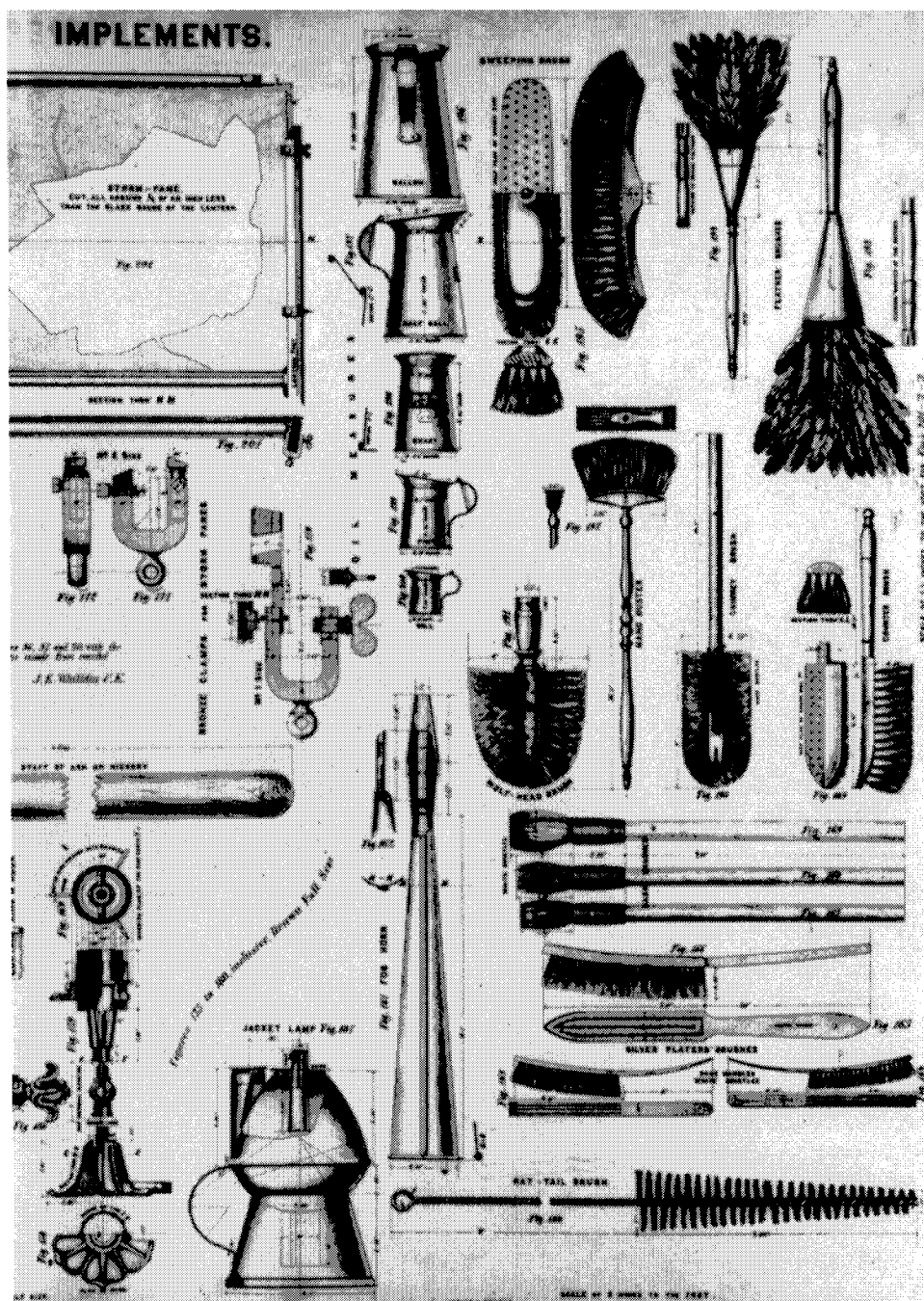


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Historic Furnishings Report

POINT LOMA LIGHTHOUSE

CABRILLO
National Monument / California

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HISTORIC FURNISHINGS REPORT

**POINT LOMA LIGHTHOUSE
Cabrillo National Monument
San Diego, California**

by
Katherine B. Menz

Harpers Ferry Center
National Park Service
U. S. Department of the Interior
December 1978

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CHAPTER A: INTERPRETIVE OBJECTIVES

The overall interpretive theme of Cabrillo National Monument as stated in the master plan is that of men and their relationship with the sea. A major aspect of this theme is the old Point Loma Light, an example of an early navigational aid and one of the first lighthouses on the California coast. One of the management objectives of the park is that the lighthouse and its furnishings should reflect the lifestyle and living conditions of the 19th-century light keeper who was responsible for the care and maintenance of the Light. The visitor should leave the Point Loma Light with the feeling of having glimpsed what life was like for the light keeper, Robert Israel, and his family.

The furnishing plan should focus on the period 1875-91 when Robert Israel was light keeper. Israel was a light keeper at Point Loma for nineteen years and much evidence exists as to the lighthouse's appearance during his tenure.

