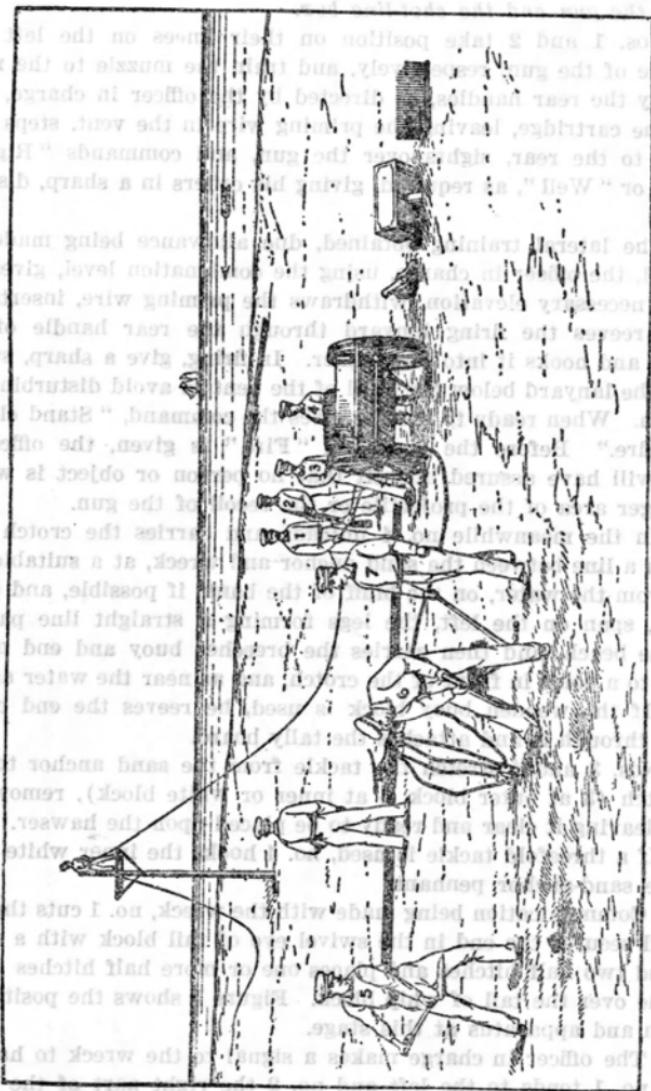


FIGURE 5.—Positions when shot line is bent to whip.

about 20 feet above the water. The boat must be hoisted to the deck and secured. The anchor is then hauled up by the anchor chain and the anchor is secured to the deck. The anchor is then hoisted up by the anchor chain and the anchor is secured to the deck. The anchor is then hoisted up by the anchor chain and the anchor is secured to the deck.

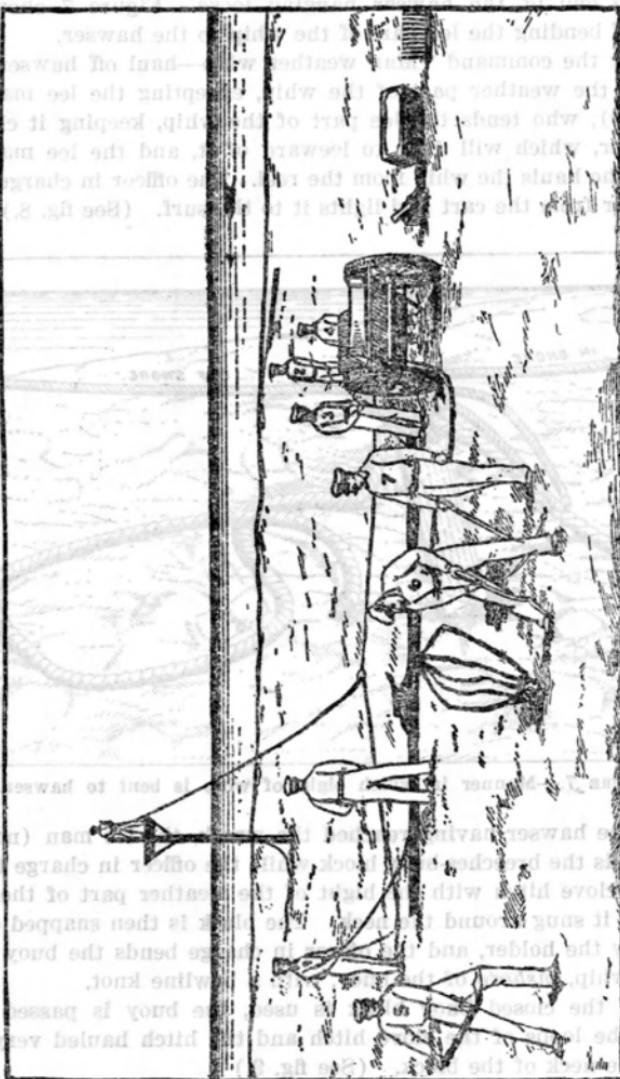


FIGURE 6.—Hauling off whip.

(12) When the tail block has been made fast on board the wreck, the lee man (no. 1 or no. 2) bends the bight of the lee part of the whip to the hawser just inside the tally board, with two round turns around the hawser and a half hitch around the standing part of the whip, the end of the hawser hanging loose. Figure 7 shows the method of bending the lee part of the whip to the hawser.

(13) At the command "Man weather whip—haul off hawser", the men man the weather part of the whip, excepting the lee man (no. 1 or no. 2), who tends the lee part of the whip, keeping it clear of the hawser, which will drift to leeward of it, and the lee man (no. 3 or 4), who hauls the whip from the reel. The officer in charge hauls the hawser from the cart and lights it to the surf. (See fig. 8.)

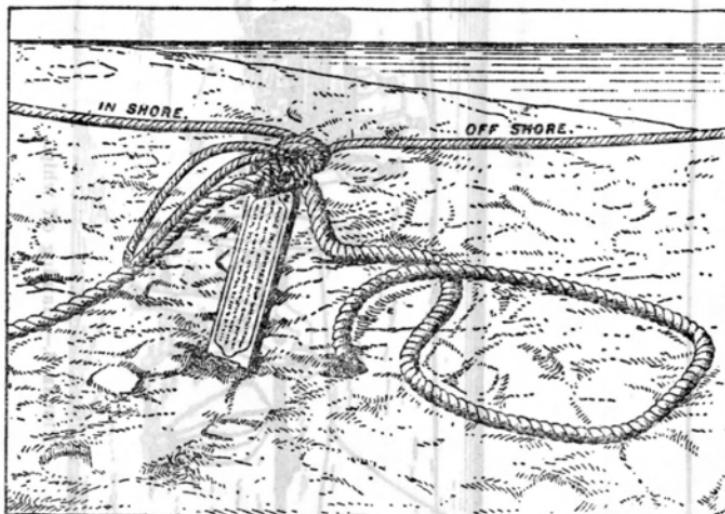


FIGURE 7.—Manner in which bight of whip is bent to hawser.

(14) The hawser having reached the wreck, the lee man (no. 1 or no. 2) holds the breeches-buoy block while the officer in charge throws over it a clove hitch with the bight of the weather part of the whip, and hauls it snug around the neck. The block is then snapped on the hawser by the holder, and the officer in charge bends the buoy bridle into the whip, *inshore* of the buoy, with a bowline knot.

(15) If the closed buoy block is used, the buoy is passed down through the loops of the clove hitch and the hitch hauled very snug around the neck of the block. (See fig. 9.)

(16) When a threefold purchase is used, the pennant block is dispensed with, and as soon as the hawser is made fast to the wreck, the men who have been manning the weather part of the whip haul in the

199. (1) Action.—The relative positions assumed by the men for the purpose of placing the apparatus are shown by figure 4. The current is supposed to be running from the right, as shown by the arrow.

(2) Officer in charge puts on his haversack; no. 4 throws buoy off the cart; nos. 5, 6, and 7 unload the shovels, pick, and sand anchor,

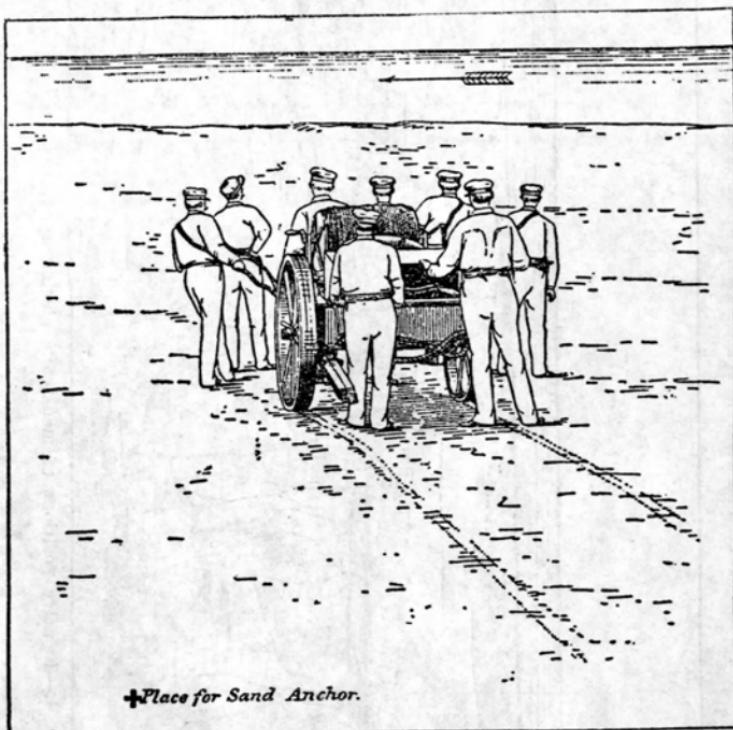


FIGURE 3.—Halt.

and proceed at once to bury the sand anchor where directed by the officer in charge. The sand anchor must be opened, its sides at right angles to each other, and buried upon its flat in a narrow cross trench of sufficient depth to eliminate the possibility of sand anchor pulling out under strain. Nos. 2 and 3 remove the shot-line box. The officer in charge and no. 1 remove the gun and place it in position 4 or 5 paces to windward of the cart; nos. 2 and 3 place the short-line box, inverted, on a line with the muzzle of the gun, and 3 feet to windward (wind), unless the wind is directly on shore, when they will place it to the right, and, after lifting the pins clear of the line, will cant the box in the direction of the wreck.

(3) If through carelessness the shot line has been faked too tightly upon the pins, it should not be forced off the pins by the bottom board, which is likely to split, but the frame should be raised and a few of

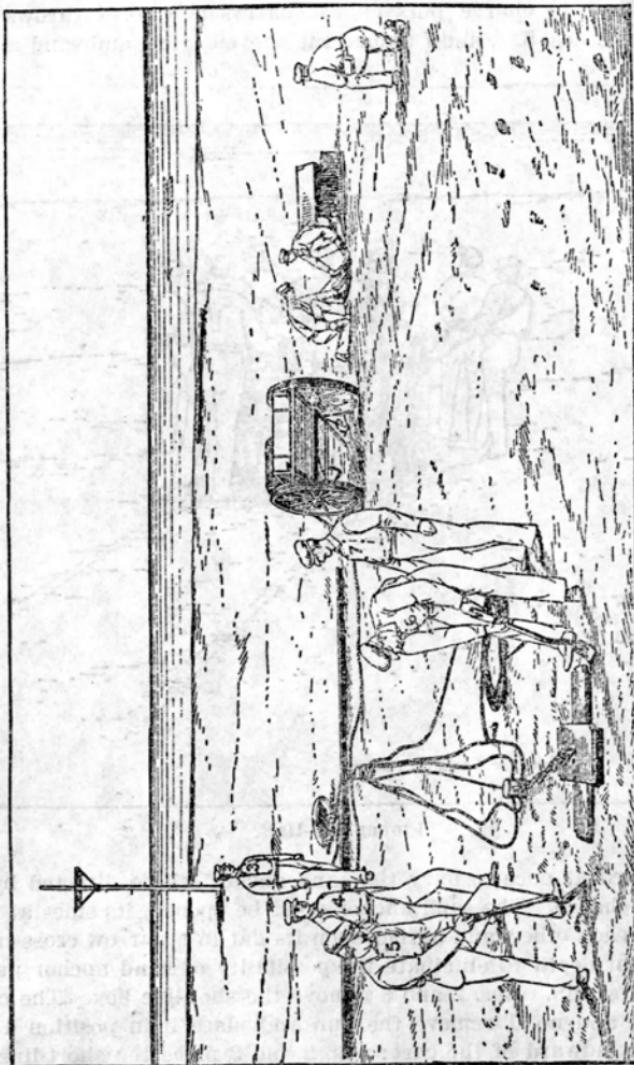


FIGURE 4.—Relative positions of men while placing apparatus.

the fakes at the points of the pins removed with the hand until sufficiently loose.

(4) Officer in charge loads with cartridge, no. 1 provides the shot, wipes and holds it while no. 2 wets a fathom of the shot line

and bends it into the shank with three half hitches. No. 1 then inserts the shot into the bore, forcing it gently but firmly down upon the charge without disturbing the fakes and *without any slack line between the gun and the shot-line box.*

(5) Nos. 1 and 2 take position on their knees on the left and right side of the gun, respectively, and train the muzzle to the right or left by the rear handles, as directed by the officer in charge, who pricks the cartridge, leaving the priming wire in the vent, steps 2 or 3 yards to the rear, sights over the gun, and commands "Right", "Left", or "Well", as required, giving his orders in a sharp, distinct tone.

(6) The lateral training obtained, due allowance being made for the wind, the officer in charge, using the combination level, gives the gun the necessary elevation, withdraws the priming wire, inserts the primer, reeves the firing lanyard through the rear handle of the carriage and hooks it into the primer. In firing, give a sharp, strong pull of the lanyard below the level of the vent to avoid disturbing the elevation. When ready to fire, he gives the command, "Stand clear—ready—fire." Before the command "Fire" is given, the officer in charge will have assured himself that no person or object is within the danger area of the projectile or the recoil of the gun.

(7) In the meanwhile no. 4 unloads and carries the crotch to a point on a line between the sand anchor and wreck, at a suitable distance from the water, on the bluff of the bank, if possible, and opens it wide, span on the left, the legs forming a straight line parallel with the beach, and then carries the breeches buoy and end of the hawser to a point in front of the crotch, and as near the water as possible. If the wooden buoy block is used, he reeves the end of the hawser through it and attaches the tally board.

(8) Nos. 3 and 4 stretch the tackle from the sand anchor toward the crotch (3 at outer block, 4 at inner or white block), remove the straps, leaving it clear and ready to be placed upon the hawser.

(9) If a threefold tackle is used, no. 4 hooks the inner white block into the sand-anchor pennant.

(10) Communication being made with the wreck, no. 1 cuts the shot line and secures the end in the swivel eye of tail block with a round turn and two half hitches and places one or more half hitches of the shot line over the tail of whip block. Figure 5 shows the position of the men and apparatus at this stage.

(11) The officer in charge makes a signal to the wreck to haul on board; no. 1 tends to the left and no. 2 the right part of the whip, separating them a distance of 50 or more yards; nos. 3 and 4 haul the whip from the reel as fast as it is needed, no. 3 standing on the left, no. 4 on the right. (See fig. 6.)

