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INSTRUCTIONS TO EMPLOYEES

OF THE

UNITED STATES LIGHTHOUSE SERVICE

1927

UNITED STATES
DEPARTMENT
OF COMMERCE



LIGHTHOUSE SERVICE

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DEPARTMENT OF COMMERCE
LIGHTHOUSE SERVICE

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DEPARTMENT OF COMMERCE,
BUREAU OF LIGHTHOUSES,
Washington, July 15, 1927.

The following general instructions are issued for the guidance of employees of the Lighthouse Service and supersede the Instructions to Employees, 1915.

Each appointed and registered employee will be furnished with a copy to be personally receipted for and carried on the accounts as Government property.

All previous orders or instructions in conflict with these general instructions are hereby revoked.

G. R. PUTNAM, *Commissioner.*

INSTRUCTIONS TO EMPLOYEES, UNITED STATES LIGHT-
HOUSE SERVICE, 1927

PART I

GENERAL INSTRUCTIONS TO ALL EMPLOYEES

1. A strict observance of these instructions is required of all persons in the service, and each person shall promptly report to the proper authority any disobedience or infraction of the instructions coming to his knowledge. Employees shall familiarize themselves with the contents of the instructions (382).

2. Attention to duties.—Constant and faithful attention to their duties shall be required of all persons in the service, and no employee shall be absent from his station or duty without authority, except in case of serious illness, which must be reported at once to the proper officer. Unless absences without authority be satisfactorily explained, charges will be filed against the employee looking toward his dismissal or other disciplinary action. Falsification of leave records, either directly or indirectly, will be considered cause for dismissal (383).

3. The efficient maintenance of aids to navigation is the primary purpose of the Lighthouse Service, and superintendents shall see that all the resources of the service are utilized to this end in the most effective manner. All persons in the service shall be vigilant in observing and promptly reporting defects in aids to navigation and in correcting such defects so far as within their power. Masters of tenders shall be held responsible for noting the correctness as to position and characteristics of all aids to navigation passed and for promptly correcting defects as to position or functioning, particularly of floating aids, giving precedence to such work unless other duty is more urgent. Superintendents shall require from keepers of light stations and masters of lightships and tenders prompt report of defects in aids within sight of such stations or vessels and shall encourage the systematic reporting of such defects by navigators and others (43).

4. Betterment of service.—(a) Employees may submit through the proper channels any remarks and suggestions for the betterment of the service. Such suggestions should be briefly and clearly stated, with reasons for recommendation.

(b) It shall be the duty of all officers and employees connected with the Lighthouse Service to further the work of the service in every possible way (471).

5. Obedience to orders.—(a) All persons in the service are required to obey readily and strictly, and to execute with promptitude and zeal the lawful orders of their superiors. They shall show to their superiors the proper deference and respect. No person in the service shall join in or abet any combination to weaken the lawful authority of, or lessen the respect due to his superior officer, or shall treat his superior officer with contempt or be disrespectful to him in manner or deportment.

(b) Violation of this regulation will be deemed cause for the dismissal of the offender (486).

6. Personal conduct.—All persons in the Lighthouse Service are required to conduct themselves in such manner as not to bring disrepute on the service, and those responsible for stations or vessels shall not cause or permit any disorderly conduct thereon (487).

7. Sleeping on watch.—No officer, keeper, or other employee shall sleep during his watch, or at his post, or leave his station or post before being regularly relieved. Violation of this instruction may be considered cause for dismissal.

8. Interference with duties.—Employees shall not allow any private or other interests to interfere with the proper discharge of their duties, and they must not engage in any business or trade that will in any way so interfere.

9. Negligence of employees.—All persons interested in navigation shall be encouraged by the officers of the Lighthouse Service to give information of any neglect of duty on the part of those employed in the Lighthouse Service, as well as information tending to the improvement of the service (484).

10. Conduct of business.—Subordinates must conduct official business through their immediate superiors; any official act or correspondence relating to the Lighthouse Service or the use of any papers connected therewith, otherwise than with the knowledge of such superiors, is strictly prohibited (24).

11. Oppression of subordinates.—(a) Superiors of every grade are forbidden to oppress those under them by tyrannical conduct or by abusive language. Authority over subordinates shall be exercised with firmness and justice, and each person shall set a good example to others.

(b) The use of profane language in giving and enforcing orders or the nagging of any subordinate at any time is forbidden (488).

12. Relations to the public.—Courtesy to the public is enjoined on every officer and employee of the Lighthouse Service while engaged

on official duties. When persons make inquiry concerning the work of the service, courteous reply should be made and the information given if practicable and in accordance with the regulations. Discourtesy to the public will not be tolerated, and persons in charge shall see that their subordinates conduct themselves with politeness and propriety (475).

13. Efficiency and cleanliness.—Employees in charge of lighthouse vessels, buildings, or reservations are responsible for the care, management, efficiency, and cleanliness thereof and for the proper conduct of all persons thereon.

14. Person and dress.—Untidiness in dress or uncleanness of person will be a subject for disciplinary measures.

15. The utmost neatness of vessels, reservations, their equipment, appurtenances, and all other property of the Lighthouse Service is demanded. Spare articles and utensils must be kept at hand and ready for use.

16. Damage to aids.—(a) If buoys or other aids to navigation have been damaged by any vessel or person, employees in charge who observe or have knowledge of such damage shall immediately report same to the superintendent, together with all information that will aid in fixing the responsibility, including the whereabouts of the vessel or person causing the damage.

(b) Damage by storm, sea, fire, or other cause to buildings, grounds, or protective works shall be promptly reported.

(c) The action of the sea on the foreshores at stations shall be watched, and any encroachment causing or threatening damage shall be promptly reported.

17. Uniforms.—Superintendents shall require that all male employees stationed on vessels or at light stations and depots shall wear a uniform when at their station, as prescribed in the "Regulations for uniforms." As respects the crews of vessels, the superintendents may exercise discretion in enforcing the full requirements during the first month of service and also as to probationary appointees not likely to be retained after the probationary period. When the nature of the work makes it desirable, such as when landing coal or supplies, clothes suitable for such work may be worn. (See also art. 158) (410).

18. The order or class and distinctive characteristics of all aids to navigation shall be fixed by the Commissioner of Lighthouses, and no change in them shall be made without his authority. Public notice shall be given of all authorized changes (44).

19. Distinguishing marks for fixed aids.—(a) All lighthouse structures shall be distinguished by shape, arrangement, and color, according to the peculiarity of the respective localities, the background against which they are projected, and the characteristic features of adjacent structures.

(b) Beacons on the sides of channels when practicable shall be colored to conform to the coloring prescribed for buoys, subject to the above condition as to background.

(c) When new towers and buildings are erected, the old towers shall be removed unless otherwise directed, so as to preserve the general appearance of the site from seaward. Buildings shall not be erected, nor the color changed, nor any other change made in the general appearance of a light station without authority of the commissioner.

(d) Trees or limbs may be cut down only where necessary to prevent obscuration of the light, either on lighthouse grounds or on other land where permission has been secured. Where such cutting materially affects the general appearance of a light station the commissioner's authority must be obtained in advance (81).

20. Marking of wrecks.—(a) Whenever a vessel, raft, or other craft is wrecked and sunk in a navigable channel, accidentally or otherwise, it shall be the duty of the owner of such sunken craft to immediately mark it with a buoy or beacon during the day and a lighted lantern at night and to maintain such marks until the sunken craft is removed or abandoned, and the neglect or failure of the said owner so to do shall be unlawful. (Sec. 15, act of March 3, 1899, 30 Stat. 1152.)

(b) Every person and every corporation that shall violate, or that shall knowingly aid, abet, authorize, or instigate a violation of the provisions of section * * * 15 of this act shall be guilty of a misdemeanor and on conviction thereof shall be punished by a fine not exceeding \$2,500 nor less than \$500, or by imprisonment (in the case of a natural person) for not less than 30 days nor more than one year, or by both such fine and imprisonment, in the discretion of the court, one-half of said fine to be paid to the person or persons giving information which shall lead to conviction. (Sec. 16, same act.)

(c) The Commissioner of Lighthouses may, when he deems it necessary, place a lightship or other suitable warning of danger on or over any wreck or temporary obstruction to the entrance of any harbor or in the channel or fairway of any bay or sound. (Sec. 4676, R. S.)

(d) Superintendents shall, upon the request of district engineers of the Engineer Department at Large, maintain suitable warnings on abandoned wrecks until the wrecks are removed by the Engineer Department.

(e) Whenever an unmarked wreck constituting a menace to navigation is found, measures should immediately be taken by the lighthouse superintendent for its proper marking unless it is known that it will be marked promptly by the owner. The attention of

the owner of an unabandoned wreck should be invited to sections 15 and 16 of the act of March 3, 1899, as above, and unless he promptly marks the wreck, as required by law, the most available means should be taken by the superintendent to mark the wreck, either by using a lighthouse tender or by hiring a suitable vessel for the purpose, the cost to be charged to the owner of the vessel. The nearest district engineer of the Engineer Department at Large should be advised promptly of the wreck and of the provisions taken to mark the same. The marks placed thereon by the Lighthouse Service should be maintained until the wreck is removed or is marked by the owner. In case there is sufficient expense incurred by the Lighthouse Service in marking wrecks under jurisdiction of the Engineer Department to justify reimbursement therefor, superintendents will advise the district engineers of the amount with a view to settlement as provided by law. A wreck may be marked at the owner's request for a period not to exceed 30 days, unless authority is obtained from the commissioner to extend this time, and a reasonable charge should be made therefor.

(f) In case the owner seeks to claim, or refuses to abandon, a wreck which has been marked by the Lighthouse Service, and fails to keep it lighted as required by these regulations, he may be required to pay a fair price for lighting services rendered by the Lighthouse Service up to the time when the vessel is either removed or formally abandoned by him, and, if necessary, his attention should be invited to the law as herein set forth. (Concurred in by Chief of Engineers, October 17, 1912.)

(g) In case of an intervening period between the date of abandonment of a wreck by the owner and the date of assuming responsibility by the Engineer Department at Large, and for which it is impracticable to charge either party, the Lighthouse Service will assume the expense incurred for such period.

(h) Charges for marking wrecks, including supplies and the time of tenders, also buoys, etc., and depreciation of same, will be based on schedules prescribed by the Commissioner of Lighthouses, as detailed in Bureau Circular Letter No. 193, dated May 1, 1916 (84).

21. Removal of wrecks, etc.—(a) The following is quoted, in effect from Treasury Department circular of April 2, 1913, to commanding officers of the Coast Guard:

3. Under the provisions of sections 19 and 20 of the act of March 3, 1899, the duty of removing wrecks which may endanger navigation has been assigned to the district engineers of the Engineer Department at Large, and the responsibility for such work rests upon them as agents of the Secretary of War. This order contemplates that the Coast Guard shall cooperate with and assist the engineer offices in the execution of that duty to the extent herein specified. This order also provides that in some emergencies, when the district officer can not be reached, the commanding officers of Coast Guard cutters shall, on their

own responsibility as additional agents of the Secretary of War, take the immediate action necessary to clear the channel. If doubt arises concerning the proper action in particular cases, the general principle should be borne in mind that the existence of a wreck within navigable waters of the United States, so situated that it endangers or is likely to endanger navigation, should be brought to the attention of the district engineer of the Engineer Department in charge of the district as speedily as possible, and that his action concerning disposition of the wreck should be awaited if the emergencies of the case will reasonably permit of the delay. For the purpose of the cooperation contemplated by this order, the jurisdiction of the Secretary of War over navigable waters of the United States is to be regarded not as strictly limited to the waters within the usual marine league, but as including, according to the present practice, all the coast waters in which aids to navigation or other structures are established by the United States Lighthouse or War Department authority.

4. The following instructions will be observed by the commanding officers of all Coast Guard cutters in the matter of derelicts, wrecks, etc.:

5. *Floating dangers.*—Derelicts and other floating dangers to navigation, wherever found, will be taken to the most convenient port whenever it is practicable to do so.

Whenever it is not practicable to take a derelict or other floating danger into port, it should be destroyed or beached, extreme care being exercised in each case that such destruction does not leave sunken or floating wreckage of such size or character as to constitute a menace to passing ships. If the derelict or other floating danger is to be destroyed within the navigable waters of the United States and the emergencies of the case will permit, the engineer in charge of the district should be communicated with by telegraph or otherwise consulted before final action is taken.

Whenever circumstances make it necessary for a Coast Guard cutter to destroy a derelict or other floating danger to navigation within the navigable waters of the United States, the commanding officer will at once notify the United States Engineer Office of that district.

6. *Sunken obstructions.*—Whenever the commanding officer of a Coast Guard cutter has knowledge of any obstruction to navigation of the character described in section 19 or 20 of the act of March 3, 1899, in any river, lake, harbor, or canal, or inside a line connecting the headlands of any sound or bay, he will at once notify the district engineer and take no further action except on request of that officer.

7. When the commanding officer of a Coast Guard cutter has knowledge of any obstruction to navigation of the character described in section 19 or 20 of the act of March 3, 1899, within the navigable waters of the United States (not being in any river, lake, harbor, or canal, or not inside a line connecting the headlands of any sound or bay), he should proceed as follows:

If the obstruction does not stop, seriously interfere with, or specially endanger navigation, and immediate removal is not necessary, the commanding officer will notify the district engineer and take no further action except upon the request of that officer.

If the obstruction does stop, seriously interfere with, or specially endanger navigation, and there is not time to communicate with the district engineer, the commanding officer is authorized to remove or destroy such obstruction so far as to clear the channel, using his best judgment to prevent any unnecessary injury in the premises. He will notify the district engineer of his action as soon as practicable.

In either of the two above cases the commanding officer will see that the wreck is properly buoyed or lighted before he leaves it, the details and cost of the same to be reported to the district engineer.

8. Sunken obstructions outside the navigable waters of the United States will be removed or destroyed by the Coast Guard.

9. *Assistance to district engineers.*—A division commander is authorized, upon request from a district engineer, to direct any vessel of his division to give the latter officer such assistance in the removal of wrecks as may be practicable and mutually agreed upon.

Commanding officers of Coast Guard cutters not attached to a division, are authorized, upon request from a district engineer, to give the latter such assistance in the removal of wrecks as may be practicable and mutually agreed upon.

Division commanders and commanding officers are authorized to correspond directly with the district-engineers on matters concerning the removal of wrecks.

(b) In connection with paragraph 7 of the foregoing the Treasury Department further states, in effect:

Commanding officers of the Coast Guard will be instructed to promptly notify the nearest lighthouse superintendent whenever wrecks are buoyed or lighted by vessels of the Coast Guard, giving full information as to the character of the buoy or light established, and forwarding, if practicable, a section of chart showing its position, in order that such information may be published in the weekly Notice to Mariners.

(c) Superintendents will give such information, when received by them, such other publicity as may be deemed advisable in the usual way (85).

22. *Data affecting charts.*—Masters of tenders and other persons in the Lighthouse Service shall promptly report to the superintendent any information obtained by them affecting the accuracy or completeness of charts, sailing directions, or other nautical publications, including notes as to prominent landmarks, dangers, or important improvements not shown, or erroneous information on the charts. When desirable use pieces of charts in forwarding this information, which charts will be replaced. The superintendents shall promptly forward such reports to the commissioner, for transmittal to the office publishing the chart, and also any similar information that may have been observed on inspection trips and that will be of benefit in correcting or improving charts or sailing directions for use in navigation (71).

23. *Assistance to vessels and persons in distress.*—(a) It shall be the duty of light keepers and their assistants, and officers and crews of vessels of the Lighthouse Service, to give or summon aid to vessels in distress, whether public or private, and to assist in saving life and property from perils of the sea whenever it is practicable to do so; but under no circumstances, except those of extreme and imminent danger, shall a light ship be moved from her proper station to aid in such work; provided that no salvage or other compensation, in addition to the stated salary to which such employees are regularly entitled, shall be claimed or received by them for aid or assistance so rendered. Report of the assistance rendered, with all important

facts, shall be immediately made through proper channels to the superintendent.

(b) Whenever shipwrecked persons are sheltered at a light station, or on board a vessel belonging to the Lighthouse Service without provisions and with no means of paying for or procuring the same, the keeper of a light station or master of a vessel is authorized to furnish such persons subsistence from any stores which he has on hand, or necessary clothing, if practicable. When subsistence or clothing has been thus furnished, the proper officer will take a receipt from the persons so furnished for the actual value thereof, and, when practicable, shall present an account covering the same to the master of the vessel or owner or agent of said vessel for payment.

(c) In case the master of the vessel, or its owner or agent, is inaccessible or refuses to pay the account, the keeper of a light station or the master of a vessel by whom such subsistence or clothing has been furnished shall transmit through the superintendent an account, specifying the number of meals and giving a detailed list of the articles of clothing furnished, accompanied, if practicable, by a certificate signed by the master or officer in command of said vessel, or by the owner or agent thereof, that the account is correct and no payment thereof has been made. Full details should be given.

(d) Upon the receipt of an account as stated herein the superintendent will immediately forward the same to the commissioner with his recommendation as to the payment thereof.

(e) Any unusual expense, such as damage to boats, hawsers, or other equipment of a station or vessel, directly caused in rendering aid to shipwrecked persons or vessels or those in danger of shipwreck, should also be reported to the commissioner with the superintendent's recommendation as regards reimbursement therefor (372).

24. Familiarity with apparatus.—(a) Employees must promptly learn the manner of working, care, and maintenance of all apparatus, equipment, and machinery placed in their charge and require their assistants to make use of every opportunity to do likewise.

(b) Officers and employees in charge must give proper instructions to their assistants in connection with the care and operation of the apparatus and should see that such instructions are understood and followed.

25. Repairs and alterations.—The persons attached to a vessel or light station are expected and required to make without delay all needed repairs and authorized alterations within the capabilities of that force. Repairs or alterations beyond the capabilities of the personnel shall be made the subject of a special and detailed report to the superintendent.

26. Assistance to mechanics.—The personnel at stations and on vessels are required to give such assistance as they can to employees or working parties at their stations, etc.

27. Economy in expenditure of supplies.—In the expenditure of stores and supplies employees must practice the strictest economy compatible with maintaining at all times a most efficient vessel, light, or station. Unauthorized or excessive expenditures, damage or loss through neglect, shall be considered misconduct, and may also subject the offender to a deduction in pay to cover the loss. In cases of excessive expenditure, or where the regular supplies for a station run short, explanations will be demanded, and if they are not satisfactory, the superintendent shall inform the commissioner of the circumstances.

28. All supplies shall be inspected when received by the employee in charge or his representative. Any deficiencies or defects in quality or quantity shall be noted on the receipts given and a prompt report of the fact made to the superintendent.

29. Care in storage of gasoline.—(a) Gasoline must be kept in drums or other containers provided for the purpose, stored separately, with good ventilation, protected from the weather and, if practicable, at a distance from other structures. Gasoline containers should be painted *red*, or other distinctive color in order that the contents may not be mistaken for kerosene, etc. Empty gasoline barrels are highly explosive if containing fumes.

(b) Gasoline tanks must not be filled after dark or gasoline transferred from one receptacle to another while lights of any kind are near by. Care should be taken when working around the boat with open lights (particularly in the boathouse) to avoid possibility of gasoline explosion caused by leaks in pipes, etc. The gasoline pipe leading from the tank to the carburetor should be kept clean, free from water, and perfectly tight. Shellac should be used on threads of gasoline pipe when making connections. Leaking gasoline is the cause of many fires, and great care should be taken to avoid such leakage.

(c) All gasoline should be well strained through buckskin (chamois) before using. The gasoline tank should be kept clean and free from water. (See art. 155, for precautions in handling and using alcohol.)

30. Safety matches only shall be used when lighting the lamps and particular care taken that the match is not afterwards thrown where it may start a fire. In case of fire from any cause the fire extinguisher should be used immediately.

31. Requisitions to be checked.—(a) Requisitions of employees in charge of stations or vessels for supplies, except such as are made in cases of emergency, shall not be approved until properly checked and the superintendent is satisfied that the articles asked for are necessary.

(b) Only sufficient supplies for the proper maintenance of a station or vessel should be furnished, and, if there is a surplus of supplies,

a corresponding quantity should be deducted from the amounts to be delivered for a subsequent year.

(c) Particular care must be exercised that new articles are not furnished when those on hand may be economically repaired (380).

32. Receipts must not be given or taken in blank for public money or property but must be made out in full, with the exact amount of money, or article or articles of property, written out before being signed (259).

33. Reserve provisions.—At light stations or lightships which because of their isolation or inaccessibility are liable to be cut off from communication for considerable intervals, superintendents may, in their discretion, require that there be kept on hand a stock of reserve provisions sufficient to last for 10 days, consisting of $1\frac{1}{2}$ pounds of meat in tins and $1\frac{1}{2}$ pounds of pilot bread per day for each authorized person at station or vessel; provided that the quantity or character of such reserve may be changed, in the judgment of the superintendent. Such provisions should be kept separate from the regular mess supplies, and each tin should have the month and year of delivery legibly marked thereon. They are to be used in rotation and replaced, so that none will remain in stock more than two years. The keeper or master shall make a report at the end of each quarter to the superintendent, showing the amount of reserve provisions on hand; and each inspecting officer of the Lighthouse Service who visits isolated lightships or stations shall report as to the carrying out of the regulations relative to reserve provisions (366).

34. Medicine chests and the regulation "Medical handbook" shall be furnished such stations and vessels as may be authorized by the commissioner. Complete medical outfits shall be furnished only to lightships and inaccessible offshore stations, and for tenders and more accessible stations such portions of the outfit may be furnished as the circumstances warrant, in the discretion of the superintendent, including medicines for children where needed. All medicine chests shall be kept in good condition, and care shall be taken to see that they do not contain deteriorated medicines. Medicine chests shall be accounted for on the property return, but a detailed list of the medicines need not be included in the return (332).

35. Storage of oil and carbide.—(a) All kerosene and carbide belonging to the Lighthouse Service shall be kept in an oil house, carbide house, or room by itself and shall be visited daily to detect loss by leakage or otherwise, and every precaution taken for its safe-keeping. No fire or lighted lamps shall be carried into the houses.

(b) Without the sanction of the commissioner no oil belonging to the Lighthouse Service shall be stored in any cellar, warehouse, or other place of deposit with goods, wares, or merchandise.

(c) Oil cases at all times must be stored top up and tightly corked. (See art. 155, precautions against fire (358).)

36. Empty export oil cases should be surveyed, condemned, and destroyed at the light stations wherever used, unless there is a local market for their sale in the usual way, to be determined by the superintendent. Any old style 5-gallon boxed oil cases on hand, if in serviceable condition, may be sold after proper authority has been obtained, with the export cases, if considered advisable, or may be returned to the general depot for disposition; unserviceable cases to be disposed of through survey and condemnation at the light stations or depots.

Every precaution must be taken to keep the transporting cans for oil dry and to prevent the accidental addition of water to the illuminating oil through the unsealed corks. Landing the transporting cans by floating, or their use as steps, chocks, etc., in boat work is strictly forbidden.

37. Furniture for dwellings.—(a) Furniture, utensils, etc., for dwellings at light stations and depots having quarters for families shall not be furnished by the Lighthouse Service; provided that in special cases of isolation, or for other special reason, articles of furniture, etc., may be furnished upon the approval of the commissioner in each case. Cooking and heating stoves and lamps, where these are not already included as fixtures of the dwellings, may be furnished at Government expense.

(b) For light stations having resident keepers, but where no quarters for families are provided, furniture, utensils, and tableware will be supplied by the Lighthouse Service where necessary; these shall be limited to such articles as are in common use for the purpose and as are necessary for the use and comfort of the keepers. Expensive furniture, chinaware, or silver shall not be furnished. Kitchen and dining-room furniture and utensils shall be supplied for one mess only at each station, and all articles so supplied shall be of plain and serviceable quality. Beds and bedding shall consist of a single bed for each keeper, with bed springs, mattress, mattress cover, pillow, pillowcase (colored), and blankets (blue or dark color). Sheets, towels, etc., for personal use and subject to frequent laundering shall not be furnished, and each keeper should be required to furnish a supply of these articles needed for his own use. One or two small, inexpensive rugs for each bedroom may also be furnished.

(c) Lists of furniture, etc., proposed for new stations or vessels shall be submitted to the bureau for approval. When articles on the authorized lists become worn out or unserviceable, they may, upon survey and condemnation in the regular way, be replaced with similar articles without specific bureau authority, provided that purchases shall be made in accordance with regulations.

(d) No furniture or household furnishings will be provided or installed at Government expense in other than Government dwellings or structures (381).

38. Freight transportation.—(a) All shipments of lighthouse property so far as practicable shall be made upon Government bills of lading and all instructions relative thereto carefully observed. Instructions as to large shipments and those for long distances shall be obtained from the traffic division of the department. Also when practicable in the case of shipments made by dealers or manufacturers, on which charges are payable by the Lighthouse Service, a Government bill of lading to cover the shipment should be prepared and furnished the shipper. Government bills of lading, numbered serially, may be obtained on requisition. When a Government bill of lading is used the memorandum copy should be mailed, without indorsement or transmitting letter, to the commissioner for file with duplicate voucher. Note of this fact should be made in the district office record of these bills of lading. All canceled copies of bills of lading should also be forwarded to the commissioner.

(b) Articles should be properly described in accordance with consolidated freight classification on bills of lading. Proper freight rates and classification should be ascertained. Cylinders, acetylene gas, iron or steel (including coppered or nickel plated), from which gas has been exhausted will be regarded as empty, provided such gas as remains has a pressure of not exceeding 25 pounds per square inch. The same also applies to cylinders, wrought iron or steel, brazed, welded, or seamless, for compressed air or gases or liquids under pressure not otherwise indexed by name.

(c) To facilitate the proper shipment of gas containers, empty or partially filled, the following wording on bills of lading shall be used so far as practicable in describing such shipments:

Cylinders, gas, H. P. Pintsch, steel (or iron), not plated, as follows:

----- over 25 pounds pressure
under red label -----
----- 25 pounds or less pressure
under white label -----

Cylinders, acetylene gas, steel (or iron), as follows:

----- over 25 pounds pressure
under red label -----
----- 25 pounds or less pressure
under white label -----

(d) Rubber stamps can be procured for this purpose, if desired, with legends reading as above. The blanks in the stamps should be filled out to show the number of cylinders of each class and the weight of each class separately, as in the following example:

Cylinders, acetylene gas, steel (or iron), as follows:

10, over 25 pounds pressure under red label ----- 3,500 pounds.
7, 25 pounds or less pressure under white label ----- 2,350 pounds.

(e) Where this legend is used it will not be necessary to specify the exact pressure of any cylinders.

(f) The serial numbers of the cylinders shipped should be indicated on the bill of lading for identification purposes. The weight of each cylinder shipped should be available for reference, but need not be stated separately on the bill of lading. When bills of lading are prepared to cover shipment of cylinders by outside parties to the Lighthouse Service the same legend should be used so far as practicable, giving instructions to shippers for filling in the blanks. In cases where shipments of cylinders are made after charging, with cylinders filled, the description of the cylinders in accordance with regulations of the bureau of explosives, Interstate Commerce Commission, specifying that they are filled and red label used, will be sufficient.

(g) Containers shipped as empty (except in carload shipments to be unloaded by consignee) must have the old red, yellow, white, or green labels removed or completely covered by a square white label, measuring not less than 6 inches on each side and bearing thereon the word "Empty" in letters not less than 1 inch high. (From regulations of the Interstate Commerce Commission, effective January 1, 1923.) Gases having a pressure exceeding 25 pounds per square inch are classed as compressed gases, and containers should not be shipped as empty when they contain gas under a higher pressure. Red labels shall be used on containers returned for recharging, when they may not properly be shipped as empty. Containers shipped as empty must have valves properly closed.

(h) When property is damaged or lost in transit, report of the damage or loss, stating the amount thereof, should be indorsed on the bill of lading by the person receipting for the property. Statements of damage, loss, etc., shall give full and accurate information as to the quantity or extent of same, stating the money value and the weight of commodities when lost or destroyed, also any facts that may be apparent as to how the damages, loss, etc., occurred, appearance of packages, etc., in order to determine the responsibility. If impracticable to make such full statement at time bill of lading is accomplished, it should be done by separate letter as soon as practicable, advising the delivery carrier, and two copies of such letter furnished the commissioner.

(i) Freight charges on shipments covered by Government and commercial bills of lading will be settled by the General Accounting Office. Generally, in cases where charges are payable from appropriation "General expenses, Lighthouse Service," no deduction from district allotments will be made; but where freight charges are payable from a special appropriation it will be necessary to make deductions from district allotments, and proper reservation should be made therefor on the district books. When freight shipments

covered by Government bills of lading are received, memorandum should be taken of the bill of lading number and date, with brief description of property, so as to identify same.

(j) When shipping lighthouse property in carload lots, care should be taken in giving instructions to order the smallest size car which will properly accommodate the articles to be shipped. Explanation of the necessity for cars other than the minimum length should be given on the bill of lading or otherwise in connection with the account for freight charges.

(k) In order to guard against possible duplicate payments, certificates in lieu of bills of lading lost by transportation companies must not be furnished by superintendents until the matter has been reported to the bureau with recommendation and bureau authority obtained.

(l) In order to obtain the benefit of the lowest rates on Government shipments, only the name of the carrier to which shipments are delivered shall be inserted in the bills of lading. Routing orders, however, when furnished by the bureau will show the complete routing for the information of the superintendents (305).

39. Use of public property and services.—No property or supplies of any description belonging to the Lighthouse Service, or official work of any person employed in the Lighthouse Service, or the use of any lighthouse vessel, boat, team, or other equipment, shall be applied to any purpose outside of the public business, or otherwise than as provided in proper instructions or regulations. (See arts. 23 and 101, "Assistance to shipwrecked persons," and "Work for private parties.")

40. Protection of property.—Employees are required to take proper measures to protect public property in their charge from encroachment, trespass, or any other acts inimical to the interests of the Lighthouse Service. In case of controversy, the facts will be reported to the superintendent.

41. Responsibility for safe-keeping of property.—(a) All employees having the custody or use of property belonging to the Lighthouse Service are held responsible for its proper use, preservation, and safe-keeping, and are required to take all proper measures to protect it from loss or damage, and when such property is not satisfactorily accounted for, the officer or other person to whom it was intrusted shall be charged with its value.

(b) Department authority shall first be obtained, however, before making any deduction from an appointee's salary on account of any damage or loss of Government property.

(c) Typewriting machines, etc., must be kept properly oiled and in good order.

(d) No person in the service shall waste or permit improper use of supplies, materials, or other public property, or fail to attempt to prevent such waste if the same comes to his knowledge (339).

42. Loan or gift of public property.—(a) No article of Lighthouse Service property shall be disposed of by gift, loan, or in any other way for the personal use or benefit of anyone. Property may, however, be loaned temporarily to other branches of the Government, under specific authority of the commissioner, when a sufficient public exigency warrants.

(b) Property may be loaned to private parties by specific authority of the commissioner when in his judgment a substantial interest of the Government may be subserved thereby.