CHAPTER B:

OPERATING PLAN

Four rooms in the lighthouse will be completely refurnished to appear as they did during the Israel occupancy. A partial refurnishing is recommended for that portion of the lean-to which is visible to the visitor. The closet on the second floor should be furnished as a storeroom for the lightkeeper's tools and implements.

Visitor access to the house will be by self-guided tour during regular park hours. The visitor will enter by the front door and then turn either to the left or right to view the parlor and kitchen. From the kitchen barrier, he can look into the lean-to. He then proceeds upstairs to view the two bedrooms and storage closet. He can look up the tower but cannot walk up any further. The visitor must return down the center stairway. Barriers will be constructed so visitors can step part of the way into each room.

Occasionally living history demonstrations will take place in the kitchen. Some food preparation may take place using reproduction items.

CHAPTER C: HISTORIC OCCUPANCY

The Point Loma Lighthouse had 11 keepers and 22 assistants during its 36 years of operation (see Appendix I for list). This report will focus on the last keeper, Robert D. Israel, because of his long tenure in the house and the availability of material about the family.

Israel remained at Point Loma for 19 years. Prior to Israel, no keeper had stayed for more than six years. The rapid turnover was not unusual for a job which was low paying and required long hours in an isolated area. A light keeper's salary was \$1,000 a year until 1880 when it was reduced to \$800 a year. Assistant keepers earned between \$500 and \$625 a year (see Appendix I). Keepers often took additional jobs to supplement their income. For example, the first assistant keeper at Point Loma operated a shipyard (January 29, 1855 to January 29, 1856) during his assignment in San Diego. However, if an outside job interfered with lighthouse duties, it could result in a dismissal. George Shaw, keeper at nearby Point Fermin in 1887 was reported to the Lighthouse Board for being absent from his station. He was found living in a tent in San Pedro, charging admission to an exhibition of war photos.¹

Robert D. Israel was no exception to the general practice of keeping an outside job. During the years he was light keeper, he and his wife Maria made several thousand dollars profit as successful land speculators, buying and selling San Diego property. Most often they

1. Letters Received by the Lighthouse Board from the 12th District Inspector, December 23, 1887, RG 26, National Archives [cited hereafter as Letters Received, Inspector, 12th District].

would purchase land for the price of back taxes, and later resell it at a considerable profit. For example, in 1869 Maria Israel bought 88 acres for \$1.00.² In the same year, they sold seven lots of land for a total of \$500.³

Robert Israel was appointed assistant keeper in 1871 and was promoted to keeper in 1873. He remained at Point Loma until 1892. His last year was spent tending the new Point Loma Light built below the 1855 light station on the point.

Like many men who joined the Lighthouse Service, Israel had had an active and varied career before becoming a light keeper. He was born March 23, 1823, in Pittsburgh, Pennsylvania.⁴ As a young man he was probably trained as a chairmaker which was the occupation noted on his enlistment papers when he joined the U. S. Army, December 4, 1846, to serve in the Mexican War.

Israel enlisted in the Army in New Orleans, indicating he had probably traveled down the Ohio and Mississippi Rivers from Pittsburgh looking for a new place to settle. He was twenty-three when he enlisted. His records indicate he joined a regiment newly established to serve along the Oregon Trail.

New Orleans at that time was a major supply depot, departure point and recruitment center for the war with Mexico. The city was full of

2. San Diego County Records, 1864, Deed Book 4, p. 257.

3. San Diego County Records, 1869, Deed Book 5, p. 394.

4. See enlistment papers for Robert D. Israel, December 5, 1846, RG 94, National Archives, and R. D. Israel, Pension File, RG 15, National Archives.

newly recruited soldiers and there were frequent parades which must have impressed young Robert Israel. He was assigned to Company E of the Regiment of Mounted Riflemen but never did serve on the Oregon Trail.⁵ The Mounted Rifles became one of the most celebrated Army units. General Winfield Scott addressed them as "The Brave Rifles" in congratulating them on their role in the conquest of Mexico, and the phrase became the regiment's motto. Israel fought in the siege of Vera Cruz, the battles of Cerro Gordo, Contreras, Churubusco, Chapultepec, and the Belen Gate.⁶ Israel was very proud of his Mexican War service. One brief article in the San Diego Union of 1880 mentioned Israel's presence in town and his reminiscences of the war. They described him as "present efficient lighthouse keeper at Pt. Loma and former hero at many bloody battlefields of the Mexican War of 1846."⁷ According to Israel's grandson he treasured his Mexican War uniform, made of dark blue cloth with yellow edging, keeping it for many years in a wooden chest in his bedroom.⁸

Israel was honorably discharged at the end of the Mexican War in 1848 and he received a land grant for his service. He returned to Pittsburgh briefly where he wrote to the Commissioner of Pensions in November 1848 requesting his land grant be sent to him in Pittsburgh.⁹ His discharge papers had been stolen from him in New Orleans and he was afraid the grant would go to the thief.