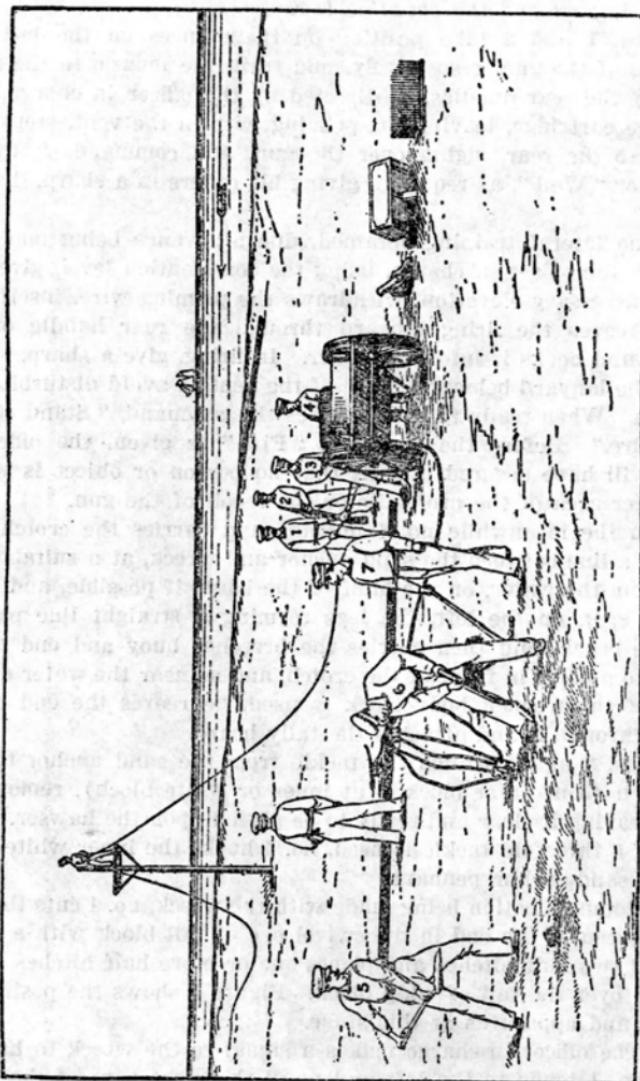


FIGURE 5.—Positions when shot line is bent to whip.

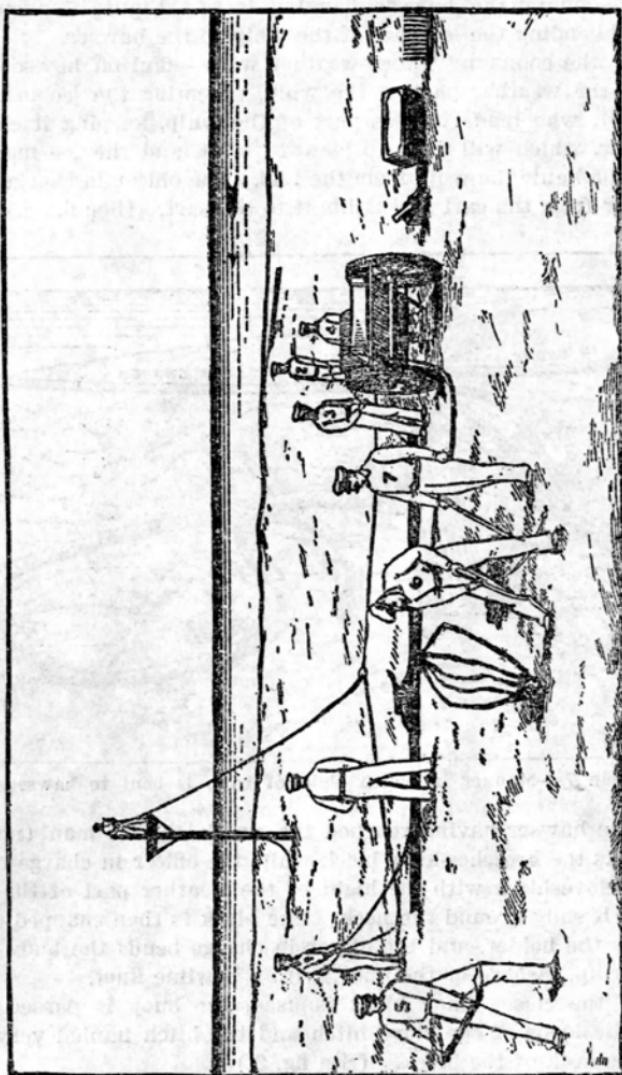


FIGURE 6.—Hauling off whip.

(12) When the tail block has been made fast on board the wreck, the lee man (no. 1 or no. 2) bends the bight of the lee part of the whip to the hawser just inside the tally board, with two round turns around the hawser and a half hitch around the standing part of the whip, the end of the hawser hanging loose. Figure 7 shows the method of bending the lee part of the whip to the hawser.

(13) At the command "Man weather whip—haul off hawser", the men man the weather part of the whip, excepting the lee man (no. 1 or no. 2), who tends the lee part of the whip, keeping it clear of the hawser, which will drift to leeward of it, and the lee man (no. 3 or 4), who hauls the whip from the reel. The officer in charge hauls the hawser from the cart and lights it to the surf. (See fig. 8.)

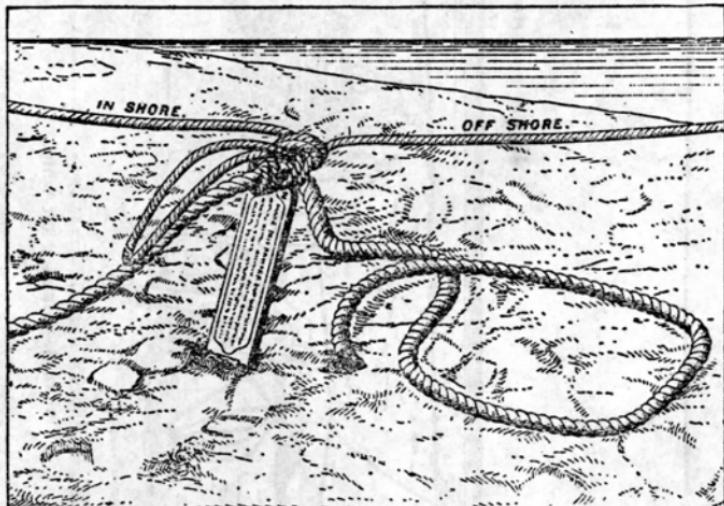


FIGURE 7.—Manner in which bight of whip is bent to hawser.

(14) The hawser having reached the wreck, the lee man (no. 1 or no. 2) holds the breeches-buoy block while the officer in charge throws over it a clove hitch with the bight of the weather part of the whip, and hauls it snug around the neck. The block is then snapped on the hawser by the holder, and the officer in charge bends the buoy bridle into the whip, *inshore* of the buoy, with a bowline knot.

(15) If the closed buoy block is used, the buoy is passed down through the loops of the clove hitch and the hitch hauled very snug around the neck of the block. (See fig. 9.)

(16) When a threefold purchase is used, the pennant block is dispensed with, and as soon as the hawser is made fast to the wreck, the men who have been manning the weather part of the whip haul in the

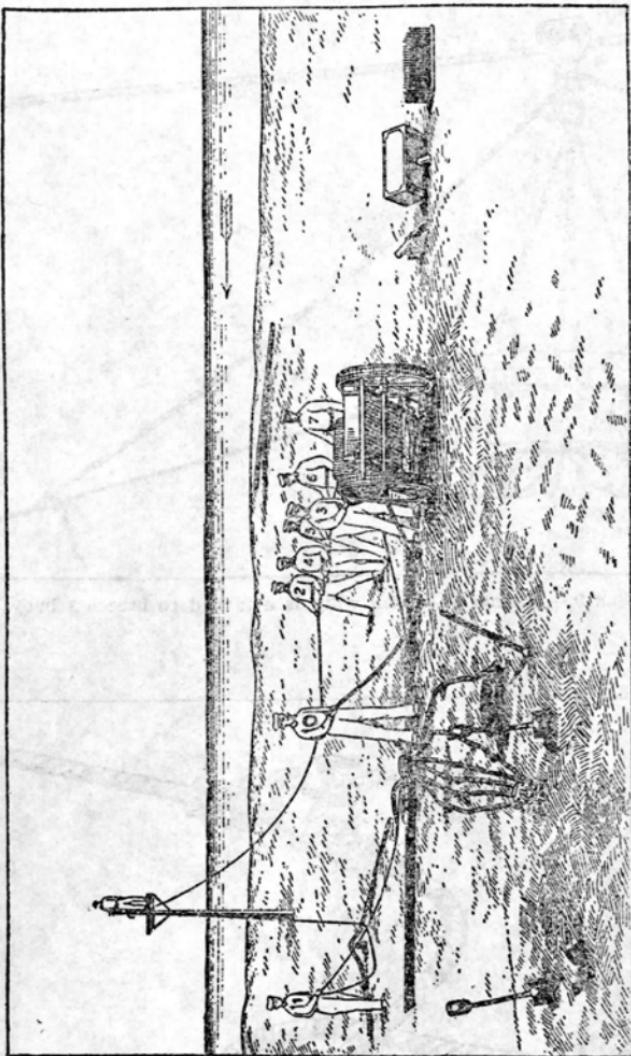


FIGURE 8.—Hauling off hawser.

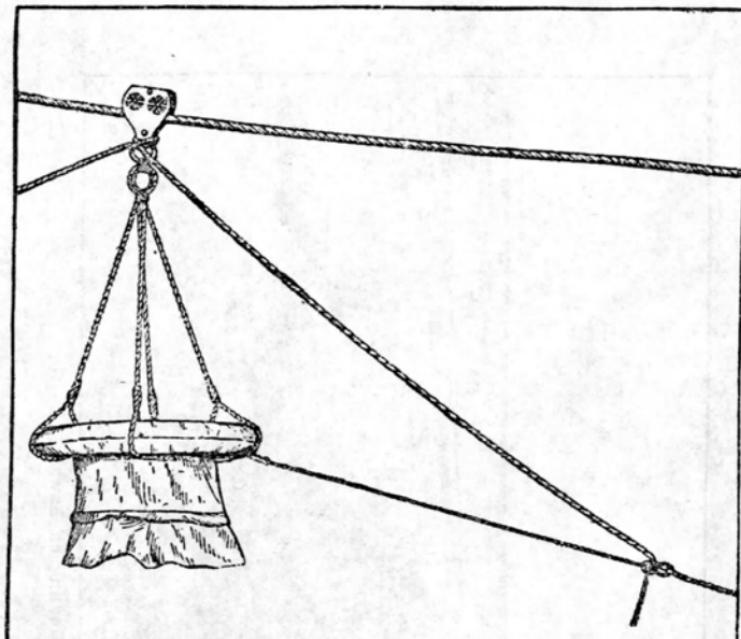


FIGURE 9.—Manner in which whip is attached to breeches buoy.

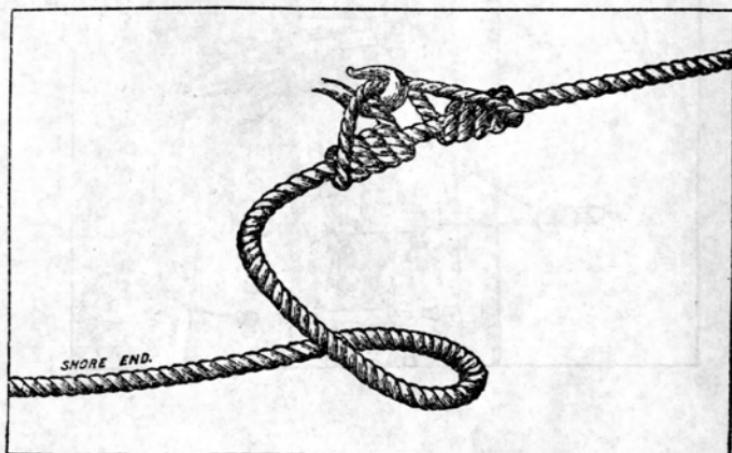


FIGURE 10.—Manner of adjusting strap to hawser.

slack of the hawser, no. 5 holding the turn around the sand-anchor pennant or pennant cleat, no. 3 adjusting the strap or chain tail around the hawser, and no. 4 hooking the outer block of the tackle into the strap. The proper manner of adjusting the strap is shown in figure 10.

(17) The hawser is then hauled moderately taut by the officer in charge and nos. 1, 2, 3, 4, 5, 6, and 7. No. 5 takes a turn with the fall, while nos. 3 and 1 at the heel of the left leg of the crotch and nos. 2 and 4 at the heel of the right leg, with the officer in charge and nos. 6 and 7 in the center, raise the crotch by raising the center, bringing the heels as near together as necessary, no. 3 passing and securing the span. (See fig. 11.)

(18) The crotch is inclined outward sufficiently to allow the hawser to be hauled well taut upon its gaining a perpendicular position.

(19) The tackle is again manned, if necessary, and the hawser hauled taut when the fall is belayed by no. 5 around the neck of the inner block or pennant cleat (being careful not to choke the luff) and the whip is manned. If it becomes necessary to fleet the three-fold tackle when the pennant block is not used, no. 5 takes a turn with the hawser around the sand-anchor pennant or pennant cleat, no. 3 fleets the strap, and no. 4, with the necessary assistance, overhauls and hooks the outer block of the tackle.

(20) To fleet tackle when pennant block is used, the officer in charge racks both parts of hawser together near pennant block, and the tackle is then overhauled and hooked by the men assigned to those duties.

(21) When a twofold purchase and a pennant block are used, no. 6, as soon as the hawser is attached to the wreck, snatches the bight into the pennant block and locks it, and the men on the weather part of the whip haul in the slack of the hawser, when nos. 3, 4, 5, and 6 put the tackle on, nos. 3 and 4 at the outer block, no. 3 with the strap, nos. 5 and 6 at the inner block, no. 6 making a cat's-paw in the hauling part of the hawser, into which nos. 5 and 6 hook the inner block.

200. **Man lee whip—Haul off buoy.**—Nos. 1 and 2 have charge of the left and the right side of the whip, respectively. Nos. 3, 4, 5, 6, and 7 are shifting men, man the lee part, and haul the buoy off to the wreck. (See fig. 12.)

201. (1) **Man weather whip—Haul ashore.**—Nos. 3, 4, 5, 6, and 7 shift to the weather part of the whip and haul ashore, the officer in charge superintending and assisting when necessary. (See fig. 13.)

(2) The officer in charge and no. 7 assist the rescued persons out of the buoy when they reach the shore.