(c) In case of buoys, lanterns, and other apparatus and equipment liable to loss or damage during the time of use, the transfer of such articles for the use of other branches of the Government will be made only upon reimbursement to the Lighthouse Service of the value of the article transferred, with the understanding that when such property is no longer needed it may be retransferred to the Lighthouse Service at its valuation in the condition when returned, making allowance for depreciation in accordance with rules established by the commissioner; provided that such property may be loaned to other services of the Department of Commerce, with the understanding that it be returned to the Lighthouse Service after use in like condition as when loaned by the Lighthouse Service.

(d) If in exceptional cases a superintendent deems it advisable to loan equipment, instead of transferring such property at its valuation as provided above, recommendation should be submitted for waiving the regulation, with the reasons therefor (340).

43. Recovery of property.—(a) Whenever any buoy or any boat or other property belonging to any lighthouse or lightship or tender is reported to have been found adrift or otherwise and is delivered or offered to a superintendent and a claim made for its recovery, the superintendent shall receive the buoy or boat or other property, examine into the case, and report the facts to the commissioner with his recommendation as to payment for services rendered in the recovery and delivery of such property; no salvage or any demand of the character of salvage shall be allowed. In the event of any person or persons recovering any anchors, cables, or other property without proper authority the superintendent shall demand such property, and if it be not delivered upon a written demand he shall report the facts to the commissioner.

(b) Superintendents shall report, in duplicate, the date, time, and approximate position of buoys picked up in the open sea, with the station from which they went adrift, and date, if known (346).

44. Movable articles to be marked.—All movable articles of every description belonging to the Lighthouse Service must be marked "U. S. L. H. S." before applying them to the service. All castings shall be marked in the casting, articles of wood shall be branded,

all articles of canvas shall be marked with stencil plates, and articles of wrought metal shall be marked with dies. Mess equipment for vessels and stations shall, so far as practicable, be marked in the manufacture (347).

45. In the event of damage to or destruction of a vessel or station, the personnel shall remain under the authority of the employee in charge until released by proper authority. The employee in charge must promptly account for all Government property under his charge and await orders.

46. No lost moorings or appurtenances thereof belonging to the Lighthouse Service shall, upon recovery, be removed from the vicinity where found except by proper authority. (See also art. 43.)

47. Returns of property.—All persons charged with the keeping or application of supplies or other property of the Lighthouse Service shall make regular returns of the receipt and expenditure of the same to the superintendent.

48. Survey of property.—No article of supply or any fixture, tool, implement, or other property belonging to the United States shall be condemned or disposed of except by proper authority. All employees having the custody of property are required to put aside, in some inconspicuous place, all articles of supply, implements, tools, etc., which are worn out or unserviceable and prepare a duplicate survey list in ink on the proper form, in readiness for survey at all times. Except at depots, two persons either (1) the superintendent or a member of the engineering force, and (2) the master, first officer, second officer, engineer, or assistant engineer of a tender, or any one of the keepers at a station, may serve as a board of survey for articles at stations or on vessels. At depots boards of survey shall consist of not less than three persons in responsible positions, one of whom at least shall not be an employee of the depot in which the articles are stored. Worn-out or obsolete articles which have any salable value either as junk or otherwise must be sold in the prescribed manner when surveyed and condemned and the required authority obtained. Articles which may be economically repaired for efficient service either as a whole or in part should be retained in the service (349).

49. Transfer of property.—When employees in the Lighthouse Service having direct custody of property are transferred, removed, resign, or die, an inventory must be made of such property, unless such inventory is waived by the commissioner, and discrepancies, if any, reported to the commissioner with recommendation. In all cases the salary of the retiring employee shall be withheld until he accounts satisfactorily for all the public property placed in his charge or bureau authority for payments is received by the superintendent (330).

50. Care of buoys, painting, scraping, etc.—Employees having charge of such work will be held to a strict accountability in connec-

tion with the care of metal buoys. In repainting, all rust shall be properly removed before applying the paint, and except in cases of extreme urgency repainted buoys shall not be placed in the water until the paint is thoroughly dry.

51. Power boats.—All electrical connections must be kept clean and free from oil, water, etc. The dynamo or spark coil should never be taken apart—all necessary adjustments can be made from the outside. Care should be taken not to short-circuit the batteries. Switches should be left "off" when the batteries are not in use. The wires should be inspected frequently to detect grounding, as this is often the cause of fire. Dry batteries are to be stowed in a box and taken out of the boat and stored in a dry place when boat is not to be used for some time.

52. Care of engines of power boats.—(a) The engine should be kept covered in bad weather. In cold weather jackets and pump when not in use should be drained to prevent freezing. After draining off the water the engine should be run a few minutes to thoroughly dry out the jackets, etc.

(b) When laying up for the winter, cover all bright parts of the engine with heavy oil or grease—vaseline is excellent for this purpose. Pour half a pint of heavy lubricating oil in each cylinder on top of piston, turning the engine over a few times so as to spread it.

(c) The engine should not be run if missing, pounding, or heating, without prompt attempt to remedy the trouble. No emery should be used on the engine. The time of ignition should, if necessary, be changed gradually, and the engine should be slowed down before reversing. Exhaust ports, pipes, and mufflers must be kept clean.

(d) Only good gasoline-engine cylinder oil should be used. The engine should not be run with a smoking exhaust, but the supply of oil or gasoline diminished. Oilers and grease cups should be kept full, clean, and in good working order. The oil cups should be boiled in potash occasionally to clean them.

(e) The engine should not be allowed to lay for a long period without turning over. It should be turned over by hand every day, and run under power for one-half hour each week, and then thoroughly wiped and cleaned up after each run, and all parts examined for loose bolts and connections, and all grease and oil cups filled, ready for instant use. When engine does not start immediately upon first turn, it should not be tampered with, but care should be taken to see that all connections and valves are in proper position; then prime and continue to turn engine until it starts. Gasoline engines frequently require considerable cranking when cold, and much damage is often done by attempting readjustment.

53. Regulations for equipment of power boats.—The regulations issued by the Department of Commerce governing the equipment of power boats must be strictly observed.

54. **Cleaning bilge.**—Care must be taken to prevent an accumulation of water, oil, and gasoline in the bottom of the boat. The bilge should be cleaned out frequently.

55. **Operation of gasoline engines in boats.**—In starting:

- (a) Have plenty of oil and gasoline in tanks.
- (b) Oil the engines all around.
- (c) See that ignition circuit is in order, also spark plug.
- (d) Set timer so explosion occurs late.
- (e) Set carburetor a little more open than usual running mark and open all valves to fuel tanks. Test carburetor.
- (f) Turn on oil.
- (g) Turn engine over with relief valves open and note if explosion occurs at proper time in all cylinders.
- (h) Close relief valves and turn engine over through one cycle. It should start running.
- (i) Set carburetor and timer on proper position.
- (j) When engine is in operation, the circulating water must be turned on.
- (k) *To stop engine.*—Throw out ignitor switch; this leaves the engine charged with an explosive mixture, and it is sometimes possible to start again by simply throwing in switch.
- (l) Turn off oil, gasoline, and circulating water.
- (m) *Troubles.*—Failure to start: Fuel mixture too rich, mixture too lean, carburetor or needle valve plugged up.
- (n) Ignition: Broken connections, spark plug dirty or short-circuited, vibrator improperly adjusted.
- (o) Engine: Leaky piston or exhaust valves or leaky crank case, loss of compression.
- (p) Weak explosions: Ignition set too late, loss of compression, not enough fuel, weak spark.
- (q) Exhaust passage explosions: Leaky exhaust valves, too rich a mixture.
- (r) Slowing down and stopping: Overheating due to insufficient supply of water or oil, weak mixture, loose connections.
- (s) Smoky exhaust: Too much lubricating oil.

56. **Acetylene apparatus.**—(a) As a measure of safety against possible explosion, pressure gauges used in connection with acetylene lights shall be provided with steel springs, and no copper alloy shall be used on any high-pressure equipment. In testing acetylene accumulators for gas the following precautions should be used: (1) Have the face of the gauge turned away from the person making the inspection, or he should stand to one side and out of range with it; (2) care should be taken to open all gas valves slowly and gradually; (3) if a valve has been closed too tightly or is found jammed, it should be started by lightly tapping the wrench, rather than use the strength of the arm in unscrewing.

(b) When cylinders are refilled, care should be taken that they are provided with safety attachments as required by the Interstate Commerce Commission and the Bureau of Explosives (114).

57. **Handling acetylene buoys.**—(a) Buoys when received should be marked with brass tags, showing dates received.

(b) Buoys should be thoroughly cleaned and painted inside and outside at least once a year to prevent corrosion and weakening of plates.

(c) To charge buoys, see that tank pockets are perfectly dry and that fender blocks in pockets are resting evenly on bottom; place buoy in proper position to receive tanks, set tanks in pockets, and wedge firmly. Make connection between tank valves and stationary gas connections. In making connection, always use a new washer, open valve on top of tanks, test all connections with soap water for leaks and replace tank pocket covers, using care that gasket is in good condition to make tight joint. A little graphite and oil on pins and threads of tank pocket drop bolts will prevent them from corroding fast. If any gas connections are located inside buoy body, they should occasionally be tested for leaks. No naked lights or fire of any kind should be used around when testing these buoys, especially in buoy body or tank pockets.

(d) To light lantern, open tower cock located in angle leg of lantern frame, throw back hood of lantern, allow gas to flow through lantern to expel air. When gas is sufficiently strong, light lantern. Fan gas out of lantern with hand or cap, keeping face away from over top of lantern when lighting. Adjust pilot flame by means of small screw on burner column to a very small blue flame. If in bright sunlight, it will be necessary to shade pilot with hand in order to see flame.

(e) See that burner tips are clean and in good condition and that there are no leaks around same, that light is of proper size and shape, and that there are no smoke tails. Any trouble from flame is usually due to faulty burner tips.

(f) Turning left-hand screw on side of flashing chamber to the right shortens both light and dark periods; turning to left lengthens periods. Light periods can be further reduced by increasing size of attachment plate on diaphragm. Dark period may be lengthened or shortened independent of light period by manipulating right-hand screw on side of flashing chamber.

(g) Lanterns which are to be operated as fixed lights are fitted with an additional by-pass valve located over flashing chamber.

(h) After overhauling lanterns or changing characteristic of lanterns they should be tested for 48 hours before being placed in service.

(i) Never light lantern when it is lying in horizontal or inclined position, as heat is liable to crack lens.

(j) Never attempt to open lantern when it is lying in horizontal position, for lens is held in position by clamp attached to hood of lantern, and if opened in this position the lens will drop down on frame. Lenses should always be removed before buoys are handled, especially on 375 and 500 millimeter lanterns.

(k) To obtain best results, proper gas pressure should be maintained in flashing and reducing chambers—reducing-chamber pressure, 18 inches water; flashing-chamber pressure, 2 to 3 inches water, according to size of burner. The largest burners require lowest pressure. The pressure regulates the efficiency of flame. At proper pressure flame will be full with curved top and corners slightly raised; with excessive pressure, flame will blow smoke; with insufficient pressure, flame will not form proper shape, will be low in center, and will smoke.

(l) Except where specially authorized, the following standard sizes of burners shall be used in various lanterns: $\frac{1}{2}$ -foot burner in 200-millimeter lantern; $\frac{3}{4}$ -foot burner in 300-millimeter lantern; 1-foot burner in 375-millimeter lantern; $1\frac{1}{4}$ -foot burner in 500-millimeter lantern.

58. Handling oil gas buoys.—(a) Buoys when received should be marked with brass tags showing dates received.

(b) Buoys should be thoroughly cleaned and painted at least once a year to prevent corrosion and weakening of plates.

(c) To fill buoys, remove cap from filling valve, install gauge on buoy or gas tank or on both, open filling valve on buoy, then valve on tank; allow gas to flow until pressure has equalized, then start compressor and fill buoy to 12 atmospheres. Close valve, disconnect hose, and test around valve stems and connections with soapy water for leaks. Buoys should not be filled beyond this pressure. In filling from high-pressure tanks be sure that valve on buoy is opened before the one on tank. If flow of gas from high-pressure tanks stops on account of frost accumulation from expansion of gas, close and open tank valve a few times or pour boiling water on the valve, which will clear openings.

(d) To light buoys throw back hood of lantern, open gas valve at base of lantern and on buoy, and allow gas to flow for a few minutes to allow air to work out of lantern. As soon as flow of gas is sufficiently rich to ignite, light pilot flame and adjust by means of small set screw on burner base to a height of one-fourth inch and light flame by similar set screw to a height of $1\frac{1}{8}$ inches. Care should be exercised that there are no leaks around burner in internal lantern connections or pipe connections.

(e) Flat-flame lanterns properly adjusted should burn five-eighths foot of gas per hour if burning continually; mantle lanterns, $1\frac{1}{8}$ feet.

(f) Spreading toes on diaphragm post increases both light and

dark periods. Closing in toes on diaphragm post decreases both light and dark periods. Light periods can be further reduced by installing diaphragm ring with smaller hole in center. Dark periods may be separately increased by operating right-hand gas screw on outside of flashing chamber.

(g) To operate lantern as flashing light have right-hand screw open and left-hand screw closed; this passes gas through flashing chamber. To operate as fixed light close right-hand screw and open left-hand screw; this by passes gas direct from inlet to burner outside of flashing chamber.

(h) After overhauling or changing characteristics of lanterns they should be tested for 48 hours before being placed in service.

(i) Care should be exercised in use of mantle lanterns that burner tip, which in this type of lantern controls the gas consumption, is of proper size and that same does not become enlarged. Excessive consumption of gas produces improper mixture, carbonization, and breaks mantles. See that the burner nozzle is tight at all times to prevent vibration and the breakage of mantles. Before applying mantle see that all the burner parts and gas passages are clean. In applying mantle take cover off box and screw mantle on burner nozzle before removing box. When mantle is screwed up as far as it will go, remove box by a straight, steady pull. Be careful at all times not to touch the mantle, and never open lantern after mantle has been burned if it can be avoided.

(j) Never light lantern when it is lying in horizontal or inclined position, as the flame is liable to injure lens.

(k) To obtain best results proper gas pressure must be maintained in flashing and reducing chambers—reducing chamber pressure, flat-flame lantern 4 inches water; flashing-chamber pressure, flat-flame lantern, 2 inches water; reducing-chamber, pressure, mantle lantern, $1\frac{1}{2}$ pounds; flashing-chamber pressure, mantle lantern, eight-tenths of a pound.

(l) The tips of flat-flame burners should be set so that the two holes are parallel to the pilot light, the gas being thus thrown or deflected directly into the pilot flame and insuring prompt ignition and preventing the raising of the height of the pilot light.

59. Tests of oil gas buoys and tanks.—(a) Water-pressure tests must be made every three years, as outlined below. Buoys that are in use in salt water must be kept properly cleaned and painted, otherwise they will deteriorate to a dangerous extent between tests. Buoys or tanks which may have been subjected to accidents, rough usage in transportation, or about which there may from any cause be a doubt as to their safety in service shall be cleaned and given a rigid surface inspection and tested before further use. The gauge used in testing must be correct.

(b) Do not allow buoys or tanks to have less than one-half atmosphere of pressure, to prevent explosive mixture of gas and air, until immediately before testing.

(c) For buoys pump out all gas possible, remove counterweight and manhole cover, clean out inside of buoy, install testing plate in place of manhole plate. This testing plate shall consist of a piece of 1-inch steel plate, drilled for bolt holes to match buoy, machined on inside face, with a 1-inch pipe tap hole in center for connecting test pipe. Attach hose and gauge.

(d) For tanks pump out all gas possible, remove regular head, clean out inside of tank, and attach testing head, which is similar to plate described for buoys but provided with two holes, a 1-inch inlet for water, and a 3/8-inch outlet for gas or air extending by internal pipe to the upper side of the tank, then attach hose and gauge.

(e) Buoy or tank must be placed in such position as will permit absolutely all gas or air to be blown out when being filled with water. Unless this is done a gas or air pocket will be formed, a dangerous condition, which may result in serious damage. Buoys must be placed with the *outlet valve uppermost*, and tanks must be placed on an incline with the internal pipe uppermost. Open outlet valve and fill buoy or tank with water.

(f) Close outlet valve when buoy or tank is full of water and all gas or air exhausted, pump in water *slowly* to a pressure 50 per cent more than the working pressure used in the buoy or tank. Examine carefully for leaks. It is of the utmost importance that the buoy or tank be entirely free of gas or air; that the test pump be operated slowly and without impact or ram to avoid developing dynamic pressures which may overstrain the buoy or tank or rupture the material and possibly result in bursting.

(g) After completion of test disconnect testing apparatus, open valves, remove testing head, and allow buoy or tank to drain thoroughly. Clean and dry out interior thoroughly.

(h) Replace permanent manhole plate and for buoys also counterweight.

(i) If air pressure is available, subject buoy or tank to an air pressure of 100 pounds per square inch for the purpose of testing joints that have been remade. During this test go over all parts of buoy or tank with soapy water.

(j) Blow air out of buoy or tank with gas. Charge three times with gas to a pressure of one atmosphere, and blow out each time, so as to free the gas from air as much as practicable.

(k) Charge buoy or tank with gas to a pressure of 12 atmospheres, go over with suds all parts where joints have been broken. Temperature changes will affect pressure, so that small leaks may not be readily detected by observing gauge readings.

(l) Keep a record of the entire test, noting the serial number stamped on the buoy or tank, or other definite means of identification.

(m) Tests must be made every five years and in such manner as to comply with the requirements of the Interstate Commerce Commission of every oil-gas buoy, tank, and flask shipped to a charging plant for refilling. The methods and apparatus for making these tests are prescribed in the Bureau of Explosives pamphlet No. 12, effective October 1, 1914, and should be made at the charging plant where special apparatus is provided for the purpose (115).

(n) When a buoy, tank or flask is transferred from one district to another, the district making the shipment shall furnish the district to which the article is consigned the date when it was last tested, the pressure, and the method used, and the name of the employee or company who tested it.

60. Operation of oil-gas buoys.—The following instructions should be observed in connection with the flashing apparatus of oil-gas buoys:

(a) The lanterns should be tested at least 48 hours before putting into service.

(b) All valves should be in line and seat properly.

(c) The pressure of the pot should be kept constant.

(d) The nozzles should be kept clean, but must not be reamed out in the cleaning.

(e) If there should be a lengthening of the light period or flash, it is probably due to some defect in the flashing-chamber adjustment or a clogging of the gas tip.

(f) A lengthening of the dark period is probably due to either a loss of pressure in the regulator or a leak in the piping or at the inlet flange.

(g) A short light period is probably due to either a leak at the gas tip or too large an orifice which may have been caused by cleaning same with too large a needle.

61. Transportation of high-pressure oil gas flasks on tenders.—All high-pressure flasks must be carried in the open air on tenders to avoid the danger of fire or explosion by escaping gas coming in contact with lamps or open fires. (See art. 59.)

62. Buoy appendages.—(a) The ballast balls used for keeping buoys in an upright position must be attached by a swivel or shackle and the chain shackled to the eye in the lower part of them, except bell buoys, which are to be moored by a bridle. The length of chain will depend upon the depth of water. Sinkers shall be made of iron, concrete, or stone, according to circumstances.

(b) Large gas buoys located in waters where there is a large rise and fall of the tide should be fitted with swivels to prevent fouling of the mooring chains.

(c) Iron and concrete sinkers shall be cast, stone sinkers fitted, and shackles, swivels, straps, pins, screws, nuts, and other ironwork on the buoys made and fitted according to the drawings, specifications, and instructions approved by the commissioner.

(d) All buoy moorings should be raised and examined at least once every year to prevent their loss by breaking adrift.

(e) Superintendents shall see that old lightship chain is utilized for mooring buoys when practicable (107).

63. Paints and oils for buoys.—The best quality and description of paints and oils must be used for coloring and numbering buoys. Shackles, swivels, chains, iron sinkers, and ballast balls shall be kept properly covered with coal tar applied at a temperature of 180° F. (112).

64. Occupancy of lighthouse premises.—Permission will not be given, except by authority of the commissioner, to any person to occupy any premises belonging to the Lighthouse Service; and in case of trespass it is the duty of any person of the Lighthouse Service to whom it may become known to make report to the superintendent without delay (335).

65. Improper use of structures.—Superintendents shall see that no light keeper's dwelling or lighthouse structure is used as a pilot station or as a boarding or lodging place for pilots or other persons not in the Lighthouse Service, except by special authority of the commissioner. It is not intended, however, to prohibit a keeper from having relatives or friends visit his family and remain for short periods at stations having dwellings occupied by families and subject to the approval of the superintendent (336).

66. No traffic or trade shall be carried on within any vessel or reservation of the Lighthouse Service, and no article of private property shall be exposed for sale on the premises. Refreshments shall not be sold on any reservation, without written authority of the commissioner, which will be given only in cases of special exigency and under proper supervision of the superintendent (337).

67. (a) The immediate families of employees may occupy such quarters on reservations as may be designated by the superintendent.

(b) Employees will be held responsible for the personal conduct of their families residing on premises belonging to the Lighthouse Service.

68. Contractors for work under the Lighthouse Service will not be allowed to board their men at a light station unless it be impracticable to obtain board in the neighborhood, in which case the contractor shall deposit in advance with the keeper, or with the superintendent (as the latter may direct), such sum of money as the superintendent may require as security for such board. The superintendent will inform the keeper by letter of the amount of money in his hands, and he will pay to the keeper such portion as is needed to satisfy proper bills for such board as may be incurred (368).

69. Correspondence.—(a) Official letter paper only shall be used for official correspondence. Communications must be legibly written, in concise terms, without interlineations and with writing confined to one side of the sheet.

(b) The first sheet shall be headed with the name of the vessel, reservation, or place where written, and the date.

(c) Each page shall be numbered, and signatures must be followed by the signer's official title.

(d) In communications addressed to superintendents and other officials, their titles shall be used, without name of individual, as "Superintendent of Lighthouses, Portland, Me."

(e) All official communications will be answered promptly. In the case of important matters calling for immediate reply, where complete reply can not be made without delay, receipt of the communication will be acknowledged and a statement given as to length of anticipated delay and the reason therefor.

(f) All correspondence on business of the Lighthouse Service, whether addressed to persons within the service or persons, firms, or organizations outside the service, shall be forwarded through the immediate official superior of the writer. Whenever such correspondence, by reason of absence from headquarters or other emergency, can not be handled through the commissioner's or superintendent's offices, copies must be furnished promptly for official files.

(g) Communications addressed to superior officers from subordinates through their immediate superiors, if expressed in respectful language, shall be promptly forwarded by indorsement, with such comment or recommendation as the circumstances warrant.

(h) If an employee has knowledge of facts which he believes should be brought to the attention of the district superintendent or the Commissioner of Lighthouses, but which he does not feel can be forwarded in detail through regular channels, he may ask for an opportunity to report in person to the superintendent or the commissioner but will be held responsible in case of false, malicious, or trivial accusations or reports (21 and 23).

70. Use of telegraph, radio, air mail, etc.—(a) The telegraph, cable, air mail, and radio should be used as means of official communication in cases of emergency only or under special instructions. Care should be exercised in preparing telegrams, etc., and messages should be concise, definite, and not susceptible of error in transmission or interpretation. Unnecessary words, punctuation, etc., should not be used. Cablegrams should be coded, so far as practicable, when it is advantageous to the Government to do so.

(b) All telegrams, cablegrams, and radiograms sent on official business of the Lighthouse Service should be written on the official blanks printed for this purpose, with blank spaces properly filled in,

but the official blanks should not be used for unofficial messages. Signatures to telegrams addressed to officers and employees of the service, except in cases of possible uncertainty in identifying the sender, should contain only the surname of the sender.

(c) Telegrams, etc., of a personal nature, relating to leave of absence, payment of salary, and expense vouchers, must not be sent as "Official business" but shall be prepaid and sent on the telegraph company's blank form.

(d) Telegrams sent to the bureau after 1 o'clock p. m. Pacific time, 2 p. m. mountain time, 3 p. m. central time, and 4 p. m. eastern time are not received in Washington until after office hours and, except in cases requiring immediate attention, are not delivered until the following morning. Telegrams filed for transmission to the bureau after such hours, and those filed at any other time of day, shall, if not requiring attention until the following morning, be sent at Government night rates. Superintendents shall make arrangements for the prompt delivery of telegrams and special-delivery letters received outside of office hours (26).

71. **Official radiograms** on business of the Lighthouse Service may be transmitted from one naval radio station to another without expense under conditions prescribed by the Navy Department. (Navy Department letter, April 1, 1914) (27).

72. **Naval radio service.**—(a) The prefix "Govt." should appear as the first word of all messages sent via the Naval Radio Service, and the second word of messages from the Lighthouse Service should be the prefix "Com." except as provided below.

(b) Lightship stations, being on permanently moored vessels, are not regarded by the Naval Communication Service as "Stations on shipboard" but in the same status as coastal stations; therefore messages to be transmitted to lightships should be transmitted in the same manner and under the same rules as other domestic telegraph messages. They take "domestic" count, and the prefix "Com." should be omitted.

(c) The prefix "Com." is not required to be used on official messages of this department sent to a naval radio station "Prepaid" where there is no transmission by land line or commercial or foreign radio company beyond the naval radio station. For example, a message filed "Prepaid" on Lighthouse Service telegraph blank, with the Western Union Telegraph Co., at Baltimore, Md., for transmission via naval radio station direct to a lighthouse tender at sea, should omit the prefix "Com.," as there would in this case be no charge of the Naval Communication Service against this department. But a message in the reverse direction—that is, from the tender to Navy shore station via Western Union to Baltimore—would require the prefix "Com." Or, in the first instance, if the naval radio station

must relay the message via land line or commercial radio the prefix should be used.

(d) As it is to the advantage of the Lighthouse Service to utilize the Naval Communication Service, for whose service no charge is made, in preference to commercial radio companies, all radio operators in the service and others who send messages via radio should be instructed always to route messages via naval radio where practicable, and a good reason to justify routing via commercial companies should be required, as payments for the latter may otherwise be suspended. To forestall inquiry or suspension in such cases, payments to commercial radio companies made in district offices should be accompanied by explanation (28).

73. **Official letters, documents, or books** of a station or vessel shall not be removed or destroyed except by order of the superintendent.

74. **Penalty envelopes and labels** must not be used except for official purposes (31).

75. **Standard time.**—(a) In all records of the Lighthouse Service only standard time is to be used, except in off-lying regions where such time system is not in use.

(b) In localities where "daylight saving" time for a certain period of the year is authorized by local law or ordinance, superintendents of districts affected thereby are authorized to observe such time but shall inform the commissioner of the beginning and termination of such period (36).

76. **Transportation of personal household effects.**—When employees having household effects for transfer are transferred from one station or district to another for permanent duty, and it is not practicable to transfer the household effects by tender, reasonable cost of transportation, packing, crating, etc., of such personal household effects, may be allowed, within the limit of funds authorized. In order that the maximum amount appropriated for this purpose may not be exceeded, prior authority of the bureau must be obtained, and recommendations submitted by superintendents must include an estimate of the cost in each case. A statement of the actual cost, including transportation, crating, packing, etc., should also be furnished as soon as ascertained. The most advantageous method of transportation should be used, considering railroad, steamship, truck, etc. Transportation by rail or steamship should be covered by Government bill of lading where practicable; if commercial bill of lading is used, the transportation bill should be rendered to the bureau in the same manner as provided for Government bills of lading. Bids for packing, crating, etc., if any, and for transportation by truck or van, shall be obtained in the same manner as for other purchases for the Lighthouse Service, and bills therefor shall be paid in the district office. Payment of expenses for trans-

portation, packing, crating, etc., of furniture shall not be made by means of reimbursement to the employee except where direct payment to persons or corporations doing the work is impracticable (298).

77. Official stations for field force.—Foremen and other employees should have designated stations situated as near as practicable to their regular place or places of duty, so as to minimize the expense of travel. In districts where a large part of an employee's duty is performed at a depot, such depot should be designated as the official station of the employee. No expense for subsistence or travel is allowable at the designated official station of an employee or between such official station and his home, and if the employee chooses to reside elsewhere it will be understood to be for his personal convenience (292).

78. Payment for traveling expenses.—(a) Official travel by employees in the Lighthouse Service will be made upon the written order of the proper officer on the form provided therefor. This travel order shall define the duty to be performed, the maximum allowance for subsistence and whether on a per diem or actual expense basis, and shall state the appropriation from which expenses therefor shall properly be paid. The original travel order, or a copy of the same, with a reference to the original order, if filed with the previously paid account, must in all cases be attached to the voucher upon which payment for traveling expenses is made.

(b) Employees of the Lighthouse Service in charge of working parties may pay the traveling and other expenses of laborers and field employees in the service financially unable to pay them. Payment of such expenses should be authorized in the travel order, and the voucher in which reimbursement is made should contain a certificate by the superintendent to the effect that the person on whose account the expenses were incurred and paid has not been and will not be reimbursed therefor.

(c) Travel-expense vouchers shall show the hour and day of departure from and return to the traveler's official station or home; also the day and hour of arrival at and departure from each place of the traveler's itinerary at which a stop-over is made for any purpose; and in cases where travel vouchers are submitted before the completion of the work, the date of arrival at the last-mentioned place of duty shall be carried forward to the subsequent voucher. If a duty at any place within the traveler's itinerary is prolonged beyond a period of 30 days, the travel voucher should show the approximate period to be covered by his duty assignment at such place or the approximate date of return to official headquarters, or both, as well as any other pertinent facts which will tend to show whether his duty at such place is of a temporary nature as distinguished from

prolonged duty which may constitute a change of station at which subsistence is not allowable (287).

79. Travel by longer route.—When travel is taken by an employee by other than the shortest usually traveled route, and same is for the traveler's convenience and not on official business or due to the exigencies of travel, the excess time taken, as well as the extra expense of travel by longer route, shall be charged to the employee, and vouchers covering all such travel must contain appropriate explanation as to how such time and expense are charged. If the employee has no annual leave to his credit, such time must be charged to leave without pay and reference made on the travel vouchers to the voucher on which the deduction in pay is made (288).

80. Expenses of attendance at meetings of associations, etc.—The payment by the Government of expenses of attendance of officers or employees of the Lighthouse Service at any meeting or convention of members of any society or association is prohibited (289).

81. Reimbursement to Lighthouse Service employees for other than traveling expenses shall be limited to emergency purchases for which cash payment was demanded by dealers and shall be paid on the voucher form used for traveling expenses. The employee being reimbursed must furnish properly receipted bills as subvouchers and must enter and sign on the face or back of each such subvoucher the following certificate: "This party refused to make delivery without cash payment" (293).

82. Government transportation requests and identification cards.—(a) Standard transportation requests and identification cards shall be used as prescribed in the Standardized Government Travel Regulations. The name of the employee's station or vessel shall be inserted on the Government transportation requests after the official title of employee using same. The duplicate or coupon of Government transportation requests before being forwarded to the commissioner shall be indorsed over the signature of the superintendent or officer in charge in his absence—"This travel has been authorized and has actually been taken and is approved." The duplicate or coupon shall also state the appropriation from which the charges are payable. The indorsement and signature may be made by using a rubber stamp and initialed by the chief clerk or other responsible subordinate (294).