5. Ibid.

6. Ibid.

7. San Diego Union, January 11, 1880, p. 4.

8. Interview with Mr. and Mrs. Robert Israel by Emily Morse and Ross Holland, January 4, 1963.

9. Unindexed Bounty Land File, Robert D. Israel, National Archives, RG 15, 43-165-160-47.

In 1849 Israel and his brother Joseph traveled to California, probably attracted by the gold rush,¹⁰ although he settled in San Diego. Israel may have sold his land grant in order to finance his trip. During his first years in California, Israel held a variety of jobs, the first of which appears to have been as a blacksmith. On August 30, 1854, Robert D. Israel was paid \$57.00 by the San Diego Town Board of Supervisors for making handcuffs.¹¹ In 1853 Israel had been an unsuccessful candidate for constable on the Phoenix Independent ticket.¹² At some point in the early fifties Israel also joined the San Diego Guards. Smythe's History of San Diego states Israel took part in the Indian Wars in the early fifties. He was, according to Smythe, the orderly sergeant who ordered the Indian Garra's execution.

In August 1856, Israel was elected 2nd Sergeant of the San Diego Guards.¹³ While he was in the Guards, he continued his blacksmithing. An 1856 notice in the San Diego Herald commends Israel and John Van Alst for making "a fine wagon" at the quartermaster's depot during intervals when not needed by the quartermaster. It was the second wagon they had made over the past year. The author wrote: "For beauty of construction, style of finish and great strength, it surpasses anything we have ever seen on the Pacific Coast."¹⁴ One year later Israel and Van Alst became

10. San Diego Union, November 11, 1883, p. 3.

11. State Board of Supervisor's Records, August 30, 1854, Cabrillo National Monument Files, and also in Israel Biography File, Serra Museum.

12. San Diego Herald, August 24, 1853, p. 2.

13. *Ibid.*, August 9, 1856, p. 2.

14. *Ibid.*

partners in a carriage-making and blacksmithing business.¹⁵ Israel dropped out of the partnership in January 1858.¹⁶ He and Van Alst, however, remained business associates. A notice confirming their partnership as the owners of eight San Diego lots of land appeared in 1869.¹⁷

After his attempt at blacksmithing, Israel turned to ranching and possibly horse raising. In 1858 an advertisement in the San Diego Herald shows Israel entered a bay horse named "Buey" in a San Jose race for a \$1,000 purse.¹⁸ Whether or not he won is unknown. One of Maria's uncles, Juan Machado, hosted horse races at his ranch in Desconso, Lower California, and he may have encouraged Israel.¹⁹

The 1860 census lists Israel as a farmer with a farm valued at \$1,000, a personal estate of \$1,000, real estate of \$500, farm machinery and implements of \$500, 5 horses, 3 asses and mules, 3 milk cows and 1,200 bushels of wheat. For the next decade it appears Israel was primarily occupied in farming. There is evidence he attempted opening a saloon in 1869 but he also seems to have continued ranching.²⁰ He and his family were living on a ranch when

15. Ibid., September 26, 1857, p. 2.

16. Ibid., January 30, 1858.

17. San Diego Union, January 16, 1869.

18. San Diego Herald, November 6, 1858, p. 2.

19. Rosemary Masterson, "The Machado-Silvas Family," The Journal of San Diego History, pp. 32-39.

20. San Diego Union, November 14, 1869.

he joined the Lighthouse Service. The Israel's last child was born in 1871 at San Juan Ranch.²¹

Three years after his arrival in San Diego, Israel married into the socially prominent Machado family. In a Catholic ceremony at St. Joseph's Church on August 5, 1852, he married seventeen-year old Maria Arcadia Allipas, granddaughter of Jose Manuel Machado, one of the first settlers of Old Town.²² The Machado family probably encouraged and aided Israel with his local political involvement. Although he lost the election for constable in 1853, he was appointed notary public in June 1856;²³ he served on a grand jury panel in 1857;²⁴ and he was elected Supervisor of Guaymaca Precinct in 1858.²⁵ His name appears on the notice of a public meeting to discuss the question of whether the southern counties should form a territory in 1859.²⁶ He became a school trustee in 1856.²⁷ In 1869, he served as a weekly delegate to the Union Republican County convention and then he became a member of the Republican Central Committee.²⁸ He remained on the Central Committee until his lighthouse appointment in 1871.

21. Ibid., June 22, 1871, p. 4.

22. San Diego Herald, August 27, 1852, p. 3.

23. Ibid., June 14, 1856, p. 2.

24. Ibid., April 11, 1857, p. 2.

25. Ibid., September 4, 1858, p. 2.

26. San Diego Herald, February 26, 1859, p. 1.

27. William E. Smythe, History of San Diego 1542-1908 (San Diego, The History Co., 1908), p. 276.

28. San Diego Herald, February 26, 1859, p. 1.

Israel was a strong Republican supporter. He resigned as school trustee in 1867 over the dismissal of the new school teacher Mary Walker. Mary had attempted to take a black woman to lunch in the Franklin House dining room. The woman was the stewardess who befriended Mary when she was seasick during her voyage to San Diego from New England. Israel is reported to have said: "I'll be damned if I wouldn't take that school money and throw it in the bay as far as I could send it, before I would dismiss the teacher to please those copperheads . . . I will never consent to her dismissal."²⁹

Dr. David B. Hoffman, Collector of the Port of San Diego, and a distant relation of Israel's by marriage, was responsible for appointing him as assistant lighthouse keeper to Enos Wall in 1871. Wall was also a distant member of the Machado family.