202. Odd numbers are on the left, even numbers are on the right when stationed at the beach cart; and throughout the exercise, when

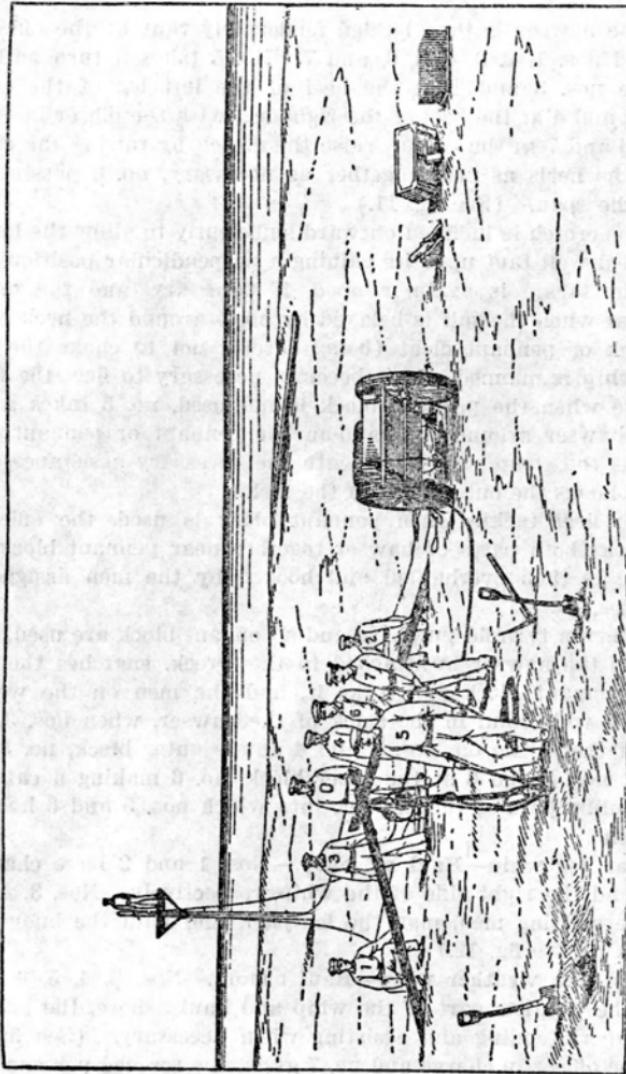


FIGURE 11.—Raising the crotch.

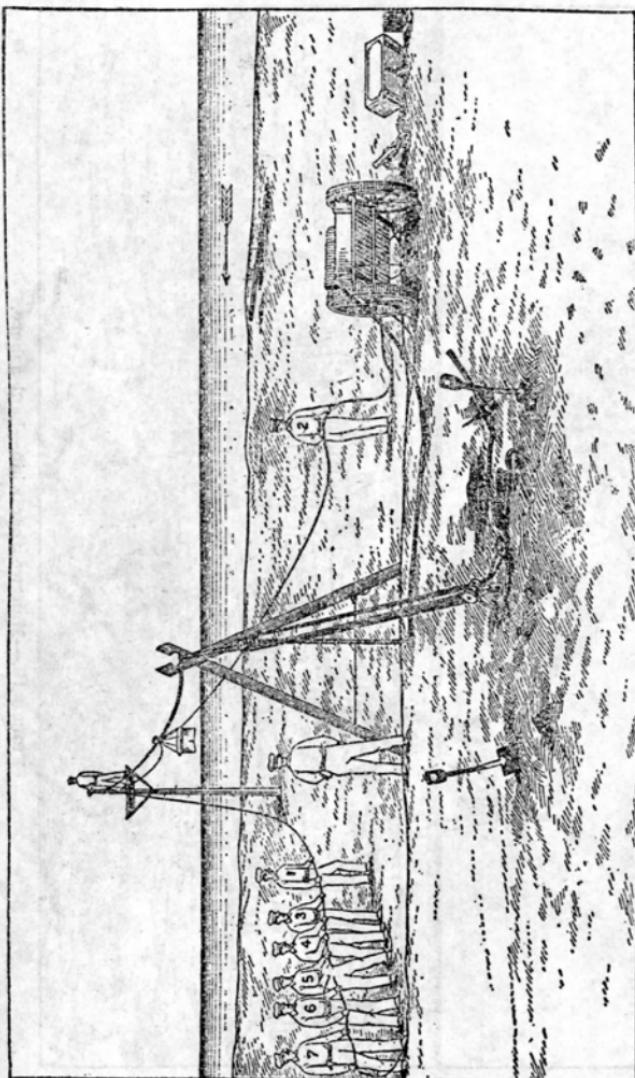


FIGURE 12.—Man lee whip—haul off.

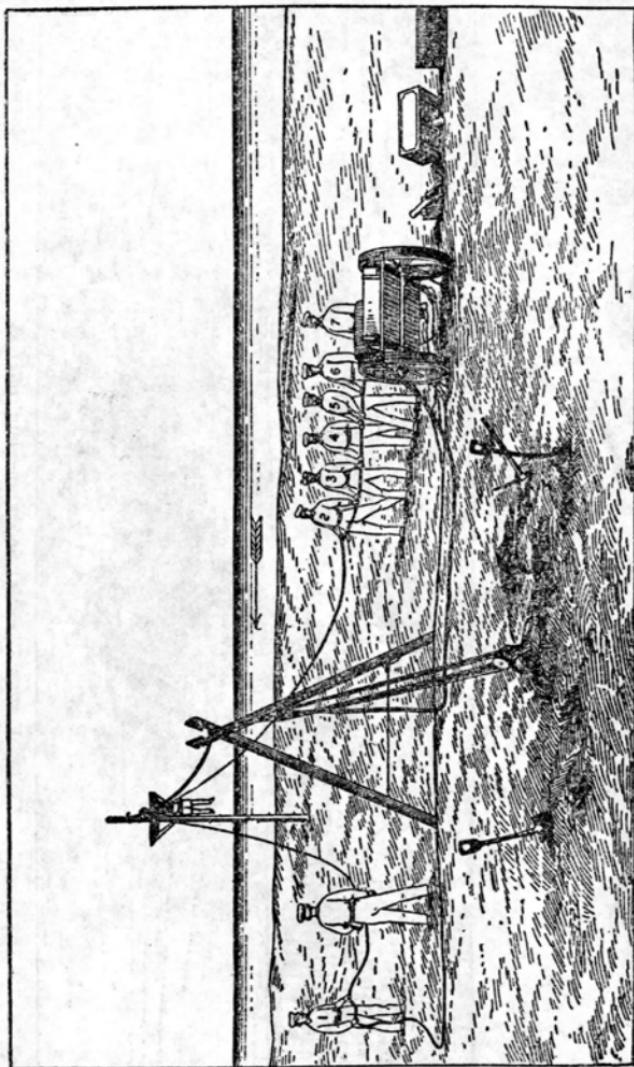


FIGURE 13.—Man weather whip—haul ashore.

two numbers work in company, as in training the gun, tending the whip, hauling the whip from the reel, etc., the odd number is on the left, the even number on the right.

203. The exercise must be considered as a whole, and when a man has performed one duty he will proceed to execute the next assigned him. All must work together. While the officer in charge and nos. 1 and 2 are opening communications with the gun and shot line, nos. 3, 4, 5, and 6 will have the hawser and its connections ready for sending off and hauling taut.

204. When practicing, no. 6 or no. 7 will go to the wreck pole as soon as the gun is discharged and haul off and make fast the whip and hawser.

205. When the members of the crew have become expert in the performance of their several special duties they are, in drill, to be successively transferred, temporarily, to the performance of the duties of each of the other members until every man becomes proficient in the particular duties of every position.

206. Instances may occur when a wreck is breaking up rapidly, and there is not sufficient time to send off the whip and hawser, or the crew are too much exhausted to haul the gear off. In such cases, after communication is made by means of the shot line, that line should be cut, and the shore end bent to a single part of the whip; when the end of the whip has reached the wreck the bight of the whip should be bent into the slings of the buoy (block removed) so that the buoy may be pulled off through the surf by the people on the wreck.

207. Work can be facilitated if, after the gear is set up and in working order, a good man from one of the adjacent crews be sent off to the wreck in the breeches buoy to superintend the work at that end, assist the people into the buoy, etc.

208. When more crews than one are present, the adjacent crews will assist in hauling off and setting up the hawser, hauling the buoy off and on, and assisting the people from it.

209. Officers in charge are particularly directed to allow no interference in the management of the apparatus from outside parties, but may accept their assistance in hauling on lines, etc.

210. (1) When the life car is to be used in drill, where the drill ground is over water, it should be substituted for the breeches buoy, and be hauled to and from the wreck pole upon the hawser in the same manner as the buoy, the hawser being rove through the eye of each bail or passed through blocks provided for the purpose and the whip line made fast to the bails as follows: Take two half hitches with a bight of the whip around the outer bail under the eye, carry the whip to the inner bail and make it fast with a bight as before, having the bail upright, and the whip between them taut for a span.

(2) In addition to the above, the practice at a drill should include the hauling of the car back and forth through the water as follows: The shot line having fallen over the wreck pole, bend the whip line into the rings at the ends of the life car in the same manner as described above, except that the line between the rings should be left sufficiently slack not to obstruct the hatch of the car. The car should be then hauled back and forth over the water. This maneuver should be repeated two or three times. Where this cannot be done on account of the absence of water at the drill ground, two men will go out in the surfboat and anchor it at the usual practice distance from the shore. A line will then be fired across the boat, and the drill will be carried out as last above directed.

TO LOAD THE BEACH CART

211. The crews are not to be exercised in loading the carts expeditiously, but rather in compactly stowing the apparatus, following the instructions contained herein, insofar as practicable.

(a) One man lights along the hawser while 4 men, 1 at each corner of the cart, proceed to coil it down, right-handed and from the outside toward the center, in a Flemish coil. Having completed the first layer, carry the bight to the outside of the coil, and coil toward the center again. This is done in order that the hawser, when in use, may run from the center of the coil.

(b) Tally board no. 2 is to be spliced or bent on the top end of the hawser and stowed away in the center of the coil. This tally board bears the following directions in English on one side and in French on the other:

"Make this hawser fast about 2 feet above the tail block; see all clear and that the rope in the block runs free, and show signal to the shore."

(c) With the tail block on the bight of the whip, make each end of the whip fast with a small stop to the side of its reel, and reel up, working toward the center; when both parts meet the separator, work back to the end, and so on until the whip is on the reel. The tail block will hang in the middle of the whip over the front of the reel.

(d) Tally board no. 1 is to be spliced permanently into the tails of the whip block just above the splice. This tally board contains the following directions in English on one side and in French on the other:

"Make the tail of the block fast to the lower mast, well up. If the masts are gone, then to the best place you can find. Cast off shot line, see that the rope in the block runs free, and show signal to shore."

two numbers work in company, as in training the gun, tending the whip, hauling the whip from the reel, etc., the odd number is on the left, the even number on the right.

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(b) Tally board no. 2 is to be spliced or bent on the top end of the hawser and stowed away in the center of the coil. This tally board bears the following directions in English on one side and in French on the other:

"Make this hawser fast about 2 feet above the tail block; see all clear and that the rope in the block runs free, and show signal to the shore."

(c) With the tail block on the bight of the whip, make each end of the whip fast with a small stop to the side of its reel, and reel up, working toward the center; when both parts meet the separator, work back to the end, and so on until the whip is on the reel. The tail block will hang in the middle of the whip over the front of the reel.

(d) Tally board no. 1 is to be spliced permanently into the tails of the whip block just above the splice. This tally board contains the following directions in English on one side and in French on the other:

"Make the tail of the block fast to the lower mast, well up. If the masts are gone, then to the best place you can find. Cast off shot line, see that the rope in the block runs free, and show signal to shore."

(e) The inner block, or that next the sand anchor, should be painted white, the outer one left bright. The tackle is to be over-hauled its full length, and a strap placed around all parts of the fall, under each block. The outer block is to be placed under the reel on the left side, and all parts of the fall, coiled right-handed around upon the hawser, laying them down flat, finishing with the inner block under the reel, opposite the outer block.

(f) The gun is to be placed athwart the hawser, immediately over the axle, muzzle to the right. Stops, 3 feet long, are spliced into the top of the sides of the cart body, and are made fast through the front and rear handles of the right side of the gun carriage.

(g) Shot-line box A, containing no. 9 line, is to be placed across the cart in the rear of the gun, filling the space between the gun and

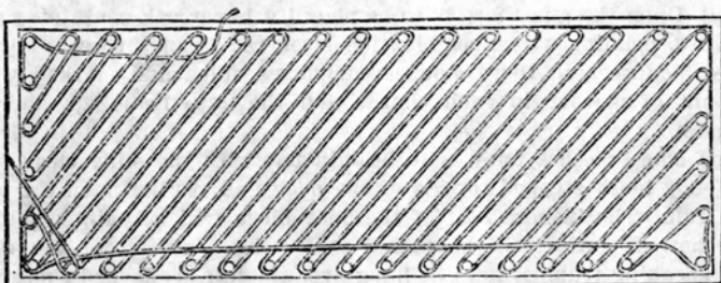


FIGURE 14.—Method of faking the shot line.

the tailboard. Stops, 3 feet in length, are spliced into the top of the sides of the cart body and are made fast into the handles of the shot-line box, and no. 7 and no. 4 lines in their respective boxes are secured on top of all.

(h) The shot lines must be faked as shown in the diagram (fig. 14), and hauled as closely around the pins as can be done without causing the line to bind on the pins.

(i) The rammer is to be placed between the gun and the shot-line box.

(j) The sand anchor is to be placed across the rear end of the cart, upon its edge, resting upon projecting pieces, the pennant hooked into the sand anchor and moused.

(k) The stops spliced into the eyes of the tailboard rods are to be passed down outside of the anchor, around the horns of the cross frame of the cart body, back, up outside the anchor, and made fast in the eye again.

(l) The pennant is to be kept up in place by the same stops. The sharp point of the pickax is to be stuck between the sand anchor and the tailboard, on the left side, the handle to the right, the point of the pick resting upon the sand-anchor support.

(m) The loops of the shovel handles are to be placed over the upper horn of the pick, blades of the shovels to the right, and kept in place by a stop spliced around the right rear brace of the cart body and brought up over and around the shovel handles.

(n) A $\frac{3}{4}$ -inch hole is bored through both legs of the crotch, at a distance from the bolt equal to the extreme length of the cart. A span of $1\frac{1}{2}$ -inch rope, 3 fathoms long, is spliced into one of these holes. The crotch is to be secured under the cart on the left side by taking a half hitch around both legs with this span, making the span fast around the horn of the after crosspiece of the cart body, the head of the crotch being made fast at the breast piece with a two-legged stop spliced there for that purpose.

(o) Five or more shots secured in a canvas kit, and a heaving stick and line are to be placed upon the hawser in front of the gun.

(p) Upon the gun there is to be placed a haversack containing the lanyard, priming wires, combination level, red flannel, three 6-ounce, three 5-ounce, and three 4-ounce cartridges, filled and marked with amount of powder in each charge and the date made up, and 24 primers.

(q) The breeches buoy is to be laid flat with the sling clear and the buoy block stopped to side of the buoy and resting upon the reel and gun. The inshore half of the buoy block will be painted white. The hawser cutter will be placed under the afterpart of the reel. The speaking trumpet is to be hung over the left headboard rod.

(r) The gun worm and ax are to be hung in leather beackets on the left and right sides of the cart body, respectively.

(s) The tarpaulin, stopped at the corners and sides, is to be spread over all.

(t) A water light in a pail shall always be carried, suspended from the underside of the cart. A life preserver shall also be carried on the cart for use in case a man must be sent into the surf with the lines. Signal flags shall be becketed on the side of the cart.

(u) Two torches shall be secured to the headboard by fixtures supplied for them.

(v) Two lanterns (unlighted till required for signaling) shall be carried, one on each side, attached to the uprights.

212. Loaded as above, the reel stanchions placed 6 inches from the headboard, the cart should exactly balance. If through difference in size and weight of crotch and sand anchor the cart does not balance, it can be adjusted by moving the gun a few inches forward or aft.