(b) On account of the possibility of their use by unauthorized persons, Government transportation requests should be safeguarded the same as cash. Officers and employees who receive these requests in the performance of travel or for other purposes will be held responsible for their safe-keeping, and in case of improper use because of failure to properly safeguard them, they will be chargeable with

the amount which may be required to be paid by the United States because of use by unauthorized persons.

83. Use of private automobiles.—(a) The use of private automobiles on official business is governed by the provisions contained in the Standardized Government Travel Regulations.

(b) In no case shall the use of their privately owned automobiles for official duty be required of officers or employees.

(c) In making claim for reimbursement for gasoline, lubricating oil, or storage the regular travel voucher form shall be used, and the account shall show the points visited, the distances actually traveled by means of privately owned automobiles, the amount, price, and kind of supplies for which reimbursement is claimed, whether or not public conveyance was available, and whether the means of transportation used was the most economical and advantageous for the Lighthouse Service (296).

84. Street-car and ferry tickets and tokens.—(a) Street-car and ferry tickets and tokens purchased by the Government are Government property of the same class as Government transportation requests and scrip books, and are to be furnished employees for use in performance of their official duties only.

(b) Employees in a travel status who receive a per diem allowance in lieu of actual expenses are not entitled to street-car fares in going to and from work in addition to such per diem. This also applies when subsistence is allowed on an actual expense basis, and street-car fares are allowable only in so far as the maximum amount of actual expenses allowed is not exceeded for any day.

(c) Proper records of street-car and ferry tickets and tokens purchased by district offices should be kept, including a record of the employees to whom they are issued, and also a brief record of the specific service for which used (297).

85. Oaths to expense accounts.—Chief clerks in the offices of lighthouse superintendents and other employees in the Lighthouse Service designated by them are required, empowered, and authorized when requested to administer oaths, required by law or otherwise, to accounts for travel or other expenses against the United States; for such services no charge shall be made (299).

86. Expenses in connection with oaths of office.—Traveling expenses due to the necessity for subscribing to an oath of office will not be paid by the Government; nor will fees for administering oaths of office be paid by the Government (300).

87. Leave of absence, per diem employees.—(a) Employees of the Lighthouse Service compensated at a per diem rate of pay may be granted 15 working days' leave of absence each year without forfeiture of pay during such absence, under rules prescribed by the Secretary of Commerce; provided that no employee of the class

herein mentioned shall be entitled to any leave until he has served 12 consecutive months, when he may be granted 15 days' leave, and that during the second or any subsequent year 15 days' leave at the rate of one and one-fourth days per month, as earned, may be granted from the beginning of the second service year; provided further, that the superintendents of the several lighthouse districts, shall have discretion as to the time when the leave can be allowed without detriment to the service, and that absence on account of sickness shall be deducted from the leave hereby granted. (Act March 3, 1915, sec. 4, 38 Stat. 927.)

(b) The above act does not grant leave with pay but merely authorizes leave with pay to be granted and applies to per diem employees of the Lighthouse Service.

(c) The year referred to in the statute is to be regarded as the service year.

(d) Upon completion of the first service year each employee earns the right to be granted 15 days' leave with pay, and during the second and each subsequent service year he earns at the rate of one and one-fourth days' leave for each month of service.

(e) At any time during the second service year each employee may be allowed to take not exceeding the 15 days earned during the first service year and also not exceeding the amount of leave earned during the second service year up to the date when the leave to be allowed will expire, after deducting the amount of leave with pay already taken. At the expiration of the second service year all right to be granted leave earned during the first or second service year expires.

(f) At any time during the third or any subsequent service year each employee may be allowed leave earned during that year up to the date when the leave to be granted will expire, after deducting the amount of leave with pay already taken that year. Reinstated employees who have previously served one year or more may also be granted leave on this basis from the date of reinstatement.

(g) Application for leave of absence with pay, except in the case of sickness, shall be made in advance and approval thereof obtained before taking the leave.

(h) In cases where leave without pay has been charged, when leave with pay has not been earned, the leave without pay may later be changed, at the request of the employee, to leave with pay when accrued and reimbursement made for the period for which salary was withheld; but all adjustments of this kind shall lapse at the end of the service year.

(i) The leave authorized by the foregoing may be allowed to be taken at such time or times as will cause the least detriment to the service, and the work shall, if practicable, be so arranged that no employee entitled to be granted leave shall be deprived thereof. But

leave with pay will not be granted in periods of less than one-half day.

(j) Extended absences on furlough, or leave without pay, will proportionately diminish the yearly allowance of annual leave. When the period of furlough or leave without pay exceeds 30 days, a deduction, at the rate of one and one-fourth days a month for the entire period of absence, will be made from the yearly allowance of annual leave; provided, however, that when such absence is due to personal illness no deduction will be made unless the employee's absence without pay exceeds 90 days.

(k) Superintendents are authorized to withhold leave accruing to per diem employees during periods of absence without authority, except in cases of sickness, or during suspensions from duty and pay, when such absence amounts to three days or more (454).

88. Notice of resignation required.—(a) Any person who leaves the service without due notice, or offers his resignation and leaves the service without action thereon on such short notice as to cause embarrassment to the service, shall be recommended for dismissal unless he can give satisfactory reasons for his action. Superintendents shall submit proper report and recommendation in such cases.

(b) Desertion from duty at light stations, vessels, or other critical duty in the Lighthouse Service shall be punished with dismissal, regardless of length of service, and persons so dismissed shall not be reemployed (435).

89. Letters of caution.—In every case where an employee is cautioned or reprimanded, superintendents shall make further report in regard to such employee at the end of six months. In the case of letters of caution issued by superintendents, copies in duplicate shall be forwarded to the commissioner for information and files of the bureau and the department (440).

90. Suspension from duty, pay, and allowances.—(a) When superintendents consider that, in taking disciplinary action, the case requires the suspension of the employee, the facts should be reported to the bureau with recommendation for suspension; provided that in case of gross insubordination, neglect of duty, or other serious violation of the regulations which requires immediate suspension the superintendent is authorized to suspend the offending appointee for a period not to exceed 90 days pending decision in his case; and the facts, together with the action taken, shall be reported to the commissioner at the earliest practicable date. Masters of vessels and keepers in charge should promptly advise the superintendent when disciplinary measures warranting suspension are called for. The effective date of the suspension shall always be definitely reported. In cases where superintendents do not consider the case serious enough to initiate the suspension they may in proper cases recommend that

the employee be suspended, effective at the close of a date sufficiently in advance to admit of prior department authority being obtained or effective upon date of notification of department suspension, which date should be reported to the bureau by letter in duplicate.

(b) Suspension shall be with lawful pay and allowances if the person is exonerated of the charges or if they are not found to be sufficiently substantiated to justify suspension without pay and allowances, and shall be without pay and allowances if they are sustained in a degree sufficient to warrant such action.

(c) When a suspended employee is in charge of a mess, or of the disbursement of accounts, etc., proper arrangements shall be immediately made to turn those duties over to another employee, beginning with the effective date of the suspension if practicable.

(d) An employee during suspension is not to be considered as separated from the service, and his particular position can not be filled by the appointment thereto of another person pending determination of his case. Where another employee can not be temporarily detailed or assigned, without change in title or pay, to perform the duties of the suspended employee, the superintendent may recommend the authorization of an additional temporary position, stating recommended rate of pay, name of person selected, etc., pending the disposition of the charges. All suspensions initiated are subject to approval by the Secretary of Commerce (438).

91. Charges against employees.—An appointed or registered employee reported for delinquency or misconduct will be furnished by the superintendent with a copy of the charges preferred against him and given three days in which to submit such statement as he may desire. An employee under charges who desires to make no statement will so report in writing.

Reports of misconduct or complaints shall be confined exclusively to the facts of the specific case. Statements submitted in reply to or in explanation thereof must be expressed in temperate language, free from countercharges, and relate specifically to the matters referred to in the charges. If there are countercharges, they should be put in a separate letter. Opinions must not be expressed nor the motives of others impugned (439).

92. Salary and retirement pay checks.—(a) Salary checks shall not be mailed to light stations and lightships or delivered to any employee before the end of the period covered. Officers or employees in charge of vessels or stations are directed to inform the superintendent, using the telegraph or telephone when necessary, when any change occurs after rolls are submitted that affects the pay of any employee under their charge, and to return to the superintendent with explanation checks sent in their care if they know or believe such checks to be in excess of the correct amount.

(b) Checks to retired employees shall not be mailed until the pay certificate of the retired employee, on the proper form and prepared as required by instructions thereon, is received in the district office. Such certificate should not be signed before the last day of a month and should be returned for a new certificate in case of evidence of signature before the last day of the month (278).

93. Pay in case of change in duty.—Generally, whenever an employee is ordered to another station or district for duty involving a change in his compensation he shall be paid at his former rate of pay until he enters on duty at his new station. Where special conditions require or make it desirable that this rule be modified, superintendents should bring the matter to the commissioner's attention, with proper recommendations (301).

94. Allowances for family quarters.—(a) The head of an executive department or independent establishment, where, in his judgment, conditions of employment require it, may continue to furnish civilians employed in the field service with quarters, heat, light, household equipment, subsistence, and laundry service; and appropriations for the fiscal year 1927 of the character heretofore used for such purposes are hereby made available therefor: *Provided*, That the reasonable value of such allowances shall be determined and considered as part of the compensation in fixing the salary rate of such civilians. (Act March 2, 1926, sec. 3, 44 Stat. 161.)

(b) An allowance of fuel as authorized by the commissioner may be made to employees where quarters for their families are furnished by the Lighthouse Service.

(c) Deduction shall be made on pay rolls, etc., to cover the value of allowances furnished, as determined by the Secretary of Commerce, and including family quarters, fuel, etc.

(d) In case an employee is on leave without pay, or is under suspension pending the outcome of charges, the established value of the allowances furnished or reserved for the employee during the entire period should be deducted from any sums due or which may become due him. Cases involving deductions where no salary is due or to become due an employee should be submitted to the commissioner with the superintendent's recommendation (362).

95. Commissary privileges for keepers and vessel employees.—

(a) Officers and crews of vessels of the Lighthouse Service and light keepers and depot keepers of the Lighthouse Service shall be permitted to purchase commissary and quartermaster supplies from the Army, Navy, or Marine Corps at the price charged officers and enlisted men of the Army, Navy, or Marine Corps. (Act May 22, 1926, sec. 4, 44 Stat. 626.)

(b) Superintendents shall furnish information to employees entitled to this privilege as to posts where commissary supplies may be obtained and the conditions applicable.

(c) Employees who avail themselves of the commissary privileges as authorized must pay in cash for supplies at the time of purchase and should only request supplies for their own needs and those of their families. Supplies shall not be purchased from the Army, Navy, or Marine Corps for resale or transfer to other persons (370).

96. Wearing apparel.—No article of wearing apparel, clothing, or uniform shall be purchased with funds appropriated for the Lighthouse Service, except as specifically authorized by law or regulation (312).

97. Clothing equipment.—(a) The following-named articles of equipment may be furnished for use of certain employees: Rubber boots for working parties employed in wet places; rubber boots, oilskins, and hats on vessels; white linen or cotton coats and caps and aprons for the use of cooks, stewards, and mess attendants on vessels; rubber gloves, when required, for the use of employees engaged in working with chemicals or with electrical apparatus, or in making chemical, physical, or laboratory tests, and whose principal duties do not require the continued use of such equipment.

(b) When the above-named articles are furnished, they will remain the property of the Government as the regular equipment of the vessel, working party, station, depot, etc., and will be taken up on property returns and accounted for as public property.

(c) Superintendents are directed not to provide articles of the above classes unless they deem such provision to be to the best interests of the Lighthouse Service in increasing the efficiency of the service. Prior bureau authority must be obtained on the proper form and the necessity stated thereon, regardless of the amount involved, before this class of articles can be purchased by superintendents (313).

98. Purchase of property by employees.—The purchase of condemned Lighthouse Service property by employees of the service should be discouraged, and under no circumstances shall any employee of the the Lighthouse Service who has taken part in the condemnation or sale of Government property be permitted to become purchaser thereof, either directly or indirectly. The commissioner's authority should be obtained before any sale to an employee of the service is consummated (352).

99. Telephones in private residences.—No money appropriated by this or any other act shall be expended for telephone service installed in any private residence or private apartment or for tolls or other charges for telephone service from private residences or private apartments, except for long-distance telephone tolls required strictly for the public business and so shown by vouchers duly sworn to and approved by the head of the department, division, bureau, or office in which the official using such telephone or incurring the expense

of such tolls shall be employed. (Act August 23, 1912, 37 Stat. 414) (309.)

100. Officials, etc., interested in contracts.—(a) No officer of the Bureau of Lighthouses, superintendent, light keeper, or other person in any manner connected with the Lighthouse Service shall be interested, either directly or indirectly, in any contract for labor, materials, or supplies for the Lighthouse Service, or in any patent, plan, or mode of construction or illumination, or in any article of supply for the Lighthouse Service. (Sec. 4680, R. S.)

(b) Without authority from the commissioner, no person in the Lighthouse Service shall purchase for the Lighthouse Service any article from any other person connected therewith or pay any such person for any service rendered in addition to his regular duties (213).

101. Work for private parties.—(a) No work for private individuals, firms, or corporations shall be done by the Government force at any lighthouse reservation or on any lighthouse vessel, or by any person in the Lighthouse Service, except by authority of the commissioner upon an application specifying the nature of the work to be done and accompanied by a statement from the superintendent that the necessary labor or appliances can not be procured in the vicinity from private contractors. If the services of a lighthouse tender are requested by a private party in cases where an emergency is not involved, superintendents should consider whether the services of privately owned tugs can be obtained for the work required; the use of Lighthouse Service vessels or equipment is not considered justified merely to save private parties reasonable expense in the conduct of their business. In cases of emergency, however, superintendents may, in their discretion, render such assistance as may be practicable if compatible with the interests of the Lighthouse Service, reporting the circumstances promptly to the commissioner for approval.

(b) Assistance rendered to private parties by lighthouse tenders should be charged for on the basis of the cost of maintenance of the tender for the preceding fiscal year, as shown by cost-keeping summaries, considering a year as comprising 313 working-days of 10 hours each (473).

102. Employees are forbidden to accept fees or other remuneration for courtesies extended or aid rendered in their official capacity. With the specific authority of the superintendent, just compensation may be accepted, but not demanded, for personal supplies or property voluntarily furnished in an emergency.

103. Acceptance of gifts.—(a) No person connected with the Lighthouse Service shall take or receive, directly or indirectly, any gift, gratuity, commission, or valuable consideration of any kind from any contractor or other person with whom the service has had

or is likely to have business dealings, or in any manner act as agent or attorney for such contractor or person.

(b) Violations of this regulation will render any such person in the Lighthouse Service liable to dismissal and prosecution and the contract liable to cancellation (476).

104. Contributions, presents, etc.—No officer, clerk, or employee in the United States Government employ shall at any time solicit contributions from other officers, clerks, or employees in the Government service for a gift or present to those in a superior official position; nor shall any such officials or clerical superiors receive any gift or present offered or presented to them as a contribution from persons in Government employ receiving a less salary than themselves; nor shall any officer or clerk make any donation as a gift or present to any official superior. Every person who violates this section shall be summarily discharged from the Government employ. (Act February 1, 1870, sec. 1784, R. S.) (477.)

105. Extortion by officials.—Every officer, clerk, agent, or employee of the United States, and every person representing himself to be or assuming to act as such officer, clerk, agent, or employee, who, under color of his office, clerkship, agency, or employment, or under color of his pretended or assumed office, clerkship, agency, or employment, is guilty of extortion and every person who shall attempt any act which if performed would make him guilty of extortion, shall be fined not more than \$500, or imprisoned not more than one year, or both. (Act March 4, 1909, sec. 85, 35 Stat. 1104) (478.)

106. Giving or accepting bribes, etc.—Officers, agents, and employees of the United States are prohibited from directly or indirectly asking, accepting, receiving, or agreeing to receive any money, property, or other valuable consideration whatever for services rendered or agreed to be rendered, either by themselves or others, in procuring or aiding to procure any contract, office, or place from the United States or from any officer or department thereof, or in relation to any proceeding, contract, claim, or other matter or thing in which the United States is a party or directly or indirectly interested, or with intent to have their decision or action on any question, matter, or proceeding which may be pending or which may by law be brought before them in their official capacity influenced thereby. Penalties of fine, imprisonment, etc., for violation of laws covered in this article, both as regards officers, agents, and employees of the United States, and contractors, dealers, or other persons involved in such violation are provided in sections 39, 112, 113, and 117 of the Criminal Code of the United States. (35 Stat. 1096, 1108, and 1109) (479.)

107. Conspiring to commit offense.—If two or more persons conspire either to commit any offense against the United States, or to

defraud the United States in any manner or for any purpose, and one or more of such parties do any act to effect the object of the conspiracy, each of the parties to such conspiracy shall be fined not more than \$10,000, or imprisoned not more than two years, or both. (Act March 4, 1909, sec. 37, 35 Stat. 1096) (480).

108. Political activity and assessments.—Superintendents shall see that all new appointees are furnished, for their information and guidance, copies of the latest department circular relating to political activity and assessments forbidden by civil service law and rules. A copy shall also be posted conspicuously in the office of every superintendent (481).

109. Influencing legislation.—(a) Hereafter no part of the money appropriated by this or any other act shall, in the absence of express authorization by Congress, be used, directly or indirectly, to pay for any personal service, advertisement, telegram, telephone, letter, printed or written matter, or other device intended or designed to influence in any manner a Member of Congress, to favor or oppose, by vote or otherwise, any legislation or appropriation by Congress, whether before or after the introduction of any bill or resolution proposing such legislation or appropriation; but this shall not prevent officers and employees of the United States from communicating to Members of Congress on the request of any Member or to Congress, through the proper official channels, requests for legislation or appropriations which they deem necessary for the efficient conduct of the public business.

(b) Any officer or employee of the United States who, after notice and hearing by the superior officer vested with the power of removing him, is found to have violated or attempted to violate this section shall be removed by such superior officer from office or employment. Any officer or employee of the United States who violates or attempts to violate this section shall also be guilty of a misdemeanor and on conviction thereof shall be punished by a fine of not more than \$500, or by imprisonment for not more than one year, or both. (Act of July 11, 1919, 41 Stat. 68.)

(c) The right of persons employed in the civil service of the United States, either individually or collectively, to petition Congress, or any Member thereof, or to furnish information to either House of Congress, or to any committee or member thereof, shall not be denied or interfered with. (From act August 24, 1912, sec. 6, 37 Stat. 555) (482).

110. Use of influence for promotions.—(a) No recommendations for the promotion of a classified employee shall be considered by any officer concerned in making promotions unless it be made by the person under whose supervision such employee has served; and such recommendation by any other person, if made with the knowledge

and consent of the employee, shall be sufficient cause for debarring him from the promotion proposed, and a repetition of the offense shall be sufficient cause for removing him from the service. (Civil Service Rules, Rule XI, par. 3.)

(b) Violation of this order by any officer or employee in the Lighthouse Service should be brought to the attention of the commissioner by superintendents, with appropriate recommendation (483).

111. Making false statements reflecting on the character and conduct of a superior, malicious talebearing to officers in authority, or detrimental criticism of the same character, whether orally or in writing, will be considered cause for the dismissal of the offender (485).

112. Presenting false claims against the Government for payment or approval is punishable by a fine of not more than \$5,000, or imprisonment of not more than five years, or both (262).

113. Misuse of public records.—(a) Willful and unlawful concealment, removal, mutilation, obliteration, destruction, or falsification of any official record, proceeding, map, book, paper, document, or other thing is punishable by a fine of not more than \$2,000, or imprisonment of not more than three years, or both, and forfeiture of office and disqualification from holding any office under the Government of the United States. (From secs. 128 and 129, act March 4, 1909, 35 Stat. 1111.)

(b) The unauthorized possession or use of any letter, record, or other document belonging in the files of the Lighthouse Service, or of any copy or extract thereof, by any person connected with the service is prohibited.

(c) Unlawful use of papers in order to procure the payment of money from or by the Government is punishable by a fine of not more than \$5,000, or imprisonment of not more than 10 years, or both. (From act March 4, 1909, sec. 40, 35 Stat. 1096) (39).

114. False accounts and reports.—(a) Whoever, being an officer, clerk, agent, or other persons holding any office or employment under the Government of the United States and being charged with the duty of keeping accounts or records of any kind, shall, with intent to deceive, mislead, injure, or defraud the United States or any person, make in any such account or record any false or fictitious entry or record of any matter relating to or connected with his duties, or whoever, with like intent, shall aid or abet any such officer, clerk, agent, or other person in so doing; or whoever, being an officer, clerk, agent, or other person holding any office or employment under the Government of the United States and being charged with the duty of receiving, holding, or paying over moneys or securities to, for, or on behalf of the United States, or of receiving or holding in trust for any person any moneys or securities, shall, with like intent, make

a false report of such moneys or securities, or whoever, with like intent, shall aid or abet any such officer, clerk, agent, or other person in so doing, shall be fined not more than \$5,000, or imprisoned not more than 10 years, or both. (Act March 4, 1911, 36 Stat. 1355.)

(b) No person connected with the Lighthouse Service shall make or sign a false or misleading report, even though he believe he is ordered to do so by a superior (40).

115. False certificates.—Whoever, being a public officer or other person authorized by any law of the United States to make or give a certificate or other writing, shall knowingly make and deliver as true such a certificate or writing containing any statement which he knows to be false, in a case where the punishment thereof is not elsewhere expressly provided by law, shall be fined not more than \$5,000, or imprisoned not more than one year, or both. (Act March 4, 1909, sec. 106, 35 Stat. 1107) (41).

116. Private instruction for examination.—(a) No officer or employee of the Government shall, directly or indirectly, instruct or be concerned in any manner in the instruction of any person or classes of persons, with a view to their special preparation for the examination of the United States Civil Service Commission.

(b) The fact that any officer or employee is found so engaged shall be considered sufficient cause for his removal from the service. (Ex. Ord. October 13, 1905) (392).

117. Publishing information.—(a) Lighthouse superintendents may, subject to the exceptions herein noted, give out for publication any customary information regarding the Lighthouse Service which will be of use or interest to maritime interests or the general public. In addition to the routine notices to mariners they may, in their discretion, furnish to the press news items of interest in regard to the progress of the work, such as the establishment of new aids to navigation, the improvement of present aids, the bringing in for repair of light ships, etc.

(b) Superintendents must not, however, give out for publication, or otherwise give publicity to, any matter as to which there is doubt regarding the advisability or desirability of its publication, including matters relative to personnel, administration, or policy, or matters under consideration by the department or bureau, without prior authority of the commissioner.

(c) Other employees are forbidden to give out for publication any information respecting the service, except as they may be specifically authorized.

(d) Prior authority must be obtained for the publication of articles or the delivering of lectures concerning the Lighthouse Service or its work, and a copy of any published article should be forwarded to the commissioner. Informal talks confined to descriptions of the Light-

house Service, and avoiding matters of policy, may be given by superintendents or by their subordinates with their approval, without prior authority of the commissioner (474).

118. Smoking.—(a) No smoking shall be permitted in buildings belonging to the Lighthouse Service, except in living quarters. Superintendents shall issue such orders regarding smoking on lighthouse reservations or vessels as will prevent the danger of damage to Government property by fire.

(b) No smoking is allowed in gasoline boats, nor in the vicinity of acetylene or oil gas cylinders or buoys while being transported on tenders or under any other circumstances.

119. Payment of debts.—All persons in the Lighthouse Service must pay their honest, just, and legal debts; failure to do so will be considered cause for dismissal (491).

120. Intoxicants or drugs on lighthouse vessels or reservations.—

(a) The introduction of alcoholic liquors or other intoxicants on board any lighthouse vessel or within any lighthouse reservation is strictly prohibited, and officers or employees in charge will be held directly responsible for the enforcement of this regulation.

(b) The possession or use of intoxicating liquors for beverage purposes, obtained in violation of law, or of prohibited drugs, or any illegal connection therewith, by persons in the Lighthouse Service will be considered cause for disciplinary action against the offenders.

(c) Superintendents are authorized and required to initiate the suspension, in accordance with civil-service rules, of any employee of the Lighthouse Service found in a state of intoxication, and such action must be at once reported in detail to the commissioner.

(d) Personal habits which are liable to detract from the ability to perform duty in times of stress or danger will not be excused or tolerated (489).

121. Intoxicated persons on lighthouse premises.—No intoxicated or other objectionable person shall be allowed on vessels or reservations belonging to the Lighthouse Service, and any violation of this regulation shall be considered proper cause for dismissal or other disciplinary action.

122. Violation of fishery and game laws.—(a) Disciplinary action shall be taken in the case of any employee of the Lighthouse Service found guilty of violating the laws protecting game, fur-bearing animals, and the fisheries; and if the circumstances warrant such action, measures shall be taken toward his dismissal from the service.

(b) Proper report shall be made by keepers and other employees in charge of lights of any violations of the "Regulations for the protection of migratory birds" coming to their attention.

(c) Fishing privileges shall conform to prescribed State laws or regulations (492).

123. Vaccination.—Employees whose duties require them to perform interstate travel, or who are regularly engaged in the handling of mail or other material to be carried in interstate traffic, may receive, without cost, vaccination against smallpox or typhoid fever, or both, upon applying in person at those places designated by the Surgeon General of the United States Public Health Service and presenting a certificate from their immediate chief showing the nature of their employment.

124. Employees not fitted for service.—Employees in charge will report without delay any subordinate whom they consider inefficient, lacking in zeal, or in any manner unfitted to be continued in the Lighthouse Service.

PART II

LIGHT KEEPERS AND DEPOT KEEPERS

125. Responsibility of keeper in charge.—The keeper in charge shall be responsible for the proper execution of all the duties of the station or depot, whether performed by himself or his assistants, and including cleanliness and good order.

126. The official title of the light keepers at a station shall be keeper (employee in charge), first assistant keeper, second assistant keeper, third assistant keeper, etc.

127. The term "light keepers" shall include the keeper and all assistant keepers at a station.

128. Qualifications of light keepers.—(a) Besides the requirements as to physical ability, the civil-service requirements as to experience and fitness include ability as a waterman or boatman accustomed to handling and pulling sail and motor boats in all kinds of weather, and in certain cases ability to properly handle and care for fog-signal apparatus and machinery. Ability to read and write is required in all cases.

(b) In certain districts where there is little or no necessity for the use of boats at stations, the requirements as to boating experience by applicants may be modified or omitted.

129. In the absence of the keeper his duties will devolve upon the senior assistant keeper present.

130. Weekly inspection.—Keepers will make a personal weekly inspection of the station, including quarters of all assistants and laborers. This inspection of quarters will be made in the presence of the subordinate concerned at a reasonable hour and record made of condition in the journal. This inspection requirement may be waived or modified by the written authority of the superintendent, and in his discretion, in case of illness in the assistant keeper's family or for other reasons.

131. Light stations must never be left unattended.—Either the keeper or an assistant must always be present on duty. At stations having no assistant the keeper must arrange for some competent person to take charge during his absence, which should not extend beyond sunset, except in an emergency or unless authorized by the superintendent.

132. Transportation of keepers and families.—When a lighthouse keeper is transported, under orders, on a tender from one station to

another, he shall be considered as an official passenger. Members of a keeper's family not Government employees, when being transported with a keeper on a tender from one station to another, shall be considered as unofficial passengers and furnished subsistence as such, if desired. They may, however, furnish their own subsistence if they so prefer, but payment must be made by the keeper for any subsistence furnished his family by the tender (371).

133. Teachers for keepers' children.—(a) Section 2 of the act approved June 20, 1918 (40 Stat. 608), provides:

That hereafter the appropriation, "General expenses, Lighthouse Service," shall be available, under regulations prescribed by the Secretary of Commerce, for the payment of traveling and subsistence expenses of teachers while actually employed by States or private persons to instruct the children of keepers of lighthouses.

(b) Whenever light keepers at stations located where there are not school facilities have children of school age, superintendents shall ascertain whether such keepers desire to avail themselves of the benefits of the act of June 20, 1918, quoted above.

(c) Where keepers desire such instruction for their children, superintendents shall advise the proper public-school authorities of the provision of the act of June 20, 1918, referred to, and cooperate so far as practicable in obtaining the services of the teachers required. In cases where public-school teachers are not available, or it is desired to employ teachers other than public-school teachers for the purpose, superintendents shall submit such cases to the commissioner with full details and recommendation.

(d) Where the regular means of transportation by rail or steamer are not available, teachers may be transported from their homes or regular stations to light stations and return by private conveyance or by lighthouse tender when available and it is considered economical to do so.

(e) Payment for meals furnished teachers by keepers or while en route on tenders will be made by the district office on the proper form and at the regularly authorized rates for employees of the Lighthouse Service.

(f) The necessary travel shall be authorized in each case by the written order of the superintendent of lighthouses, and reimbursement for travel expenses, except meals at stations and on tenders, will be made to the teacher by the district office on the blank form and in the manner provided for employees of the Lighthouse Service. Where practicable, necessary railroad and steamship transportation of teachers shall be furnished on the regular Government transportation requests (369).

134. Leave and shore liberty, keepers and assistant keepers.—

(a) For the purpose of granting shore liberty and annual leave to keepers light stations will be divided into two classes, as follows:

(b) Class I includes isolated stations where families do not reside and exceptional cases set forth below, and keepers at such stations may be allowed shore liberty not to exceed 96 days in a calendar year, or at the average rate of 8 days per month for coast districts and lake stations in operation throughout the year, and at stations not in operation during the closed season of navigation not to exceed the average rate of 3 days per month during the actual time the station is in operation.

(c) Shore liberty includes annual leave, sick leave, Sundays and holidays, and time consumed in coming from and returning to station, except as provided herein.

(d) Class II includes all shore stations except as set forth below, and keepers at such stations may be granted 30 days' leave per annum, exclusive of Sundays and holidays, but inclusive of sick leave. At stations having only one keeper the station may be left in charge of a member of the keeper's family during his absence on leave, without charge to the Government, provided that where, by reason of the character of the machinery or other conditions at a station, such an arrangement for the relief of the keeper is considered impracticable or inadvisable by the superintendent, arrangements may be made to allow the keeper not exceeding 15 days' leave in any calendar year, by the employment of a substitute, where necessary, at Government expense. In meritorious cases such keepers may be allowed, in the discretion of the superintendent, not exceeding 30 days' leave in any calendar year without providing a substitute at their expense. Where substitutes are provided at Government expense, annual leave must be taken in not more than two periods each year, and the keeper shall be required to cooperate in providing board and lodging for the substitute at reasonable cost.

(e) In exceptional cases the unusual remoteness or the unhealthfulness of location of certain shore stations where quarters for families are not provided should be considered in classifying them.

(f) When light keepers are on shore liberty or annual leave and for any reason are unable to report to their stations, through no fault of their own, within the time allotted they should promptly notify the superintendent and request instructions; and if assigned to duty, the time consumed in performing such duty should not be counted against their shore liberty or annual leave; Provided that no expense incurred for subsistence during such periods of delay shall be paid by the Lighthouse Service unless specifically authorized by the superintendent.