Although the Machado family seems to have assisted Israel, Maria's mother evidently still felt some concern for her daughter's financial welfare after she married Israel. In 1854 she gave Maria several parcels of land in San Diego, making sure Israel would have no control over it.³⁰

Robert and Maria Israel had four sons; Henry Clay, born February 11, 1862; Joseph Perry, born February 3, 1865 (died 1869); Robert Lincoln, born July 8, 1867; and another son named Joseph Perry, born June 12, 1871. Although Israel was appointed to the Lighthouse Service in May of 1871, Maria did not move to the lighthouse until after the birth of her last son, according to the birth announcement

29. Henry Schwartz, "Devotion to Friend Cost Schoolmarm Her Job in Old San Diego," San Diego Union, October 31, 1916, p. D2.

30. Indenture, April 27, 1854, between Juana Wrightington and Arcadia Israel, Cabrillo National Monument Files.

in the San Diego Union.³¹ She may have remained on their ranch because of the small quarters at the lighthouse until Israel was promoted to keeper in June 1873, at which time she was appointed his assistant.

Life at the lighthouse, although isolated, was never dull for the Israel boys. During the school week they stayed with their grandmother, Juana Machado Wrightington, or one of their aunts in Old Town San Diego.³² Only weekends and vacations were spent at the lighthouse. When Mrs. Israel's half-sister, Maria Wrightington Minter, died, the Israels took in their young niece, Emma Minter. According to the 1880 census, she was six years old and living with the Israels at that time. In a magazine interview, when asked how she amused herself at the lighthouse, Emma Minter replied: "What had I for playthings - the nicest in the world. Pretty shells, colored stones, kelp babies."³³

In addition to the usual activities of young boys, hunting and fishing and swimming, the Israel children gathered seashells, hawks' eggs and kelp for use in making items to sell to visitors. They gathered seashells to polish and sell on their own and for their mother who decorated picture frames with the smaller ones. Their grindstone for polishing was kept at the back of the lighthouse. The boys would blow and paint the hawks' eggs.³⁴

31. San Diego Union, June 22, 1871, p. 4.

32. Interview with Robert Israel III, December 7, 1967.

33. Winifred Davidson, "No. 355," San Diego Historical Society Quarterly, Vol. 1, No. 4, October 1955, pp. 48-50. Cabrillo National Monument Files.

34. Interview with Mr. and Mrs. Robert Israel III by Emily Morse and Ross Holland, January 4, 1963.

The Israels were able to sell many of these homemade items to the visitors who came to the lighthouse. A grandson reported his father and uncles received \$1.00 a shell and Mrs. Israel received \$75.00 for one of her seashell frames enclosing a small picture (by Joseph) made out of pressed seaweed.³⁵ (There is a \$10.00 price marked on one of the surviving pictures in the park collection which suggests Bert Israel exaggerated somewhat.)

Evidence indicates the Israel boys left home at an early age. In 1878, Robert Israel's oldest son, Henry (at age 16), was recommended for the U. S. training ship, "Jamestown."³⁶ Henry does not appear as living at home in the 1880 census records; he had probably been accepted aboard the training ship and was away. According to his nephew Robert, Henry spent most of his life on shipboard.³⁷ From April to July 1889 Henry served briefly as his father's assistant at the Point Loma Light between the appointments of David Splaine and Thomas Anderson. He was transferred to become first assistant at Ano Nuevo Light because of a Lighthouse Service rule that no two members of the same family could have charge of the same light.³⁸

Robert probably was married in 1887. His first child was born October 24, 1888 at Point Loma,³⁹ where he had taken his wife to have her child under his mother's care. He had probably left the lighthouse several years before the birth of this child. In 1892 there

35. Interview with Mr. Robert Israel, December 7, 1967.

36. San Diego Union, July 7, 1878, p. 1.

37. Robert Israel interview, December 7, 1967.

38. San Diego Union, July 24, 1889, p. 2.

39. *Ibid.*, October 27, 1888, p. 4.

is evidence he was managing a ranch for his father and had been doing so for several years.⁴⁰

Joe was probably the Israel's only son still living at the lighthouse in the late 1880s. When Israel left the Lighthouse Service in 1892, Joe filled in as assistant keeper to Haydon Cartwell until another keeper was appointed.⁴¹

Emma Minter was also still at the lighthouse with the Israels at this time. Mrs. Laude Mustain remembered her mother visiting Emma during the 1880s⁴² and Philip Savage, assistant keeper, refers in 1886 to a female guest in his letters to the Lighthouse Board, who may have been Emma.⁴³