213. While standing in the house, the cart should have a support under the center of the axle.

HAWSER CUTTER

214. (1) After the crew is landed from a stranded vessel, it may be necessary to detach the hawser from the wreck, either for the

Hawser Cutter
purpose of using it elsewhere or because the wreck is rapidly breaking up. In either case the hawser cutter should be used. To do this, the breeches buoy is first removed, and then, facing the wreck and standing on the left of the hawser, the cutter is placed upon it by grasping it, the white end of the cutter being inshore, the eyes of the knives inclined toward the wreck. The cutter is then closed and the clasp secured, head of pin to seaward.

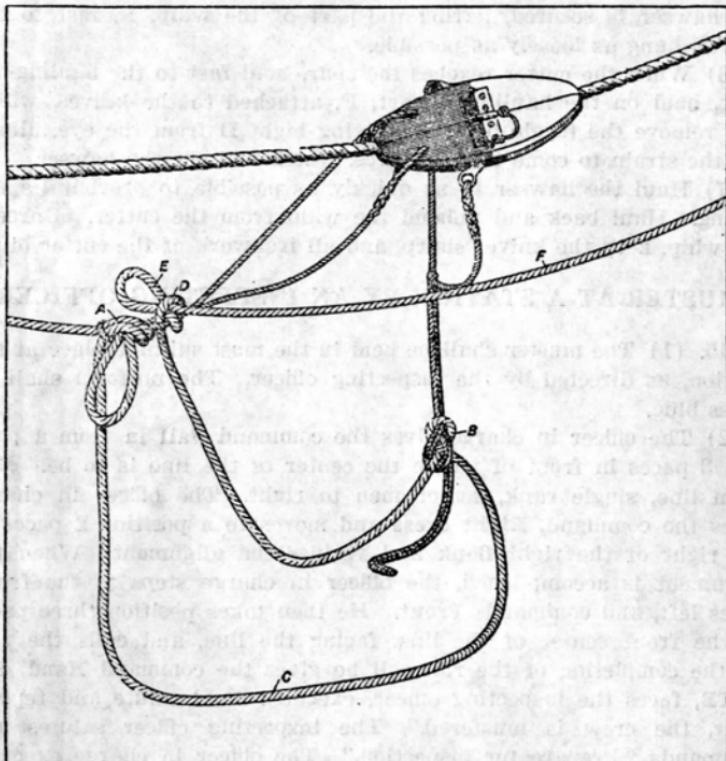


FIGURE 15.—Hawser cutter arranged for hauling off.

(2) The becket in the outer end of the cutter should have two eyes formed in the bight by passing a seizing around both parts 2 inches from the bight, and a second seizing 2 inches from the first. The method of bending the whip to the hawser cutter is as follows (see fig. 15) :

(3) Bend a bight of the weather part of the whip into the outer eye of the becket, leading from the outer end of the cutter, with a sheet bend, as at A, and the tail of the knife lanyards into another

bight of the same part of the whip with a bowline knot, B, allowing sufficient slack line, C (say 2 fathoms), to permit the knives to work.

(4) About 2 feet inshore of the last knot, take up another bight, D, of the whip, and pass it up through the second eye in the outer becket, toggling it with another bight, E. This transfers the weight of the whip from the knives to the becket, thus relieving the hawser from their pressure while the cutter is being hauled off to the wreck.

(5) Haul the cutter out as close as possible to the spar to which the hawser is secured, letting the part of the whip, F, fast to the knives, hang as loosely as possible.

(6) When the cutter reaches the spar, hold fast to the hauling-out part, haul on the hauling-in part, F, attached to the knives, which will remove the toggle bight E, freeing bight D from the eye, allowing the strain to come to the knives, which will cut the hawser.

(7) Haul the hawser in as quickly as possible to prevent its unlaymenting. Haul back and unbend the whip from the cutter. Unreeve the whip, keep the knives sharp, and all ironwork of the cutter oiled.

MUSTER AT A STATION BY AN INSPECTING OFFICER

215. (1) The muster shall be held in the most suitable place at the station, as directed by the inspecting officer. The uniform shall be dress blue.

(2) The officer in charge gives the command **Fall in** from a position 3 paces in front of where the center of the line is to be. Men form line, single rank, senior men to right. The officer in charge gives the command, **Right dress** and moves to a position 2 paces to the right of the right flank and verifies the alignment. When the alignment is accomplished, the officer in charge steps to the front, faces left, and commands **Front**. He then takes position three paces in the front center of the line, facing the line, and calls the roll. At the completion of the roll call he gives the command **Hand, SALUTE**, faces the inspecting officer, executes hand salute and reports "Sir, the crew is mustered." The inspecting officer salutes and commands "Prepare for inspection." The officer in charge executes "two", faces the line and commands **Two**, and takes position at the right flank of the line.

(3) The inspecting officer inspects the uniforms, obtains required data, asks if any man has a complaint to make, and when he finishes, commands **Dismiss the muster**.

(4) The officer in charge salutes, steps 2 paces to the front, faces left, and commands **Dismissed**.

INFANTRY DRILL AT STATIONS

216. Infantry drill at stations shall be in accordance with the "Landing Force Manual", United States Navy, 1927, pages 6 to 35,

embracing elementary instruction, instruction with rifle, manual of arms, loadings and firings, drill of the rifle squad and drill of the rifle platoon. Instructions in the care and firing of small arms, nomenclature, etc., shall be in accordance with chapter 11, pages 120 to 138 of the "Landing Force Manual", United States Navy, 1927.

217. All stations shall be provided with one or more copies of this publication accessible to the men.

PILOTING $1 \text{ degree} = 60 \text{ Naut Miles}$
 $1 \text{ minute of lat} = 1 \text{ "}$

218. Local knowledge is invaluable in piloting and the crews of the various stations should know the channels, depth of water, currents, aids to navigation, etc., in the vicinity of their stations without reference to charts. In trips off shore and to other localities a working knowledge of piloting is necessary.

219. The essentials needed for most piloting are: chart, compass, dividers, parallel rulers, pencil, lead line, and distance-determining equipment such as taffrail log or engine tachometer. These essentials and their uses are as follows:

(1) *The chart.*—Charts are of various kinds, made so for different localities or uses, but the mercator projection is the one which will be used by Coast Guard stations on the coast. These charts are printed by the Coast and Geodetic Survey, and those essential for the use of a station should be renewed once a year in order that changes which may occur in coast line or aids to navigation may be known. The chart will show the condition of the coast line, aids to navigation, depth of water, and the characteristics of the bottoms to be found. Soundings may be in feet or fathoms; notation on the chart will tell which is used. Scale of distances may be given under the information data, one for nautical miles and another for yards, and if this is not given, then the latitude scale at the side of the chart should be used. [In this case a minute of latitude is equal to 1 nautical mile. Thus, a degree of latitude is equal to 60 nautical miles. In most cases the degrees are subdivided into 10-minute scales and the 10-minute scales again divided up for minutes and half minutes. Remembering that 1 minute equals 1 nautical mile, no trouble should be experienced. Always take the distance from the latitude scale directly to the east or west of your position.]

NOTE.—In localities such as the Great Lakes where polyconic charts are also used and where the land mile, 5,280 feet is used instead of the nautical mile for measuring distance, scales of nautical miles, land miles, yards, and meters are given on the chart.

At convenient places on charts a compass "rose" is printed. The outer circle of this "rose" is marked in degrees which are true bearings. The zero of this "rose" points to the geographical north pole. The inner rose is in points and quarter points of the compass and

is known as the "magnetic rose" as the variation for the locality has already been applied. The north of this rose points to the magnetic north pole. Where boat compasses are marked in degrees, the true rose should be used and the compass error (variation and deviation) applied. Where the boat compass is marked in points and quarter points, the magnetic rose should be used and only the deviation applied. The variation for the locality is given at the center of the rose on the chart.

(2) *The compass.*—The mariner's compass consists of a bowl with a glass top which is filled with a liquid (usually a mixture of 45 percent pure alcohol and 55 percent distilled water). A circular card marked off in degrees (from 0 to 359) or points and quarter points, is suspended in the liquid on a pivot. Attached to the card is one or more permanent magnets which causes the zero or north marking of the card to point always in the direction of the magnetic north pole, unless deflected by deviation or local attraction. A leakage of liquid will cause a bubble to form in the compass. This can easily be removed by first removing the plug on the side of the compass and ascertaining the liquid the compass uses (some modern compasses use pure kerosene). Insert the proper mixture by holding the plug opening up and using a medicine dropper until all air is exhausted. Then replace the plug and see that the gaskets and all parts of the compass are tight. If a bubble forms after several days, it shows that a leak is occurring, and in this case repair or renewal of the compass should be requested.

In pulling boats the compass is set up in the fore and aft line of the boat and can usually be depended upon for magnetic directions, especially if it is placed well aft and the anchor, grapnel, and other steel or iron objects are kept well forward and at least 20 feet from the compass.

In power boats the large mass of iron in the engine causes deviation in the compass. The amount of deviation will vary on different headings, probably being greatest on NE., SE., SW., and NW. headings. To ascertain the deviation, the method used will vary in different localities. The boat can be headed on ranges which are given on the chart, and the difference, after applying the variation for the locality, noted. If an *accurate* dumb compass is located in the lookout tower, temporary vertical staffs can be put up in the bow and stern of the boat as ranges and the boat headed toward or away from the lookout tower. When the staffs are in range, a flag signal can be given from the lookout tower and a bearing taken by the lookout and compass in the boat read at the same time. After variation is applied, the difference between the lookout bearing and the compass reading is the deviation if the boat was headed away from the tower. If the boat was headed toward the tower, 180° should be added to the bearing.

taken by the lookout if the bearing is between 0° and 180° . If the bearing taken by the lookout is between 180° and 360° , then subtract 180° to obtain reciprocal bearing. If magnetic bearing of a range is used, the variation is ignored.

Example (1). Lookout bearing of boat 127° true. Boat's heading by compass 300° . Variation from chart for locality 5° west.

127 true bearing from lookout.

180 (added).

307 true reciprocal bearing from lookout.

300 compass heading.

7 east compass error.

5 west variation.

12 east deviation for compass heading of 300° .

Example (2). Lookout bearing 10° . Boat's heading by compass 15° . Variation from chart 3° west.

10 true bearing.

15 compass bearing.

5 west compass error.

3 west variation.

2 west deviation for heading of 15° by compass.

Example (3). True bearing of range from chart 358° . Boat's heading by compass on range 5° . Variation 8° west.

358 true bearing.

5 compass bearing.

7 west compass error.

8 west variation.

1 east deviation for heading of 5° by compass.

Example (4) : Magnetic bearing of range using inner rose of chart NE $\frac{1}{2}$ E. Compass reading, heading on range NE. Deviation $\frac{1}{2}$ point east.

Example (5) : Magnetic bearing of range SW by S. Compass heading on range SW $\frac{1}{2}$ W. Deviation $1\frac{1}{2}$ points west.

Always set up the compass with the lubbers line in the midships fore and aft line of the boat if practicable, and as far away from

all metal as possible. If the deviation is found for different headings, make a permanent fitting or mark for setting up the compass if it is not permanently installed.

In applying known deviation and variation to the true course to obtain a compass course or vice versa, learn the following rule: "Given true course, to obtain compass course; add westerly variation and deviation." This may be shortened to "True to compass add west." This being known, it is plain that true to compass subtract east, or compass to true subtract west, or compass to true add east. There are only these four conditions, and if one "True to compass add west" is known, the others can easily be figured.

Examples:

True course taken from chart-----	80
Variation for locality taken from chart-----	5 W.
Magnetic course-----	85
Deviation-----	2 E.
Compass course-----	83
True course taken from chart-----	120
Variation-----	9 E.
Magnetic course-----	111
Deviation-----	6 W.
Compass course-----	117
Compass course-----	320
Deviation-----	9 E.
Magnetic course-----	329
Variation-----	5 W.
True course-----	324
Magnetic course from inner rose of chart-----	SE.
Deviation in points-----	1½ W.
Compass course-----	SSE½ E.
Magnetic course inner rose-----	NNE.
Deviation in points-----	½ E.
Compass course-----	N. by E½ E.

(3) *Dividers*.—Two pointed legs movable about a joint so that the extremities may be set at a required distance from one another. Used in transferring distances from or to the scale of a chart. If not provided with dividers, the edge of a piece of paper with pencil marks may be used.

(4) *Parallel rulers*.—Pair of rulers or straight edges connected together by metal strips in such manner as to allow freedom of movement of each member of the pair parallel to the other. Used for transferring lines to or from the compass rose on a chart to ascertain the course or to lay off bearings and courses.

(5) *Lead line*.—For ascertaining the depth of water, each station shall be equipped with a 25-fathom lead line. Lead should weigh from 7 to 9 pounds, and line should be first wet and then accurately marked from bottom of the lead as follows:

- 1 fathom with 1 strip of leather
- 2 fathoms with 2 strips of leather
- 3 fathoms with 3 strips of leather
- 5 fathoms with a white rag
- 7 fathoms with a red rag
- 10 fathoms with a leather having a hole in it
- 13 fathoms with 3 strips of leather
- 15 fathoms with a white rag
- 17 fathoms with a red rag
- 20 fathoms with a string with 2 knots

The lead lines at stations should also be marked in feet by sail-twine seizings up to 2 fathoms.

The lead may be hollowed out at the bottom and filled with tallow or yellow soap to bring up samples of the bottom. The chart shows the character of the bottom in different localities, and this knowledge is often desired, especially in a fog.

(6) *Distance determining equipment*.—Where boats are equipped with an engine tachometer, the boat should be run back and forth over a measured nautical mile or known distance to ascertain her speed for various revolutions. The boat should make one run each way with the engine turning up the same number of revolutions and the mean of these two runs taken as her speed for that number of revolutions. The run each way is necessary because of wind and current effects. Three speeds should be established: full, half, and slow. Divide the number of miles into the number of minutes and the result will be the number of minutes it takes to go 1 mile. A 10-knot boat takes 6 minutes to cover 1 nautical mile. Remember that damage to the propeller or change of propeller will alter the speed of the boat and make speed previously judged from revolutions unreliable.

Some stations are equipped with taffrail logs for use on power boats for determining distances traveled through the water. These should be towed over a known distance and error, if any, ascertained.

OBTAINING AND VERIFYING POSITIONS

220. *Cross bearings.*—If two or more objects such as lighthouses, beacons, Coast Guard stations, tanks, church steeples, etc., are visible and identified on the chart, the position of the boat can be determined by heading the boat at one object and reading the compass. This will be the compass bearing of the object and note should be made of it. Then head at another object and read the compass, and so on if more than two bearings are desired. If the compass is marked in points, apply the deviation for the heading and using the parallel rulers, transfer this bearing from the inner rose of the chart to the object on which the bearing was taken, and draw a line from the object to seaward. Do the same with the bearing on the second object and where the lines intersect will be the position of the boat. This position can be verified by additional bearings in the same manner on other known objects. If the compass is marked in degrees, apply the deviation and variation to obtain true bearings, and the outer rose should be used in transposing the lines of bearing to the objects. Better positions are obtained if the angle formed by two lines of bearing is between 45° and 135° .