(g) At stations where two keepers are authorized a keeper may be granted leave in not exceeding four-day periods, within the total number of days authorized for such stations, without the employment of a substitute; provided that such periods of absence may

be limited to not more than two days each at certain stations upon the recommendation of the superintendent and the approval of the commissioner; provided further that where keepers desire leave in more extended periods arrangements may be made to allow a keeper leave in not less than 10-day periods, within the authorized total number of days allowed, by the employment of a substitute at Government expense where necessary, either for the entire periods of absence or for so much thereof as may be required. Where substitutes are provided at Government expense the keepers shall be required to cooperate in providing board and lodging for the substitute at reasonable cost. Where practicable, regularly authorized additional keepers shall be assigned to duty for the relief of keepers while on leave at stations having not more than two keepers and where the employment of a substitute at Government expense would otherwise be necessary. At stations not in operation during the closed season of navigation no leave requiring the employment of a substitute shall be allowed keepers during the time the station is in operation without providing a substitute satisfactory to the superintendent at their own expense, except where relief can be furnished by the assignment of a regularly authorized additional keeper.

(h) At stations where three or more keepers are authorized a keeper may be granted shore liberty with pay without a substitute; provided that the remaining keepers are, in the superintendent's opinion, able to care satisfactorily for the station for the period of authorized shore liberty.

(i) In granting shore liberty or annual leave to keepers of light stations during the stormy season superintendents should carefully consider the danger of injury to public property, etc., during such leave.

(j) Shore liberty or annual leave may be temporarily suspended or reduced by the superintendent, if upon inspecting a station its condition is found to be unsatisfactory.

(k) Unused shore liberty or annual leave shall not be carried over to the next calendar year.

(l) Shore liberty or annual leave shall not be granted a keeper in excess of the amount accrued at the time leave is desired, except when the best interest of the service will be conserved, or in especially meritorious cases. Subject to the provisions of article 135, deduction shall be made from the salary of a keeper leaving the service for the number of days of shore liberty or leave he may have had in excess of the accrued amount.

(m) An absence record shall be kept at each station on the proper form. The station record of absence shall be examined when the station is inspected.

(n) At such isolated stations as are specifically recommended by superintendents and approved by the commissioner keepers may be allowed not to exceed one day as actual and necessary time of transit each way in addition to the leave allowed under the regulations.

(o) Special rules are in effect for unusually isolated stations in remote localities in the ninth and sixteenth districts (451).

135. General provisions regarding leave.—Stations with quarters: Keepers are not considered absent from duty when engaged in regular routine of station, such as attending minor lights, getting supplies, mail, etc., and attending church, except where such absences exceed six hours in any one day, in which case the absence in excess of six hours, unless on official business and so shown on the record, shall be charged to leave, provided that all absences at night shall be recorded on Form 303 and so reported monthly on Form 65.

Stations without quarters: A keeper at his usual residence or en route between the light structure and his home, between regular watches, shall not be considered absent from the station. Absences of any other character will be recorded on the prescribed form. Record, however, should be kept showing what keeper is on duty at any time. At isolated stations with or without quarters, all absences of whatever nature will be recorded on Form 303, such stations to be determined by the superintendent. Keepers leaving a station temporarily must notify the senior assistant present of their departure, return, probable duration of absence, and any other matter necessary to an intelligent execution of their duties. Keepers will require assistants to obtain permission before leaving the station, to report their departure, return, and, if practicable, directions for reaching them in an emergency.

All cases of sickness or other disability preventing a proper performance of duty will be reported as "absence caused by sickness, etc."

Special or doubtful cases not covered by these regulations will be referred to the superintendent for decision.

136. Lamplighters in charge of lights who are only employed upon lighthouse duties for a portion of their time each day are not considered entitled to leave of absence with pay.

137. No sick leave shall be granted by superintendents unless they are satisfied that the applicants are actually too sick to appear for duty, and they may require that a physician's certificate be supplied for every absence on account of illness, however short.

138. Leave during closed season.—Employees in districts where navigation is closed during the winter season may be granted leave of absence in excess of the accrued rate from January to March in each year, when their services can be spared, with the understanding that should such employees leave the service before the end of the calendar

year deduction to cover the leave taken in excess of that which accrued up to the date of their separation shall be made from salary due them and proper amount refunded if salary due is not sufficient.

139. There is no general authority to grant employees leave with pay on election and registration days, etc., unless they are under the regulations entitled to leave with pay, in which case their absence from duty if duly authorized would be charged to such leave.

140. Any abuse of leave of absence shall be reported to the commissioner by the superintendent with recommendation, and further leave refused until authorized by the commissioner. (See art. 134, leaves of absence.)

141. In cases of sickness or other disability light keepers must provide efficient reliefs, and prompt report of the fact must be made to the superintendent. All cases of sickness or other disability interfering with the regular and full performance of the keepers' duties must be noted on Form 303.

142. Watches.—(a) At stations having one or more assistant keepers, watches must be kept and so divided that an equal share of work and desirable hours of watch shall fall to the keeper and to each assistant. Watches shall be stood in such place and manner as to give continuous and the best possible attention to the light and the fog signal when in operation.

(b) At stations having no assistant, the keeper must not leave the light for at least half an hour after lighting, in order to see that it is burning properly, and must visit the light at least twice between 8 p. m. and sunrise, and on stormy nights the light must be constantly looked after.

(c) At stations where automatic alarms are installed the keepers shall see that these mechanisms are kept in good working order, and that they are tested from time to time to see that they function in a proper manner.

143. Length of time to exhibit lights.—Lights must be exhibited punctually at sunset and kept lighted at full intensity until sunrise, when the lights will be extinguished and the apparatus put in order without delay for relighting. When not in use, the illuminating apparatus must be covered and the lantern curtains hung.

144. At stations where navigation is closed because of ice in the winter, and in the absence of definite instructions from the superintendent, lights may be extinguished when navigation ceases but must always be shown when it is at all possible for vessels to benefit by them. The time of discontinuance and of relighting must be promptly reported. Keepers of isolated stations, when in doubt, should be governed in exhibiting their lights by the action of those less isolated.

145. Cleanliness of station.—Light keepers must keep their premises clean and well whitewashed, grounds in order, all the inside painted work of the lanterns well washed. Spare articles on hand must be examined frequently, kept clean, and in order for use.

146. Property returns for light stations.—(a) A property return on the proper form shall be prepared for each light station by the keeper showing the property on hand at his station on June 30 of each year and the property received and expended during the fiscal year. One copy must be forwarded to the superintendent not later than August 1. An inventory must be taken, and the property reported in the return must be checked by actual count, and all discrepancies must be explained in a letter attached to the return or by certificates for lost property. For use in making up the property return and examining the same there must be kept at each station a file of all invoices or bills for property received and copies of surveys of property. Account must be kept of all supplies expended, either by memorandum receipts or in a memorandum book.

(b) In connection with the periodic inspection of a light station or at any other time, but at least once annually, the property records shall be examined at the station by the inspecting officer to verify their correctness. Selected items of property shall be checked against the keeper's last annual property return, with special reference to the amount shown "on hand" by said return and taking into consideration the receipts and expenditures since the last return as shown by the records. Statement as to condition of property at light stations shall be included in the report of inspection of the stations.

(c) The annual property return shall be carefully checked and verified in the district office (328).

147. Erection of buildings.—Keepers shall not erect any buildings of a permanent character on lighthouse premises except as may be authorized. Approval must first be obtained from the superintendent as to the location, size, exterior appearance, disposition upon the removal of the keeper, etc., of minor buildings such as henhouses, which keepers may wish to erect at their own expense.

148. Salutes.—A vessel displaying official flags indicating the presence on board of officials or persons entitled to such courtesy shall be saluted with three strokes of the bell, or three blasts from other signal, when practicable, upon its departure from the station or in passing. Bells having no inside clapper should have connecting rods detached before saluting with the striker.

149. Boats.—(a) Boats shall be marked and known by their official numbers assigned by the superintendent. Except in cases of emergency, involving the saving of life or property, or unless authorized by the commissioner, lighthouse boats shall be used for official pur-

poses only, which shall be construed to include all work connected directly or indirectly with the care and maintenance of the station and the personnel thereof.

(b) Station boats must never be used for heavy freight or by working parties, except under the supervision of the keeper or by authority of the superintendent.

(c) Keepers and assistant keepers will be held responsible for the proper care of station boats while ashore for supplies, liberty, or other official purposes and will be chargeable financially for the loss or damage due to lack of proper precautions at any time.

150. Painting of boats.—All boats of stations or depots shall be painted lead color inside and out, with their official number painted on each bow under the letters "U.S.L.H.S." The numbers and letters on such boats shall be in black, of suitable proportions, 3 inches high. (See art. 164 for method of painting structures.)

151. Keyboard.—When practicable, a keyboard will be kept in a safe and accessible place where all official keys must be hung when not in use by light keepers.

152. Necessary supplies will be issued daily by the keeper in the presence of an assistant, if practicable. The exact quantities thus expended must be entered immediately in the record for entering expenditures.

153. The 5-gallon brass cans shall be used for the daily issue of kerosene and must be completely emptied and cleaned before refilling. In refilling, pour off gently all except about 1 inch of the oil from the transporting can into the brass can. The remaining inch of oil in the transporting can is to be then drawn off in a can kept for the purpose and set aside for use in the hand and table lamps.

154. In drawing oil from the brass can for daily consumption in the lens lamp again set aside the last inch of oil in the bottom of this can for use in the hand and table lamps. With oil vapor lamps, the additional precaution must be taken of passing the oil through the filter the day before and setting aside the last layer of oil in the bottom of the filter for use in the hand or table lamps.

Oil must never be siphoned from the transporting cans or any other method of emptying employed than pouring off. The oil must be strained when poured off and again when poured into the lamp.

155. Precautions against fire.—(a) Every precaution must be taken against fire. Fire buckets, when provided, must be kept filled with water and other fire apparatus kept accessible and in a fixed place.

(b) Liquid chemical fire extinguishers must be kept charged, have attached tags showing date of charging, must be recharged at least once every year, kept in a fixed and easily accessible place, and the personnel instructed in their use.

(c) Ashes or sand must be kept available for use on burning kerosene, gasoline, etc.

(d) Should oil or gasoline become ignited, the best means of extinguishing it is by the use of the liquid chemical fire extinguishers, being sure to direct the stream at the base of the fire. In the absence of such an extinguisher sand, earth, or ashes should be used. A heavy woolen blanket thrown over the fire will also tend to smother it.

(e) Fires or lights in buildings must never be left unattended.

(f) Smoking is prohibited in all buildings belonging to the Lighthouse Service except in living quarters.

(g) Open lights must never be taken into rooms used for storing oils, paints, gasoline, or other inflammable materials.

(h) Only safety matches, or those furnished by the Lighthouse Service, will be allowed on lighthouse premises.

(i) Oily waste, rags, and other means of spontaneous combustion must be promptly destroyed (333).

(j) The following instructions shall be carefully observed in the handling and use of alcohol for incandescent oil vapor lamps and other purposes at light stations:

1. It is to be stored in the oil houses at light stations on shore or in the oil rooms of stations on submarine sites, both the oil houses and the oil rooms to be well ventilated.

2. That it be kept stored in the original 1 and 5 gallon cans in which it is received at the station and not transferred in quantity to larger containers with faucets. Containers should be so painted or plainly marked as to avoid possible mistakes as to contents.

3. That the cans be stored separately from other stores, marked or tagged for easy identification and placed so that leaks will show up readily. No open lights, lighted cigars, cigarettes, or pipes are to be taken into the places where alcohol is stored. The cans are to be examined once a week at least for leaks.

4. No cans with faucets will probably be furnished, but should they be either in commercial cans or otherwise the faucets are to be examined to see that they shut tight. Cans provided with the usual low screw cap near one corner must have the caps kept fastened down tight.

5. An ordinary $\frac{1}{2}$ -pint squirt can full of alcohol is generally sufficient for an incandescent oil vapor lamp for one night, and no greater amount should be drawn unless for good reasons, or for use in connection with fog signal engine torches, it is desirable to fill a 2-quart lamp feeder. The latter should be kept at some convenient place but not carried into the lantern; the squirt can should be used only in the lantern or at the fog signal engine torch.

6. The squirt can must be filled only in daylight from the original cans in the oil house or room or from the lamp feeder. Both these

containers must be kept tightly closed and spouts capped and observed often for leaks. The lockers in which both are kept must be well ventilated and the doors labeled to show what is inside and warn against carelessness. If alcohol is spilled, allow it to evaporate or mop up, especially in the lantern before any matches are used.

7. No matches other than safety matches as provided by the Lighthouse Service must be used and then only with caution in lighting incandescent oil vapor lamps, night lamps in the tower, and fog signal engine torches. A receptacle for used matches should be kept in each place.

8. Matches, candles, or open flames of any kind must not be used for searching in dark places about the oil houses, oil rooms, towers, or where inflammable materials are stored or gas may collect.

9. The use of electric flashers or lanterns is optional, to be purchased as occasion demands or permits.

10. All keepers and other employees must be warned of the danger due to careless handling of alcohol in connection with open lights of any kind and that disciplinary action will follow disregard of the above.

156. **Fire drills at depots.**—Fire drills shall be required at depots where combustible property is stored at least once a month, and each drill shall be noted on the keeper's monthly report or other proper record (334).

157. **Storehouses, oil houses, and other storage buildings at depots and light stations** shall be kept locked, except when being entered on official business.

158. **Regulation working clothes** may be worn when engaged in cleaning apparatus, etc. (See art. 17, uniforms.) Regulation aprons may be worn when cleaning lamps and lenses.

159. **Allowances for fuel and gasoline at stations.**—(a) A fuel allowance will be made to a light station only as may be authorized by the commissioner.

(b) Each station to which a Government power boat is assigned shall have an authorized allowance of gasoline or other fuel, to be based on the reasonable official requirements of the station.

(c) These allowances are not to be considered as either a perquisite or an emolument, but solely to facilitate the work of the service. Allowances of gasoline or other fuel for motor boats shall be based on the approximate number of hours each boat is run on official business during a month and the horsepower of the motor of each boat. In computing necessary requirements it has been found that 1 pint of gasoline per running hour for each horsepower has proved sufficient, and allowances should be made on this basis, but consideration should be given to an adjustment to meet special conditions due to age, condition, or inefficiency of the engine, the total

extra allowance for all causes not to exceed 25 per cent for any one station. The amount authorized shall be considered as simply a limit to the quantity to be used for official purposes connected with the station, and superintendents are required to take such measures as are necessary to control the consumption of gasoline in station boats and to see that it is restricted to the actual needs of the service economically carried out. If accumulations of these supplies result, they must be indicated clearly in requisitions and must be used up the following year and taken into account when filling requisitions (361).

160. **Electric current and lamp allowances.**—(a) The following are maximum allowances for current, etc., at lighthouse dwellings having commercial electric light paid for by the Lighthouse Service, based on the lighting requirements of a dwelling containing six rooms of average size:

(b) Amount of current to be paid for by Lighthouse Service not to exceed 30 kilowatt-hours per month.

(c) Number of lamps to be furnished by Lighthouse Service not to exceed 10 per year.

(d) Adjustments in allowances for quarters having more or less than six rooms to be made according to the following schedule:

Kitchen: Two lamps per year, 7 kilowatt-hours per month.

Dining room: One lamp per year, 4 kilowatt-hours per month.

Living room: Three lamps per year, 11 kilowatt-hours per month.

Bed room: Two lamps per year, 4 kilowatt-hours per month.

(e) All current and lamps used in excess of authorized allowances to be paid for by keepers.

(f) Unless there are valid reasons to the contrary, superintendents will be guided by the foregoing schedule in fixing present and future maximum allowances for commercial electric current and lamp consumption.

161. **Keepers to furnish accommodations.**—(a) Whenever it may be necessary for a superintendent or other agent of the Lighthouse Service to remain at a light station, he is authorized to occupy one of the rooms of the keeper's dwelling as an office and chamber and may require the keeper to furnish him board and necessary furniture, for which a reasonable compensation shall be paid.

(b) The keepers of light stations are required to give such assistance as they can to working parties connected with the Lighthouse Service. If the outbuildings at the stations will not properly lodge the party, the keeper may be called on by the superintendent to furnish lodgings at the rate not to exceed two persons for each room not actually occupied by him or his family.

(c) Payment for meals furnished working parties and other employees will be made by the district office at the regularly authorized rates on the proper form, unless other rates are authorized by the commissioner (367).

162. Courtesy to visitors.—(a) Visitors must be received with courtesy and may be admitted in limited numbers to lighthouse reservations and lighthouses at prescribed hours as may be determined by the superintendent and which will not interfere with the work of the service.

(b) Visitors while on the reservation shall be accompanied by an employee and must not be allowed to touch any part of a lens or other apparatus, or deface or injure any part of the equipment, buildings, or grounds. Children must not be admitted unless accompanied by adults.

(c) Disorderly or boisterous persons must not be admitted nor unseemly conduct of any description allowed.

(d) Employees are forbidden to accept gratuities.

(e) Keepers shall see that a copy of the "Rules for visitors," Form 119, is posted at or near each entrance to the reservation or at some other convenient place where it can be seen by visitors, as well as in the tower and in the fog-signal house, if any.

(f) Keepers shall strictly enforce the regulations in regard to visitors and will be held accountable for damage caused by them to lighthouse property.

(g) The power machinery and other apparatus must not be started for the purpose of showing visitors the operation of the light or the fog signal, etc.

163. Repairs to be made by keepers.—(a) All painting and application of washes to structures at light stations and minor repairs and improvements required in the ordinary preservation and maintenance of the buildings and stations shall be done, so far as practicable, by the keepers of the stations, under the direction of the superintendent; but in the case of extensive repairs, or when from any cause it is considered by the superintendent impracticable for the keepers to do the work required, necessary assistance may be given by the employment of competent workmen.

(b) No additions, alterations, or other changes to telephones installed at light stations by the Lighthouse Service or by the Coast Guard shall be made except upon proper authority (139).

164. Painting structures, etc.—(a) All painting and application of washes, including the necessary cleaning, scraping, or chipping at light stations, shall be done by the keepers, except when otherwise ordered by the superintendent. Both the interior and exterior of all structures at light stations must be kept clean by frequent scrubbing and be properly preserved by the application of paints and washes.

(b) No parts will be painted to give them a clean appearance when there is ample paint to protect the parts and same are dirty or dingy in appearance. They shall be scrubbed, which will be done as

often as necessary, and no paint shall be applied until the existing paint is worn thin. This applies to the exterior of buildings and towers as well as to the interior. In cases where the paint is excessively thick, cracked, peeling, or blistered, the same shall be scraped off and surfaces sandpapered before any more paint is applied. When a blow torch is used, care shall be taken regarding fire risks, and the torch must not be inverted while lighted.

(c) *Roofs, etc.*—All tin or galvanized-iron roofs, gutters, and leaders should be painted once each year. Before painting, all loose or blistered paint should be scraped off and all parts brushed with wire brushes. Then all bare spots should be painted two coats of red lead paint and, when dry, the entire surface painted with one coat of brown metallic paint. All exposed ironwork should be painted once each year. Before painting, the surface should be carefully examined to see if there are any blisters or any rust forming under the paint. If so, the entire surface thus affected should be scaled to the bare metal with scaling hammers, then painted with two coats of red lead and, when the red lead is dry and hard, with one coat of the color required by the regulations. If rusty spots are observed to be forming between times of annual painting, such spots should be given attention in the above manner at once. Where drinking water is obtained from roofs, special instructions will be given by the superintendent.

(d) *Washes.*—Before applying a new coat of wash, all loose peeling sections of the preceding coats should be scraped off. Surfaces should be scraped when necessary to keep the wash from becoming excessively thick.

(e) *Windows.*—All window sashes must be kept well puttied. When it is found that the old putty is cracked, it should be entirely removed and sashes allowed to become perfectly dry, after which they will be primed with white-lead paint and, when paint has dried sufficiently to become sticky, the putty may then be replaced and paint and putty allowed to harden together. When putty becomes hard, it may then be painted. In so doing care must be used not to get paint on the glass and make a ragged appearance.

(f) *Boats.*—Care must be exercised in the painting of boats to see that all loose and cracked paint is cleaned out of the bottom and that they are well cleaned and dry before painting.

(g) *Brass work.*—The painting of any brass work or apparatus is prohibited.

(h) *Machinery.*—Fog-signal engines or other machinery shall not be painted except by special permission of the superintendent. New machinery shall not be painted.

(i) *Hardwood floors* in dwellings should not be painted except by special authority of the superintendent but must be kept thor-

162. Courtesy to visitors.—(a) Visitors must be received with courtesy and may be admitted in limited numbers to lighthouse reservations and lighthouses at prescribed hours as may be determined by the superintendent and which will not interfere with the work of the service.

(b) Visitors while on the reservation shall be accompanied by an employee and must not be allowed to touch any part of a lens or other apparatus, or deface or injure any part of the equipment, buildings, or grounds. Children must not be admitted unless accompanied by adults.

(c) Disorderly or boisterous persons must not be admitted nor unseemly conduct of any description allowed.

(d) Employees are forbidden to accept gratuities.

(e) Keepers shall see that a copy of the "Rules for visitors," Form 119, is posted at or near each entrance to the reservation or at some other convenient place where it can be seen by visitors, as well as in the tower and in the fog-signal house, if any.

(f) Keepers shall strictly enforce the regulations in regard to visitors and will be held accountable for damage caused by them to lighthouse property.

(g) The power machinery and other apparatus must not be started for the purpose of showing visitors the operation of the light or the fog signal, etc.

163. Repairs to be made by keepers.—(a) All painting and application of washes to structures at light stations and minor repairs and improvements required in the ordinary preservation and maintenance of the buildings and stations shall be done, so far as practicable, by the keepers of the stations, under the direction of the superintendent; but in the case of extensive repairs, or when from any cause it is considered by the superintendent impracticable for the keepers to do the work required, necessary assistance may be given by the employment of competent workmen.

(b) No additions, alterations, or other changes to telephones installed at light stations by the Lighthouse Service or by the Coast Guard shall be made except upon proper authority (139).

164. Painting structures, etc.—(a) All painting and application of washes, including the necessary cleaning, scraping, or chipping at light stations, shall be done by the keepers, except when otherwise ordered by the superintendent. Both the interior and exterior of all structures at light stations must be kept clean by frequent scrubbing and be properly preserved by the application of paints and washes.

(b) No parts will be painted to give them a clean appearance when there is ample paint to protect the parts and same are dirty or dingy in appearance. They shall be scrubbed, which will be done as

often as necessary, and no paint shall be applied until the existing paint is worn thin. This applies to the exterior of buildings and towers as well as to the interior. In cases where the paint is excessively thick, cracked, peeling, or blistered, the same shall be scraped off and surfaces sandpapered before any more paint is applied. When a blow torch is used, care shall be taken regarding fire risks, and the torch must not be inverted while lighted.

(c) *Roofs, etc.*—All tin or galvanized-iron roofs, gutters, and leaders should be painted once each year. Before painting, all loose or blistered paint should be scraped off and all parts brushed with wire brushes. Then all bare spots should be painted two coats of red lead paint and, when dry, the entire surface painted with one coat of brown metallic paint. All exposed ironwork should be painted once each year. Before painting, the surface should be carefully examined to see if there are any blisters or any rust forming under the paint. If so, the entire surface thus affected should be sealed to the bare metal with scaling hammers, then painted with two coats of red lead and, when the red lead is dry and hard, with one coat of the color required by the regulations. If rusty spots are observed to be forming between times of annual painting, such spots should be given attention in the above manner at once. Where drinking water is obtained from roofs, special instructions will be given by the superintendent.

(d) *Washes.*—Before applying a new coat of wash, all loose peeling sections of the preceding coats should be scraped off. Surfaces should be scraped when necessary to keep the wash from becoming excessively thick.

(e) *Windows.*—All window sashes must be kept well puttied. When it is found that the old putty is cracked, it should be entirely removed and sashes allowed to become perfectly dry, after which they will be primed with white-lead paint and, when paint has dried sufficiently to become sticky, the putty may then be replaced and paint and putty allowed to harden together. When putty becomes hard, it may then be painted. In so doing care must be used not to get paint on the glass and make a ragged appearance.

(f) *Boats.*—Care must be exercised in the painting of boats to see that all loose and cracked paint is cleaned out of the bottom and that they are well cleaned and dry before painting.

(g) *Brass work.*—The painting of any brass work or apparatus is prohibited.

(h) *Machinery.*—Fog-signal engines or other machinery shall not be painted except by special permission of the superintendent. New machinery shall not be painted.

(i) *Hardwood floors in dwellings* should not be painted except by special authority of the superintendent but must be kept thor-

oughly clean and properly coated and protected by shellac or varnish. Workbenches ordinarily should not be painted.

(j) *Scrubbing and cleaning.*—To clean painted woodwork or other painted surface, scrub with clean, fresh water and soap. If necessary, a small amount of sal soda, ammonia, or washing compound may be put in the water. After scrubbing wipe off with clean water and cloth.

(k) *Paint board.*—Keepers will be furnished, when practicable, with a sample paint board carrying authorized colors and the standard shades with which they are concerned, with instructions for mixing them. Bright and glaring colors must not be used in painting interior walls.

(l) *Preparation of work for painting.*—Paint will not adhere to nor dry upon wood or metal which is not perfectly clean and entirely free from moisture, dust, soot, and grease. The surface to be painted must be thoroughly dry, and no painting should be done in rainy or foggy weather or just after a frost. Dust and soot must be removed by brushes and cloths and by washing with hot soft water and soap.

(m) *To remove paint from woodwork.*—Mix soft soap, 2 ounces, and potash, 4 ounces, in a small quantity of boiling water with quicklime, one-half pound, to form a paste; apply hot and let it remain for one day, or use some form of prepared paint remover.

(n) *To prepare new tin work.*—All traces of oil, grease, and rosin must first be removed, and to secure a clean surface it may be washed with benzene. If light rust has set in, apply sandpaper, dust off, and give a coat of boiled linseed oil before proceeding to paint.

(o) *To prepare new galvanized iron.*—To make paint adhere to galvanized iron, its surface should be allowed to weather naturally or roughened by washing with vinegar or diluted muriatic acid applied with a wide, soft brush. When dry, the surface is ready for the first coat of paint. All traces of the acid should be removed.

(p) *To prepare plastered walls.*—The walls must be thoroughly dry and brushed free from all dust and loose particles of mortar. Then prime with two or three coats of linseed oil or red-lead priming, and when they are dry the colored finishing coats can be put on.

(q) *To prepare brickwork.*—In order that a good piece of painting be obtained, it is necessary that the walls be absolutely dry and free from moisture, and that the suction of the brickwork be stopped. If the bricks are inclined to be soft, at least one week of dry weather should elapse; but, better still, painting should be deferred until well into a dry spell. Give the wall a good brushing with a stiff corn broom in order to remove dust, loose sand, etc., before priming, which should be of raw oil with very little pigment in it, and when dry, putty up. Use pure white lead in the second coat, thinning with two parts

raw oil and one part turpentine, adding a little drier as required; rub well in. Then apply the finishing coat, flat, or glossy as desired; if glossy, use good boiled linseed oil. Not less than three coats should be applied. If the walls have already been painted and the paint is scaling off, see that the walls are well scraped and allowed to stand during the hot months in order that all moisture can evaporate before beginning to repaint.

(r) *To prepare new woodwork.*—In unpainted woodwork kill all knots, sap, and pitch streaks with a coat of clear shellac dissolved in alcohol, or otherwise they will cause yellow stains in the finished work. Bad knots should be cut out and a piece of good wood inserted in their places. After treating the knots, etc., a thin priming coat of paint is applied. Raw linseed oil may be used in priming new woodwork. As the object of the priming coat is to fill the pores of the wood, it should be carefully applied; a poor priming coat is sure to give unsatisfactory results. All nails should then be set in to a depth of one-eighth inch or more, and the nail holes, cracks, joints, etc., should be well puttied. Then rub down with sandpaper, and remove dust.

(s) *Mixing paints for inside use.*—If the paints are ready mixed, use as stated above. If not ready mixed, take the necessary quantity of paint from the can or keg and mix in a bucket with boiled linseed oil until it is of the consistency of cream, then put in japan drier or other drier in the proportion of 1 part of drier to 32 parts of paint and mix the paint, oil, and drier well together, when it will be ready for immediate use. When the paint in the bucket becomes thicker than cream, it must be thinned by adding small quantities of spirits of turpentine, and it may be necessary to add at the same time a very small quantity of boiled linseed oil to increase its drying qualities. For white paint mix white lead and white zinc in equal parts with spirits of turpentine to form the consistency of cream. If the paint thickens, then thin with turpentine. Black paint may be prepared with dry lampblack mixed with damar or coach-maker's varnish and then thinned to the consistency of cream with boiled linseed oil and spirits of turpentine. A gloss may be given to ready-mixed black paint by adding damar or coach-maker's varnish.

(t) *Mixing paints for outside work.*—Paints for outside work are to be mixed with boiled linseed oil and the necessary quantity of japan drier. In mixing paints for outside work spirits of turpentine is not to be used except in very small quantities. When painting in cold weather is necessary, turpentine may be used as directed by the superintendent. Particular care should be taken in mixing paints for outside work to stir the mixture thoroughly. For outside white paint mix $3\frac{1}{2}$ parts of white lead and $5\frac{1}{2}$ parts of white zinc with boiled linseed oil to the consistency of cream, adding not over $\frac{1}{2}$ pint japan drier and $\frac{1}{4}$ pint of turpentine to the gallon of oil. For outside lead color use lampblack in oil, using above formula for white.

For outside black paint mix lampblack in oil with boiled linseed oil and the necessary quantity of japan drier. For outside brown mix brown metallic, if in paste form, with boiled linseed oil to proper consistency, using not over $\frac{1}{2}$ pint japan drier and $\frac{1}{4}$ pint turpentine to 1 gallon of oil. Ready-mixed brown metallic contains driers necessary.

(u) *Methods of producing colors.*—Gray or lead color: To white paint ground in oil, or ready-mixed paint, add small quantities of lampblack or black paint ground in oil until the desired shade is obtained. Straw or buff color: To white paint ground in oil add in small quantities at a time chrome yellow, or yellow ochre, until the desired shade is obtained. Brick color: Mix Venetian red and yellow ochre. Oakwood color: To white paint add yellow ochre. Portland straw color: Mix umber, yellow, and white paint. Various colors may also be produced by the use of pure paint materials combined with tinting colors put up by various paint manufacturers. Red lead for iron and buoy work: Wet the dry red lead with water, first allowing it to stand 24 hours, then drain off the water. Mix 100 pounds red lead with 3 gallons boiled linseed oil. Add 10 pounds Venetian red (paste form) to the red lead after it has been mixed with a small quantity of the oil. Stir thoroughly and add balance of the linseed oil. Stir occasionally during use. If red lead in paste form is used, break up the paste by the addition of pure raw linseed oil, a little at a time, stirring thoroughly. Add a small quantity of japan drier as required. About $2\frac{1}{2}$ to 3 gallons of raw linseed oil and 1 to $1\frac{1}{2}$ pints of japan drier will be required to each 100 pounds of red-lead paste.