From the time Point Loma Light was built, there was a great deal of romantic interest in the lighthouse among the local San Diegans.⁴⁴ Numerous articles in the San Diego Union recommended the trip to Point Loma. One traveler wrote in 1890: "One of the most enjoyable little outings in the vicinity of San Diego is a trip to the Point Loma lighthouse, where every night for a quarter of a century has gleamed a guiding star to mariners seeking an entrance to our harbor."⁴⁵ Point

40. San Diego Union, February 5, 1892, p. 5.

41. Ibid., February 7, 1892, p. 5.

42. Laude Mustain, taped interview, April 1964, Cabrillo National Monument Files.

43. Letters Received, Inspector, 1886-87, May 16, 1886, RG 26, National Archives. (see Appendix II)

44. Marjorie Tisdale Wolcott, Pioneer Notes From the Diaries of Judge Benjamin Hayes 1849-75 (Los Angeles, privately printed, 1924), n.p., January 13, 1860, San Diego.

45. San Diego Union, April 27, 1890, p. 2.

Loma was such a popular and romantic spot, even though difficult to reach, that one couple had their wedding performed at the lighthouse on December 11, 1876.⁴⁶ Frequent weekend picnics and hayrides were made to Point Loma. In 1873 one picnicker at the lighthouse wrote: "The rather laborious task of climbing the very steep hills was more than compensated for by the glorious view that opened itself out before the picnickers."⁴⁷ Sometimes the picnics culminated in a country dance which would last all night. The Israel boys all played instruments: Joe the violin, Henry the guitar and Robert the banjo.⁴⁸

One San Diegan wrote about Robert Israel, "Capt. Bob was more nimble on his feet than any of the rest."⁴⁹ Marie Israel also enjoyed dancing, although it was her mother who was remembered for a Spanish dance she and her sister performed which included balancing glasses of water on their heads.⁵⁰

Visitors were also attracted to Point Loma during whaling season. Excursions from San Diego were organized to see the "trying operations"--the extraction of whale oil which was done right on the beach.⁵¹ The Israel boys attended these beach operations, one of the

46. Ibid., December 12, 1876, p. 4.

47. Ibid., January 8, 1873.

48. Robert Israel interview, December 7, 1967.

49. Lillian C. Whaley, "California's Oldest Town, 1893" (manuscript in collection of Whaley House, San Diego, California).

50. Lillian C. Whaley, "Memoirs 1888-30" (manuscript in collection of Whaley House, San Diego, CA).

51. San Diego Union, January 20, 1861.

benefits of which was doughnuts made by the cook in whale oil.⁵² They also could earn extra money by signalling to the whalers of the presence and directions of schools of whales.⁵³

Maria Israel served as assistant keeper until February 15, 1876. She must have been busy raising her children, housekeeping, and tending the lighthouse. One story told about her by her grandson was that during her watches she would sit in the stairwell under the light and sew.⁵⁴ Two examples of her needlework have survived: embroidered pillow shams which show her to have been an accomplished needlewoman.

Another of Maria's activities was tending the garden. The productivity of the garden varied widely from year to year. Water was always a problem at Point Loma and lack of adequate rainfall may account for the garden's poor years. Prior to the Israels' tenure at the lighthouse, in 1869 Keeper John Jenkins had an extensive garden according to one visitor:

Neatness and order prevailed in the little enclosure. The flower beds--surrounded by auluna shells, the tidy walks and neatly arranged beds told, at a single glance, the story of the taste and industry of these industrious inhabitants of this lonely tower. Beside the walls of the house, some tomatoes were just ripening, while well grown potato vines and other garden vegetables luxuriated in the genial sun and wooing breezes.⁵⁵

52. Ibid., July 14, 1929.

53. James Mills, "Southern California's Oldest Light," San Diego Historical Society Quarterly, October 1955, p. 47.

54. Robert Israel III, taped interview #7, Cabrillo National Monument Files.

55. San Diego Union, January 16, 1869.

But by 1874 another visitor to the lighthouse recounted a different story:

Mrs. Israel told us that she had endeavored in vain to make a few of the most hardy flowers and vegetables grow, but the position was too much exposed to admit of cultivation.⁵⁶

At this time Maria Israel was assistant lighthouse keeper and had young boys ages 12, 6 and 2, so she probably had little time for gardening. Several years later the San Diego Union under "Local Brevities" reported:

Robert D. Israel...left on our table an immense head of lettuce--as large as an ordinary cabbage--raised by Mrs. Israel in a little garden which she cultivates at the lighthouse... this specimen of lettuce convinces us that almost anything will grow if properly cultivated.⁵⁷

In 1886 the garden was still doing well according to Israel's assistant, Philip Savage. Savage wrote to the Lighthouse Board that he did not see why he should whitewash the vegetable garden fence when he did not get any of the vegetables.⁵⁸ (See Appendix II for series of letters by Savage and Israel, recording a minor feud between the two).

Keeper Israel's daily duties were spelled out in Lighthouse Service publications, the most important of which were Instructions to Light-Keepers, and Instructions and Directions for Management of Lens,

56. Ibid., February 22, 1874.

57. Ibid., May 13, 1884, p. 3.

58. Letters Received, Inspector, 12th District, 1886-87, June 6, 1886, RG 26, National Archives. (see Appendix II)

Lights and Beacons. Each keeper was also provided with a Light List. These publications were periodically updated.

