

## *Directions to the light-keepers of the United States.*

1. The lights must be extinguished every day at sunrise, the *curtains* put up around the interior of the lantern, and, as soon after as practicable, the keeper or keepers shall commence the process of cleaning the lamps, trimming the wicks, and polishing the reflectors or refractors, (as the case may be,) wiping off the plate-glass, &c., &c., observing strictly the following directions:

### TO CLEAN AND TRIM THE LAMPS OF REFLECTING LIGHTS.

2. The reservoirs, tubes, and burners must be thoroughly cleaned, and occasionally rinsed out with clean hot oil. When necessary, the burners must be supplied with new wicks, taking care to cut their tops perfectly even. At least once in two weeks the reservoirs, tubes, and burners will require to, be cleaned with hot ley, to remove the gummy matter which is liable to accumulate and disturb the perfect and uniform flow of oil to the wicks. When the weather is cold enough to cause the oil, if put in the lamps in the morning, to become thick during the day, they must not be filled until, a short time before sunset, when the oil must be warmed, and the heaters applied, to aid in keeping it in a liquid state. Oil containing sediment must be carefully strained before putting it into the reservoirs; and should any be found unfit for use in the lantern, it must be used for the house lamps.

### TO CLEAN, POLISH, AND ADJUST THE REFLECTORS AND LAMPS.

3. The reflectors must be removed, one at a time, from the frame, and carried carefully into the room next below the lantern. If the back or copper part be tarnished, place it on the table or stand provided for that purpose, with that side up; mix a small quantity of tripoli powder in waste oil, and apply it with a cloth, rubbing it until all the tarnish is removed; then, clean it off with dry powder and another cloth. This operation will be required once or twice a week, according to the state of, the weather and the condition of the lantern. The reflector must then be placed on the stand, with the front or silvered part up, and *polished with the greatest care*, as upon this the brilliancy and efficiency of the light mainly depend. Having wiped off the dust and burnt particles of wick with a soft cloth, moisten, a small quantity of *rouge powder*, which has been previously found to be free from gritty particles, with spirits of wine, (not more than, enough for one day's use,) and apply it with a soft leather, or small soft, brush, to the silver, rubbing it all over in right lines, up and down, with the apparent grain, and, before it is quite dry, polish it with a dry leather and a small quantity of dry rouge powder, rubbing it briskly until it becomes brilliant, and perfectly free from tarnish and stains. The gritty particles found in rouge powder, or whiting, may be separated from the fine powder by mixing it with a small quantity of water, and thoroughly working it into a paste; then put it into a sufficient quantity of water to make a clear mixture; when well mixed let it stand a few moments, and then pour off the liquid, leaving the-heavy particles at the bottom. After the liquid has settled for half an hour, pour off the water, and the fine rouge or whiting remaining at the bottom will be ready for use, and to which spirits of wine may be added if necessary.

The reflectors will ordinarily be required to be cleaned in this manner about once a week; at other times, when the silver is not much discolored, it will be sufficient to apply a little dry rouge powder in a soft bag lightly, breathing on it at the same time, and then polish it off with a clean dry leather. The silvered part of the reflectors must be cleaned with the *rouge powder*, whiting, and spirits of wine, authorized by the *instructions* of the Light-house Board, and in the manner indicated in the directions. The *tripoli powder* must be used exclusively for the brass work.

4. The glass chimneys must be made perfectly clean and free from stains, and to fit into their sockets steadily and perfectly upright, (parallel to the axis of the burner,) to prevent the sides from being smoked or injured by being unequally heated by the flames.

5. The screws for raising and lowering the wicks, and chimneys must be tried, to ascertain if they can be moved without difficulty, and the tubes of the burners examined, to see if the oil stands at the proper level, to supply the wicks with regularity; but the lamps must never be tilted to regulate the flow of oil. Defective lamps must be removed, and spare ones substituted at once.

6. The reflectors should be as close to each other, both the lower and the upper tiers, as possible, their lips perpendicular to the horizon, and the burners in the focus of each. Too much care cannot be observed in performing this part of the keeper's duty, to insure the strongest ray of light being directed to those points of the horizon of most importance to the mariner, and to prevent, as far as possible, any waste of light, by allowing it to be transmitted to points where it is not required. The adjustments of the lamps and reflectors can be easily made by the aid of the eye, a foot-rule, and a plummet.

7. The leathers, cloths, linen rags, and polishing powders must be kept in tight cases, well wrapped up, free from damp and dust. In using the leathers great care must be taken to fold them smooth, free from crease or uneven surface, and that no grit or other hard substance adheres to them to injure the silvered surface of the reflectors; and no leather, which has been wetted or washed with water, shall be used, on any account, to clean the silvered part of the reflectors.

8. Having completed the cleaning of the lamps, burners, and reflectors, and placed them properly on their frames, and the whole illuminating apparatus being in every respect ready for lighting, the cover kept for that purpose must be placed over the lamps and reflectors carefully, so as to prevent any dust from settling on them during the cleaning of the lantern-floor and platform, both of which must be carefully washed and wiped with cloths when necessary. When the interior of the dome, chandelier, astragals, &c., &c., require to be cleaned with water, or in any other way than by the use of brushes and dry cloths, it must be done early in the day, and before the lamps and reflectors are cleaned, that the whole may be thoroughly dry before sunset.

9. Previous to lighting the lamps in the evening, the curtains must be taken down carefully and put away in a clean place, and all the reflectors wiped off with a soft, clean cloth to remove any dust that may have settled on them during the day. Care must be

taken, at all times, to prevent dust and sand from getting into the lantern. When there is sufficient wind to move the dust and sand, the lantern-door should be kept tightly closed.