(v) *Use and care of brushes.*—Paintbrushes are round, oval, or flat, and their flag ends set either flush, slightly rounded, or chiseled to suit the kind of work for which they are intended. The large paintbrushes are used for priming and painting over large surfaces which require considerable quantities of paint. The small brushes are similarly used for smaller surfaces. Separate brushes should be used for each color. If there is a shortage of brushes and it is desired to use them for a different color, wash them in linseed oil or turpentine and then with soap and water. The oil or turpentine used for washing should be saved for mixing paint of the same color. It is important to properly swell a new brush before putting it to use, but under no circumstances should it be put into water to soak, for this will cause the brush to always work flabby, and if the bristles are of fine grade the brush will twist out of shape. The best method of swelling the head of the brush that has dried out, is to separate the bristles carefully and pour a tablespoonful of water on the brush end of the handle and then stand the brush with the bristles up until the water has been absorbed. This will swell the head and make it as firm as when made. Brushes which have been used must not be left to dry with the paint in them. They must be kept

soft by immersing them in enough linseed oil to cover the bristles to within one-half inch of the binding only. Place sufficient linseed oil in a can, pail, or jar and hang or suspend the brushes in the oil, the bristles to be free from the bottom. Brushes standing in water with bristles and ferrules wholly immersed will soon be unfit for use. When through using brushes, and they are to be laid away for some time, they should first be washed in turpentine, then with soap and water until all paint is removed, and then thoroughly dried.

(w) *Care of paints.*—Keep in a dry place. Keep driers or varnish in tins or bottles. The paint remaining in a partly empty keg or pail should be covered with oil and a cover placed over the same. Never leave paint to dry or exposed to the air or weather.

(x) *Instructions for painting.*—Paint should be put on by strokes parallel with the grain of the wood, and long, smooth pieces like window and door casings should be finished by drawing the brush carefully along the whole length if practicable, so that there may be no breaks in the lines or by smoothing on to the painted surface as work progresses. If the brush is held too obliquely to the work, it will leave the paint in thick masses wherever it is first applied after being dipped into the pot, and the surface will be daubed but not painted. A succeeding coat should not be put on until the one previously applied has become thoroughly dry and hard, which will never be the case so long as it is sticky in the least to the touch. Each coat should be of the same thickness throughout, otherwise the work when completed will have an unfinished and slovenly appearance. Paint put on too thin after priming will crack in drying; if put on too thick it will blister, wrinkle, and peel off. In using the brush where there is sufficient space, draw long strokes to extend the color in a smooth and uniform manner. Where the space is contracted or rough, the paint should be laid on in dabs for the purpose of getting it into the recesses and places where the surface is unequal.

(y) *Colors.*—The following colors shall be used in painting lighthouse structures.

Outside colors, unless otherwise authorized by the commissioner:

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|--|---|
| 1. Wooden structures..... | Dark red, brown, or white, red, or lead-colored trimmings. ¹ |
| 2. Towers..... | White. |
| 3. Lanterns and gallery rails..... | Black. |
| 4. Iron structures (other than towers)--- | Brown. |
| 5. Shutters..... | Red, green or brown. |
| 6. Iron walks, rails, and steps..... | Brown. |
| 7. Wooden walks, rails and steps..... | Lead color. |
| 8. Stone and brickwork (when authorized) and rough board work. | Whitewash. |

¹ Continue use of brown metallic as improved by remedies employed in each district or some good brand of red oxide paint approaching brown in color.

Inside colors:

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|---|---|
| 1. Interior of lanterns and generally all interior woodwork except hardwood. | White (with the exception of blank panes, which should be dull black). |
| 2. Wooden floors, staircases, rails, and walls, when authorized to be painted (hard-pine floors and hardwoods generally are not to be painted). | Grained or lead color. |
| 3. Iron floors, staircases, and railings, and interior ironwork in general, pedestals, and service tables. | Brown. |
| 4. Walls, cellars, and outhouses, when painting has not been authorized. | Whitewash. |
| 5. Plastered wall and ceilings----- | Where practicable, the interior walls and ceilings of houses, instead of being papered, shall be painted regulation tints, as follows: Cream-colored, light sea green, drab, or transparent oil paint, or reliable cold-water paints of the same tints. |

(z) All surfaces used for collecting water supplies shall be painted with nonpoisonous paints.

(aa) The outside colors prescribed herein shall be modified where necessary, to the extent that the color of oil houses and other out-buildings at stations and depots will harmonize with the color of the main structures.

(ab) *Interior walls and ceilings.*—Where practicable, the interior walls and ceilings of houses shall be painted or washed regulation tints instead of being papered. A dull finish is preferable.

(ac) *Putty.*—If it is necessary to make it, take 4 parts of pulverized Spanish or gilders' whiting to 1 part of raw linseed oil and beat it up into a paste. If wanted as quick-drying putty, use boiled linseed oil. When too hard for use, it may be softened by mashing and rolling in the hands and by the addition of a little linseed oil. Keep put up in bladders protected from the sun and weather or in friction-top tin cans covered with linseed oil.

(ad) *Coal tar and asphaltum varnish.*—These materials must not be used for painting lanterns, lantern decks, or steel structures generally.

(ae) *Whitewash.*—The following recipe for whitewashing has been found by experience to answer on wood, brick, and stone nearly as well as oil paint and is much cheaper: Slake half a bushel of unslaked lime with boiling water, keeping it covered during the process; strain it and add a peck of salt dissolved in warm water, 3 pounds of ground rice put in boiling water and boiled to a thin paste, half a pound of powdered Spanish whiting and a pound of clear glue dissolved in warm water; mix these well together, and let the mixture stand for

several days. Keep the wash thus prepared in a kettle or portable furnace and when used put it on as hot as possible with painters' or whitewash brushes. The following formula for mixing whitewash when properly made and put on, gives a white that does not easily wash or rub off, viz: To 10 parts of best freshly slaked lime add 1 part of best Portland cement, mix well with salt water and apply quite thin. Whitewash must never be used on ironwork.

(af) *Cement wash for outside of lighthouses.*—Take fresh Portland cement 3 parts, clean sand 1 part, and mix them thoroughly with fresh water. With the approval of the superintendent neat cement, without the admixture of sand, may be used in special cases. This will give a gray or granite color, dark or light according to the color of the cement. If a brick color is desired, add enough Venetian red to the mixture to produce that color. The cement, sand, and coloring matter must be mixed together. If white is desired, the walls when new should receive two coats of cement wash and then whitewash. After the work has received the first coat, a single coat every three or four years will be sufficient. It is best to thoroughly dampen the wall with clean fresh water and follow immediately after with the cement wash. This course will prevent the bricks from absorbing the water from the wash too quickly and will give time for the cement to set. Care must be taken to keep all ingredients of the cement wash well stirred during the application of it. The mixture must be made as thick as it will admit of to be conveniently put on with a whitewash brush.

(ag) *Varnishing.*—In using varnish great care should be taken to have everything quite clean, washing it if necessary. The cans should be kept corked, the brushes free from oil and dirt, and the work protected from dust or smoke. Varnish should be applied in very thin coats, laid on in the direction of the fibers of the wood and sparingly at the angles. Good varnish should dry so quickly as to be free from stickiness in one or two days. Its drying will be greatly facilitated by the influence of light, but dampness and drafts of cold air must be avoided. No second or subsequent coat of varnish should be applied until the previous coat is permanently hard, otherwise the drying of the under coat will be stopped. The time required for this depends not only upon the kind of varnish but also upon the state of the atmosphere. Under ordinary circumstances spirit varnishes require from 2 to 3 hours between every coat, turpentine varnishes require 6 to 8 hours, and oil varnishes still longer, sometimes as much as 24 hours. Oil varnishes are easier to apply than spirit varnishes, in consequence of their not drying as quickly. The surface of natural wood which is to be varnished should be "filled" before the varnish is applied to prevent it from being wasted by sinking into the pores of the wood. Fillers are usually made under

Inside colors:

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|---|---|
| 1. Interior of lanterns and generally all interior woodwork except hardwood. | White (with the exception of blank panes, which should be dull black). |
| 2. Wooden floors, staircases, rails, and walls, when authorized to be painted (hard-pine floors and hardwoods generally are not to be painted). | Grained or lead color. |
| 3. Iron floors, staircases, and railings, and interior ironwork in general, pedestals, and service tables. | Brown. |
| 4. Walls, cellars, and outhouses, when painting has not been authorized. | Whitewash. |
| 5. Plastered wall and ceilings----- | Where practicable, the interior walls and ceilings of houses, instead of being papered, shall be painted regulation tints, as follows: Cream-colored, light sea green, drab, or transparent oil paint, or reliable cold-water paints of the same tints. |

(2) All surfaces used for collecting water supplies shall be painted with nonpoisonous paints.

(aa) The outside colors prescribed herein shall be modified where necessary, to the extent that the color of oil houses and other out-buildings at stations and depots will harmonize with the color of the main structures.

(ab) *Interior walls and ceilings.*—Where practicable, the interior walls and ceilings of houses shall be painted or washed regulation tints instead of being papered. A dull finish is preferable.

(ac) *Putty.*—If it is necessary to make it, take 4 parts of pulverized Spanish or gilders' whiting to 1 part of raw linseed oil and beat it up into a paste. If wanted as quick-drying putty, use boiled linseed oil. When too hard for use, it may be softened by mashing and rolling in the hands and by the addition of a little linseed oil. Keep put up in bladders protected from the sun and weather or in friction-top tin cans covered with linseed oil.

(ad) *Coal tar and asphaltum varnish.*—These materials must not be used for painting lanterns, lantern decks, or steel structures generally.

(ae) *Whitewash.*—The following recipe for whitewashing has been found by experience to answer on wood, brick, and stone nearly as well as oil paint and is much cheaper: Slake half a bushel of unslaked lime with boiling water, keeping it covered during the process; strain it and add a peck of salt dissolved in warm water, 3 pounds of ground rice put in boiling water and boiled to a thin paste, half a pound of powdered Spanish whiting and a pound of clear glue dissolved in warm water; mix these well together, and let the mixture stand for

several days. Keep the wash thus prepared in a kettle or portable furnace and when used put it on as hot as possible with painters' or whitewash brushes. The following formula for mixing whitewash when properly made and put on, gives a white that does not easily wash or rub off, viz: To 10 parts of best freshly slaked lime add 1 part of best Portland cement, mix well with salt water and apply quite thin. Whitewash must never be used on ironwork.

(af) *Cement wash for outside of lighthouses.*—Take fresh Portland cement 3 parts, clean sand 1 part, and mix them thoroughly with fresh water. With the approval of the superintendent neat cement, without the admixture of sand, may be used in special cases. This will give a gray or granite color, dark or light according to the color of the cement. If a brick color is desired, add enough Venetian red to the mixture to produce that color. The cement, sand, and coloring matter must be mixed together. If white is desired, the walls when new should receive two coats of cement wash and then whitewash. After the work has received the first coat, a single coat every three or four years will be sufficient. It is best to thoroughly dampen the wall with clean fresh water and follow immediately after with the cement wash. This course will prevent the bricks from absorbing the water from the wash too quickly and will give time for the cement to set. Care must be taken to keep all ingredients of the cement wash well stirred during the application of it. The mixture must be made as thick as it will admit of to be conveniently put on with a whitewash brush.

(ag) *Varnishing.*—In using varnish great care should be taken to have everything quite clean, washing it if necessary. The cans should be kept corked, the brushes free from oil and dirt, and the work protected from dust or smoke. Varnish should be applied in very thin coats, laid on in the direction of the fibers of the wood and sparingly at the angles. Good varnish should dry so quickly as to be free from stickiness in one or two days. Its drying will be greatly facilitated by the influence of light, but dampness and drafts of cold air must be avoided. No second or subsequent coat of varnish should be applied until the previous coat is permanently hard, otherwise the drying of the under coat will be stopped. The time required for this depends not only upon the kind of varnish but also upon the state of the atmosphere. Under ordinary circumstances spirit varnishes require from 2 to 3 hours between every coat, turpentine varnishes require 6 to 8 hours, and oil varnishes still longer, sometimes as much as 24 hours. Oil varnishes are easier to apply than spirit varnishes, in consequence of their not drying as quickly. The surface of natural wood which is to be varnished should be "filled" before the varnish is applied to prevent it from being wasted by sinking into the pores of the wood. Fillers are usually made under

Inside colors:

- | | |
|---|---|
| 1. Interior of lanterns and generally all interior woodwork except hardwood. | White (with the exception of blank panes, which should be dull black). |
| 2. Wooden floors, staircases, rails, and walls, when authorized to be painted (hard-pine floors and hardwoods generally are not to be painted). | Grained or lead color. |
| 3. Iron floors, staircases, and railings, and interior ironwork in general, pedestals, and service tables. | Brown. |
| 4. Walls, cellars, and outhouses, when painting has not been authorized. | Whitewash. |
| 5. Plastered wall and ceilings----- | Where practicable, the interior walls and ceilings of houses, instead of being papered, shall be painted regulation tints, as follows: Cream-colored, light sea green, drab, or transparent oil paint, or reliable cold-water paints of the same tints. |

(2) All surfaces used for collecting water supplies shall be painted with nonpoisonous paints.

(aa) The outside colors prescribed herein shall be modified where necessary, to the extent that the color of oil houses and other out-buildings at stations and depots will harmonize with the color of the main structures.

(ab) *Interior walls and ceilings.*—Where practicable, the interior walls and ceilings of houses shall be painted or washed regulation tints instead of being papered. A dull finish is preferable.

(ac) *Putty.*—If it is necessary to make it, take 4 parts of pulverized Spanish or gilders' whiting to 1 part of raw linseed oil and beat it up into a paste. If wanted as quick-drying putty, use boiled linseed oil. When too hard for use, it may be softened by mashing and rolling in the hands and by the addition of a little linseed oil. Keep put up in bladders protected from the sun and weather or in friction-top tin cans covered with linseed oil.

(ad) *Coal tar and asphaltum varnish.*—These materials must not be used for painting lanterns, lantern decks, or steel structures generally.

(ae) *Whitewash.*—The following recipe for whitewashing has been found by experience to answer on wood, brick, and stone nearly as well as oil paint and is much cheaper: Slake half a bushel of unslaked lime with boiling water, keeping it covered during the process; strain it and add a peck of salt dissolved in warm water, 3 pounds of ground rice put in boiling water and boiled to a thin paste, half a pound of powdered Spanish whiting and a pound of clear glue dissolved in warm water; mix these well together, and let the mixture stand for

several days. Keep the wash thus prepared in a kettle or portable furnace and when used put it on as hot as possible with painters' or whitewash brushes. The following formula for mixing whitewash when properly made and put on, gives a white that does not easily wash or rub off, viz: To 10 parts of best freshly slaked lime add 1 part of best Portland cement, mix well with salt water and apply quite thin. Whitewash must never be used on ironwork.

(af) *Cement wash for outside of lighthouses.*—Take fresh Portland cement 3 parts, clean sand 1 part, and mix them thoroughly with fresh water. With the approval of the superintendent neat cement, without the admixture of sand, may be used in special cases. This will give a gray or granite color, dark or light according to the color of the cement. If a brick color is desired, add enough Venetian red to the mixture to produce that color. The cement, sand, and coloring matter must be mixed together. If white is desired, the walls when new should receive two coats of cement wash and then whitewash. After the work has received the first coat, a single coat every three or four years will be sufficient. It is best to thoroughly dampen the wall with clean fresh water and follow immediately after with the cement wash. This course will prevent the bricks from absorbing the water from the wash too quickly and will give time for the cement to set. Care must be taken to keep all ingredients of the cement wash well stirred during the application of it. The mixture must be made as thick as it will admit of to be conveniently put on with a whitewash brush.

(ag) *Varnishing.*—In using varnish great care should be taken to have everything quite clean, washing it if necessary. The cans should be kept corked, the brushes free from oil and dirt, and the work protected from dust or smoke. Varnish should be applied in very thin coats, laid on in the direction of the fibers of the wood and sparingly at the angles. Good varnish should dry so quickly as to be free from stickiness in one or two days. Its drying will be greatly facilitated by the influence of light, but dampness and drafts of cold air must be avoided. No second or subsequent coat of varnish should be applied until the previous coat is permanently hard, otherwise the drying of the under coat will be stopped. The time required for this depends not only upon the kind of varnish but also upon the state of the atmosphere. Under ordinary circumstances spirit varnishes require from 2 to 3 hours between every coat, turpentine varnishes require 6 to 8 hours, and oil varnishes still longer, sometimes as much as 24 hours. Oil varnishes are easier to apply than spirit varnishes, in consequence of their not drying as quickly. The surface of natural wood which is to be varnished should be "filled" before the varnish is applied to prevent it from being wasted by sinking into the pores of the wood. Fillers are usually made under

patents, and their exact composition is not known. Any gelatinous substance or glue may be used. Flour and starch mixed with water, benzene, or turpentine are sometimes used; but the use of such mixtures is not permitted, as they make the wood damp, producing mildew, which prevents the varnish from adhering properly. Varnish applied to painted work is liable to crack if the oil in the paint is not good; also, if there is much oil of any kind in the paint, the varnish hardens more quickly than the paint and forms a rigid skin over it which cracks when the paint contracts. The more oil a varnish contains the less liable it is to crack. One pint of varnish will cover about 16 square yards with a single coat. Under no condition should spar varnish be used for interiors.

165. Commendation.—Whenever employees render commendable service to endangered persons or property, or otherwise perform their duty under hazardous or trying conditions, or perform any special act of unselfish or unusual service of any kind in a manner to merit commendation, consideration shall be given to addressing to such employees suitable letters of commendation. For this purpose three classes of commendation are provided, based on the importance and merit of the service rendered, as follows: (1) Commendations by the superintendent of lighthouses; (2) commendations by the Commissioner of Lighthouses; and (3) commendations by the Secretary of Commerce. Outstanding cases of commendable service or acts of heroism should be submitted to the bureau with full details and appropriate recommendations by superintendents (462).

166. Efficiency stars and flags.—(a) Keepers in charge of light stations who have attained a high efficiency as shown by inspections made during a calendar year shall be entitled to wear the superintendent's efficiency star for the succeeding calendar year.

(b) Light keepers who have been authorized to wear the superintendent's efficiency star for three successive years shall be entitled to wear in lieu thereof during the third year the commissioner's efficiency star.

(c) The superintendent's efficiency star shall be of gilt and the commissioner's efficiency star of silver. Stars may be obtained by requisition on the general depot and shall be worn in the manner prescribed in the "Regulations for uniforms."

(d) The light station in each district attaining the highest general efficiency during a calendar year shall be entitled to fly the "efficiency flag" during the succeeding calendar year.

(e) The efficiency flag shall be the regulation Lighthouse Service flag and shall never be displayed above or on the same staff as the national colors. This emblem shall apply to light stations only.

(f) In order to make awards of efficiency stars of most value they should be issued with careful discrimination. With a view to uni-

formity in all districts, the superintendent's efficiency star shall not be awarded to a keeper whose station has an average efficiency of less than 90 per cent for the calendar year, and such stars may be issued in order of efficiency for not to exceed 25 per cent of the number of watched stations in a district.

(g) Keepers awarded stars and stations receiving the flag shall retain them during the year for which awarded so long as the proper standard of efficiency is maintained, and if not maintained the emblems shall be taken away. Only one efficiency flag shall be allowed each district.

(h) Superintendents shall issue a circular letter to keepers, forwarding a copy to the commissioner as soon as possible after January 1 of each year, giving the names of keepers in charge, with stations who have been awarded stars, and the name of the station receiving the flag, with the names of the entire complement of keepers thereof.

(i) The usual custom of Government reservations shall be followed with respect to the display of the national colors, so far as light stations are provided. The display of unauthorized flags on lighthouse reservations is prohibited (464).

167. Women and children at isolated or offshore stations.—(a) No women or children will be allowed to reside at isolated or offshore stations unless by special permission of the commissioner, previously obtained, through the superintendent.

(b) In case of approval of a keeper's request for authority to have relatives or friends as visitors at his station, such approval will be subject to the conditions that there will be no interference with the work of the station and with no obligations on the part of the Lighthouse Service, and that all risk and hazard will be on the responsibility of the keeper and his guests (442).

168. Improper use of dwelling and structures.—No light keeper's dwelling or lighthouse structure shall be used as a pilot station nor as a boarding or lodging place for pilots or other persons not in the Lighthouse Service except by special authority of the commissioner.

169. Officers of the Coast and Geodetic Survey, with instruments, may be permitted to make observations at lighthouses when engaged on official business, with the understanding that no interference with or expense to the Lighthouse Service will be created thereby.

170. Clean lens and lanterns daily.—(a) To clean lens wipe with soft linen cloth and finally polish with a thoroughly dry buff skin. Remove oil or grease with a linen cloth moistened with diluted ammonia or other authorized wash. Never use a skin which has been wet or damp.

(b) All material used for cleaning lens or lantern glass must be free from grit of any kind.

171. To prevent frosting of lantern glass, rub small quantity of glycerin over surface with linen cloth, repeating as necessary.

172. To clean reflectors dust with soft cloth, rub with buff skin lightly dusted with authorized powder kept in a double muslin bag, then rub lightly with a second buff skin, and finally with a third by passing over reflector with a light quick circular stroke. Stove gas will tarnish reflectors.

173. Soiled chimneys should be rubbed with a rag or softwood dipped in oil. If still discolored, rub with a wet cloth and soda or common salt; afterwards cleanse in warm water, as adhering salt will cause breakage.

174. Dampened cloths and hand brushes should be used in general cleaning about lantern to prevent dust.

175. Storing cleaning utensils.—The lantern must never be used to store cleaning utensils, etc. These must be kept in the service room or watch room.

176. Broken lantern glass must be promptly replaced. After cutting, the edges of the glass should be ground level and smooth by rubbing on a cast-iron plate covered with sharp, wet sand, or rubbing with a block of coarse carborundum. To avoid breakage from oscillation about one-sixteenth of an inch must be left on all sides between the glass and its frame. The glass must be rested on thin sheets of lead or softwood.

177. Revolving clockwork must be kept clean and well oiled after removing old and gummy oil. Clock oil only should be used on the works, a cloth greased with clock oil on the iron or steel parts. The use of a salted grease is forbidden. The foot of the vertical driving shaft must be watched to prevent cutting or wearing. The weight when not in use is to be kept on its rest.

178. (a) The chariot or carriage of a revolving lens must be kept clean and the roller bearings well oiled. When necessary to remove the rollers do so one at a time. In replacing rollers put back on same shaft or pin from which removed without changing the number of washers.

(b) If the lens revolves on ball bearings, the groove or track in which the balls run and the balls must be kept absolutely clean. The balls must be removed whenever necessary and parts in rolling contact wiped dry and clean and then a very small quantity of clock oil used sufficient to keep them from rust. Ball bearings should generally be cleaned once a week, unless conditions are exceptionally dusty or dirty, making more frequent cleaning necessary. In mercury float installations, where the balls are entirely inclosed, cleaning once a month is generally sufficient.

(c) If the lens revolves on a mercury float, see that the float turns freely in the tank without rubbing against it and that the mercury is kept at proper level and free from dirt or oil.

179. Smoked glasses.—When attending and regulating high-power lights blue or smoked goggles should be worn in order to avoid the injurious effect of such lights on the eyes.

180. Oil-vapor lamp fittings should not be discarded if they can be cleaned and continued in use. When discarded such articles should be preserved until inspected by the superintendent or his authorized representative.

181. Machinery and apparatus.—Instructions for the operation of all machinery and apparatus will be furnished to each station to cover the individual equipment of that station.

182. Record books.—(a) The following record books must be kept as a part of the official records of light stations:

(b) *Journal*.—This book will be kept at all stations having resident keepers.

(c) *Watch book*.—This book will be kept at all stations having one or more assistant keepers.

(d) *Fog-signal record book*.—This book will be kept at all stations having fog signals.

(e) *Record of absences of keepers*.—This book will be kept at all stations having a keeper.

(f) *Record of inspections*.—This book will be kept at all stations having a keeper.

(g) The above books must be kept in accordance with the printed instructions thereon.

(h) *Expenditure and receipt book*.—A record of expenditures and receipts shall be kept at all stations. This record may be kept in rough on a copy of Form 30 or as otherwise directed, but all invoices of articles received, copies of survey of property (Form 25), certificates of lost property (Form 28), and copies of the annual property return (Forms 30 and 30A) must be kept on file at the station in a systematic manner, separately for each fiscal year, and so as to be readily accessible to inspecting officers.

183. No alteration or addition will be made in any official record, except by the keeper, who must initial same whenever made, adding an explanatory note if necessary. Erasures must not be made; when corrections are necessary they may be shown by insertions and by ruling out words with pen and ink.

184. No entries or signatures shall be permitted in any of the official record books of the station, except by light keepers or officials of the Lighthouse Service.

185. Reports and returns.—Keepers shall submit the following reports and returns, carefully following the instructions on the printed forms:

Monthly:

- Report of light station, depot, or light ship (Form 65).
- Report of fog signal (Form 66) (to be submitted for stations having fog signals).

Annual:

- Keeper's annual property return (Form 30).
- Keeper's annual requisition (Form 36).
- Receipt for annual supplies (Form 27).

When occurring or required:

- Reporting accidents to personnel (special letter and "Report of Injury," Forms C. A. 1 and C. A. 2).
- Special or emergency requisition (Form 95).
- Receipt for supplies (Form 27).
- Survey of public property (Form 25).
- Certificate of lost property (Form 28).
- Transfer of property (Form 30).

Damage to or irregularity in working of illuminating or fog-signal apparatus (special letter).

Storm damage to grounds, buildings, or protective works (special letter).

Life-saving or aid to persons in distress (special letter).

Information as to defects in any other aids to navigation visible from station or coming to knowledge of keeper, as, for instance, neighboring light out or dim or buoy out of position (special letter or telegram, and also notify tender, if in vicinity, or other keeper).

Misconduct or inefficiency of subordinates (special letter).

Other occurrences worthy of report (special letter).

186. Monthly or special reports on the condition of stations, when recommending repairs or alterations, shall be explicit as to all necessary details.

187. Special reports of damage to lens or fog-signal machinery, or appurtenances, shall give cause, parts damaged, and detailed information to expedite renewal of same.

PART III

FOG SIGNALS

188. These instructions apply to all lighthouses and lightships equipped with fog signals and are in addition to the other special instructions for light stations and lightships, respectively. (Parts II, V, and VII.)

189. Responsibility for fog signals.—The keepers of stations and masters of lightships provided with fog signals will be held strictly accountable for the sounding of the signals during the whole time that weather conditions make the signal useful to navigation. It is especially to be borne in mind that it is better to sound the signal too much than too little. Keepers and masters will be held responsible for the proper care of, attention to, and management of fog signals, and of all machinery connected with these signals.

190. Sounding of fog signals.—(a) Superintendents must be certain that the fog signal at stations or on vessels is kept sounding when required, and should ascertain by trial from seaward at convenient opportunities that the signal makes an efficient sound.

(b) Unless otherwise authorized by the commissioner, fog signals must be sounded when a given object can not be seen a distance of 5 miles and submarine signals when fog appears on the horizon. Fog signals must also be sounded when the fog signal of a passing vessel is heard.

(c) Fog-signal reports must be examined in district offices and all other precautions necessary taken by superintendents to insure that the fog signals are being sounded as here required; a full explanation must be required from the keeper or master of any delay or failure to sound fog signal when it should be sounded. A report shall be submitted to the bureau as soon as practicable after July 1 and not later than September 1 of each year, showing the total number of hours' duration of fog at each fog-signal station during the preceding fiscal year.

(d) The instructions on the blank forms for fog-signal records and reports, including radiobeacons where applicable, shall be carefully observed by keepers (88).

191. Promptness in sounding fog signals.—At every station having a fog signal a close watch must be kept for the approach of fog conditions, and every effort must be made by the keeper or master to sound the fog signal at once on the actual approach of fog. The fog-signal machinery and apparatus must at all times be kept in a thorough condition of repair and preparation for use on the shortest notice; and when weather conditions warrant, all preliminary preparations must be promptly made for sounding the signal.

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Information as to defects in any other aids to navigation visible from station or coming to knowledge of keeper, as, for instance, neighboring light out or dim or buoy out of position (special letter or telegram, and also notify tender, if in vicinity, or other keeper).

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(b) Unless otherwise authorized by the commissioner, fog signals must be sounded when a given object can not be seen a distance of 5 miles and submarine signals when fog appears on the horizon. Fog signals must also be sounded when the fog signal of a passing vessel is heard.

(c) Fog-signal reports must be examined in district offices and all other precautions necessary taken by superintendents to insure that the fog signals are being sounded as here required; a full explanation must be required from the keeper or master of any delay or failure to sound fog signal when it should be sounded. A report shall be submitted to the bureau as soon as practicable after July 1 and not later than September 1 of each year, showing the total number of hours' duration of fog at each fog-signal station during the preceding fiscal year.

(d) The instructions on the blank forms for fog-signal records and reports, including radiobeacons where applicable, shall be carefully observed by keepers (88).

191. Promptness in sounding fog signals.—At every station having a fog signal a close watch must be kept for the approach of fog conditions, and every effort must be made by the keeper or master to sound the fog signal at once on the actual approach of fog. The fog-signal machinery and apparatus must at all times be kept in a thorough condition of repair and preparation for use on the shortest notice; and when weather conditions warrant, all preliminary preparations must be promptly made for sounding the signal.

192. **Explanation of failure to sound fog signal.**—Whenever a fog signal is not sounded for the entire period during which weather conditions require sounding of signal, a full explanation must be entered in the journal and fog-signal record, and, if necessary, a special report must be sent promptly to the superintendent.

193. (a) **All machinery must be inspected** and turned over daily by hand or other power. The employee in charge must make a careful examination and inspection of the entire fog-signal apparatus before putting it into operation and must see that it is in complete and satisfactory working order. When the machinery is not in operation, it must be covered with a tarpaulin or canvas cover and, when necessary, must be cleaned and wiped off. Fog signals operated by oil engines, or otherwise than by steam, will be worked at full pressure at least 15 minutes each week.

(b) Steam fog signals will be operated at full pressure at least 15 minutes each month.

(c) All parts of apparatus after a run must be thoroughly oiled and cleaned and examined for loose bolts, nuts, or other defects, and all oil tanks and oil and grease cups filled ready for starting immediately when required.

(d) The weekly and monthly tests prescribed shall be noted on the fog-signal record (Form 302) and reported in the monthly fog-signal report (Form 66), in the "Remarks" column.

194. **Accidents to be reported.**—In case of accident to or trouble with any part of the fog-signal equipment which can not be repaired by the employees of the station or lightship, an immediate report must be made to the superintendent, giving such information as will enable that officer to provide the necessary assistance and materials for putting the fog signal in good working order in the shortest time.

195. **Duplicate fog-signal plants.**—When any part of the plant or equipment is in duplicate, each set should be given an equal amount of usage.

196. **Cleanliness and care.**—The space occupied by the machinery must be kept clean, and all parts of the apparatus must be kept well oiled and free from dust, dirt, and rust. No oily waste, cotton, or woolen rags or oily cloths shall be left in boxes, corners, or elsewhere to cause danger of fire by spontaneous combustion or otherwise; but when wiping off is finished such articles shall be thrown into buckets of water for washing or, if unfit for further use, shall be promptly burned in a safe manner.