In the 1881 Instructions to Light-Keepers under "General Instructions," the Lighthouse Establishment stated (see Appendix III for complete copy):

The Keeper is responsible for the care and management of the light and station in general...

All Keepers must acquaint themselves with the workings of the apparatus in their charge...the Keepers must take pains to acquire knowledge of every detail regarding the mechanism of the apparatus.⁵⁹

In 1881 Israel and his assistant had trouble with the new mineral oil lamp. The inspector reported:

Difficulty was at first experienced by the Keepers in their [mineral oil lamps] care, as they were unable to make the leather valves last more than a month. Further instructions remedied the evil.⁶⁰

The Lighthouse Board warned:

Ignorance upon any point will not be considered as an excuse for neglect of duty.⁶¹

59. U. S. Lighthouse Establishment, Instructions to Light Keepers, July 1881 (Washington: General Printing Office, 1881), p.5 [cited hereafter as Instructions, July 1881].

60. Letters Received by the Lighthouse Board from the 12th District Engineer, 1881-82. Vol. 550, Part 4, June 30, 1882, p. 117, RG 26, National Archives [cited hereafter as Letters Received, Engineer, 12th District].

61. Instructions, July 1881, p. 5.

Keepers with assistants were informed:

The Keeper shall take an equal share in all the work and duties of the station with the assistant keepers.

...the watches must be divided so that an equal share of the work shall fall to each Keeper. A watch book must be kept and signed by each person...

The Keeper is responsible for the careful management and expenditure of stores and supplies.⁶²

The Keeper was required to keep daily records of his supplies and to make various monthly, quarterly, and annual reports to the lighthouse inspector and the lighthouse engineer.

Detailed instructions on the care of the light and illuminating apparatus were provided the keepers:

Lights must be lighted punctually at sunset, and must be kept burning at full intensity until sunrise...

When the light is extinguished in the morning the Keeper must hang the lantern curtains and immediately begin to put the apparatus in order for relighting. While doing this the linen aprons provided for the Keeper's use must be worn, that the lens may not suffer from contact with the wearing apparel....

The lens and glass of the lantern must be cleaned daily....⁶³

The keepers were told how to clean all parts of the lens and illuminating apparatus. In the 1881 Instructions although the lights were switching to the use of mineral oil, care of the lard oil lamp was

62. Ibid., pp. 5-6.

63. Ibid., p. 7.

still included.

Two types of lamps were used in third order lights: the Hains or low-reservoir, and the constant-level lamps. The Hains lamp was in use at Point Loma.⁶⁴ Care of the Hains lamp required the keeper to charge the lamp at midnight, as the Instructions informed him that "When the oil burns low it does not give so good a light." Constant-level lamps did not need to be charged.⁶⁵

When the work was completed the keepers were told:

Utensils of all kinds must be kept in their proper places. While the light is burning, everything which does not belong in the lantern must be removed from it.⁶⁶

Care of the dwelling and grounds was another major duty of the keepers, who were instructed:

The utmost neatness of buildings and premises is demanded. Bedrooms, as well as other parts of the dwelling must be neatly kept.⁶⁷

In 1884 this addendum was made to the 1881 Instructions by the Lighthouse Board:

All painting, whitewashing, and application of other washes that may be necessary for the cleanliness and good appearance of the structures at light-stations shall

64. Letters Received, Engineer, 12th District, 1883-84, Vol. 600, Part 2, February 11, 1884, p. 568.

65. Instructions, July 1881, p. 13.

66. Ibid., p. 8.

67. Ibid., p. 6.

be done by the Keepers and assistants of such stations, under the direction and supervision of the inspector of the district.⁶⁸

In a series of letters written by Robert Israel and his assistant Philip Savage to the Lighthouse Board, each complaining of the other's misconduct, the daily routine at Point Loma is clearly explained. Israel described their work for two weeks in May 1886:

On the 11th of this month the asst began to whitewash the fence and stable and made it last untill the 25th when he stoped,...he told me he had done all he was a going to do, that the ballance was mine, that he had no interest in the garden, had no chickens, and no horse to put in the corral....

...at the same time I painted the lantern red outside, white inside, the tower white inside from the top to the bottom, stairway, bannister, and hall floor, also all the doors facing the hall and tower....⁶⁹

In another letter Israel wrote:

I ordered the Assistant to sweep down the Tower stairs. He says he will not do it but when he sees fit and will not sweep the lower flight at all. I then ordered him to keep his watch in the lantern which he refuses to do but sits in his kitchen and visits the Light twice during his watch. I next ordered him to bring the oil carrier and draw the oil which he did but would not carry it up to the lantern....On the 10th I told him I was going to town on Light House Business and to finish cleaning the Privy (I had done one-half) and finish cutting weeds around the fence in all about an hours work. When he said he would do nothing unless I had my hand in it. On the

68. Ibid., addendum.

69. Letters Received, Inspector, 12th District, August 2, 1886, enclosure C, dated May 30, 1886.

11th I finished the Privy and set him to whitewashing and I went to painting the Tower red. 16th he has whitewashed seven pannels of fence, the stable and tank shed. Just what I do in one day. He...refuses to wash the stairs down on Sunday morning when it is his watch.⁷⁰

These excerpts show daily chores included painting, whitewashing, weeding the garden, cleaning the privy, and caring for the chickens and horses. After the light was extinguished, a regular part of the clean-up was sweeping the stairs and whitewashing them once a week.