10. In lighting, the lamps the keeper must light them one after another as rapidly as possible, taking care to have the tops of the wicks ignited all round, and screwed down to the lowest point at which they will burn before leaving them, and the glass chimney raised as high as possible. Having in this manner lighted all the lamps, he must commence with the one first lighted, and raise the wick gradually until the flame is about three-fourths of an inch high, and at the same time lower the chimney gradually in the same proportion.; continue the operation with each one in succession, until the first one lighted is again reached. Each light must now be raised in succession to its greatest height; and the chimney lowered to its proper point, to produce the brightest and whitest light, though very gradually, taking care that the wicks are not elevated so rapidly as to cause them to char or smoke. The flames should be from *one and a quarter to one and a half inch in height* when properly lighted, and attended. Good lights can only be produced by being frequently examined and carefully attended to, and kept perfectly free from smoky points, with clean chimneys and refractors or bright reflectors of proper shape and in perfect adjustment.

#### VENTILATION.

11. One of the most important duties of the light-keeper is to be watchful and attentive in keeping the lantern well ventilated. When there is very little wind a portion of all the ventilators placed in the lower part of the lantern may be opened, having due regard to the clear and steady burning of the lights. When there is much wind the leeward ventilators only must be opened, and only so much of them as is necessary to allow the lights to burn bright, steady, and clear. Irregular currents of air, produced either by the trap or balcony-door, or by the windward ventilators, are injurious to the lights, when the means employed are in other respects good. Before leaving the lantern, even for a moment, the keeper must be certain that the ventilators are sufficiently open to admit the necessary quantity of air to produce good combustion.

12. The paint-work of the interior of the lantern must be kept washed clean and white. The whole interior of the dome, sashes, and astragals, must be painted, white. Soot, iron rust, and dust must not be permitted to accumulate in the lantern; and in the event of the plate-glass becoming discolored by the iron rust, &c., from the dome, and frame-work of the lantern, it must be thoroughly cleaned off, without delay, with spirits of wine and rouge if necessary.

13. When ice, sleet, or drift snow settles on the outside, or when the ice forms in cold weather on the inside of the glass of the lantern, a strong brine applied to it will cause its removal without difficulty, and, in extreme cases, a small quantity of spirits of wine may be employed with advantage for the same purpose. Storm panes of glass must be kept clean and ready for replacing any that may be broken during the night.

14. Cleaning rags, chimneys, trimming scissors, brushes, oil-measures, chairs, stools, and the like, must be removed from, and kept out of, the lantern while the lights are: burning. Utensils of all kinds must be kept in their proper places, in the room immediately below the lantern.

15. When the weather becomes sufficiently cold to require fire to be kept in the stove, the temperature of the interior of the lantern must not be raised more than is absolutely necessary to keep the oil in a liquid state. The oil-heaters should be warmed in the stove of the dwelling-house before being placed in the reservoirs, and just before lighting the lamps.

16. Every effort must be made by the keeper to keep the towers, buildings, and premises, clean and in good order. Lime for whitewash, and paints, will be furnished in proper quantities, which must, be used economically. The stairs, floors, and railings must be kept free from oil, soot, and dirt.

#### LIGHTNING RODS.

17. Keepers are particularly cautioned not to neglect the electrical conductors attached to the towers and dwellings. Care must be taken to ascertain that they are not in contact with iron girders, bands, or other metal employed in the construction of the buildings; that they are not injured by being cracked or broken, and that they lead out from the building, either into the water, or; sufficiently outward and downwards into the ground to reach the wet earth; the part in the ground to be surrounded by powdered charcoal.

#### REVOLVING MACHINERY.

18. The revolving machinery requires the especial care and attention of the light-keepers. Every part of it must be carefully cleaned with small brushes, furnished for the purpose, and with pieces of soft white pine, cut to the proper size-and shape, to remove the dust and gummy oil which are liable to adhere to its different parts. When it is thoroughly cleaned, the pivots must be oiled, either with olive oil, neat's foot oil, or the best quality of sperm oil; and if the fly is driven by an endless screw, that screw must be oiled also. This operation must be performed at stated periods, and always when, upon examination, it is found necessary. The *fly, or regulator*, must be adjusted by testing the machinery in motion with the aid of a good time-piece. The duration of the revolutions must be strictly in conformity to the stated, periods in the light-house fist, and to directions from the proper officers of the aboard. The time occupied in performing the revolutions must be frequently tested, and in case of any deviation from that prescribed, the *fly* must be readjusted.

#### FOG SIGNALS.

19. These essential aids to navigation demand the same care and attention, on the part of the keepers, that the lights do. Whistles, bells, or gongs, fitted with the necessary machinery, require to be examined daily, to see that all is in working order and

adjustment. The bells must be kept clean and bright at all times, and nothing permitted to be in their vicinity which will tend to destroy, lessen their usefulness to the mariner, by deadening the sound or deflecting it from its proper direction.

During thick or foggy weather these signals must be made at the prescribed periods of time, to enable those within the limits of their sound to distinguish them from others in their vicinity. Bells, whistles, and gongs, must be sounded with as much regularity as possible during the existence of foggy or thick weather, whether worked by hand or by machinery.

#### DAY SIGNALS AND DISTINGUISHING MARKS.

20. No change in the color of towers, buildings, or their appendages, must be made, except by the positive written directions of the Lighthouse Board to the inspector of the district. In all cases where tide-signals are required to be made, the keepers will be specially instructed on the subject.

By order of the Light-house Board :

WM. B. SHUBRICK,  
*Chairman.*

THORTON A. JENKINS,

} *Secretaries*

EDM'D F. HARDCASTLE,

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