197. **Engines in operation.**—Whenever fog-signal engines are in operation, a competent person must be in attendance at all times.

198. **Fog-signal records.**—In order to secure uniformity in the operation of fog signals and the preparation of Forms 302 and 66, the instructions on the forms mentioned must be carefully observed.

PART IV

ALL LIGHTHOUSE VESSELS

199. (a) **All vessels** shall be maintained in a condition of thorough efficiency and cleanliness and of preparedness for their regular duty.

(b) The regulations of the Steamboat Inspection Service and the Bureau of Navigation as required for commercial vessels shall be observed so far as applicable for vessels of the Lighthouse Service (147).

200. **The officers of lighthouse vessels** shall be known as "deck officers" and "engineer officers."

201. **Familiarity with waters.**—The commanding officer and all deck officers must be familiar as pilots with the navigable waters of the entire district in which employed. Commanding officers will furnish any information or instruction desired by the deck officers for this purpose and will report any officer not complying with the instructions of this paragraph.

202. **Licenses from Steamboat Inspection Service.**—(a) In the case of officers on lighthouse vessels licenses by the Steamboat Inspection Service of the Department of Commerce are required similar to licenses required for officers on commercial vessels. The possession of a proper license shall be required before placing upon a civil-service eligible register the name of an applicant for appointment on a lighthouse vessel, except that in the case of lightships which have no means of self-propulsion, licenses, while desirable, are not required. It shall be stated on eligible registers whether each applicant has the necessary license. Transfer or promotion shall also not be made of an employee who does not possess the necessary license to cover the position to which his promotion or transfer is recommended; but in the case of an employee with a good record and who, in the superintendent's opinion, is qualified to fill the position, or in the case of a lightship which proceeds but seldom under its own power, the transfer or promotion of a proper person may be recommended when the license does not fully cover the position, with the understanding that a sufficient license will be obtained as early as practicable.

(b) In those cases where deck and engineer officers in the Lighthouse Service have not the necessary licenses to cover their positions they shall be required to obtain such licenses at the earliest date, unless otherwise authorized by the commissioner.

(c) The general rule adopted by the Steamboat Inspection Service, with reference to credit to be given for experience had on lighthouse

vessels is that service on motor-propelled lightships or tenders shall be considered as equivalent experience for raise of grade to that obtained on vessels subject to inspection by that service. The word "motor" as applied above covers steam-propelled vessels as well as vessels propelled by internal-combustion engines (397).

203. An officer who departs from his orders or instructions under any circumstances, or takes official action at the request of any person, must do so upon his own responsibility and immediately report the circumstances to his superior officer.

204. Responsibility for safety of vessel.—(a) The officer in command of a vessel of the Lighthouse Service is responsible for its safety and proper navigation, and no other officer or employee of the Lighthouse Service shall interfere with the officer in command in such manner as to affect his responsibility for the safety of the vessel while he remains in command thereof.

(b) The officer in command shall at all times maintain his vessel in a seaworthy condition so far as lies within his power and shall promptly report to the superintendent all defects that may exist, also all deficiencies in fuel, oil, or other needed supplies so far as these affect or are necessary for the safety and preservation of the vessel.

(c) The largest scale charts shall be used and the greatest care taken in navigating and in anchoring in dangerous localities, particularly in unsurveyed areas, making due allowance for the range of tide and uncharted dangers (165).

205. Charts and nautical publications.—All vessels shall be supplied with the latest charts, light and buoy lists, coast pilots, tide tables, and other nautical publications, sufficient for the duty on which the vessel is engaged. When vessels are inspected, it should be seen that the supply of such equipment is sufficient and up to date and that the charts are kept properly corrected (178).

206. Authority of superintendents over officers of tenders.—A superintendent may direct the officers of tenders to perform any duty which in his judgment, may be necessary for the protection and security of Government interests; but in case such duty is unusual, he must at once report the facts to the commissioner (167).

207. In the absence or disability of the commanding officer all his duties shall devolve upon the senior deck officer present. Should there be no deck officer present, the duties of the commanding officer shall devolve upon the senior engineer officer present.

208. (a) The officer of the deck is the officer on watch in charge of the ship. Every officer or other person in the ship, whatever may be his rank, who is subject to the orders of the commanding officer, shall be subordinate to the officer of the deck.

(b) The officer of the deck shall remain in charge until regularly relieved and shall not engage in any other work which may distract him from duty.

209. The officer of the deck shall, before taking charge, make himself thoroughly acquainted with the position of the vessel with reference to vessels in sight and to any land, shoals, or rocks that may be near; with the general condition of the weather, the course, speed, condition and amount of sails set, if any, all unexecuted orders, and the orders of the commanding officer; with the condition of the running lights and any other appliances required by law to be in operation or at hand in order to prevent collisions; and with the condition of the force on deck available for duty, and the general condition of the vessel.

210. Duties of officer ordered to command vessel not yet in commission.—(a) An officer who has been ordered to the command of a vessel not yet in commission shall at once make a thorough personal examination of her and inform himself as to her condition and state of preparation for service.

(b) He shall pay particular attention to the equipment and ascertain if there are any defects in her outfit and stores, including machinery, boilers, pumps, water-tight doors, bulkhead gates, valves and cocks, access to bottoms and bilges, ventilation, fire-extinguishing and distilling apparatus, spars, sails, rigging, and implements, navigation supplies and instruments, provisions, and medical outfits.

(c) He shall cause to be examined all spare parts of machinery and other spare articles and ascertain if they are suitable for the purpose intended. He shall satisfy himself that the boats are tight, and that their outfits, and the hoisting apparatus, are efficient.

(d) He shall make requisition for such articles as are required to render her efficient.

211. Assuming command of vessel in commission.—(a) If, when an officer joins the vessel to which he has been ordered, she is already in commission, he shall proceed, after taking command, as though the vessel had just been commissioned. The commanding officer about to be relieved shall transfer to him every article in his keeping that pertains to the commanding officer and afford all the information possible that will be of service in the administration and command of the vessel.

(b) An officer, upon assuming command of a vessel when she is commissioned, becomes responsible for the discipline on board.

212. Inspection upon transfer of vessel.—The commanding officer about to be relieved shall, before the transfer is effected, make a thorough inspection of the vessel in company with his successor. He shall point out any defects and account for them and explain fully any peculiarities of construction or arrangement of the vessel. A statement, in quadruplicate, of the inspection shall be drawn up and, if satisfactory, signed by the relieving officer. If not satisfactory, he shall state in what particular it is not so, and the officer

relieved shall make such explanation as he may deem necessary, each over his own signature. One copy of this statement shall be forwarded to the commissioner, through the superintendent, one to the superintendent, and one shall be retained by each of the commanding officers. The statement shall be submitted on Form 39 (Report of inspection). If necessary, additional sheets may be used, to be attached to the form, for the preparation of any part of the statement that may not be covered by the form.

213. Delivery of orders, records, etc., upon transfer of vessels.—The commanding officer about to be relieved shall deliver to his successor all general instructions and regulations received for his guidance in command of the vessel and such other official correspondence, documents, and information concerning the vessel and personnel as may be of service to his successor. He shall also fully inform his successor of the status of all orders, if any, remaining unexecuted at the time of his relief and shall immediately forward to the superintendent a detailed written statement, in duplicate, covering the same, one copy of which will be returned by the superintendent to the officer succeeding, with proper indorsement. Under no circumstances shall he carry away the original records of his official correspondence, original letters, documents, or papers concerning the vessel or her officers and crew, or unless authorized, any property or outfit pertaining to the vessel. He shall sign the log books, and all other papers requiring his approval, up to the date of his relief.

214. Damage to or loss of ship.—(a) In case of damage to or loss of the ship, the commanding officer shall remain by her with officers and crew as long as necessary and save as much Government property as possible. Every reasonable effort shall be made to save the logs and other valuable papers.

(b) Each officer and member of the crew shall be assigned to a station, and the boats shall be properly provisioned for use in case it becomes necessary to abandon the ship. The commanding officer shall be the last person to leave the ship.

215. Watch and division of work.—A proper watch and division of work among officers and crew shall be required. A regular watch must be kept at all times. In bad weather, if at anchor, a spare anchor must be ready for letting go and a sufficient watch on hand to meet any emergency.

216. Radio operators on lighthouse vessels, in addition to their duties in sending and receiving messages, shall assist in necessary repairs to the electrical outfit of the vessels. They may also be called upon by the commanding officer to perform such other mechanical work as may be necessary, as well as the preparation of reports

and other paper work on the vessel; but such work should not be allowed to interfere with their regular duties in the operation of the radio station. Consideration should be given to having quartermasters and ship's officers learn the wireless call of the ship and also the "S O S" call in case of an urgent call when the operator is off duty (191).

217. (a) A weekly inspection of the vessels under their command will be made by commanding officers, noting the results in the log and taking immediate steps to correct or report to the superintendent any unsatisfactory conditions existing.

(b) The commanding officer shall see that an examination and operating test is made once a week of all sluice valves, bilge suction strainers, bilge and fire pump suction, and discharge valves and connections, watertight doors, outlets, hatches, etc., pertaining to the water-tight compartments, ventilating apparatus, and the bilge and fire systems.

218. Serviceability of boats.—(a) Superintendents will see that all boats for lighthouses and vessels under their supervision are well built, kept in good condition and repair, and suitable for service at the places where they are to be employed.

(b) All boats must be equipped with at least two life preservers to be kept in the boat at all times; also an anchor with mooring line and a good pair of oars, together with such other equipment for motor boats as may be required by the rules of the Steamboat Inspection Service.

(c) Boats must not be overloaded, and cargo should be so placed as not to interfere with bailing if required in an emergency.

(d) All precautions should be taken to avoid accidents in the use of boats in this service. (189).

219. Painting of boats.—(a) Power boats and dinghies carried on tenders shall be painted white outside and lead color inside with the exception of the decks, transom, sheer strake, rubbing fender, covering board, king plank, washboard seats, bulkheads, quarter rounds, etc., which shall be of natural finish.

(b) Cargo boats shall be painted white outside and lead color inside with the exception of the rubbing fender, which shall be of natural finish where the material and construction will permit. All boats of tenders shall have the first letter of the name of the tender placed on each bow in brass letters of block type, of suitable proportions, 6 inches high, and the letters "U. S. L. H. S.," the full name of the tender, and the serial number of boat shall be branded on the inside of the stern.

(c) Boats of lightships shall be painted the color of the ship's hull with the name of the ship painted on the bow in the same color as the name of the ship itself. The letters "U. S. L. H. S." and the serial boat number shall be branded on the inside of the stern. (For painting light station boats see Art. 150.) (190.)

220. Offenses by crew.—The commanding officer shall, if possible, investigate in person all offenses by the crew. The investigation shall not be delegated to any other officer, unless in case of illness or absence from the ship.

221. Requests or statements of crew.—The commanding officer shall, under reasonable restrictions as to time and place, receive and consider any statement that any member of the crew may desire to make.

222. Record books.—(a) The following record books shall be kept as part of the official records of lighthouse vessels:

(b) *Deck log.*—A deck log shall be kept on all lighthouse vessels to which personnel complements are assigned.

(c) *Steam log.*—A steam log shall be kept on all lighthouse vessels having a personnel complement and propelling machinery.

(d) *Record of fog signal.*—A record of fog signal shall be kept on all lightships having fog signals.

(e) The above-named books shall be kept in accordance with the printed instructions therein.

223. Radio apparatus.—Officers on lighthouse vessels on which radio outfits are installed shall familiarize themselves with the installation and operation of the plant.

224. Radio operators are considered strictly subordinate to the commanding officer and engineer officer in charge. (See Art. 216.)

225. Shipping of crew.—The crews of lighthouse vessels may be shipped by the commanding officers under the direction of the superintendent. Service cards (vessels) shall be promptly forwarded to the superintendent for all changes affecting pay status, etc., of nonappointed employees.

226. Preference shall be given in the employment of crews of lighthouse vessels, first, to citizens of the United States and, second, to those who have legally declared their intention to become such citizens. An alien shall be employed only when it is impracticable to obtain a suitable man who is a citizen of the United States or one who has legally declared his intention to become a citizen.

227. Quartermasters and machinists.—No person shall be employed as a quartermaster or machinist who has not satisfactorily passed such examination or test, either by the superintendent, the commanding officer of the vessel, or as shown by license from the Steamboat Inspection Service, as is sufficient to demonstrate his

efficiency for such position. Preference shall be given persons who are citizens of the United States or who have declared their intentions of becoming citizens (398).

228. Number of officers and crew.—In no case shall a greater number of officers and crew be employed aboard a vessel than the number authorized, and vacancies in the personnel must be promptly reported to the superintendent.

229. Visitors.—(a) All officials who come on board or leave the ship shall receive the honors to which they are entitled.

(b) All persons coming alongside or visiting the ship shall be courteously treated.

(c) Unless prevented by urgent duty, the commanding officer shall be at the gangway to receive, and shall accompany to the side, all officials or distinguished visitors.

230. Regulations for safety of life.—Regulations promulgated by the Secretary of Commerce pursuant to law, to provide for safety of life on navigable waters, shall be enforced.

231. Pilot rules.—A strict compliance with the pilot rules of the Steamboat Inspection Service is required of all employees in charge of vessels or boats.

232. Violations of navigation and inspection laws.—Commanding officers shall report to collectors of customs and local steamboat inspectors such violations of navigation and inspection laws as may come within their observation.

233. Temperature and ventilation.—Every precaution must be taken to keep the vessel dry, well ventilated, and at suitable temperature. In seasonable weather wind sails will be set and awnings spread.

234. Property returns for vessels.—(a) A property return on the proper form shall be prepared by the commanding officer of each vessel, showing the property on board as of December 31 of each year and the property received and expended during the calendar year. One copy must be forwarded to the superintendent not later than January 31 next following. An inventory shall be taken, and the property reported in the annual return shall be checked by actual count, and all discrepancies must be explained by suitable notes in the property return or in a letter attached to the return or by certificates for lost property. For use in making up the property return and examining the same there must be kept on each vessel a file of all invoices or bills for property received on board and copies of all surveys of property made. Account must be kept of all supplies expended, either by memorandum receipts or in a memorandum book.

(b) In connection with the periodic inspection of a vessel or at any other time, but at least once annually, the property records shall

be examined on the vessel by the inspecting officer to verify their correctness. Selected items of property shall be checked against the last annual inventory, with special reference to the amount shown "on hand" by said return and taking into consideration the receipts and expenditures since the last return as shown by the records. Statements as to condition of property on vessels shall be included in the report of inspection of the vessels.

(c) The annual inventory shall be carefully checked and verified in the district office (329).

235. An inventory, corrected to date as nearly as practicable, must be kept of all movable articles of equipment.

236. Condemning and removing property.—No article of equipment, supply, or other property of the Lighthouse Service shall be condemned or removed from a vessel without authority of the superintendent.

237. Examination of stores and equipment.—(a) The commanding officer shall, each quarter and oftener if necessary, cause all spare articles, stores, cables, hawsers, and sails to be examined in order to prevent deterioration and insure their efficient condition.

(b) At this quarterly examination particular attention shall be paid to the chain cables. They must be scaled and cleaned of rust and other foreign matter. The shackles, shackle bolts, forelock pins, and swivels will be carefully examined and put in order, and such parts as require it will be coated with blacking, tallow, or white lead.

238. Quarters and messes.—The officers and crews are required to live on board the vessel to which they are attached.

Only regularly authorized messes shall be permitted on board any lighthouse vessel.

Officers shall mess in the quarters set apart for them. Meals shall not be taken in rooms or at other places than at the regular mess table, except in case of sickness or when the proper navigation of the vessel requires the presence of the commanding officer in closer proximity to the bridge or pilot house.

Passengers shall be messed in accordance with orders given by the superintendent.

239. Subsistence of officers and crews of vessels.—(a) The rates for subsistence for officers and crews of vessels of the Lighthouse Service shall be as fixed by the department. (See art. 240, as to allowance during absences.)

(b) An increase in the subsistence allowance of 10 cents per man per day for officers and men over the current authorized rates will be allowed to vessels which have an authorized complement of six or less, provided that in the case of any vessel having an authorized complement of more than six, on which the force has been reduced by authority of the commissioner or in accordance with general

regulations to six or less, such increased rate shall apply on such vessels during the period of such reduction in force.

(c) Commutation of rations is authorized for officers and crews of lightships and tenders and officials and other authorized persons of the Lighthouse Service on duty on board of such tenders or vessels, and money accruing from commutation for rations and provisions for the above-named persons on board of tenders and lightships may be paid on proper vouchers to the person having charge of the mess of such vessels. (From act of August 24, 1912, 37 Stat. 469.)

(d) For vessels on which subsistence is commuted mess funds shall be paid to the commanding officer as the person in charge of the mess, except that payment for provisions obtained from the Navy Department by vessels will be made to the Navy Department and withheld from payments made on pay rolls to officers of vessels in charge of mess, such pay rolls to have attached copies of invoices covering the amounts so withheld. Superintendents may issue such instructions as to the manner and time when vessels shall procure provisions from navy yards authorized to issue such articles as may best facilitate the arrangement in their districts, taking such precaution as may be necessary to assure that copies of all invoices are sent to the district office and the amounts thereof are deducted from the commutation allowances of the vessels. The commanding officer of each commuting vessel shall open a bank account for the deposit of all funds coming to him on account of the messes and shall make all payments by check. In case of payments for fresh supplies for which cash payment is demanded, the commanding officer may draw check payable to himself in reimbursement, provided that itemized receipted bills covering such cash payments are obtained, properly audited, and filed with the mess accounts of the vessel.

(e) To provide for the ready transfer of the mess funds in bank in case of change of the officer in charge of the mess by death, resignation, or other cause, the bank account should stand in the name of the "Officer in charge of mess, United States lighthouse tender (or lightship) ———," and the bank informed by the superintendent of the name of the officer in charge whose checks should be recognized. Upon change of officers the superintendent should advise the bank of the change and give the name of the new officer in charge of the mess.

(f) In cases where the mess on a vessel has not been started, or has been suspended during repairs or for other cause, or when for any other reason the mess is not maintained, the commissioner, upon recommendation of the superintendent, may authorize the payment of commutation of rations to the individual members of the mess, including commutation of quarters, when quarters are not available on the vessel, at such rate as may be considered reasonable.

(g) The messes of vessels on which subsistence is commuted shall accumulate a reasonable surplus to cover emergencies, due to loss, spoiling, etc., in order that the vessel may never run short of provision. It is optional with the mess whether it enters into contract for purchasing provisions. A report of the condition of the mess account must be submitted monthly to the superintendent on the prescribed form and in accordance with the instructions thereon.

(h) When vessels are placed out of commission, the commissioner may authorize the transfer of any mess balance remaining after bills are settled to another vessel of the Lighthouse Service. Superintendents will submit recommendation as to disposition of mess balances in cases of this kind (363).

240. Allowance when absent from vessels.—Officers or crews of tenders, when absent from their vessels on other than official business, will be allowed subsistence for the benefit of the messes to which they belong for not to exceed three meals in case of any continuous period of absence. Officers and crews of lightships, when absent from their vessels on shore leave, will be allowed a full day's subsistence for the benefit of the messes to which they belong for days on which one or more meals are taken aboard (364).

241. Subsistence of passengers on vessels.—(a) Authorized passengers on tenders shall be designated official and unofficial, as defined in article 162 of the Regulations for the Lighthouse Service, 1927. Payment for meals furnished unofficial passengers shall be made to the officer in charge of the mess, either by the passenger or by the person in the Lighthouse Service whose guest such passenger is, at the rate of \$1.50 per day, or 50 cents per meal, when subsisted in the officers' mess or in the saloon mess. The allowance for official passengers shall be the same as the rates charged unofficial passengers, and payment shall be made by the district office to the officer in charge of the mess, upon the receipt of certified bills on the proper form; provided that official passengers traveling on a per diem allowance in lieu of actual subsistence shall make payment direct upon completion of a trip to the officer in charge of the mess for meals taken, and the amounts so received, as well as those for unofficial passengers, shall be duly entered on the mess records at the end of each month and shown on the mess statements submitted to the district office. When passengers are subsisted in the petty officers' mess or in the crew's mess the rates for subsistence shall be those fixed for such messes. Passengers shall receive only the customary food of the mess in which subsisted, unless satisfactory arrangements are made for incurring additional costs for subsistence.

(b) In cases where authorized guests, whether official or unofficial, are subsisted on lightships the rates of subsistence, unless otherwise authorized, shall be those fixed for the mess in which meals are taken (365).

242. Record of passengers.—The names of all passengers carried on tenders shall be entered in the ship's deck log and reported on the proper form (163).

243. Cooking and mess utensils.—All cooking and mess utensils must be kept clean.

244. Welfare of crew.—(a) Particular attention shall be paid to the welfare and health of the crew. Food shall be properly cooked and served at regular hours and include a liberal quantity of fresh provisions, particularly fresh meat, onions, and potatoes. Water shall be of good quality and in liberal quantity.

(b) Clean and sanitary methods in the preparation and storing of foods, as well as their transportation from one part of the vessel to another, shall be insisted upon.

245. Vaccination.—All officers and men employed on lighthouse vessels shall, so far as practicable, be inoculated with antityphoid vaccine. Officers of the Public Health Service are authorized to administer antityphoid vaccine to all vessel employees who present themselves for the purpose.

246. Receipt for supplies.—Commanding officers shall be responsible for the correctness of quantities and quality of all fuel, provisions, and other articles received for the vessels in their charge, as receipted for or certified by them. When coal is received, the commanding officer shall see that it is correctly weighed or measured. Bills and receipts for coal must be signed by both the commanding officer and engineer of vessels. Bills for provisions on vessels which commute subsistence must be checked and certified in accordance with instructions on Form 72, "Statement of mess account."

247. Accountability for supplies.—(a) Provisions and stores of all kinds furnished for the use of the vessels, officers, and crews must be expended under the direction of the commanding officer, who shall be held to a strict account for them, and he shall be required to make returns accordingly and shall require from all under his command a rigid compliance with the regulations in relation to the receipt and expenditure of public stores.

(b) Loss, waste, or excessive consumption or expenditure of provisions and outfits shall be chargeable to the commanding officer.

248. Frequent inspections of the food and method of serving to the crew shall be made by the commanding officer or an officer representing him, and prompt steps taken to remedy any deficiency in quantity or quality.

249. Supplies carried by crew.—Supplies intended to be carried by the crew shall be in suitable packages. Perishable articles must be protected from the weather and water.

250. Passengers on vessels.—(a) Except in cases of persons rescued from vessels in distress, no persons other than the regular

officers and crews of such vessels shall be permitted to take passage on any vessel of the Lighthouse Service, except by authority of the commissioner or superintendent.

(b) No persons, except the regular officers and crews of such vessels, shall be permitted to reside continuously on any tender or other vessel of the Lighthouse Service except by the written authority of the commissioner. Lighthouse district officers or employees shall not reside on tenders except for such periods as are necessary for them to take passage and to perform their proper duties (164).

251. Boats must be kept hoisted and covered when not in use and swung inboard during bad weather. Boats must never be hoisted when loaded or when filled with water.

252. Provisions and outfits for boats.—(a) The commanding officer shall assign provisions and other articles to boats when they are sent on expeditions.

(b) If a boat is sent away from the vessel at sea, she shall be provided with sails, spars, oars, bucket, water, provisions, compass, lantern, candles, matches, and such other articles as the special occasion or duty demands. A moderate supply of provisions and water shall be kept in all boats at sea.

(c) Boat sails shall be kept in readiness for use. If it is at any time necessary to unbend and stow them below for preservation, they shall be kept in bags, properly marked, with all their gear complete, so that they may be obtained without delay.

(d) Life buoys must be kept in order and constantly in readiness for use.

(e) Fire extinguishers, properly charged, must be kept on power boats.

253. Compasses.—(a) The commanding officer shall keep himself informed of the errors of the standard and steering compasses. He shall forward to the superintendent a report of the result every time the deviations are obtained.

(b) The compass errors must be determined for new vessels and checked whenever extensive changes or repairs have been made to the vessel or after the vessel has been laid up for any length of time, and at other times as there is opportunity.

254. Chronometers.—The commanding officer shall wind the chronometers daily at a regular hour and carry out such instructions as may be given from time to time concerning their care, comparison, and rating.

255. (a) Clothing and bedding shall be inspected once each month, or oftener if necessary, in order to ascertain if they are clean, properly mended and marked, and of uniform pattern. All mattresses and pillows must have removable covers, which must be removed and washed at least once every two weeks.

(b) Bedding shall be aired weekly. Wet clothing or bedding must be immediately dried.

256. Force to remain on board vessels.—(a) Tenders while at anchor or at a wharf must have not less than one-half the force of each department on board, including one deck officer and one engineer officer; but where a department has only one officer he may be permitted to be absent when a fully competent officer of the other department is on board. This regulation shall also apply to lightships except while on station or proceeding to or from station. Lightships while on station must have not less than two-thirds of the total complement on board, including a proper proportion of the force of each department.

(b) If deemed necessary by the superintendent for the proper care of a vessel, the force to remain on board as provided herein may be increased.

(c) Commanding officers and engineers will be held responsible for the proper operation and maintenance of their respective departments while left temporarily in charge of junior officers of the vessels (176).

257. Absence without authority.—The commanding officer must require all subordinates to obtain his permission before leaving the ship and to report their return. Persons leaving the ship without authority and showing no reasonable intention of returning shall be reported as deserters. Deserters shall be debarred from further employment in the Lighthouse Service.

258. Crew not allowed in galley.—Members of the crew must be kept out of the galley unless detailed for work there.

259. Claims for damages by collision, etc.—(a) The commissioner, subject to the approval of the Secretary of Commerce, is hereby authorized to consider, ascertain, adjust, and determine all claims for damages, where the amount of the claim does not exceed the sum of \$500, hereafter occasioned by collisions, for which collisions vessels of the Lighthouse Service shall be found to be responsible, and report the amounts so ascertained and determined to be due the claimants to Congress at each session thereof through the Treasury Department for payment as legal claims out of appropriations that may be made by Congress therefor. (Act June 17, 1910, sec. 4, 36 Stat. 537.)

(b) Authority is hereby conferred upon the head of each department * * * to consider, ascertain, adjust, and determine any claim accruing after April 6, 1917, on account of damages to or loss of privately owned property, where the amount of the claim does not exceed \$1,000, caused by the negligence of any officer or employee of the Government acting within the scope of his employment. Such amount as may be found to be due to any claimant shall be certified

to Congress as a legal claim for payment out of appropriations that may be made by Congress therefor, together with a brief statement of the character of each claim, the amount claimed, and the amount allowed; provided that no claim shall be considered by a department * * * unless presented to it within one year of the accrual of said claim * * *. (Act approved December 28, 1922, 42 Stat. 1066.)

(c) In the event of a collision between a vessel of the Lighthouse Service and a merchant vessel likely to involve damages against the Government, whether the collision is considered the result of alleged negligence on the part of an officer or employee of the Lighthouse Service or otherwise, the officer in charge of the lighthouse vessel shall immediately report the matter to the superintendent of lighthouses by the quickest means available, and the superintendent will designate a board of three officers of the Lighthouse Service to ascertain all the attendant circumstances, injuries received by the merchant vessel, probable amount of damages, and determine responsibility for the accident; and the master of the merchant vessel concerned shall be notified of the time and place of meeting of the board and informed that the officers and men of his vessel will be given a hearing by the board, if such hearing is desired. If the superintendent considers it advisable and practicable, he should designate himself as chairman of the board or be present during the investigation. The report shall be prepared in triplicate (in quadruplicate, if practicable); one copy shall be forwarded without delay to the superintendent, one retained by the commanding officer of the lighthouse vessel, and one copy given to the master of the colliding vessel, provided that the officers or crew thereof who were witnesses to the collision shall have testified before the board. If for any reason it is impracticable to get prompt instructions from the superintendent of lighthouses, the commanding officer will proceed to order the board in the manner provided. The officer in direct command at the time of the accident shall not be a member of the board.

(d) The superintendent shall promptly submit duplicate copies of the board's report to the bureau and shall see that all details necessary for a full understanding of the matter are furnished; and he shall make recommendations as to disciplinary action where any blame attaches to an officer or employee of the Lighthouse Service, and also as to payment of damages.

(e) The foregoing procedure shall also apply in the case of damage to a wharf, pier, or other property, and so far as practicable, in all cases of injury to a vessel of the Lighthouse Service by collision or otherwise. The same procedure shall be followed for the repair of lighthouse vessels damaged by collision where other vessels are responsible, as for the repair of aids to navigation damaged by collision.

(f) When damage or loss to privately owned property, including damage or loss of property of Lighthouse Service employees, is caused by alleged negligence of an officer or employee of the Lighthouse Service acting within the scope of his employment, superintendents should promptly investigate and report the matter to the commissioner, with recommendation, for consideration pursuant to the act of December 28, 1922, cited above.

(g) Damage or loss of property of Lighthouse Service employees, alleged to be caused by negligence of Government employees other than those in the Lighthouse Service, should also be investigated by superintendents of lighthouses with a view to reimbursements for such damage or loss as may be found to be justifiable under the law. Employees suffering loss or damage to their property, caused by negligence of Government employees while on duty should promptly advise the superintendent of the circumstances (161).

260. Precautions against fire, etc.—(a) Fire drills shall be required on vessels at least once a month, and each drill shall be noted in the log book. Officers and members of the crews shall have regularly assigned stations to be occupied at such drills and in case of fire, which shall be posted on each vessel.

(b) Abandon-ship drills on vessels shall be required once a month and shall be entered in the deck log.

(c) All doors through water-tight bulkheads on vessels must be tested and closed once a week and their condition noted in the steam log.

(d) The sluice valves in water-tight bulkheads shall be tested at least once a month and their condition noted in the steam log.

(e) Frequent exercises shall be had, without previous warning, in order to practice the men at their duties, and the time required fully to perform them shall be entered in the log.

(f) Every precaution must be taken against fire. Lighted lamps, candles, or fires must not be left unattended or in exposed places. To this end an hourly inspection of the ship between decks shall be made by one of the watch on deck between 8 o'clock p. m. and sunrise.

(g) Open lights must never be used in storerooms or compartments used for storage of oils, paints, or gas.

(h) Kerosene must be stored separately and only in authorized places.

(i) Gasoline and other highly inflammable material must not be stored below.

(j) Except in emergencies, coal shall not be taken on board in a condition that might render it dangerous. The bunkers containing such coal shall be carefully watched. Coal, after having been received, must be kept as dry as possible. Special precautions must be taken to prevent the leakage of water into the bunkers. When coal bunkers

are not provided with permanent ventilators, the plates shall be removed for ventilation at least twice a week, and oftener if convenient, and kept removed for a period of several hours each time. Coal bags that have been used shall be examined periodically, as fine coal dust remaining in them may produce spontaneous combustion.

(k) Oil, tallow, and cotton waste shall be stowed in metallic tanks, which must be kept as far from the boilers as possible. Waste and other similar materials saturated with oil or grease must be destroyed immediately after use.

(l) Oiled or painted canvas and other oiled or painted fabrics must not be stowed below and when not in daily use must be frequently examined.