Savage wrote to refute Israel's charges:

When I [Savage] came here from the Farallon Station, I had formed the habit of staying by the light, till relieved, -- and wanted to pursue the same course here, But said he,--we don't do that here, its not wanted, when you light up you stay by the light and gage it till it settles that is till it is steady, which it will be inside of an hour, and it will stay like that all night, and then you can watch it occasionally from down in the yard, you can see the chimney just as well as if you were up there, and see as well if the light rises too high, and the paint keeps cleaner than if the Keeper stays up there...Some days after he [Israel] said to me, "I stay in my room and read all my watch, I have a mark, the flag pole is my mark, the light shines on it, and by looking through the window, I can always tell when the light is alright, and you ought to get a mark for yourself," which I did and followed his instructions to the letter only in addition that I paid a visit twice up to the light during my watch...and many times, I have staid my whole watch in the lantern, but all the gases from their rooms run up into the lantern and made me feel sick....⁷¹

70. Ibid., enclosure A, dated May 16, 1886.

71. Ibid., enclosure A, dated May 16, 1886, p. 88.

Savage also complained:

I have had to light up for the Keeper many times, and keep part of his watch some time till ten o'clock but he always enters himself in the watchbook as being at the station half an hour before sunset, it being the time for getting ready to light up.⁷²

From this series of letters (see Appendix II for complete letters) it seems the keepers at Point Loma changed watch at midnight and remained responsible for the light for the following twelve hours, one light-out and one light-up. The change may have taken place at midnight because of the necessity of refilling the Hains lamp.

In addition to the daily duties, the lighthouse inspector occasionally requested the keeper to perform other services for the Lighthouse Establishment. In December 1884, Inspector Philips was concerned over a beacon which had washed away from San Diego harbor. He wrote to the Lighthouse Board:

I directed the Keeper of Pt. Loma Light to place the 3d class Nun Buoy, that was on the wharf at San Diego, on this shoal--on the spot where the beacon stood.⁷³

The lighthouse tender was not able to place the buoy because it was not due in San Diego until January.

In the early 1880s the lighthouse inspectors began to strongly recommend the lowering of the Point Loma Light. The light was

72. Ibid., enclosure A, dated June 5, 1886.

73. Letters Received, Inspector, 12th District, Vol. 629, Part I, December 18, 1884, p. 432.

situated at such a high point that the light was often hidden by high fogs while the coastline remained visible. With the increased traffic into San Diego harbor and along the coastline, a more effective light was necessary. By the mid-1880s the inspector began using the additional argument that the condition of the buildings at Point Loma was poor. In July of 1887 he wrote: "The buildings are old and of little account..."⁷⁴ In 1890 the San Diego Union reported that the lighthouse "has been barely habitable for several years, wind and rain finding entrance in many places. Last season during showers the Captain had to go from window to window with a sponge, mopping up the water that could not be kept out." They added: "Captain Israel is anxious to get into the new quarters away from the high winds."⁷⁵

Building the new lighthouse began in 1889 at the tip of Point Loma, 400 feet below the old lighthouse. The new light was lit for the first time March 23, 1891. The Israels probably moved into the new dwelling house sometime shortly before March 23.

At this time only the new watershed had not yet been completed. A disagreement arose between Robert Israel and the Engineer W. H. Heuer over the quality of the cement used by the mason. Israel accused the mason of receiving a percentage of the price of the cement for convincing Heuer to buy it. Heuer denied Israel's charge and reported to the Lighthouse Board that Israel was sending false reports. Another mason was sent to inspect the watershed and he

74. Letters Received, Inspector, 12th District, July 1, 1887, p. 1354.

75. San Diego Union, July 8, 1889, p. 8.

found it "perfect and satisfactory" with only diminutive cracks. The lighthouse inspector also supported Heuer.⁷⁶

Probably as a result of this disagreement, Israel was discharged in January 1892. The San Diego Union reported:

He [Captain Israel] attributes his discharge to a report he recently made to his superior officer in San Francisco in November last, whereby he declared that the recently constructed watershed was improperly built.⁷⁷

After his lighthouse service Israel returned to ranching and blacksmithing.⁷⁸ Since 1888 he had been receiving a small monthly pension for his participation in the Mexican War which must have been particularly welcome after the loss of his keeper's salary.⁷⁹ In 1893 he was successful in getting his pension increased from \$8.00 per month to \$12.00 per month.⁸⁰ Israel claimed he had a bad back, kidney problems, contractions of the leg muscles, and that he was in destitute circumstances.⁸¹ However, the month following Israel's dismissal in February 1892, The San Diego Union wrote that the former lighthouse keeper was busy improving a 360 acre ranch at Coronado that he had bought several years before. His son, Robert,

76. Letters Received, Engineer, 12th District, November 25, 1891.

77. San Diego Union, January 7, 1892, p. 5.

78. According to the 1898 San Diego City Director, Israel listed his occupation at that time as a blacksmith. This occupation was probably carried on in conjunction with ranching.