221. *Two bearings of a known object and distance run between.*—If passing one known object and there are no others in sight to obtain cross bearings, then take a bearing on this known object and draw the line of bearing on the chart. Then, steer a straight course to pass the object and run at a steady known speed. After the bearing has changed about 30° or more, take another bearing and lay this line of bearing on the chart also. Then pick off the distance which has been run from the chart scale with the dividers. Move the parallel rulers with the course which has been run from the compass rose across the two lines of bearing. Work the parallel rulers over these lines of bearing until the distance between them at the straight edge of the rulers is the same as that on the dividers. The position will be at this point on the second bearing taken.

222. *Bow and beam bearing.*—Used to find distance off an object when passing abeam. The first bearing is taken on the object when it is 4 points on the bow. The course is not altered and boat is run at a known speed. The second bearing is taken when abeam. The distance run between the two bearings is also the distance the object is abeam.

APPENDIX A

The questions and answers contained in this appendix are for the purpose of assisting the officers in charge in the instruction of the crews of Coast Guard stations.

QUESTIONS AND ANSWERS

BOATS UNDER OARS

Question. What general rules govern a good oarsman?

Answer. A good oarsman in a well-drilled crew sits erect on his thwart, feet together on his stretcher, hands together on handle, with backs of hands up, oar level with rail, blade trimmed with blade of stroke oar.

At "Give way together" the first motion is to lean well forward, keep back straight, shove both arms out perfectly straight in front, point blade forward and down, and turn it so that as it is about to enter the water the flat part of the blade is perpendicular. The second motion: With feet on stretcher, eyes looking straight aft (not watching blade), keep arms perfectly rigid, and lean back beyond the vertical. Always lay back on your oar and pull it through the water. Do not attempt to pull with the arms alone, but always bring the muscles of the back into play. The third motion is known as the "recovery." When leaning back beyond the vertical, by bending the arms quickly, the blade is pulled through the water and a sudden force is applied to the oar; this is the most efficient part of the stroke. The oar is withdrawn from the water, and the wrists are dropped until the blade is parallel to the water. Take the next stroke without stopping.

Question. What are the general rules for boats' crews?

Answer. (1) When the boat is called away, move on the run and man the boat as soon as possible. (2) Always pull a good strong stroke and pay strict attention to orders. Paddling and slouchiness in a station boat shall not be permitted. (3) Never stand up in a boat if it can be avoided. (4) The crew of a boat shall always be in uniform and clean. (5) Never engage in conversation in a boat during drills or in performance of duty. (6) Always get into a boat ahead of

an officer, and leave it after him unless he gives orders to the contrary. If you are a passenger, always rise and salute when an officer enters or leaves a boat in which you are seated.

Question. What precautions should be taken in going into a crowded landing?

Answer. The boat should be pulled easily, kept under control with oars as long as possible, laying on oars if necessary, and boating them only at the last minute.

Question. What precautions are necessary in going through a narrow entrance?

Answer. Get good way on the boat, then trail or toss the oars.

Question. What precautions are necessary in pulling across the current?

Answer. Try to get a range on two objects in line, and steer by these to try to keep from being set down by the current.

Question. Which holds her way longer, a loaded or a light boat?

Answer. A loaded boat.

Question. What is the best thing to do when you have a long pull against the tide?

Answer. Run inshore where the tide is slacker than it is in mid-stream and where there is sometimes an eddy.

Question. What about carrying a lantern?

Answer. Always see that there is a lantern, filled and trimmed, in the boat. If the lantern is not provided with a shutter, it shall be fitted with a canvas screen. When lighted and not in use the lantern shall be kept so that it will not get adrift or capsize.

Question. What precautions must be taken regarding going alongside?

Answer. Never go alongside a vessel that has sternboard or which is backing her engines. In going alongside in a seaway, or when a strong tide is running, warn the bowmen to look out for the boat line, which should be hove from the vessel.

Question. How would you run a line with a pulling boat?

Answer. Coil most of the line in the stern sheets, but take end enough in the bow to make fast when you reach the required place. Pull away and let the vessel pay out more line until you are sure of having enough in the boat to reach the place, then pay out from the boat. If laying out with the tide, take less line in the boat than otherwise. If against the tide, and if practicable, take all the line in the boat, pull up and make fast, then bring end to ship. With a long line to be laid out in a strong current, it will usually be necessary to have several boats, one to run away with the end, the others to underrun the line at intervals, floating it and pulling against the current with the bight. If the end is to be secured to a bollard, put a bowline in the end before starting and throw this over the bollard.

Bend on a heaving line and let one of the bow oarsmen throw this, if hands are standing by to receive it, or jump ashore with it himself if necessary.

SMALL-BOAT SAILING

Question. What is meant by the trim of a boat?

Answer. The way she sits in the water. She is said to trim by the head or by the stern, according as to whether she is deeper in the water forward or aft.

Question. What effect does the position of weights have in sailing a boat?

Answer. If most of the weight is forward, she will trim by the head. In this case her stern is light and not deep in the water; consequently, the stern will tend to go off to leeward, throwing her head up into the wind. She will need weather tiller to keep her by the wind. Similarly, if weights are well aft, her stern will be deep in the water and her bow light. The wind will blow the bow off, the boat will tend to fall off, and it will require more lee tiller to keep her by the wind.

Question. What is meant by, "By the wind"?

Answer. A boat is on, or by, the wind when she is sailing as close to the wind as she can and still keep good headway.

Question. What is meant by weather tiller and by lee tiller?

Answer. Weather tiller: When the tiller, looking forward, points to the weather side. Lee tiller is just the opposite.

Question. What do you mean by the weather side?

Answer. Side toward the wind; that on which the wind first strikes. The lee side is the side away from the wind.

Question. What is the tiller?

Answer. The bar fitted fore and aft in the rudderhead, by means of which the rudder is moved.

Question. What is tacking?

Answer. When a boat is close-hauled on one tack, by putting the tiller down and letting go the head sheets, she is brought up head to wind; then by properly working the sails, she is made to fall off on the other tack. This is tacking. The head goes through the wind.

Question. What is the object of tacking?

Answer. To work a boat to windward.

Question. What is meant by putting a tiller down?

Answer. Putting the tiller over to the lee side.

Question. What is meant by putting the tiller up?

Answer. Putting the tiller over to the weather side.

Question. What is meant by wearing?

Answer. Getting a boat on the opposite tack by putting the tiller up, running off from the wind, and gradually bringing her to the wind

on the other tack. The head goes away from the wind; the stern goes through the wind.

Question. Which is the better method of working to windward, tacking or wearing?

Answer. Tacking, because, if properly performed, the boat will lose nothing to leeward. On the contrary, she will head reach and gain. That is, she will while in stays (while in process of tacking) run several boats' lengths to windward. In wearing, on the contrary, as a boat is run to leeward a part of the time, much distance is lost. The only advantage of wearing lies in the fact that there is always possibility of failure in tacking and greater certainty about wearing.

Question. What is leeway?

Answer. The drift a boat makes away from the wind when close-hauled.

Question. What is meant by "heaving to"?

Answer. Bringing a boat's head to the wind, and so adjusting her sails that she will make no headway through the water.

Question. What is "gybing"?

Answer. A boat gybes when the wind shifts around the stern, causing the main boom to fly over rapidly from one side to the other.

Question. Is it ever safe to gybe?

Answer. Only in moderate breezes. If the breeze is fresh, lower the mainsail before letting the wind shift from one quarter to the other.

Question. What is meant by luffing?

Answer. Putting tiller down, throwing boat up into the wind.

Question. When is it time to reef?

Answer. When a boat begins to take in water over the lee rail. Never be afraid of reefing too soon.

Question. What is meant by "wing and wing"?

Answer. When a boat, sailing before the wind, rigs foresail out on opposite side from mainsail, she is sailing wing and wing.

Question. Is this safe?

Answer. Yes; in moderate weather.

Question. What are the general instructions regarding trim?

Answer. To do her best under sail a boat must be trimmed according to her build and rig. If she carries much head sail she will have to be deeper forward than would otherwise be desirable. If she has little or no head sail she would trim by the stern. Weights should be kept out of the ends of the boats. Too much weather tiller can be corrected by shifting weights aft; too much lee tiller by shifting them forward.

Question. What precautions should be observed in handling sheets?

Answer. Never belay a sheet in any weather. In a moderate squall the boat should be luffed sufficiently to shake without spilling the sails, thus keeping headway enough to retain control but with the sheets in hand (as always). If it becomes stronger, luff more de-

cidedly and slack sheet. The sheet may, of course, be let go, and in a sudden emergency this must be done at once, in addition to putting the tiller down, and, if necessary, reducing sail. But the longer you can keep the boat under control the better, and to let go the sheets is to give up control. The above instructions are for use when on the wind.

In running free, different instructions hold good. Here the sail cannot be spilled by a touch of the tiller; consequently, slack the sheet while luffing. The force of the wind would be reduced by running off, but if it becomes too strong you can do nothing but lower the sail, and the chances are that it will bind against the shrouds and refuse to come down. There is also danger that the wind will shift in a squall causing the mainsail to gybe with violence.

HANDLING MOTOR BOATS

Question. What study should an officer in charge make concerning the handling of motor boats at his station?

Answer. He should make a special study of his boat with a view of getting perfectly familiar with her. He should learn by practice the turning circle and the effect of the screw under different conditions. He should inform himself of the amount of gasoline required to run a given distance at ordinary speed under usual conditions.

Question. What is the effect of the screw in steering?

Answer. Generally speaking, a right-handed screw, when going ahead, tends to throw the stern to starboard; when backing, to port. In other words, the stern is dragged around in the direction the propeller is turning, and this effect is noticed whether the boat itself has begun to answer the motion of the propeller or not. In attempting to turn a power boat the rudder should be shifted when the propeller is shifted, instead of waiting for the boat to lose its headway, for the rudder has the same general effect on the steering of the boat when the propeller is backing, whether the boat itself is moving astern or has not yet lost its headway and is still forging ahead. This rule is not strictly applicable to all boats, but it is a good general rule for boats with a single, right-handed screw.

Question. How would you make a landing with a motor boat?

Answer. Make landings with slow speed. In making a landing it is a common mistake to keep too much headway on and to rely upon backing the engine full speed to stop the boat. This is poor seamanship, as the engines may fail to back promptly, causing a collision or smash-up, and if they do back hard, it throws unnecessary strain on them.

Question. How would you make a landing alongside of a ship in a strong current?

Answer. Do not let the current catch the boat on the outward bow, as this might sweep her with force against the ship's side or gangway. The painter or a line from the ship may be used, the boat being kept off a little from the side until it is fast, and then sheered in by the rudder. A boat may lie alongside safely in a strong current with a line from the inner bow and the rudder slightly over for sheering out.

Question. How should a motor boat be trimmed for towing?

Answer. In towing, the stern of the towing boat should be kept well down by shifting weights aft if necessary. This keeps the propeller well immersed and gives it a good hold on the water.

Question. What precautions should be taken when running in a seaway?

Answer. When running in a seaway, speed should be reduced somewhat, not only to avoid shipping seas, but to reduce the strain on the machinery due to the racing of the screw. In running into a sea it is possible, by careful nursing, to make fair speed, watching the seas and slowing or even stopping for a moment as heavy seas are seen bearing down on the boat. If the man who is running the engine has sufficient experience to regulate the speed in this manner, it is convenient to leave this to him if he can see ahead. If running more or less across the sea, it is well to head up momentarily for a heavy wave.

TOWING

Question. Towing an unladen boat in a smooth sea, what precautions should be taken by the towing boat and tow?

Answer. Towing boat passes clear of oars of the tow, places herself in line ahead, receives painter from tow, secures it to ringbolt in sternpost, and starts slowly ahead as soon as she has hold of the painter. Bowman in the tow does not give towing boat his painter until she is about ahead. He then takes in slack towline, keeping a strain on it, and gradually pays it out, thus getting way on the tow gradually and avoiding too sudden a strain on the towline or stem of the boat.

Question. Give precautions when carrying stores.

Answer. Be careful of the oars, as they may easily be injured by letting stores fall on them. Keep all casks bung up and have tar-paulins for covering articles that might be injured by water. While loading, bear in mind any rough water that you may encounter. Do not overload a boat; you may capsize or be responsible for loss of life. When carrying treasure, always attach a buoy with a drift of the line at least equal to the greatest depth of water on the way back to the station.

Question. How would you tow alongside of a vessel?

Answer. If towing alongside, have the towline lead from as far forward on the towing vessel as possible. To sheer boat from the side of the towing vessel have towline secured and tended at the bow on the side toward the ship. Watch towline carefully and pay particular attention to the steering.

Question. What precautions must be taken for the management of a boat in tow?

Answer. A boat should never be towed without the crew being in her, or at least a sufficient number of men to manage her in the event of her breaking adrift or being compelled to cast off from the towing vessel.

Question. When would you use a drogue in being towed?

Answer. A drogue is found of great advantage when being towed before a heavy sea, as it prevents the boat running ahead in front of a sea at risk of damage against the towing vessel and keeps a more equable strain on the towline.

MARINER'S COMPASS

Question. What is a compass?

Answer. An instrument by which a ship or boat may be steered on a given course or by which bearings of an object may be taken.

Question. Describe the wet or liquid compass.

Answer. Briefly, it is a magnetic needle or several parallel magnetic needles attached to a compass card, so fitted as to turn easily on a pivot in the compass bowl. The bowl is filled with liquid to keep the card from wabbling or moving too quickly. The liquid usually contains 55 percent distilled water and 45 percent alcohol to prevent freezing. The whole is held in a composition case called the binnacle. Some modern compasses use pure kerosene. Alcohol should not be placed in these compasses as it may dissolve the card.

Question. How is the compass card graduated?

Answer. In points, half points, quarter points, and degrees.

Question. How many points are there in each quadrant or quarter of the compass card?

Answer. Eight.

Question. How many points are there in the whole compass card?

Answer. Thirty-two.

Question. Name the cardinal points of the compass.

Answer. North, south, east, and west.

Question. Name the semicardinal points of the compass.

Answer. Northeast, southeast, southwest, and northwest. These are half-way between the cardinal points.

Question. What are the eight principal points of the compass?

Answer. The four cardinal points and the four semicardinal points.

Question. How are the points half-way between the cardinal and semicardinal points named?

Answer. The point half-way between north and northeast is named north-northeast; the point half-way between north and northwest is named north-northwest; half-way between east and northeast is named east-northeast; half-way between east and southeast is named east-southeast, and so on.

Question. What is meant by "boxing the compass"?

Answer. By calling off the points of the compass in order.

Question. Box the compass.

Answer.—

North	South
North by east	South by west
North-northeast	South-southwest
Northeast by north	Southwest by south
Northeast	Southwest
Northeast by east	Southwest by west
East-northeast	West-southwest
East by north	West by south
East	West
East by south	West by north
East-southeast	West-northwest
Southeast by east	Northwest by west
Southeast	Northwest
Southeast by south	Northwest by north
South-southeast	North-northwest
South by east	North by west

Question. Into how many degrees is a compass card divided?

Answer. Three hundred and sixty.

Question. How many degrees are there in a quadrant or quarter of a circle?

Answer. One-fourth of 360°, or 90°.

Question. How many points are there in 90° of the compass card?

Answer. Eight.

Question. How many degrees are there in one point of the compass?

Answer. One-eighth of 90°, or 11½°.

Question. What point of the compass corresponds with 180°?

Answer. South.

Question. What point corresponds with 45°?

Answer. Northeast.