(m) Great caution must be used when lights are taken into the paint room. No open-flame lights are to be taken in paint room or kerosene storage room.

(n) Private property in the nature of inflammable liquids, oils, or explosives, or other dangerous stores liable to spontaneous combustion shall not be placed on board.

(o) No inflammable liquid or explosive oil shall be placed on board for ship's use, except such as is permitted by the superintendent. Spirits of turpentine, alcohol, and all varnishes and liquid driers shall be kept in metallic tanks or vessels securely stowed on an upper deck, and none of these liquids shall be taken below, except in small quantities for immediate use.

(p) Only safety matches shall be permitted on board, and the necessary precautions to be observed in their use shall be prescribed. Matches shall not be used in storerooms, holds, etc.

(q) Precautions shall be taken to guard against fire in the vicinity of the boilers and engines when steam is up and for at least 12 hours after fires are hauled.

(r) All ventilators and air conduits must be periodically examined and cleaned out in order to prevent the accumulation of rubbish and lint that might assist to spread a fire.

(s) The instructions for the care and preservation of electric-lighting plants must be carefully followed. The use of electric lights greatly reduces the chances of fire, which with such lights can occur only from defective insulation or an improper use of the plant. Once a month all oil lamps used for replacing the electric lights in case of an accident shall be lighted and kept burning for a sufficient length of time to insure their being in good order and ready for use. Men shall be stationed to close the valves in the ventilation conduits whenever the fire alarm is sounded or the signal given to close watertight doors and valves. Signals shall be provided to indicate that watertight doors, valves, and traps must be closed. Care shall be taken that this signal is accessible to the officer of the deck and kept

in readiness at all times, both at sea and in port. These signals must be so arranged that the men employed in remote compartments may hear them and not be in danger of being shut in; means of escape must be provided, and those stationed to close doors must also be required to make search for and give warning to men in distant compartments. All tenders must be provided with the signals prescribed by the Steamboat Inspection Service.

(t) Lightning conductors must be frequently inspected for good condition and proper lead to the water.

(u) Such other proper precautions as may be necessary shall be taken to guard against fire, and all fire-extinguishing apparatus must be kept in order and ready for use. When in dry dock and the fire pumps are useless, extra and stringent precautions must be taken.

(v) Parts of the ship shall be designated where smoking may be allowed for officers and crew, and, if possible, places shall be provided where all may be comfortable.

(w) Uncovered lights shall never be left unattended in any part of the ship, and covered lights shall always be so secured as to prevent breaking or capsizing. Uncovered lights shall never be used in holds, storerooms, lockers, bilges, or other places below the berth deck, except to test the air.

(x) All fires used for cooking shall be extinguished at 9 o'clock p. m., unless specially authorized to be continued longer for some specific purpose. When weather is very warm, they shall be extinguished as early as practicable, if by so doing the comfort of the crew is increased.

261. Stranding of vessels.—Officers in charge of vessels will be held strictly responsible in case of damage to the vessel through stranding or striking any rock or shoal, due to inattention to duty or negligence. Every case of a vessel stranding or touching bottom, whether or not damage results, shall be promptly reported to the superintendent and by him to the commissioner.

262. Bilges must be frequently pumped and kept sweet and clean. All holds and storerooms must be broken out and thoroughly cleaned at least once every six months.

263. Extinguishment of lights at night.—(a) All lights, except those in the cabins, staterooms, and those designated by the commanding officer as standing lights, shall be extinguished at 10 o'clock p. m., unless the time is extended on special occasions.

(b) The lights on the lower decks shall be reduced in number, unless required for the comfort of the crew, before 10 o'clock p. m. All lights in the holds, storerooms, etc., and all open lights in the ship, except those in quarters, must be extinguished not later than 7.30 p. m.

264. Standing lights at night.—There shall be at all times during the night a sufficient number of standing lights throughout the open parts of the ship to enable the officers and crew to turn out, go to the upper decks, or attend to any duty arising from a sudden emergency.

265. Special lights for officers' use in their rooms after hours may be permitted by the commanding officer, provided that they do not prevent from sleeping those who may desire rest.

266. Vessels with single electric-lighting plants shall always have on hand in the engine room and at other places throughout the vessel ready for use lamps or lanterns that will give sufficient light for emergencies.

267. The officer in charge shall require quiet to be preserved in officers' quarters after 10 o'clock p. m., except on occasions when a special extension of lights is granted.

268. Lights to prevent collisions.—Special care must be taken to have the lights required by law to prevent collisions at sea and in port kept in order and burning during the night, and there must be on hand, convenient for use, means of relighting or replacing any such light as may be extinguished.

269. A correct deviation table shall be kept for the standard and steering compasses. A copy of the deviation table for the steering compass shall be kept in the pilot house and deck officers instructed in its use.

270. Injury to moorings.—In case any person attached to any vessel of the Lighthouse Service unnecessarily slips, attempts to slip, injures, or destroys any cable or mooring, or willfully or carelessly allows such vessel to get from her station, such action shall be considered cause for dismissal (183).

271. Examination of moorings and equipment.—All precautions must be taken by superintendents to prevent lightships from going adrift, and to that end they will carefully examine all anchors, cables, shackles, swivels, and other equipment. Special attention must be given to the examination of moorings for all vessels (184).

272. A keyboard shall be kept in a safe and accessible place in the commanding officer's cabin. All keys shall be properly labeled and under no circumstances taken from the vessel. Keys not in use shall be kept on the keyboard.

273. Repairs by vessel force.—As far as possible, and when in accordance with the interests of the Government, all repairs to the hull, machinery, spars, boats, and to all articles of equipment and outfit must be made by the vessel force.

274. Reports of repairs at navy yards.—When a vessel is under repair at a United States navy yard, the commanding officer shall forward promptly to the superintendent all copies of the weekly reports of such repairs furnished by the authorities of the Navy Department.

275. Official flags.—(a) Vessels of the Lighthouse Service, when in commission, will display the American ensign and the service flag of the Lighthouse Service at all times between 8 a. m. and sunset when the vessels are in service, except during repairs or when display of a flag is impracticable. The ensign shall be displayed on a staff over the stern and service flag from the foremast. On Sundays and national holidays the jack shall also be displayed from the forward staff. On appropriate occasions of public mourning, and by specific authority of the Secretary of Commerce on such occasions, colors shall be shown at half-mast. Colors shall be hoisted at 8 a. m. and hauled down at sunset. At such times all persons in the Lighthouse Service who may be present shall salute the colors. Lightships will display colors to all passing Government vessels, including vessels of the Lighthouse Service.

(b) The Department of Commerce has adopted the following flags for the use of department officials:

(c) The flag of the Secretary of Commerce is a full-rigged ship in blue, over a lighthouse in blue, in a white shield on a blue field, with a five-pointed white star in each corner of the flag.

(d) The flag of the Assistant Secretary of Commerce is the same as that of the Secretary of Commerce, except that the colors are reversed.

(e) The flag of the Commissioner of Lighthouses is blue, with a white triangle bearing a blue lighthouse. The service flag of the Lighthouse Service is triangular in shape, white, with a red border, bearing a blue lighthouse. The flag of lighthouse superintendents is white, with a narrow blue border, and bearing a blue lighthouse in the center; it will not be used by other officers of the service acting as superintendent.

(f) The flag of the Commissioner of Fisheries is blue, with a white fish in the center with its head toward the hoist. The service flag of the Bureau of Fisheries is blue, with a white fish on a red diamond.

(g) The flag of the Superintendent of the Coast and Geodetic Survey is a white triangle, base toward the hoist, on a blue field. The service flag of the Coast and Geodetic Survey is a red triangle, base down, in a white circle on a blue field.

(h) The flag of the Commissioner of Navigation is blue, with a full-rigged ship in white in the center. The service flag of the Bureau of Navigation is a full-rigged ship, white, in a red circle on a blue field.

(i) All of the flags above mentioned are rectangular in shape except the service flag of the Lighthouse Service.

(j) Whenever the Secretary or the Assistant Secretary of Commerce or the Commissioner of Lighthouses is on board of a lighthouse

tender, his flag shall be displayed at the main, provided that when more than one officer is aboard the flag of the superior only is to be shown. The use of the superintendent's flag on appropriate occasions is discretionary with the superintendent.

(k) At no time will the service flag or the national ensign be shown without the other on vessels of the Lighthouse Service.

(l) Flags of officials, except superintendents, will be furnished through the commissioner when required, except where flags have been specially authorized to be kept by the district office.

(m) National ensigns, Lighthouse Service flags, superintendents' flags, and international signal-code flags may be obtained in standard sizes by requisition on the general depot.

(n) Lighthouse tenders, when working on buoys in channels or other frequented waters, may display a red flag (international signal-code letter B) and a black ball at the fore as a warning to other vessels to slow down while passing.

(o) No other flags shall be shown by vessels of the Lighthouse Service except for the purpose of dressing ship on national holidays and upon other proper occasions (160).

276. Saluting lighthouse vessel.—A lighthouse vessel flying an official's flag shall be saluted with three blasts of the whistle or three strokes of the bell, and such salute shall be returned in a similar manner.

277. Saluting naval vessels.—(a) Lighthouse vessels, when in the presence of United States or foreign naval vessels, shall follow the motions of such vessels in making colors, striking the bell, half-masting colors, or any similar ceremony.

(b) Naval procedure shall also be followed when a vessel of the Lighthouse Service is at a navy yard whether or not a naval vessel is present.

278. Use of double bottoms.—The double bottoms of iron and steel ships may be utilized for carrying fresh water for steaming purposes whenever it is desirable, except those used for storage of fuel oil. Under ordinary service conditions the double bottoms shall be kept free from water. When salt water is admitted to the double bottoms of a ship, either purposely or accidentally, a report of the fact and the accompanying circumstances must be made to the superintendent.

279. When visiting a lighthouse reservation outside their district, commanding officers shall report their arrival and departure to the superintendent of that district and shall observe all orders and regulations established for the government of the reservation concerned.

280. Care and preservation of iron and steel ships.—(a) The commanding officer shall cause all compartments and mechanical devices

for the management and safety of the vessel to be inspected weekly, except double-bottom compartments, which shall be inspected quarterly, unless in special cases a more frequent examination is necessary. Special care is enjoined in the inspection and preservation of the inner bottoms, their vertical bounding bulkheads, keelson, etc., under boiler compartments, the framing, floors, plating, etc., under tanks, together with their foundations, all parts of the vessel's sides and bottom in coal bunkers and under ceilings of hold compartments.

(b) The commanding officer and the chief engineer shall each inspect monthly all compartments, water-tight doors, and mechanical devices for the management and safety of the vessel for which each is specially responsible, and shall make to the superintendent after each inspection separate written reports of the condition of the parts of the ship and of the mechanical devices thus inspected.

(c) Whenever a ship is docked, the commanding officer and the senior engineer shall make a thorough examination of all valves, strainers, drain plugs and zincs, the rudder and fittings, propellers, propeller shafts, struts, stern tubes, bearing bushings, and all other openings or underwater fittings, also the shell plating, riveting, etc., and the result and condition shall be entered in the steam and deck logs. The commanding officer shall forward to the superintendent a report thereon, which shall include a similar report from the senior engineer.

281. Painting bottom.—(a) When a vessel is docked, the bottom shall be thoroughly cleaned and all loose and blistered paint removed by scaling and scraping, but no paint of any kind which adheres firmly and affords protection shall be removed.

In the first, second, third, fifth, sixth, seventh, eighth, ninth, sixteenth, seventeenth, eighteenth, and nineteenth districts bottoms of steel and iron tenders shall be painted in accordance with the following, unless special authority is obtained from the commissioner.

(b) One complete coat of red lead mixed with pure boiled linseed oil, and, if quick drying is desirable, a small amount of turpentine and drier; this coat must be allowed to become absolutely hard and dry before applying the antifouling. One complete coat of paint shall extend from the bottom of the keel to 18 inches above the water line.

(c) One complete coat of antifouling composition.

(d) One complete coat of boot-topping composition extending 18 inches above and below the water line.

(e) The antifouling and boot-topping compositions shall be those known under the proprietary names of Rahtjen's Red Hand Brand, Holzapfel's, Von Hovel's, or other approved compositions of similar nature, preference being given to the one which has given the best results in the locality in which it is to be used.

(f) In the fourth, thirteenth, fourteenth, and fifteenth districts the bottoms of steel and iron tenders shall be painted in accordance with the following:

(g) One complete coat of red lead.

(h) One complete coat of one part red lead and one part white zinc.

(i) The lead and zinc shall be ground separately in boiled linseed oil, then together in boiled linseed oil, and properly mixed.

(j) In the tenth, eleventh, and twelfth districts the bottom of steel and iron tenders shall be painted in accordance with the following:

(k) One complete coat of two parts of red lead and one part of white zinc.

(l) One complete coat of antifouling paint.

(m) The lead and zinc shall be ground separately in boiled linseed oil, then together in boiled linseed oil, and properly mixed. The antifouling paint shall be that known under the proprietary name of Peninsular Special Antifouling or other approved paint of a similar nature.

(n) In all coast districts the bottoms of steel and iron lightships shall be painted in accordance with the following, unless special authority is obtained from the commissioner.

(o) One complete coat of red lead mixed with oil, and, if quick drying is desirable, a small amount of turpentine and drier; this must be allowed to become absolutely hard and dry before applying the next coating.

(p) One complete additional coat of red lead as per foregoing paragraph.

(q) One complete coat of antifouling composition.

(r) One complete coat of boot-topping composition, extending 18 inches above and below the water line.

(s) The antifouling and boot-topping compositions shall be those known under the proprietary names of Rahtjen's Red Hand Brand, Holzapfel's, Von Hoveling's, or other approved compositions of similar nature, preference being given to that which has given the best results in the locality in which it is to be used. When the former coating of red lead is generally in good condition, after the bottom has been washed and cleaned, the first coat shall be applied only on such parts as may be necessary.

(t) In the tenth, eleventh, and twelfth districts the bottoms of steel and iron lightships shall be painted in accordance with the instructions for tenders of these districts.

(u) In cases where the conditions indicate the necessity for special treatment or additional paint, the bureau shall be immediately advised and the proper instructions will be issued.

282. Docking of vessels.—(a) In all districts all iron and steel vessels shall be docked and painted every 12 months, with the following exceptions: In the seventh, eighth, ninth, and nineteenth districts all iron and steel tenders shall be docked and painted every six months. In the tenth, eleventh, and twelfth districts all iron and steel vessels shall be docked and painted every two years.

(b) Wooden vessels shall be docked and the sheathing renewed, as necessary, every two years in districts situated on the coasts (except in the seventh district, where wooden vessels shall be docked every six months) and in the thirteenth, fourteenth, and fifteenth districts; and every three years in the tenth, eleventh, and twelfth districts unless ice conditions or repairs to the shafting, propellers, etc. of self-propelled vessels make more frequent docking advisable.

(c) Superintendents will be held responsible for the docking of vessels in general accordance with the foregoing instructions, and a docking schedule, providing for the proper relief of vessels, should be prepared for a period of at least six months in advance, at periods to prevent undue interruptions in the work of the district. Docking when needed should not be deferred with the idea of being accomplished when extensive repairs are made, but general repairs should be executed at the time of periodic docking.

(d) The failure to dock a vessel within the prescribed period shall be made the subject of a special statement on the front page of the monthly reports of operations following the lapse of the period, and the date of the last docking and the reasons for the failure shall be given therein.

(e) As soon as practicable after a vessel has been undocked and the conditions found indicate that serious or important items of work will be necessary at the next docking, a special report on the prescribed form, in duplicate, of the condition, of the underwater body at the time of the docking shall be made to the commissioner, together with a brief summary of repairs accomplished, the brand of paint, and number of coats applied when in dock, etc., and also recommendations relative to future repairs. Special report is not required if conditions indicate that the work to be done at the next docking will be only of the ordinary or usual kind.

(f) When vessels are placed in dock, the superintendent will be responsible for the careful examination of all underwater body and parts and for the preparation of the proper record, in order that needed repairs at the next docking may be anticipated in specifications and invitations for bids.

(g) The painting of underwater surfaces of all vessels shall be in accordance with instructions issued by the commissioner.

(h) Proposals for docking for the purpose of making repairs to underwater bodies shall be obtained upon the proper form provided.

(i) Superintendents must prepare the specifications so as to avoid where practicable the necessity for the award of extra work to contractors without competitive bids, with special reference to additional repairs to be made below water while the vessels are in the dock.

(j) Bids for overhauling and rebushing stern tubes and struts, removing propellers, withdrawing propeller shafts for examination, lifting rudder, and repairs to rudder pintles, etc., shall be included in the specifications only as optional items unless it is known that such work is actually needed and will be done (156).

PART V

LIGHTSHIPS

283. Responsibility of master.—The master of a lightship shall be responsible for the efficient maintenance of the ship on its station as an aid to navigation and for its cleanliness and upkeep and the welfare of the crew.

284. Characteristics of lightships.—(a) Lightships shall be distinguished at night by the number, characteristics, and position of the light or lights, and during the day by color, rig, day marks, etc., with the marking name of the station painted on each side. The marking name shall be as short as practicable to retain the proper identification of the station and shall be painted in the largest size letters practicable to insure the greatest clearness.

(b) No number shall be shown on the outside of the hull, but the number shall be cut in the main hatch deck beam.

(c) Lightships should be referred to in correspondence by the full names and numbers and should be so carried in office records (91).

285. Paint colors, lightships.—Lightships shall be painted of such color and be otherwise distinguished as may be prescribed by the commissioner, and no change of color or other characteristics will be made without his authority. The interior parts of lightships shall be painted as far as practicable in the manner prescribed for the painting of tenders. (See art. 281.)

286. Lightship not to be moved without authority.—Under no circumstances, except those of extreme emergency, shall a lightship be removed from her station without authority from the superintendent.

287. Charts and nautical instruments.—All deck officers must be familiar with the use of charts and nautical instruments on board and able to determine the ship's position.

288. Moorings, etc.—No change shall be made in the prescribed kinds and weights of anchors, the sizes and lengths of cables, and the manner of mooring lightships at the different stations without prior approval of the commissioner. All shackles, swivels, and pins for moorings shall be made according to approved drawings and specifications (182).

289. Examination of moorings and equipment.—All precautions must be taken to prevent lightships from going adrift, and to that end all anchors, cables, shackles, swivels, and other equipment will be carefully examined. Special attention must be given to the examinations of moorings for all vessels (184).

290. Relief lightships prepared for service.—All relief lightships shall be furnished with the necessary equipment and supplies and kept always ready for service (185).

291. The machinery of a relief lightship must be kept in good condition, brought into action at least once a month, and conditions noted in the log (186).

292. Compass adjustment of lightship.—Before a lightship is placed on station after repairs or overhauling the superintendent must see that the compass is in adjustment, the binnacle and magnets placed in their proper positions, and a deviation card furnished (187).

293. Mooring chains.—(a) The inboard ends of mooring chains must be securely fastened to an eye or ring bolt provided for the purpose.

(b) The scope of the riding chain shall be moderate in fair weather and a full scope in heavy weather.

(c) The riding chain must be hove in and examined for defects each month, its condition being noted in the log and reported to the superintendent.

(d) To protect the bow from heavy drift ice, a shot of chain shall be led from the upper hawse pipe to the riding chain and set taut by veering on the riding chain.

(e) Where directed by the superintendent, a spherical mooring buoy shall be shackled into the chain for vessels stationed in deep water.

294. Submarine bells on lightships shall be kept on deck when not in use, in order that their efficiency may not become impaired as a result of deterioration from galvanic action and to protect such parts as may be affected by the heat of the sun, etc. They should be set in a cradle conveniently located and secured and inclosed in a neat, canvas-covered painted box, fitted with louvres or ventilating holes. On the approach of a storm or bad weather they shall be placed overboard in ample time to prevent damage by strains or striking the ship's side. The condition of the bells at the time of the inspection of lightships will indicate whether or not these instructions are being carried out.

295. Signal flags on lightships.—(a) All coast lightships, especially relief lightships, shall display the international code signal of the station whenever a vessel is approaching or in the vicinity and there are any indications that such vessel is in strange waters or fails to recognize the station, or whenever a vessel asks for the information. Sets of such flags may be obtained by requisition on the general depot.

(b) In order to simplify the present procedure of calling to establish communication by visual methods, as far as ships of the Navy are concerned, all signal stations (lightship and lighthouse) under the control of the Secretary of Commerce have been assigned the letter

“G” as a call—that is, the international flag “G” hoisted by any United States man-of-war (or at night “G” made by flashing light) is a call to the Government signal station then in signal distance.

(c) Similarly, when there is a United States man-of-war in the vicinity any Government signal station may call the man-of-war (or if there be more than one, the senior of these present) by hoisting the international flag “G” (or at night by “G” made by flashing light).

(d) Naval ships have been instructed to answer this call from any Government signal station by hoisting the international code pennant “at the dip”—namely, about 6 feet below the full hoist. Lightships and light stations will answer the call “G” from the United States man-of-war in a similar manner.

(e) It is to be noted the above applies to ships of the United States Navy only (95).

296. Lightships off station.—(a) Lightships off station must be promptly reported to the superintendent with reasons and details thereof. Every precaution must be taken to prevent and to immediately detect a lightship dragging off station. Should a lightship have dragged such distance as to mislead passing vessels, both day and night characteristics must be concealed and the fog signal, if any, must not be sounded.

(b) If the lightship is equipped with radio apparatus, messages shall be sent broadcast by the master advising all vessels that the lightship is off station as soon as the fact is known.

(c) If for any reason a lightship is dragged, breaks adrift, or is not on proper station at night, if anchored, anchor lights are to be shown, and, if under way, running lights as required by law for other vessels; and by day the international code signal letters “QE” (lightship is not at anchor on her station) are to be constantly shown, anchored, or under way.

297. Use of propelling power.—The utmost caution and judgment should be exercised by the commanding officer in the use in stormy weather of the propelling machinery on a lightship while riding at the moorings, and, if found necessary, the speed should be carefully controlled at all times by the engineer officer, who should be in constant communication with the commanding officer.

298. Sails must be kept bent during stormy season and frequently loosed to dry in fair weather.

299. Lights must be lighted and hoisted punctually at sunset and kept burning at full intensity until sunrise.

300. Inspections.—The commanding officer must inspect daily at 8 p. m., see the watch set, lights burning properly, and the ship secure for the night.

301. The bilges must be sounded once every watch at night and during bad weather once every hour. Any unusual conditions must be reported at once to the commanding officer.

302. **Lightning conductors.**—If fitted with outriggers, lightning conductors must be rigged out between sunset and sunrise and in bad weather at all times.

303. **Interference with lightships.**—No vessel must be allowed to make fast to a lightship or in any manner to obstruct the visibility of her lights.

304. **Boats of lightships** shall be used for official purposes only; they shall not, under any pretense, be detained on shore, or when alongside of a lightship remain in water for a longer time than may be absolutely necessary. When not in use they shall be kept hoisted to the davits and at night and during stormy weather swung inboard. They shall be kept free of water and have all ballasts and stores removed before being hoisted up and secured. Commanding officers shall be held accountable for loss of, or damage to, the boats while absent by their order.

305. **Stopping passenger steamers.**—Except in cases of emergency, masters of lightships shall not stop passenger steamers to put mail or other articles on board. When such emergency arises, the commanding officer shall see that the lightship's boat is in charge of an officer, and such case shall be reported to the superintendent.

306. **Leave and shore liberty, officers and crew, lightships.**—(a) For leave and shore liberty purposes lightship stations are separated into two classes, I and II.

(b) Class I lightship stations include those that are isolated and without convenient communication with the shore, and men on vessels on such stations are allowed not to exceed 120 days shore leave per year. Class II lightship stations include those that are not distant from the shore and have convenient communication, and men on vessels on such stations are allowed not to exceed 108 days shore leave per year. All time away from vessel is to be counted as shore leave, including time of transit, Sundays and holidays, and the allowance of 120 or 108 days' shore leave shall include sick leave.

(c) Shore leave is to be taken at intervals in regular rotation, but it is not compulsory that employees take shore leave during any period when they do not desire shore leave. The schedule of leave shall be prepared by the master of the vessel in accordance with the regulations, with due consideration to the engineer's wishes as to leave of engineer's force, and it shall be posted in a conspicuous place on board the vessel. Periods of shore leave shall not exceed 15 days each, except in cases of vessels located at extremely long distances from shore, such as Nantucket Shoals and Diamond Shoal, or for other special reasons, where the leave periods may be extended not to

exceed 30 days to permit liberty parties being transported by tenders. The 30 days shall also apply to the offshore vessels during the stormy season where it is impracticable for liberty party to go to and from vessel except by tender. Subsistence will be allowed on tenders for time of transit to and from lightships.

(d) Shore liberty may, in the discretion of the superintendent, be reduced during the stormy season of the year when considered necessary for the safety of the vessel. Shore liberty for the complement of any lightship may be temporarily suspended or reduced by the superintendent if, upon inspecting a lightship, its condition is not found to be satisfactory, the reduction being whatever is deemed necessary to keep the vessel in proper condition.

(e) During periods when a lightship is in port, for repairs or other purposes, leave and shore liberty may, in the discretion of the superintendent, be reduced or discontinued.

(f) When any member of the complement of a vessel fails to return from shore leave within time allotted, the excess shore leave taken is to be deducted from the amount of shore leave due. When any member of liberty party finds that it is impossible for him to report at appointed place to return to ship with the liberty party, he is to report that fact to the one in charge of the liberty party before the time at which the liberty party is to assemble to return to vessel, stating the reason for his being unable to be on hand to return to vessel, also the date when he will be able to return. The one in charge of the liberty party will report to the district office before leaving shore for the ship the fact of any of the liberty party not being on hand to return to ship with the liberty party and the circumstances of the case.

(g) A record of shore liberty shall be kept in the space provided in the back part of the deck log, showing the number of days each member of complement is absent from the vessel each month, and masters of vessels shall report at the end of each calendar year any leave in excess of amount allowed taken by any member of complement of vessel.

(h) Unused shore liberty or annual leave shall be computed on a calendar-year basis, but unused leave during a calendar year may, in the discretion of the superintendent, be used during the next calendar year, provided it is taken before April 1.

(i) Shore liberty or annual leave shall not be granted in excess of the amount accrued at the time leave is desired, except when the best interests of the service will be conserved, or in especially meritorious cases. Deduction shall be made from the salary of an employee leaving the service for the number of days of shore liberty or leave he may have had in excess of the accrued amount (452).

307. Reports.—The following reports shall be made for lightships:

Weekly: Coal and water report (Form 71).

Monthly:

Officers' report of tender or lightship (Form 44).

Report of light station, depot, or lightship (Form 65).

Statement of mess account (Form 72).

Report of fog signal (Form 66).

Pay roll.

Annual:

Property return and inventory (Forms 53a, 53b, 53c).

Requisition for supplies (Form 37).

When necessary:

Reporting missing aids or aids not functioning properly (special letter).

Reporting urgent repairs required (special letter).

Reporting unusual observations or occurrences (special letter).

Reporting when vessel is off station (special letter).

Reporting accidents to the vessel or to the crew (special letter and "Report of injury," Forms C. A. 1 and C. A. 2).

Special or emergency requisitions on Form 95.

Reporting the shipping or the discharging of men (Form 42).

Certificate of lost property (Form 28).

Transfer of vessel (Forms 53a, 53b, 53c).

PART VI

LIGHTHOUSE TENDERS

308. Duties of officer in charge.—(a) Under the orders of the superintendent the commanding officers of lighthouse tenders shall attend to the placing, replacing, changing, or moving of all floating aids to navigation, the delivery of fuel, supplies, construction material, and to such other lighthouse duties as may be required of them, and will promptly report to the superintendent each action taken relative to such aids.

(b) Under the orders and plans for work received from the superintendent the commanding officer shall arrange the work of the tender and carry it out so as to accomplish the results required as expeditiously and economically as practicable. Where details of order of work are left to his discretion, he shall make every endeavor to employ the tender in the most efficient manner.

(c) He shall report promptly to the superintendent any information obtained of benefit to the service, and he may submit suggestions for increasing the efficiency of the tender or for the good of the service generally.

309. Reporting any neglect of duty at stations, etc.—The commanding officer shall promptly report any neglect of duty or irregularity observed at any light station, lightship, or depot, visited or passed.

310. Observation of aids to navigation.—(a) A careful inspection by tenders in passing will be made of the appearance, position, functioning, and characteristic of all aids to navigation. Any unauthorized deviation therein or indication of neglect shall be promptly reported to the superintendent by the commanding officer. In the case of unattended aids, and others if practicable, the defect shall at once be corrected by the commanding officer, if this can be accomplished without interference with more urgent work.

(b) Whenever a buoy is relieved, the correctness of its position, and of the information regarding it in the Buoy List or Light List, shall be verified.

311. Publications corrected to date.—The latest editions of charts, light and buoy lists, and other nautical publications covering the district must be used and kept corrected to date. Notices to Mariners must be examined and charts corrected therefrom.

312. Superintendent on board.—The superintendent when on board shall be kept constantly informed by reports from the officer

in charge of the tender of all matters of which he should have cognizance and shall be consulted for orders in matters of laying out the movements or work of the tender.

313. Speed.—Except in an emergency, or when otherwise specifically directed by the superintendent, tenders will steam at an economical speed.

314. Miles steamed.—The determination of miles steamed for each tender shall be based upon the number of propeller or wheel revolutions per mile, this number to be determined from the total number of revolutions required to run a known distance between two points at the average speed of the tender. In the absence of such a basis the miles steamed shall be ascertained from the propeller or wheel revolutions and its pitch, making a proper allowance for slip (175).

315. Piloting vessel.—The officer in charge shall pilot the vessel under his command under all ordinary circumstances but may, with authority of the superintendent, employ a pilot when necessary. The presence of a pilot will not in any manner relieve the officer in charge of responsibility for the safe navigation of the vessel.

316. Control over personnel of stations, etc.—The commanding officer shall exercise no control over the personnel of a depot or station where the vessel under his command may be moored, unless by the direction of the superintendent, except in matters coming under the police regulations of the vessel.

317. Police powers.—Masters of lighthouse tenders shall have police powers in matters pertaining to Government property and smuggling (166).

318. Navigation qualifications.—Deck officers must be capable navigators and familiar with the use of all nautical instruments on board, and commanding officers shall assist and encourage them in becoming proficient.

319. Draft of vessel.—The officer in charge shall, immediately before leaving and as soon as practicable after entering port, ascertain the draft of the vessel forward and aft and enter it in the log book.

320. Soundings.—(a) When under way on soundings the officer in charge shall have casts of the lead taken as frequently as necessary to verify the position.

(b) When going into or out of a port or approaching an anchorage, shoal, or rock, with or without a pilot on board, the hand leads shall be kept going, if necessary, in order to obtain correct soundings. During thick weather frequent soundings must be taken.

321. Sounding gear and other apparatus.—The officer in charge shall frequently examine the lead lines and other sounding gear and all apparatus used for determining the speed of the vessel and see that they are in order and correctly and properly marked.

322. Stowage of oil on tender.—The officer in charge shall be careful to have all oil containers properly stowed on board of the tender and to take every precaution to prevent loss or danger from any cause.