Question. What point corresponds with 135°?

Answer. Southeast.

Question. What point corresponds with 225°?

Answer. Southwest.

Question. Does the north point of a magnetic compass always point to the true north; and if not, why?

Answer. It does not always point to the true north, because the compass needle is deflected by forces called variation and deviation.

Question. How would you obtain the true bearing of an object using a magnetic compass in a motor boat?

Answer. By applying the variation for the locality and the deviation for the heading of the boat to the compass bearing of the object.

Question. How is the magnetic bearing of an object obtained using the magnetic compass in a motor boat with known deviation?

Answer. By applying the deviation for the heading of the boat to the compass bearing of the object.

Question. What is the lubber's point of a compass?

Answer. The vertical line on the inside of a compass bowl corresponding with the fore-and-aft of the ship or boat.

Question. For what is it used?

Answer. In steering this line is made to coincide as nearly as possible with the given course.

Question. Where should a compass be placed in a station boat to secure the best results? Why?

Answer. As near the amidships fore-and-aft line and as far away from movable or fixed iron or steel as practicable. The iron or steel deflects the compass needle and may increase its error, so that it would be unreliable.

Question. What is a dumb compass?

Answer. A circle marked with the graduations of the compass card (points and degrees), but without a needle. It is used for taking bearings.

Question. How should it be fixed in a station?

Answer. It should be permanently fixed so that it is properly oriented to the true north.

Question. How is a dumb compass fitted for taking bearings?

Answer. It is fitted with a movable sighting bar pivoted at the center of the compass card.

RULES OF THE ROAD FOR BOATS

Question. What lights are required to be carried by rowboats?

Answer. Rowboats, whether under oars or sail, shall have ready at hand a lantern showing a white light, which shall be temporarily exhibited in time to prevent collision.

Question. What fog signals are required for a power boat under way on the inland waters of the Atlantic, Pacific, and Gulf coasts?

Answer. If underway and not towing or being towed, it shall sound, at intervals of not more than 1 minute on the whistle a prolonged blast. When towing other vessels, it shall sound at intervals of not

more than 1 minute, 3 blasts in succession, namely, 1 prolonged blast followed by 2 short blasts. A boat towed may give, at intervals of not more than 1 minute, on the fog horn, a signal of 3 blasts in succession, namely, 1 prolonged blast followed by 2 short blasts, and she shall not give any other. A boat when at anchor shall, at intervals of not more than 1 minute, ring the bell rapidly for about 5 seconds. (On the Great Lakes, see Navigation Laws of the United States.)

Question. When is a power boat underway within the meaning of the rules of the road?

Answer. When she is not anchored or made fast to the shore or to a ship or aground.

Question. What is the definition of a steam vessel by the rules of the road?

Answer. The words "steam vessel" shall include any vessel propelled by machinery.

Question. At what speed should vessels proceed in a fog, mist, falling snow, or a heavy rain squall?

Answer. They shall go at a moderate speed, having careful regard to the existing circumstances and conditions.

Question. When underway, what fog signals does a sailing vessel give?

Answer. One blast on the fog horn if on the starboard tack, 2 blasts if on the port tack, 3 blasts if running free.

Question. What is the rule for vessels of more than 300 gross tons when moored or anchored in a fairway or channel?

Answer. They shall display between sunrise and sunset on the forward part of the vessel where it can best be observed, one black ball or shape not less than 2 feet in diameter.

Question. What are the sailing rules when one boat is running free and another is close-hauled?

Answer. A boat which is running free shall keep out of the way of a boat which is close-hauled.

Question. Two boats are close-hauled on opposite tacks. Which shall keep out of the way of the other?

Answer. A boat which is close-hauled on the port tack shall keep out of the way of a boat which is close-hauled on the starboard tack.

Question. Two boats are running free with the wind on opposite sides. Which shall keep out of the way of the other?

Answer. The boat which has the wind on the port side shall keep out of the way of the other.

Question. Two boats are running free with the wind on the same side. Which shall keep out of the way of the other?

Answer. The boat which is to windward shall keep out of the way of the boat which is to leeward.

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Answer. The boat which is to windward shall keep out of the way of the boat which is to leeward.

Question. Which has the right of way, a boat under sail with the wind aft or any other boat?

Answer. A boat under sail which has the wind aft shall keep out of the way of any other boat under sail.

Question. What is the rule of the road about power boats or boats under oars meeting end-on or nearly end-on so as to involve risk of collision?

Answer. Each shall alter her course to starboard so that each may pass on the port side of the other.

Question. In the preceding question, suppose the course of each power boat is so far to starboard of the other that they are not to be considered as meeting end-on; what shall each do?

Answer. Either boat shall immediately give two short blasts, which the other boat should answer promptly with two similar blasts, and they shall pass on the starboard side of each other.

Question. What is the rule for power boats or boats under oars meeting or crossing so as to involve risk of collision?

Answer. The boat which has the other on its own starboard side shall keep out of the way of the other.

Question. What is the rule for a power boat or a boat under oars meeting or crossing a boat under sail?

Answer. The boat under power or oars shall keep out of the way of the boat under sail.

Question. When, under the rules, one boat must keep out of the way, what shall the other do?

Answer. The other shall keep her course and speed.

Question. If a boat, whether under oars, sail, or power, is overtaking another boat, what shall the overtaking boat do?

Answer. The overtaking boat shall keep out of the way of the overtaken boat.

Question. What sound signals are used by power boats on approaching each other?

Answer. Any power boat approaching another shall indicate what course she intends to take by the following signals on her whistle:

(a) One short blast to mean, "I am directing my course to starboard."

(b) Two short blasts to mean, "I am directing my course to port."

(c) Three short blasts to mean, "My engines are going full speed astern."

Question. Do the signals in the preceding question also apply to a motorboat approaching a steam vessel?

Answer. They do.

Question. To which side of a fairway must a boat ordinarily be kept?

Answer. In a narrow channel every boat under power or oars shall, when it is safe or practicable, keep to that side of the fairway or mid-channel which lies on the starboard side of such boat.

Question. What signal is given on nearing a short turn or bend?

Answer. A long blast of the whistle.

Question. Suppose a long blast is answered by a similar blast from the far side of a bend, what should be done?

Answer. The usual signals for meeting and passing should then be given by both boats.

Question. When leaving the side of a long dock or proceeding out of a slip, what signal shall a power boat give?

Answer. It shall give the same signal as in the case of vessels meeting at a bend, but immediately after clearing the dock or slip, so as to be fully in sight, it shall be governed by the steering and sailing rules.

Question. When two power boats are meeting end-on, how does each steersman alter his course?

Answer. Each puts his helm to port so as to pass on the port side of the other.

Question. How is this altering of the course indicated?

Answer. Each steersman blows one short blast on the whistle.

Question. If, under the circumstances, the other blows one blast before you do, what should you do?

Answer. I would answer with one blast and put my helm to port.

Question. If you find it is not possible for her to pass on your port side, what should you do?

Answer. I would sound several short and rapid blasts, not less than four, of the whistle, and if the boats have approached each other within a short distance, I should reduce speed to bare steerageway, or if necessary stop or reverse.

Question. You are in charge of a power boat running in the same direction as a power boat ahead and wish to pass her on her starboard side, what should you do?

Answer. I would give 1 short blast of the whistle, and, if she answered with 1 short blast, I would port the helm and pass on her starboard side.

Question. Suppose you wish to pass on her port side?

Answer. I would give 2 short blasts and, if she answered with 2 short blasts, I would starboard the helm and pass on her port side.

Question. Suppose in either case she gave several short blasts in answer, not less than four, what would you understand?

Answer. That she did not consider it safe for me to pass at that point.

Question. How long can she keep you trailing behind her?

Answer. Only so long as there is danger in passing, as in a narrow or obstructed channel or fairway. When there is sufficient room she must indicate on which side I may pass.

Question. What are cross signals?

Answer. Answering 1 blast with 2, or 2 blasts with 1.

Question. Are they ever permissible?

Answer. No.

Question. What should you do in case another boat gives you a cross signal on meeting?

Answer. I should give several short and rapid blasts, not less than four, and if necessary stop and reverse.

Question. You are in charge of a power boat, a steam vessel is approaching on your port bow so as to involve risk of collision, which boat has the right-of-way and what should you do?

Answer. My boat has the right-of-way, and I would hold my course and speed.

Question. Suppose the other boat was on your starboard bow, what would you do?

Answer. The other boat would have the right-of-way, and I would reduce speed and go under her stern, or stop, or reverse.

Question. Suppose the boat is overhauling you anywhere from two points abaft your beam to astern?

Answer. I would have the right-of-way and would hold my course and speed.

Question. Suppose it is a sailing vessel on your port bow; what would you do?

Answer. She would have the right-of-way, and I would alter my course to clear her or stop or reverse.

Question. Suppose a sailing vessel was coming up anywhere on your starboard quarter close hauled and on the starboard tack, which would have the right-of-way?

Answer. I would have the right-of-way.

Question. What is meant by close hauled?

Answer. A vessel or boat is close hauled when she is sailing as close as possible to the wind.

Question. What is meant by running free?

Answer. A boat is running free when she is able to lay her course with the sheets eased off.

Question. When are you justified in disregarding the rules of the road?

Answer. When the dangers of navigation and collision or any special circumstances may render a departure from the rules necessary in order to avoid immediate danger.

Question. What light would you use as an anchor light for a boat?

Answer. An ordinary hand lantern showing a white light.

MOTOR BOAT LAWS

Question. Under the law, what do the words "motor boat" mean?

Answer. They mean every vessel propelled by machinery and not more than 65 feet in length, except tugboats and towboats propelled by steam. The term includes boats temporarily or permanently equipped with detachable motors, and such vessels when so equipped are considered motor boats.

Question. How shall the length of a motorboat be determined?

Answer. By measuring from end to end over the deck, excluding sheer.

Question. Into how many classes are motorboats divided?

Answer. Into three classes.

Question. What motor boats are included in class 1?

Answer. Those boats less than 26 feet in length.

Question. What motor boats are included in class 2?

Answer. Those 26 feet or over and less than 40 feet in length.

Question. What motorboats are included in class 3?

Answer. Those of 40 feet or over and not more than 65 feet in length.

Question. What lights shall every motor boat of class 1 carry when underway from sunset to sunrise?

Answer. (1) A white light aft to show all around the horizon. (2) A combined lantern in the fore part of the vessel, and lower than the white light aft, showing green to starboard and red to port, so fixed as to throw the light from right ahead to two points abaft the beam on their respective sides.

Question. What lights shall motor boats of classes 2 and 3 carry when underway from sunset to sunrise?

Answer. (1) A bright white light on the fore part of the vessel as near the stem as practicable, so constructed as to show an unbroken light over an arc of the horizon of 20 points of the compass, so fixed as to throw the light 10 points on each side of the boat, namely, from right ahead to 2 points abaft the beam on either side.

(2) A white light aft to show all around the horizon.

(3) On the starboard side a green light so constructed as to show an unbroken light over an arc of the horizon of 10 points of the compass, so fixed as to throw the light from right ahead to 2 points abaft the beam on the starboard side. On the port side a red light so constructed as to show an unbroken light over an arc of the horizon of 10 points of the compass, so fixed as to throw the light from right ahead to 2 points abaft the beam on the port side.

Question. What shall be the dimension of the glass or lens for the white light in the fore part of a motorboat of class 2?

Answer. Not less than 19 square inches. L

Question. What shall be the dimension of the glass or lens for the white light in the fore part of a motorboat of class 3?

Answer. Not less than 31 square inches. ✓

Question. What shall be the dimension of the glass or lens for the side lights of a motorboat of class 2?

Answer. Not less than 16 square inches. ✓

Question. What shall be the dimension of the glass or lens for the side lights of a motorboat of class 3? ✓

Answer. Not less than 25 square inches.

Question. What shall be the character of the glass or lens for lights on motorboats of classes 2 and 3?

Answer. They shall be fresnel or fluted glass.

Question. With what shall the side lights of classes 2 and 3 be fitted?

Answer. They shall be fitted with inboard screens of sufficient height and so set as to prevent these lights from being seen across the bow.

Question. What is the length of the side-light screens for boats of class 2?

Answer. Not less than 18 inches. ✓

Question. What is the length of the side-light screens for boats of class 3?

Answer. Not less than 24 inches. ✓

Question. What lights shall motorboats carry when propelled by sail and machinery, or by sail alone?

Answer. They shall carry the colored side lights suitably screened, but not the white lights.

Question. With what sound-producing appliance shall motorboats be provided?

Answer. With a whistle or other sound-producing mechanical appliance capable of producing a blast of 2 seconds or more in duration.

Question. What shall be deemed to be a prolonged blast within the meaning of the motorboat law?

Answer. A blast of at least 2 seconds.

Question. What additional sound-producing appliances shall every motorboat of class 2 or 3 carry?

Answer. An efficient foghorn and an efficient bell.

Question. What shall be the size of the bell on class 3 motorboats?

Answer. It shall be not less than 8 inches across the mouth.

Question. What life-saving appliances shall every motorboat and every vessel propelled by machinery other than by steam, more than 65 feet in length, carry?

Answer. Either life preservers, or life belts, or buoyant cushions, or ring buoys, or other device sufficient to sustain afloat every person on board and so placed as to be readily accessible.

Question. What additional life-saving appliance shall be provided on all motorboats carrying passengers for hire?

Answer. They shall carry one life preserver for every passenger carried.

Question. What is required of the person operating a motorboat carrying passengers for hire?

Answer. He is required to be duly licensed for such service by the local board of inspectors.

Question. What are the requirements of law regarding fire-extinguishing appliances on motorboats?

Answer. Every motorboat, and also every vessel propelled by machinery other than by steam more than 65 feet in length, shall carry ready for immediate use the means of promptly and effectually extinguishing burning gasoline.

Question. What penalty may be imposed by proper authority for violation of any of the motorboat laws?

Answer. A fine not exceeding \$100.

Question. What light shall a vessel under 150 feet in length carry when at anchor?

Answer. It shall carry forward, where it can best be seen, but at a height not exceeding 20 feet above the hull, a white light in a lantern so constructed as to show a clear, uniform, and unbroken light visible all around the horizon at a distance of at least 1 mile.

Question. Are motorboats required to carry lights between the hours of sunrise and sunset?

Answer. No.

Question. What should be the position of the after light relative to the forward light in motorboats?

Answer. The after light should be higher and so placed as to form a range with the forward light and should be clear of house awnings and other obstructions.

Question. Does the law specify the size of the white light to be carried on motorboats of class 1?

Answer. No.

Question. What sound-producing appliance for motorboats has been held to be in compliance with the law?

Answer. A mouth whistle capable of producing a blast of 2 seconds or more in duration which can be heard for at least one-half mile.

Question. Can foghorns take the place of whistles on motorboats of classes 2 and 3?

Answer. No.

Question. With what lifesaving appliance shall every motorboat not carrying passengers for hire be provided?

Answer. With life preservers or life belts or buoyant cushions or ring buoys, or other device sufficient to sustain afloat every person on board. This includes members of the crew, children, and babies.

Question. Whose approval shall life-saving appliances have?

Answer. The board of supervising inspectors of the Steamboat Inspection Service.

Question. What qualities shall life preservers and buoyant cushions possess?