323. Test of gas connections.—The greatest care must be taken in testing connections and joints of gas tanks in buoys and beacons, and this work must be done by a competent officer or employee. Masters of tenders shall note on the report of work done on gas buoys and beacons the name of the officer who performed this duty (116).

324. Gas buoys and gas beacons.—The instructions for the handling and care of each type of gas apparatus must be carefully observed and all precautions taken to avoid accident (117).

325. Buoys and appendages landed for every purpose shall be placed on chocks, giving a free circulation of air, and properly sorted and marked, where necessary.

326. Placing and replacing aids.—(a) Light and buoy lists and other official publications of the Bureau of Lighthouses shall be used, so far as practicable, as a guide in placing all floating aids to navigation.

(b) Coast and Geodetic Survey and Lake Survey charts, so far as they exist, are to serve as the basis and guide in placing and keeping in their places all authorized floating aids, or aids of a temporary character, and copies of these charts are to be furnished to the superintendent, showing the positions of all aids, including private aids, or prominent landmarks which actually exist but are not shown on the charts, so that the proper corrections may be made when new editions of the charts are issued.

(c) Special care must be exercised by commanding officers of tenders in determining the proper positions for lightships, buoys, beacons, and stakes. In the absence of specific orders from the superintendent, all floating aids found missing or out of position should be replaced and promptly reported. Every effort must be made to replace these aids as near the old positions as possible, using the available landmarks, the lead, and the charts. The usefulness of an aid to navigation depends mainly upon the certainty of finding it in the place designated by the latest notice to mariners, so long as the channel or obstruction it was placed to mark has not since materially changed in direction or character. Whenever a buoy is placed the depth of water must be determined by the lead and the sounding obtained reduced to the plane of reference of the charts for tide or other correction.

(d) A rough running survey shall be made and plotted of navigable waters of which there is not available a large-scale detailed chart. The positions of the aids shall be indicated thereon and from it shall be made a list of the aids in the order of passing.

327. Standing watch.—(a) When under way the officer in charge of the deck on all lighthouse tenders having bridges will stand watch on the bridge and the lookout will be stationed in the bow.

(b) In the event of the lookout not being able to be stationed in the bow, due to bad weather, he will keep lookout from one wing of the bridge.

(c) On all tenders not having bridges the officer of the deck will stand watch in the pilot house.

328. When at sea, and especially when approaching land or in pilot waters, the officer of the deck shall keep himself informed of the position of the vessel, whether land or lights are in sight, or whether either are likely to be seen, and of all other particulars which may be of use to him in keeping the vessel out of danger. If approaching land or shoals, he shall keep leadsmen in the chains and have the anchors and chains clear and ready for use.

329. Report to commanding officer.—The officer of the deck shall promptly report to the commanding officer all land, shoals, rocks, lighthouses, beacons, buoys, discolored water, vessels, or wrecks discovered; all changes in the weather or shifts of wind; any change in speed made by himself; and any marked change in the barometer, force of the wind, state of the sea, or marked indications of bad weather; the display of storm signals on shore; all serious accidents; the movements of passing vessels; and, in general, all occurrences worthy of notice.

330. Changing course.—The officer of the deck shall not, unless to avoid immediate danger, change the course without directions from the commanding officer, and then he will report the change to him as soon as possible.

331. Supplies, repairs, etc.—The commanding officer shall, before arriving in port, cause to be submitted to him requisitions for all supplies and shall immediately upon arrival take the necessary steps to procure needed supplies, in accordance with regulations. He shall also at the same time submit to the superintendent reports of all repairs needed, requests for surveys, and all other papers requiring action.

332. Repairs of apparatus.—Engineers of tenders shall have minor repairs to the fog-signal or lighting apparatus at light stations made when practicable and when they can be made without interference with more important work of the tender (78).

333. Painting of tenders.—Unless otherwise authorized by the commissioner, tenders shall be painted in the following colors:

Black.—Outside of hull between upper line of boot topping and highest sheer line; ventilators above weather deck and outside of cowls; foremasts from hounds to truck; and mainmasts in wake of smoke discharge from funnels; hoisting engine, windlass, capstan, steering engine, davits (except where outlined against

white houses), rudder quadrant (see also under "Red lead"), and similar deck machinery; vessel's name and letters "U. S. L. H. S." on ring life buoys; steam cylinders of auxiliary machinery in engine room where not lagged; ironwork of wooden booms and masts; booms from head to 3 feet below center of relief-purchase guide sheave; all fittings, piping, etc., within these areas.

Black nonblistering funnel paint.—Funnel, with casing and umbrella, escape and whistle pipes.

White.—Topsides above highest sheer line; all deck houses above coaming plates or sills of main deck; all deck houses on superstructure deck above sills and coamings; quarters in general where not natural finished; light boxes, exclusive of characteristic color; inside of light and ventilator trunks; sides and ceilings of upper and lower boiler and engine rooms from 42 inches above deck or floors; ring life buoys, handrails, grab rails (if not brass), rail and awning stanchions, rigging turnbuckles, sheer poles, and similar fittings; main engines and auxiliary machinery, except steam cylinders; galley sides and ceiling from 42 inches above floor or deck; all fittings, piping, etc., within these areas. The oil-tight bulkheads of vessels using oil for fuel are to be painted white throughout. Light lead or straw color may also be used for sides and ceilings of upper and lower boiler and engine rooms. Tanks for oil shall also be painted white.

Brown.—Working surfaces of buoy and main decks, and all fittings; lower engine and lower boiler rooms to 42 inches above lower floor; all fittings, piping etc., within these areas.

Light lead.—Canvas decks, tops of deck and pilot houses; coamings; holds, including ceilings, storerooms, lockers; upper boiler or drum room to 42 inches above floor or grating; boiler and uptake lagging and clothing; all fittings, piping, etc., within these areas. Inboard side of bulwarks, from deck to height of main rail, bulwark stanchions, waterways, and sills of all deck houses; also sides and ceilings of upper and lower boiler and engine rooms, if desired.

Light straw.—Steel foremasts from weather deck to hounds, steel mainmasts from weather deck to height of wake of smoke discharge from funnel; upper engine room and galley to 42 inches above floor; steel booms; all fittings, piping, etc., within these areas; also sides and ceilings of upper and lower boiler and engine rooms, if desired.

Vermilion.—Inside ventilator cowls.

Red lead.—Inside ironwork of all framing, floors, etc., in bilges; also foundations for engines, boilers, and auxiliaries in way of and to the upper turn of bilges; all fittings, piping, except copper and brass, within these areas; rudder quadrants, when in such locations as to be subject to excessive corrosion.

Natural finish (varnish).—Wooden foremast from weather deck to hounds; wooden mainmast from weather deck to height of wake of smoke discharge from funnel; wooden booms; flagpoles; interior trim and paneling where not painted.

Cement wash.—Inside of trimming and fresh-water tanks, including all fittings, piping, etc.

Polished metal work.—The painting of polished brass, such as valve bonnets, air ports, etc., or other bright metal work, is forbidden (181).

334. Brass miniature lighthouses, bedded on tar felt and red lead, shall be fitted and secured upon each side of the bow above the fender on tenders; in the case of river tenders they shall be placed on the sides of the main deck house at the forward end (180).

335. Leave of absence, crews of tenders.—(a) Members of crews of tenders may be granted leave of absence in accordance with the following:

(b) So far as the exigencies of the Lighthouse Service permit, members of crews of tenders, after six months' service, may be allowed 10 days' leave of absence (inclusive of sick leave) with pay in a calendar year. The granting of such leave is to be in the discretion of the master of the tender, but all leave of absence for over 24 hours shall be referred to the superintendent for approval, in his discretion, in advance of the taking of the leave. In case of the discharge of a member of a tender's crew who has taken leave in excess of the amount allowed, within the period of 10 days authorized for the calendar year, the superintendent in his discretion may make proper deduction from any pay due such member at the time of his discharge.

(c) Short periods of shore liberty, not exceeding 24 hours, may be granted by the master regardless of length of service, and shall not be deducted from the 10 days' leave of absence hereby authorized.

(d) All leave other than the short periods of shore liberty herein authorized shall be recorded in the back of the log book. Unused leave shall not be carried over until the next calendar year (453).

336. Reports.—The following-named reports shall be made for tenders:

Daily: Report of master of tender (Form 54).

Monthly:

Officers' report of tender or light ship (Form 44).

Report of lost, unserviceable, or recovered buoys, lanterns, appendages, etc. (Form 62e).

Statement of mess account (Form 72).

Pay roll.

Annual:

Property return and inventory (Forms 53a, 53b, 53c).

Requisition for supplies (Form 37).

When necessary:

Reporting missing aids, or of aids not functioning properly (special letter).

Reporting urgent repairs required (special letter).

Reporting unusual observations or occurrences (special letter).

Reporting accidents to the vessel or to the crew (special letter and "Report of injury," Form C. A. 1 and C. A. 2).

Requisition for supplies (Form 95 may be used).

Reporting the shipping or the discharging of men (Form 42).

Certificate of lost property (Form 28).

Transfer of vessel (Forms 53a, 53b, 53c).

In submitting reports, the instructions on the blank forms should be carefully observed.

PART VII

ENGINEERING INSTRUCTIONS FOR LIGHTHOUSE VESSELS

337. (a) The chief engineer shall be in charge and responsible for the good working, the efficiency, and the cleanliness of the engineering department, which shall include the propelling engines, boilers, pumps, hoists, all auxiliary machinery, and every mechanical apparatus installed on board the vessel and required for the good performance of its duties as a lighthouse tender or lightship as may be the case.

(b) In entering upon his duties he shall make a thorough examination and inspection of all parts of the propelling engines, the line shafting and bearings, all auxiliary and deck machinery, and, as stated above, also check and certify the inventory for all engineers' stores and spare parts, noting their condition on the list.

(c) Should defects or deficiencies be discovered during this inspection, it is his duty to make at once a detailed written report of all facts, addressed to the superintendent and forwarded through the master of the vessel.

(d) The chief engineer is also responsible for the good condition, the scaling and painting of the inner hull and its structural parts inclosed between the engine and boiler-room bulkheads, the shaft alleys, coal bunkers, storerooms and workshops, together with those compartments, double bottoms, and bilges which are accessible through the engineer compartments. This includes the cleanliness of the bilges, the good condition and working of all sea valves, the draining system with all strainers, pipe connections, sluice valves, etc.

(e) The engineer's log book must be kept up to date and every item correctly entered. The daily fuel consumption, also the amount of fuel on hand in the bunkers, shall be reported daily to the master of the vessel.

(f) The weekly and monthly reports, the inventories of the engineer's stores at hand, the requisitions for supplies, applications of leave of absence, etc., shall be made out on their proper forms and submitted through the commanding officer to the superintendent.

(g) The chief engineer, after conferring with the master of the vessel, shall select suitable men for the positions of oilers, firemen, etc., within the authorized complement of the vessel.

(h) The chief engineer shall personally operate or supervise the operation of the machinery at all times when unusual care is required

to be given to the working of the engine. He shall make frequent visits to the engine and boiler rooms during the day, and at night when the vessel is underway or at its station, to assure himself that the officers and men on watch are performing their respective duties and that the performance of the machinery and boilers is satisfactory.

(i) He shall, in the disposition and stowage of stores and in the use of lights, take every possible precaution against fire.

(j) He shall see that the apparatus in his charge for extinguishing fire is always kept ready for use.

(k) He shall frequently examine the coal bunkers and oil tanks and ascertain the quantity of fuel actually on hand. Should he discover any material excess or deficiency, as compared with previous fuel reports, he shall report it at once to the master of the vessel.

(l) Before fueling he shall ascertain the condition of the bunkers and tanks and of all water-tight openings and shall satisfy himself that no unauthorized materials are stowed in the fuel spaces.

(m) He shall require, with the approval of the commanding officer, a proper watch and division of work of officers and crew assigned to duty in the engineer's department of the vessel.

(n) He shall be responsible at all times, whether underway or at anchor, for the good order and cleanliness of the engineer department.

(o) He shall report to the commanding officer whenever a boiler is injured, any accident or derangement to the propelling engines or auxiliary machinery, and record the cause and full details in the steam log.

(p) Should he consider it necessary at any time to reduce the load on the boiler safety valves, he shall so report to the commanding officer. Any change in the load shall be recorded in the steam log.

(q) Whenever he deems it necessary, it shall be his duty to make written suggestions or reports, through the commanding officer, to the superintendent concerning the machinery and its dependencies or other fittings of the ship for which he is responsible.

(r) Should he receive an order the execution of which would, in his opinion, injure the machinery or boilers, or tend to extravagance in the consumption of fuel, he shall report his opinion to the commanding officer and suggest a remedy.

(s) He shall not at any time for the purpose of repairs delay the movement of the vessel even temporarily, except by permission of the commanding officer.

(t) He shall not permit fires to be lighted or hauled, except in cases of emergency, without orders from the commanding officer.

(u) He shall, whenever the vessel arrives in port after a cruise or season's work, report to the superintendent, through the commanding officer, in writing, all work needed for the proper care and preservation of the machinery and boilers, stating separately the work that

can be postponed, if necessary, and that which can not, without injury, be delayed. He shall note opposite each item whether the work can or can not be done by the force on board, together with an estimate of the time and expense required.

(v) He shall keep the steam log in accordance with the instructions and directions as printed therein.

(w) He shall record, in a blank book kept for that purpose, the location of all spare parts of machinery; a complete statement of everything that transpires in his department; the most efficient rates of expansion in the different cylinders for various speeds, noting the page or pages of the steam log from which the data were obtained. This record shall be turned over to his successor.

(x) He shall enter in the steam log a record of all injuries to any of the engineer force while within the engineer department and make prompt report thereof.

(y) He shall forward all official reports, communications, and returns, through the commanding officer, to the superintendent.

(z) During the temporary absence or disability of the chief engineer the engineer next in rank remaining on board shall perform the duties of the chief in addition to his own.

338. Duties of the engineer officer of the watch.—(a) The engineer officer about to take charge of the watch duty shall not relieve his predecessor until he has satisfied himself that the condition of the machinery is as reported when turned over to him.

(b) The engineer officer of the watch shall use every effort to maintain machinery in an efficient condition and to prevent any accident or injury to the same.

(c) He shall cause to be faithfully executed and observed all instructions and directions received from the chief engineer in reference to the use, care, and preservation of the machinery, and in other professional duties with which the chief engineer is charged by these instructions.

(d) He shall report at once to the officer in charge of the vessel any derangement or probable derangement of the machinery which may affect the maneuvering powers of the ship, or any part of the machinery operating the characteristic display of a lightship.

(e) He shall not permit the speed of the engines to be altered without orders from the deck officer in charge, except through necessity.

(f) He shall notify the chief engineer as soon as he discovers anything wrong with the machinery or boilers.

(g) He shall execute promptly any order received from the deck by signal or otherwise.

(h) He shall at all times carry out any instructions he may receive from proper authority.

(i) He shall preserve order among his subordinates in the engine and fire rooms.

(j) He shall keep the steam log and make such entries as are required by the instructions contained therein.

(k) He shall not absent himself from the place of his duties unless regularly relieved.

339. The engineer officer having the day's duty shall be responsible for all work being done in the engineer department and all engineering work being done by the engineer force. In the morning he shall see that the morning orders are properly executed. In the evening before retiring he shall inspect the department and satisfy himself that all cocks and valves are closed or otherwise as ordered; that all unnecessary lights are out; that all precautions have been taken to guard against fire, leakage, or other accident; and he shall report the condition of the department to the chief engineer.

340. All orders regarding the management of the machinery or the men belonging to the engineer force shall, except in an emergency, be given through the engineer officer on duty.

341. Absence of engineer officers.—Engineer officers shall, before applying for leave to be absent from the ship, obtain permission from the chief engineer. Should the chief engineer refuse such permission, he shall report his reasons to the commanding officer.

342. General care and management of engines, boilers, machinery, etc.—(a) Under no circumstances are engines and boilers to be endangered by carrying too heavy a pressure of steam. They are to be run with the greatest possible care and with the closest attention given to safety valves, water and steam gauges, and other attachments.

(b) The boilers of all lighthouse vessels shall be cleaned at least once in three months, or as often as conditions will permit, and the date on which each boiler is cleaned shall be entered in the steam log book. If through unforeseen emergencies or from accident it is necessary to allow steam to go off a boiler before the regular cleaning period, then the boiler shall be cleaned at that time, but a full explanation of the reasons for so doing shall be noted in the steam log book.

(c) Special mention shall be made in the monthly reports of the condition of the boilers and the means which have been employed for their preservation.

(d) The cylinders, receivers, and steam jackets must be gradually and thoroughly heated and drained before steam of full pressure is admitted to them.

(e) The greatest care must be exercised that "water rams" are guarded against by carefully draining all pipes while raising steam.

(f) The rate of expansion in each cylinder for the different powers shall be ascertained. The powers developed in each cylinder shall be nearly equal at the various cut-offs, and the horsehead arms on the

reverse shaft, the links, or the cut-off gear, as may be the case, shall be marked accordingly.

(g) The indicators shall be attached to the cylinders only for immediate use, and they shall be dried, cleaned, and lightly lubricated with cylinder oil before being put away.

(h) Tallow or oil of vegetable or animal origin shall not be used for the lubrication of cylinders and valves, but mineral oil only shall be employed, using the minimum amount consistent with safety.

343. Examination and care of parts.—(a) The crank pins, cross-head pins, main bearings, eccentrics, etc., shall be examined twice a year and a record of their adjustments entered in the log book. Connecting rods shall be swung at this time, if necessary.

(b) The thrust bearings and the tunnel shaft bearings shall be examined at frequent intervals and their condition entered in the log.

(c) The steam and water cylinders and the steam and water valves of all auxiliaries shall be opened and examined at least once in six months and a note of the condition of the various parts entered in the log. Each valve shall be carefully examined and kept faced to a good seat.

(d) Cylinders and valve chests of the engines shall be opened every three months, and at that time the leads of the valves and the clearances of the pistons shall be accurately determined. A careful examination shall be made of all parts, and a full statement of their condition and the amount of loss of clearance, etc., shall be entered in the log book.

(e) As little oil as possible shall be used for interior lubrication. This prohibition is intended to apply to every steam cylinder in the ship, for whatever purpose intended.

(f) All cocks and valves throughout the engineer department are to be moved at least once each week.

(g) When not under steam, the engines and main valves are to be moved every day, when possible, and all steam machinery jacked at frequent intervals, the fact being noted in the steam log.

(h) Zinc plates shall be fitted in the hot wells and condensers to prevent corrosive action. The condition of the zinc and of the interior surfaces shall be frequently examined and noted in the steam log.

(i) All holding-down bolts shall be examined at least once in three months and care taken that the nuts of pillow block bolts do not become set fast.

(j) The engine-room gongs and bells and the instruments fitted on board for telegraphing signals to and from the engineer department shall be carefully tried before getting under way.

(k) Mineral oil causes rubber valves to swell and overlap each other. All such valves must be examined periodically, turned and trimmed to their original size, if necessary. Their condition, as well as that of the condensers, at each examination shall be noted in the steam log, with all further information that may be considered necessary. Rubber valves will be washed in a solution of soda or potash.

(l) Water shall only be used where necessary on the bearings. When water has been used, the bearings shall be examined at the earliest opportunity.

(m) The tubes of surface condensers must be examined at least once in six months and kept clean. If not examined, the reasons for the omissions are to be stated in the monthly report. If any considerable amount of steaming has been done, the condensers must be examined before the expiration of the time mentioned. If at any time the condenser tubes are found to be leaking, steps will be taken, as soon as practicable, to prevent the passage of circulating water from the condensers to the hot-well and feed-pump suction.

(n) Caps of sounding pipes must be kept closed when not in use. The height of water in the bilges shall be measured and the water pumped overboard each watch and all bilge strainers cleaned.

(o) Independent circulating and air pumps will be started at least 15 minutes before attempting to move the engines, or to warm the cylinders by means of the pass-over valves.

(p) When filters or grease extractors are fitted, they must be in continuous use except when under repairs or being cleaned.

(q) The valves of air and circulating pumps shall be examined frequently.

(r) The interiors of evaporators shall be frequently examined and the tubes or coils cleaned and scaled when necessary.

(s) When evaporator tubes or coils are made of iron or steel, zinc plates shall be fitted for protectors, as in boilers. When the evaporator is not in use, the shell and coils shall be drained.

344. Special care of boilers.—(a) Rolled zinc slabs shall be fitted in such parts of the boilers as may be directed. The chief engineer on each inspection of the boilers shall examine these zincs and note their condition in the log. Special care must be taken to insure perfect metallic contact between the zincs and the stays or plates of the boilers to which they are attached, the surfaces in contact being filed bright. Iron baskets shall be fitted to catch the disintegrated zinc. These zincs shall be renewed as soon as their exposed surfaces are reduced by oxidation to about half their original thickness. Zincs that have become bent, cracked, or distorted should be removed at once.

(b) It has been found by experience that the number of rolled-zinc slabs (12 by 6 by 1 inch) required for the thorough preservation of boilers is about one for every 100 square feet of heating surface. This proportion is, however, merely intended as a guide and not to interfere with any alteration of position or number which may appear desirable or necessary for the arrest of oxidation.

(c) No tallow or oil of vegetable or animal origin shall be allowed to enter the boilers. This prohibition applies to all boilers in use aboard ship of whatever type or service.

(d) The dry pipes and drains of the steam drums are to be examined frequently to ascertain if the holes in them are clear.

(e) Boilers that are not in use shall be kept, if possible, full of fresh water made slightly alkaline, and failing this, full of salt water made slightly alkaline. When water is used from a boiler, the water line must not be allowed to fall below the lower gage cock. The boilers when empty shall be kept dry by such means as are at the disposal of the officer in charge. The water bottoms and lower part of the fronts are to be kept free from scale and rust and contact with ashes and well painted. When boilers are empty, the furnaces shall be primed with fish oil on the fire side.

(f) The main and auxiliary stop valves, safety, check, and blow valves, and any other valve or cock by which steam or hot water could enter the boilers in which men are at work, shall be shut and secured so that they can not accidentally open or be opened. The engineer officer having the day's duty will see that these precautions are carried out before he allows any men to enter the boilers.

(g) The safety valves shall be partially lifted by the hand gear at least once each week when not under steam to insure their good working order.

(h) The boilers shall always be filled with fresh water when possible. When filled from overboard, the necessity for doing so from shallow water or using impure water of any kind should, as far as possible, be avoided. The water will be retained in the boilers without change as long as possible, even when the fires are not lighted. The boiler will be drained only when necessary for examination, cleaning, or repairs, and the water changed only when dirty or acid, or when the boiler is to be used for distilling without the aid of an evaporator.

(i) The boilers shall not be used for trimming ship nor for water tanks for any purpose except for a reserve of fresh water.

(j) Salt water shall never be introduced into the boilers except for the purpose of washing out the interiors or to make up a deficiency of feed when steaming, when the supply of fresh water is not sufficient. When the interior of a boiler has been washed out with salt water, it shall be filled with fresh immediately thereafter, or if fresh water is unobtainable, with salt water. The exteriors are to be kept as dry

as possible, and nothing wet or combustible is to be stored over or around them.

(k) The bilges in the firerooms are to be kept dry and well painted or oiled.

(l) Sudden changes of temperature in the boilers are to be avoided; and when circumstances will permit, at least six hours should be occupied in raising steam from cold water, in other than water-tube boilers.

(m) Connection doors must not be used to check the draft and fires.

(n) The uptakes shall be kept free from dirt and well painted.

(o) Fires shall not be hauled after discontinuing steaming, except in case of emergency, but shall be allowed to burn down and die out in the furnaces, with the dampers, furnaces, and ash pits closed. The boilers shall be blown down at the lowest pressure practicable, or, if necessary to empty them, the water shall be pumped out.

(p) The temperature of the feed water should be from 190° to 240° F., and in general where no special heaters are fitted shall be as high as is consistent with the maintenance of a fair vacuum. The air space between the uptake and casings of the boilers shall be examined frequently and any accumulation of soot or coal dust prevented.

(q) When it is necessary to keep ashes in the firerooms temporarily, they must not be stowed against any part of the boilers or bulkheads; boards or heavy canvas must be used to protect the metal surfaces. Coal must not be stowed in the firerooms in such quantities as to cover up the handles or wheels of valves or to get into the bilges, thus choking up suction and strainers and endangering the safety of the ship.

(r) In order to determine the condition of the water in the boilers, using fresh water only as regards its acidity, neutrality, or alkalinity, the water in each boiler will be tested at least once a day when they are under steam, and once a week when the fires are not lighted. If the water in the boilers be in an acid condition, a small quantity of soda solution will be put into the condensers or hot wells, from which it will be pumped into the boilers with the feed water. Only the least quantity of soda sufficient to accomplish the purpose intended shall be used. Boilers using salt water only, or as additional feed supply, must be fitted with salinometer pots (one for each boiler), properly connected to the boiler about halfway between the bottom and the low-water line in the boiler. When steaming and using salt feed only, the saturation in each boiler must be taken once every hour; when using salt feed supplementary, every four hours, or as the chief engineer may direct, to suit the conditions on board the vessel. If the density of the boiler water as shown on the hydrometer scale should show two thirty-seconds or more, the boiler should be blown through the bottom blow. In no case should the water in the boiler

be blown out below the first try cock on the water column. The surface blow should be used once during the watch to skim off the impurities and grease accumulating on the surface of the water. Heavy banked fires should never be kept except in cases of emergency, but when so banked ash-pan doors shall not be put in place.

(s) The boilers of all vessels in commission shall be tested by water pressure at such times as the chief engineer may deem necessary or advisable and at least once each year by the United States local inspectors of steamboats. The hydrostatic pressure applied to boilers shall not exceed the designed working pressure plus 50 per cent of the same. During the application of hydrostatic pressure the boilers will be carefully examined and proper gauges used to detect any change in the form of any of their parts. In applying water pressure care must be taken that there is no leak past the main or auxiliary stop valves.

(t) Should a drill test be made and reveal unusual thinness of any plates, the water pressure will be carefully applied, in order that injury may not be caused by overpressure.

(u) The following particulars of the results of boiler tests will be entered in the steam log. The greatest pressure applied; the load per square inch on safety valves previous to the test and when boilers were first used; the date of last repair; the effect of the test on the plates and stays of furnaces, combustion chambers, and shell, and on the tube sheets; and such additional information as necessary to make a complete report on the condition of the boilers.

The boilers shall be thoroughly examined at regular intervals of about three months. A detailed report of the condition of each boiler, fusible plug, connection, etc., at each of these examinations shall be entered in the steam log.

(v) When during the periodical examinations of boilers the engineer in charge has reason to believe that any part or parts of the boiler are unduly worn or corroded, he will cause these parts to be tested by drilling, the holes to be not over one-half inch in diameter. The thickness of the plates originally and when drill-tested, the probable cause of corrosion or wear, and all other details of the test will be entered in the steam log and reported to the superintendent.

(w) Full information will be noted in the steam log of the kind, quality, steaming power, and other particulars of the fuel as received. When it is impossible to obtain any of this information, a special note of the fact will be entered in the steam log.

345. When using red lead at any time for painting the double bottoms or other confined spaces in the engineer department, the chief engineer officer will see that proper precautions are taken to prevent its injurious effects on the health of the men. Two days is the max-

imum length of time that a man should be kept continuously at this work.

346. Cotton waste or any other materials used for wiping and which are saturated with oil will be destroyed immediately after using, or, if intended for starting fires, will be put in a covered iron receptacle and the latter kept in a safe place.

347. All chocks and ties fitted to cylinders, boilers, and other parts of machinery to prevent their shifting from the effects of collision will be kept at all times in an efficient condition.

348. Steam launches and motor boats.—(a) The preceding instructions for the management, care, and preservation of the machinery of the vessel will, so far as applicable, govern the management, care, and preservation of the machinery of steam launches and motor boats.

(b) The safety valves of the boilers of steam launches will be examined whenever steam is raised after an interval of more than seven days not under steam. The condition of the safety valves, water gauges, check valves, etc., will be ascertained from time to time while the machinery is working. Great care will be taken to keep these important fittings in a thoroughly efficient condition.

(c) Salt water will not be used in the boilers of steam launches except in cases of great emergency, and after its use the boilers will be scaled and cleaned as soon as possible.

(d) Unless it is expected that the machinery of steam launches will be used again in a few days, the wearing surfaces of cylinders and valve chests will be cleaned and lightly coated with mineral oil and the engines made ready for use. All drain cocks should be kept open and the engines, valves, pumps, etc., moved every day.

(e) Strainers on sea-valve openings will be kept clear and receiving pipes of circulating and air pumps examined and cleaned annually or more frequently if necessary.

(f) The boilers of steam launches will be frequently examined, internally and externally, and hydrostatically tested in the same manner as the main boilers.

(g) Fuel connections must be absolutely tight. Oil, gasoline, or kerosene must not be allowed to enter into the bilges of the boat. All connections must be frequently examined and be tight.

(h) All fuel must be strained when filling the tanks.

(i) The electric batteries must be stowed in a dry and protected place.

(j) The dynamo for the ignition system must be kept dry and free from grease and dirt.

(k) The exhaust pipe and muffler should be covered with nonconducting material to prevent the scorching of the surrounding woodwork.

(l) The Rules and Regulations of the Board of Supervising Inspectors of the Steamboat Inspection Service for the equipment of motor boats and steam launches must be adhered to.

349. (a) When a vessel is laid up, the iron or steel bright work of the machinery, except such parts as pass through stuffing boxes, or upon sliding surfaces (as piston-rods, valve stems, slide and guide faces, and journals), shall be covered with white lead and tallow.

(b) All packing shall be removed from piston rods or valve stems.

(c) All parts passing through stuffing boxes, or working upon their surfaces, such as piston rods, valve stems, guide and slide faces, clutch coupling slides, interiors of steam cylinders and valve chests, must be cleaned and covered with a coating of vaseline and the machinery moved upon first application so as to bring all these parts upon properly covered surfaces.

(d) All bearings must be well oiled, the oil holes plugged with waste, and the engines turned one complete revolution after oiling.

(e) All water-containing parts of the machinery inside of outboard valves shall be thoroughly drained. Particular attention should be paid to draining of pump cylinders; condensers; feed, blow, and suction pipes; fire main; and all steam and exhaust piping where it is possible for water to gather. In draining these pipes, drain plugs to be removed or flange joints should be broken at the lowest parts of each system and wherever a pocket is formed which is not drained by a proper drainpipe. Outboard valve casings below valve seats must be covered where possible with nonconducting material, such as sawdust or manure, temporarily boxed in.

(f) The gauges and oil cups will be drained but not removed.

(g) The sea valve must be closed and properly secured and precautions taken to prevent freezing, by filling chests with heavy oil or by other efficient means.

(h) The storerooms must be cleaned.

(i) The smokestack and ventilators must be covered.

350. Care of the electric plant.—(a) This apparatus must be kept clean, in perfect condition and repair; the dynamo must be protected from moisture.

(b) Proper precautions must be taken against short circuits and the overheating of the armature and the rheostats.

(c) Switches must be wide open or securely shut to prevent arcing; contact surfaces must be clean.

(d) The steam turbines or engines and their lubricating systems must be frequently examined and kept in proper state of efficiency.

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