Answer. They shall be capable of sustaining afloat for a continuous period of 24 hours an attached weight so arranged that whether the said weight be submerged or not there shall be a direct downward gravitational pull upon such life preserver or cushion of at least 20 pounds. If a buoyant cushion is furnished for more than one person, its capacity must be proportionately greater.

Question. Is a life preserver or buoyant cushion stuffed or filled with granulated cork or other loose granulated material permitted?

Answer. No.

Question. Are pneumatic life preservers or cushions permitted?

Answer. No.

Question. What substitutes for life preservers, life belts, etc., may be used?

Answer. Wooden life floats which meet the approval of the Department of Commerce.

Question. Would a motorboat hired at a launch livery and carrying a person in addition to the person operating it be considered as carrying passengers for hire?

Answer. Yes.

Question. Are there any specific means prescribed for promptly extinguishing burning gasoline?

Answer. Yes. The Department of Commerce has approved the carbon dioxide, carbon-tetrachloride or foam-type of fire extinguishers.

Question. What motorboats are subject to inspection by the Steamboat Inspection Service?

Answer. Motorboats propelled otherwise than by steam of 15 gross tons, carrying freight or passengers for hire, but not engaged in fishing as a regular business.

Question. What motorboats must be documented?

Answer. All motorboats of 5 net tons or over, when engaged in trade, must be documented; that is to say, must be licensed by the collectors of customs.

Question. Are vessels under 5 net tons documented?

Answer. They are not documented in any case.

Question. What distinction is there between the license of a vessel and the license of a motorboat operator?

Answer. The license of the vessel obtained from the collector of customs (designated a document) is additional to and must not be confounded with the license required for the operator of a motorboat.

Question. How must a documented vessel be marked?

Answer. She must have the name and home port on the stern and the name on each bow. The tonnage mark and official number should be deeply carved or otherwise permanently marked on her main beam or other approved place.

Question. What is every undocumented boat propelled in whole or in part by machinery required to have as authority to operate?

Answer. A number awarded by the collector of customs of the district in which the vessel is owned. No numbers not so awarded shall be carried on the bows.

Question. Is a boat equipped with detachable motor required to have a number?

Answer. Yes; if the boat is over 16 feet in length.

Question. Does the law require that the name of an undocumented motorboat be displayed?

Answer. No; but a number is required on each bow.

Question. Are motorboats required to have copies of pilot rules on board?

Answer. Yes; they are required to have on board two copies of the pilot rules.

Question. What is the duration of the license granted the operator in a motorboat?

Answer. Five years.

CUSTOMS AND NAVIGATION LAWS

Question. What powers have officers in charge of Coast Guard stations and houses of refuge as customs officers?

Answer. They have the powers of inspectors of customs.

Question. Briefly, what are the powers of inspectors of customs?

Answer. (a) To go on board vessels in any port of the United States or within 4 leagues of the coast thereof if bound to the United States; to search the same and any person, trunk, or envelop on board, and to this end to hail or stop such vessel and use all necessary force to compel compliance.

(b) If it shall appear that a violation of law is committed whereby the vessel or the merchandise on board is liable to forfeiture, to seize the same. They may also arrest any person engaged in such violation.

Question. When are officers in charge of stations expected to use these powers?

Answer. Whenever the occasion demands. They are not, however, expected to board and examine vessels unless they have reason to believe such vessels are engaged in a violation of the customs or navigation laws.

Question. What flag should a station boat on boarding duty carry?

Answer. A station boat on boarding duty in the enforcement of the customs or navigation laws shall carry the Coast Guard ensign at all times. At night a searchlight or hand torch shall be used to illuminate the flag previous to boarding.

Question. What is the duty of an officer of a station in regard to smuggling?

Answer. To take such measures as may be within his power to prevent smuggling, and upon detection of any violation of the customs revenue laws to forthwith report the same and to seize merchandise in the act of being smuggled or which has been smuggled.

Question. May an officer in charge of a station search a vehicle on which he has reason to believe there is merchandise subject to duty or which has been introduced into the United States contrary to law?

Answer. Yes; he may stop, search, and examine the same and may search any trunk or envelop in which he has reasonable cause to suspect there is merchandise which was imported contrary to law, and such merchandise will be subject to seizure.

Question. What constitutes a valid seizure?

Answer. To constitute a valid seizure there must be open visible possession claimed and authority exercised by the seizing officer. The parties must understand that they are dispossessed and that they are no longer at liberty to exercise any control over the property.

Question. Suppose there is voluntary abandonment of the merchandise by the seizing officer?

Answer. In that case the seizure would lose its validity.

Question. What shall be done with seized goods?

Answer. Merchandise or property of any kind seized shall be guarded until placed in the custody of the collector of the district in which the seizure is made.

Question. Must a seizing officer make known his character?

Answer. Every officer or other person authorized to make searches and seizures shall make known, upon being questioned, his character as an officer or agent of the customs or Government.

Question. Has he authority to require other persons to assist him?

Answer. Yes; he may require any person within the distance of 3 miles to assist him in making an arrest, search, or seizure.

Question. Suppose such person shall without reasonable excuse neglect or refuse to assist the officer upon proper demand?

Answer. He will be guilty of a misdemeanor and be subject to a fine of not more than \$200 nor less than \$5.

Question. What is the penalty for resisting a revenue officer in the discharge of his duties or for rescuing or destroying seized property?

Answer. A fine of not more than \$2,000 or imprisonment for not more than 1 year.

Question. May an officer in charge of a station enter buildings to make search or seizure?

Answer. He, and the persons assisting him, may, if deemed necessary and if probable cause exists, enter into or upon or pass over the lands, inclosures and buildings, other than the dwelling house, of any person, but he should, however, when practicable, first obtain a search warrant for the purpose, and always before searching a dwelling house.

Question. What is necessary before seizure is made?

Answer. That there shall be probable cause for it.

Question. What is probable cause?

Answer. "If the facts and circumstances before the officer are such as to warrant a man of prudence and caution in believing that the offense has been committed, it is sufficient."

Question. How shall the term "smuggling" be construed?

Answer. It shall be construed to mean the act, with intent to defraud, of bringing into, or attempting to bring into the United States dutiable articles without passing the same or the packages containing the same through the customhouse or submitting them to the officers of the revenue for examination.

Question. Are officers of the customs entitled to a fee as informer?

Answer. No. They are prohibited from either directly or indirectly receiving, accepting or contracting for any portion of such fee.

Question. What is the penalty for bribing or attempting to bribe a revenue officer or employee?

Answer. A fine not exceeding \$5,000 or imprisonment for not more than 2 years, or both.

Question. What is the ordinary presumption regarding derelict or wrecked merchandise?

Answer. Merchandise picked up at sea derelict or taken from a wreck is *prima facie* dutiable, and should be so regarded until the matter is passed upon by the proper customs officers, whether it is claimed to be of American origin or not.

Question. What rights have salvors in such goods?

Answer. They have an uncertain interest in them depending upon the decree of a competent tribunal. They have also a presumptive right to possession of merchandise saved by them from abandoned wrecks, but their possession of them must be reported to the collector of customs.

Question. Is it lawful for a vessel bound for the United States from a foreign port to transfer its cargo, or any part thereof, into another vessel in the open seas within 4 leagues of the coast of the United States?

Answer. No. It is unlawful, except in case of accident, necessity, or distress, which must be proved in the manner described by law.

Question. What action should you take in any such case coming under your observation?

Answer. I should at once investigate the matter and report all the facts, together with the names of the vessels involved, to the district commander and collector of customs by the quickest available means and obtain instructions.

Question. Where is it unlawful for a vessel from a foreign port to unlade its cargo?

Answer. It is unlawful for any vessel to unlade its cargo, or any part thereof, elsewhere than at a port of entry or port designated as a customs station to which it is destined, without special permission from the collector of customs.

Question. Is it lawful for a foreign vessel to transport merchandise and passengers from port to port in the United States?

Answer. No; but she may proceed from one domestic port to another for the purpose of unloading her foreign cargo or to take on cargo for a foreign voyage.

Question. (a) Under what conditions are the equipment and ship's stores of a wrecked foreign vessel dutiable when brought into the United States?

(b) When are they free of duty?

Answer. (a) The equipment and ship's stores taken from a foreign vessel wrecked outside the waters of the United States are dutiable when brought into the United States.

(b) When a foreign vessel is wrecked in the waters of the United States, the equipment and ship's stores recovered and brought into port are free of duty, as are also the materials and equipment of a foreign vessel condemned and dismantled in the United States.

Question. Is the importation of opium unlawful?

Answer. The importation of smoking opium or opium prepared for smoking is prohibited. The importation of opium in any other form or of preparations or derivations thereof is prohibited except for medicinal purposes.

Question. What opium should be seized on discovery?

Answer. All smoking opium should be forthwith seized and also all forms of opium not shown on the vessel's manifest.

Question. Define the following terms as used in Customs Regulations of the United States: (a) Vessel; (b) vessels of the United States; (c) marine document.

Answer. (a) The word "vessel" includes every description of water craft or other artificial contrivance used or capable of being used as means of transportation on water.

(b) The term "vessels of the United States" applies to such only as are documented either by license or by enrollment or by certificate of registry.

(c) "Marine document" is a general term covering all documents issued by the coast guard to the master of a vessel.

(c) The term "marine document" relates either to a register, an enrollment, or a license.

Question. (a) What marine document may be issued to a vessel of 20 net tons and upward? (b) to a vessel of 5 net tons and less than 20 net tons?

Answer. (a) Vessels of 20 net tons and upward may be either registered or enrolled and licensed.

(b) Vessels of 5 net tons and less than 20 net tons can be licensed or registered.

Question. What marine document do vessels of the United States navigating the waters on the northern, northeastern, and northwestern frontiers otherwise than by sea require?

Answer. They require a special enrollment and license which permits them to be employed in either the coasting or the foreign trade on such frontiers.

Question. What vessels are not required to be documented?

Answer. Certain classes of boats, lighters, and barges.

Question. What barges, lighters, and other boats must be documented?

Answer. Barges, lighters, and other boats provided with sail or internal motive power.

a Barges and boats without sail or internal motive power of their own engaged in trade with Canada, or employed upon the marine waters of the United States.

b Barges and boats without sail or internal motive power of their own carrying passengers.

Question. What vessels may engage in trade between port and port of the United States?

Answer. Vessels of the United States and certain classes of barges, lighters, and other boats which are exempt from documentation.

Question. (a) Where and how must the draft be marked on every registered vessel of the United States? (b) What indicates the draft of any line?

Answer. The draft of every registered vessel shall be marked upon the stem and sternpost in English feet or decimeters in either arabic or roman numerals.

(b) The bottom of each numeral shall indicate the draft to that line.

Question. (a) Of what two descriptions are marine documents as regards place of issue? (b) How are they distinguished from each other?

Answer. (a) Marine documents are of two descriptions: Permanent, granted to vessels belonging to ports at which the document issues, and temporary, granted to vessels not belonging to ports at which the document issues.

(b) The two classes of documents are distinguished from each other by plainly writing the word "permanent" or "temporary" in the margin of the document immediately above the number.

Question. For what length of time are marine documents valid?

Answer. Registers and enrollments are valid for any length of time until a contingency shall arise requiring their surrender. Licenses are valid for 1 year only but may be renewed or changed at any time during the year for which they are granted. No enrollment or license granted to any vessel shall be considered in force longer than such vessel is owned and is of the description as set forth in the document and is engaged in the business or employment for which the document was granted.

Question. What vessels of the United States may engage in the foreign trade by sea?

Answer. Registered vessels.

Question. By whom must marine documents be issued?

Answer. By the collector of the port.

Question. Must a vessel's tonnage be given in her marine documents?

Answer. Yes. Her gross and net or registered tonnage must be given.

Question. What is gross tonnage?

Answer. *Gross tonnage*.—The capacity of the spaces within the frames or ceiling of the hull of a vessel and the closed-in spaces above deck available for cargo, stores, passengers, or crew, with certain specified exemptions, expressed in tons of 100 cubic feet.

Question. What is net tonnage?

Answer. *Net tonnage*.—The net or registered tonnage is the remainder after deducting from the gross tonnage the spaces occupied by the propelling machinery (including allowances for fuel), crew quarters, master's cabin, and navigation spaces.

Question. Where and how must a vessel's name and home port be marked on her?

Answer. The name of every documented vessel, "yachts excepted", shall be marked in full upon each bow and upon the stern, and the home port shall also be marked in full upon the stern. The name shall be painted or carved or gilded in Roman letters in a light color on a dark ground or in a dark color on a light ground. The letters shall not be less than 4 inches high.

Question. Where else than on the bow and stern must the name of every steam vessel be marked?

Answer. Every steam vessel must also have her name conspicuously placed in distinct, plain letters not less than 6 inches high on each outboard side of the pilot house, if it has such, and in case the vessel has side wheels, also on the outer side of each paddle box.

Question. Where must the name and home port be placed on documented yachts?

Answer. On some conspicuous part of their hulls.

Question. What is a vessel's home port?

Answer. Either the port where the vessel is registered or enrolled, or the place in the same district where the vessel is built, or where one or more of the owners reside.

Question. Must every documented vessel have an official number?

Answer. Yes. It shall be carved in the main beam.

Question. How many letters form the signal letters of a merchant vessel of the United States, and where may the same be found?

Answer. Four letters. They may be found in the "List of Merchant Vessels of the United States", or in "Sea-Going Vessels of the United States."

Question. What book is used when the signal letters are known and the name of the vessel is desired?

Answer. "Sea-Going Vessels of the United States."

Question. What, in addition to the official number, must be permanently marked on the main beam?

Answer. The vessel's net tonnage.

Question. What vessels of the United States must be inspected by the Steamboat Inspection Service?

Answer. (a) Vessels other than motorboats propelled in whole or in part by steam and vessels of above 15 gross tons carrying freight or passengers for hire and propelled by gas, fluid, naphtha, or electric motors.

(b) Sailing vessels of over 700 gross tons carrying passengers for hire; sea-going barges of over 100 gross tons, and all other vessels of over 100 tons carrying passengers for hire.

Question. What is the law regarding the carrying of powder on steam vessels carrying passengers?

Answer. No steam vessel employed in the carriage of passengers shall carry gunpowder without having conspicuously posted on board such vessel a certificate issued by the local inspectors authorizing the carriage of such gunpowder.

Question. Must the master of every vessel of the United States be a citizen thereof?

Answer. Yes.

Question. Must the officers of every vessel of the United States be citizens thereof?

Answer. In general, all officers who shall have charge of a watch, including pilots, shall be citizens of the United States.

Question. What exceptions are there to the general law requiring watch officers of vessels of the United States to be citizens thereof?

Answer. Where on a foreign voyage or on a voyage from an Atlantic to a Pacific port of the United States, such vessel, is for any reason, deprived of the services of an officer below the grade of master, his place or a vacancy caused by the promotion of another officer to such place may be supplied by a person not a citizen of the United States until the first return of such vessel to her home port.

Question. Whom, in addition to the master, mates, and pilots, does the word "officers" include on vessels propelled wholly or in part by steam?

Answer. The chief engineer and each assistant engineer in charge of a watch.

Question. What officers of steam vessels of the United States must be licensed?

Answer. All masters, chief mates, second and third mates if in charge of a watch, engineers, and pilots.

Question. Of other vessels?

Answer. The masters of sail vessels of over 700 gross tons and of all other vessels or barges of over 100 gross tons burden carrying passengers for hire. Chief mates of these vessels may be licensed on application, provided they pass the required examination, but no penalty accrues for failure of such vessel to carry a licensed mate.

Question. Must a licensed officer display his license on the vessel upon which he is employed?

Answer. Yes. Within 48 hours after going on board for duty, a licensed officer must display his certificate of license, which shall be framed under glass, in some conspicuous place on such vessel where it can be seen by passengers and others at all times.

Question. How can you tell how many licensed officers any steam merchant vessel or ocean-going vessel of the United States carrying passengers should have?

Answer. The number of licensed officers she should carry, as well as the number of men in her crew, is given on the vessel's certificate of inspection.

Question. What is a certificate of inspection?

Answer. It is a document issued a vessel certifying that the laws relating to the construction and equipment of such vessel have been complied with.

Question. Must the certificate of inspection be displayed on board inspected vessels?

Answer. Yes; it must be displayed in a conspicuous place in the vessel where it is most likely to be observed by passengers and others and be kept there at all times.

Question. What is the difference between an officer's license and the license issued to a vessel?

Answer. An officer's license is a document issued by a board of local inspectors of steam vessels authorizing the person to whom it is granted to perform certain duties as an officer on vessels of the United States; a license issued by a collector of customs to a vessel is a marine document authorizing the operation of the vessel.

Question. How does a register and enrollment identify a vessel?

Answer. By her name, home port, build, dimensions, tonnage, and rig, and by her master's name and the name of her owner, and if

more than one owner, by the names of all and the portion owned by each, and especially by her official number.

Question. How does a license identify a vessel?

Answer. By her official number, name, rig, and tonnage, and by her master's name and the name of her husband or managing owner.

Question. Must the enrollment and license of a vessel of 20 net tons and over be separate documents?

Answer. No; they may be consolidated into one document.

Question. Can a vessel enrolled and licensed for trade on the northern, northeastern, or northwestern frontiers engage in trade elsewhere than on those frontier waters?

Answer. No. On leaving the inland waters on the frontiers to engage in trade on the seaboard, she must surrender her frontier papers and take out coasting papers, and if bound on a foreign voyage partly by sea, she must take out in lieu of her frontier papers a certificate of registry.

Question. Can a marine document be used for any other vessel than for the one for which it is granted?

Answer. No. It can be used solely for the vessel for which it is granted and shall not be sold, lent, or otherwise disposed of to any person whatever.

Question. When must permanent marine documents be surrendered?

Answer. Permanent marine documents are to be surrendered when a vessel is sold in whole or in part; when a vessel has been lost or taken by an enemy, or otherwise prevented from returning to the port to which she belongs; when a vessel is burned or broken up; when a vessel is altered in form or burden by being lengthened, shortened, or built upon, or from one denomination to another by the mode or method of rigging or fitting; on a change from one employment to another; on the death, removal, or resignation of one of the chief officers of an incorporated company owning any vessel and whose name appeared on the documents of such vessel; on a change of residence of the managing owner from one port to another within the same customs district without change of ownership.

Question. When must temporary marine documents be surrendered?

Answer. Temporary marine documents are to be surrendered to the collector at the port where the vessel belongs within 10 days after her arrival, and in all cases in which the surrender of the permanent documents is required.

Question. What is meant by the term "arrival" at the port where the vessel belongs?

Answer. By the term "arrival" is to be understood the voluntary arrival of the vessel at her home port to which she was destined in the regular course of her employment. If, for instance, a vessel has been sent to another port, and has the name of her master, and

is forced by stress of weather into her home port while on her voyage for another port of destination, or stops there on such voyage to take in provisions or water or take on passengers, or baggage, such not being her usual employment, it is not an "arrival" within the meaning of the law, and the master is not obliged in consequence thereof to surrender her temporary document and take out a permanent document.

Question. Can the name of a documented vessel be changed except as prescribed by law?

Answer. No, under penalty of forfeiture.

Question. Is it lawful for an officer of the customs to inspect the marine documents of a vessel?

Answer. It is lawful at all times for any officer of the customs to inspect the marine documents of any vessel, and if the master on board of any vessel shall not exhibit the same when required by such officer, he will be liable to a fine of \$100. The papers of a documented vessel, when such vessel is in commission, should be on board and accessible to the person in charge, except when such papers are in the custody of the collector.

Question. What yachts may be licensed, and what privileges do licensed yachts have?

Answer. Yachts measuring 16 gross tons or over, used or employed exclusively as pleasure vessels, may be licensed to proceed from port to port within the United States, without entering or clearing and to foreign ports without clearing at the customhouse.

Question. May they transport merchandise or passengers for hire?

Answer. No; they cannot engage in any trade, nor in any way violate the revenue laws of the United States, under penalty of seizure and forfeiture.

Question. Must the master or other person in command of a yacht exhibit her marine documents on demand to any officer of the customs?

Answer. Yes; and he must submit to such examination as the officer may see fit to make for the protection of the revenue.

Question. Are foreign steam tugs permitted to tow documented vessels of the United States from one port or place in the same to another?

Answer. No; unless the towing is in whole or in part within or upon foreign waters.

Question. In coming from seaward, what color buoys mark the starboard or right-hand side of the channel?

Answer. Red.

Question. What color buoys mark the port or left-hand side?

Answer. Black.

Question. How are dangers and obstructions marked?

Answer. By buoys with black and red horizontal stripes.

Question. On which hand should these buoys be left?

Answer. With channel ways on either side they may be left on either side with due caution as to the position of the buoy with relation to the obstruction, as shown on the chart. In general, obstruction buoys have no distinctive shape. In the case of obstruction buoys marking obstructions or forked channels and it is desired to indicate the main channel, a can buoy with the black band at the top is used when the important channel is to the right for entering vessels, and a nun buoy with the red band at the top when the important channel is to the left.

Question. How are buoys that indicate the fairway marked?

Answer. With black and white vertical stripes. These buoys should be passed close-to. Mid-channel buoys have no distinctive shape at present.

Question. How are sunken wrecks marked?

Answer. By red and black buoys, horizontal stripes. These buoys are the same as obstruction buoys.

Question. What color are quarantine buoys?

Answer. Yellow.

Question. What are white buoys used for?

Answer. As they have no special meaning, they are often used for special purposes not connected with navigation, such as marking anchorages, etc.

Question. How are the starboard and port channel buoys numbered?

Answer. The numbers begin from the seaward end of the channel. Black buoys have odd numbers. Red buoys have even numbers.

Question. Why are perches or balls or cages sometimes placed on buoys?

Answer. Such buoys are at turning points. The color and the number indicate on which side they shall be passed.

Question. What types of buoys are in common use?

Answer. Nun, can and spar, whistle, bell, and lighted buoys.

Question. What is the shape of a nun buoy?

Answer. Either conical or truncated cone.

Question. Of a can buoy?

Answer. Cylindrical.

Question. What is a combination buoy?

Answer. A buoy which has either light and bell or light and whistle.

Question. What are reflector buoys?

Answer. Any unlighted buoy on which mirrors have been placed to reflect the light of a vessel's searchlight.

Question. What color lights are used for lighted buoys?

Answer. White, red, and green.

Question. How are whistle and bell buoys operated?

Answer. By the action of the sea, therefore they sound irregularly and in calm weather they are less effective, or may even cease to sound.

Question. What are station buoys?

Answer. They are buoys placed alongside of lightships and important buoy stations to mark the place in case the regular aid is carried away. They are colored the same as the regular aid and those for lightships carry the legend "LS."

Question. What precautions should be used in regard to buoys?

Answer. Check them from the chart and bear in mind that they are likely to be carried away or shifted, and in the case of mechanical buoys the apparatus may be out of order.

BOAT SALUTES AND BOAT ETIQUETTE

Question. You are in charge of a pulling boat. How do you salute a flag officer in another boat with his flag flying?

Answer. Toss oars; stand and salute with hand; remain at salute until it is returned or the flag officer has passed.

Question. Who is a flag officer?

Answer. Any officer of the line of the Coast Guard or Navy above the rank of captain, or any general officer of the Army or Marine Corps.

Question. Suppose you are in charge of a laden or a towing boat, how would you salute a flag officer?

Answer. Make the hand salute only; do not stand.

Question. If you are in charge of a boat under sail, how do you salute a flag officer?

Answer. Make the hand salute only; do not stand.

Question. What are the instructions for saluting when you are in charge of a motor boat?

Answer. In motor boats the engines are to be stopped in all cases in which pulling boats "toss" or "lay on" oars.

Question. Suppose a flag officer does not have his distinctive flag flying, how do you salute him?

Answer. Stand up and salute with hand; do not "toss" oars.

Question. You are in charge of a pulling boat. How do you salute an area commander, a division commander, or a commanding officer above the rank of lieutenant, who passes in another boat with his pennant flying?

Answer. Lay on oars; stand and salute with hand.

Question. Suppose you are in charge of a laden or a towing boat or a boat under sail, how would you salute the officer mentioned in the preceding question?

Answer. Salute with hand; do not stand.

Question. Suppose the area commander, division commander, or commanding officer is not flying his pennant?

Answer. Rise and salute with hand; do not lay on oars.

Question. How would you salute a commander without a pennant flying?

Answer. Rise and salute with hand; do not lay on oars.

Question. How do you salute all other commissioned officers other than flag officers and commanding officers above the grade of lieutenant?

Answer. Rise and salute with hand. If in charge of a laden or towing boat or boat under sail, do not stand.

Question. How do you salute a cadet, midshipman, or warrant officer?

Answer. Salute with hand.

Question. You are in charge of a boat of any type; what do you do when a commissioned officer enters or leaves your boat?

Answer. Rise and salute him.

Question. If you are a passenger in the stern sheets of a boat, do you salute on these occasions?

Answer. Yes; rise and salute.

Question. If you are one of the crew of a boat but not in charge, do you salute?

Answer. No; not unless detailed as boat keeper.

Question. You are in charge of a boat; what salutes would you render to foreign military or naval officer or officers of the United States Army, Navy, Marine Corps, Public Health Service, Naval Militia, or National Guard?

Answer. Salute them in the same manner as Coast Guard officers of the corresponding rank.

Question. What is the "Position of attention" in a boat?

Answer. Sitting erect on the thwarts or in the stern sheets.

Question. What do the members of the crew do when officers enter or leave the boat?

Answer. Sit at attention. This takes the place of a salute.

Question. You are a passenger in a running boat which contains officers; what must you remember?

Answer. To keep quiet.

Question. You are outside the canopy of a motorboat that salutes another boat in passing; what do you do?

Answer. Stand at attention and face the passing boat.

Question. You are in charge of a motorboat containing an officer for whom a salute is being fired; what do you do?

Answer. Stop engine at first gun of salute; head boat up parallel to saluting ship; see that men outside of canopy stand at attention and face the saluting ship.

Question. You are in charge of a boat overhauling another boat that contains officers, what do you do?

Answer. Slow down; never pass without asking permission to do so. Always give way to a senior boat at a landing place or gangway, unless otherwise directed by proper authority.

Question. You are in charge of a boat carrying the Secretary of the Treasury; what reply would you give to the quartermaster's hail of "Boat ahoy" in going alongside a Coast Guard or Navy vessel at night?

Answer. "Treasury."

Question. You are in charge of a motorboat approaching a Coast Guard or naval ship at night, or during the day when flag or pennant is not displayed in the bow, or when the rank of the passenger cannot be distinguished; how would you indicate his rank if the person you are carrying is the Secretary of the Treasury?

Answer. By seven short blasts of the whistle.

NOTE.—Additional questions of this nature should be asked using as a guide the Regulations, United States Coast Guard, chapter covering honors and distinctions.

Question. In what order do officers and enlisted persons enter a boat?

Answer. Juniors enter boats ahead of seniors.

Question. In what order do officers and enlisted persons leave a boat?

Answer. Juniors leave boats after seniors.

Question. Being in charge of a boat, what is your duty while waiting at a shore landing or gangway?

Answer. Haul clear of shore landings and gangways.

Question. What is your duty in regard to the boat's crew?

Answer. Not to permit the crew to leave the boat except by proper authority.

Question. How would you render the hand salute?

Answer. (1) Raise the right hand smartly until the tip of forefinger touches the lower part of the headdress above the right eye, thumb and fingers extended and joined, palm to the left, forearm inclined at about 45° , hand and wrist straight.

(2) The salute being returned, or the officer passed and the salute unobserved, drop the hand quickly by the side.

(3) The left hand is used only when the right hand is engaged.

(4) When saluting, turn the head and eyes toward the person saluted.

(5) The salute should be rendered at 6 paces before passing, or being passed by an officer, unless the nearest point reached be greater than 6 paces, and not more than 30 paces, in which case salute at the point nearest the officer.

Question. Do men who are in military or division formation salute, even when they are directly addressed?

Answer. No; but if at "rest", they come to attention. I

Question. What are the instructions regarding personal salutes ashore?

Answer. (1) All salutes in passing or approaching are begun first by the junior at 6 paces distance or at 6 paces from the nearest point of passing; no salutes, except as otherwise prescribed, are made at a greater distance than 30 paces.

(2) Officers in civilian dress are saluted in the same manner as when in uniform.

(3) Officers will at all times acknowledge the salutes of enlisted men.

(4) When an officer enters a room where there are enlisted men, "attention" is called by the first one who perceives him; then all rise, remain standing at attention, uncovered, and preserve silence until the officer leaves the room or commands "carry on."

(5) An enlisted man, being seated and without particular occupation, rises on the approach of an officer, faces toward him, and salutes; if standing, he faces toward the officer for the same purpose. If the parties remain in the same place or on the same ground, such compliments need not be repeated.

(6) If actually at work, men do not cease their occupation to salute an officer unless addressed by him.

Question. What courtesies are rendered to officers of other services by personnel of the Coast Guard.

Answer. Men at all times, in all situations pay the same compliments to officers of the Army, Navy, and Marine Corps, to officers in the service of the United States, and to officers of foreign services as they do to the officers of the ship or command to which they belong.

Question. What is the regulation in regard to the use of the ship's gangway when coming on board?

Answer. The starboard gangway shall be used by all commissioned officers and their visitors; the port gangway shall be used by all other persons. If the construction of a ship or other circumstances make a change of this rule expedient, the change may be made at the discretion of the commanding officer.

Question. Is there any exception to this rule?

Answer. Yes; in heavy weather the lee gangway shall be used.

Question. What is meant by the "lee gangway"?

Answer. The lee side of a vessel is the side opposite to that against which the wind blows; the latter is called the weather side.

Question. What permission must you obtain before leaving the ship at any time?

Answer. Permission from the officer of the deck to leave the ship.

Question. In going on board ship, what report do you make to the officer of the deck?

Answer. After saluting the colors and then the officer of the deck, report, "I request your permission to come on board, sir."

Question. What report on leaving the ship?

Answer. "I request your permission to leave the ship, sir."

Question. Do you always salute the officer of the deck?

Answer. Yes; always salute when addressing, or being addressed by the officer of the deck, or any other officer.

Question. When you receive an order from an officer, what is the proper reply to make?

Answer. The reply, "Aye, aye, sir."

Question. What is the meaning of "aye, aye, sir"?

Answer. The order is understood and will be obeyed.

Question. What expressions should be avoided in replying to an order received from a senior?

Answer. The expressions "All right, sir", "Very good, sir", or "Very well, sir", should not be used in response to an order from a superior.

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