79. Robert D. Israel Pension File, U. S. War with Mexico, RG 15, National Archives.

80. Ibid.

81. Ibid.

had been in charge of growing 300 fruit trees of different varieties. Israel was doing well enough to order an additional 700 olive trees and 1,000 apricot trees.⁸²

82. San Diego Union, February 5, 1892, p. 5.

CHAPTER D: EVIDENCE OF ORIGINAL FURNISHINGS

Kitchen, Dining Room, Hall, Lean-To

According to the original 1855 lighthouse drawings, the kitchen was the north room with the lean-to addition. The cook stove was placed in this room. Stoves and their accouterments were standard issue to the lighthouses of the 12th District. In 1861 the Lighthouse Records show Point Loma was given a new cooking stove and pipe.¹ Although no other reference to a stove in the keeper's quarters has yet been found, it seems likely the 1861 stove was replaced at least once more before the lighthouse was moved. In the 1880s most of the stoves in the 12th District were replaced by "Eureka Ranges and Stove Furniture," numbers 7 and 8.

The justification for the new stoves was that most of them had long been in use and were worn out. New stoves would be less expensive than the repairs. All were to be of the same make so parts could be acquired, stored and replaced as needed.²

Stove furniture included pots and pans, tea kettles, and wash boilers. Point Reyes requested an iron tea-kettle, 2 fry pans, and one tin wash boiler, all Eureka #7, in 1883.³ Coffee mills may also have been

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1. Letters Received, Inspector, 12th District, January 8, 1861.
 2. Ibid., April 17, 1883.
 3. Ibid., April 12, 1884, p. 466.

"stove furniture." Farallon Islands was issued a Eureka #7 coffee mill along with their ranges.⁴

In 1883 a request was sent to the Lighthouse Board for Eureka ranges and stove furniture for twelve lighthouses.⁵ In that same year Point Loma was issued a piece of zinc "for repairs to the dwelling."⁶ The zinc was probably intended to go beneath the cook stove. In 1884 Farallon Islands was issued a Eureka range and furniture #7 for \$55.00.⁷ Pigeon Point was issued one set of stove furniture, Eureka #7, for \$5.50 and two sets of stove furniture, Eureka #8, for \$12.50.⁸ The assistant's quarters at Point Loma was furnished in 1887 with a Eureka range #7 and fixtures for \$27.00, and Eureka firebrick, grates and furniture for \$6.55.⁹

Most likely food preparation would have taken place in the lean-to since the larger room was also used as the dining area and probably as a kind of family sitting room.

Evidence of the usage of the larger room is found in the letters from the assistant keeper to the lighthouse inspector complaining of the Israels' conduct towards him¹⁰ (see Appendix II). The following

4. Ibid., p. 470.

5. Ibid., April 17, 1883.

6. Ibid., November 8, 1883.

7. Ibid., April 12, 1884, p. 470.

8. Ibid., p. 472.

9. Ibid., June 15, 1887.

10. Ibid., August 2, 1886, pp. 86-114 (enclosures from May-June 1886).

statement offers valuable information concerning the use and contents of this room:

As I entered the front door of his dwelling [Israel's], his dining room door being open,--I saw him sitting at his table.... but the noise I made in opening the door made him get up, he came to look at the clock.¹¹

The clock was probably located in the hallway since Israel had to get up from the table to view it.

Clocks were standard lighthouse issue. Point Loma received its first clock, according to the Lighthouse Board Records, in 1856.¹²

Styles of lighthouse clocks varied both over time and with the maker. One of the earlier styles appears to be a banjo clock made by E. Howard Company which appears in an 1865 engraving of lighthouse equipment (see Illustrations 2 and 14).¹³ A later style is an oak-framed round clock made by Seth Thomas.¹⁴

An 1881 list of unpaid bills in the office of the lighthouse inspector for the 12th District lists two pertinent bills, one for \$21.00 owed to Seth Thomas for repairing clocks and one separate bill for \$3.50 for

11. Ibid., p. 90, enclosure dated May 16, 1886.

12. Ibid., December 1, 1856.

13. United States Lighthouse Establishment, Light Keepers Implements, RG 26, National Archives, Plate 98.

14. Lighthouse Tender Interior, Miscellaneous, Still Photos Section, Coast Guard Headquarters, Public Affairs Branch. A clock of this type is in the collection of the Calvert County Marine Museum, Solomon's Island, Maryland. See also Illustration 15.

repairing a clock at Point Loma (the company is not mentioned).¹⁵ The separate bill for the Point Loma clock suggests it was not a Seth Thomas. An 1886 letter to the chairman of the Lighthouse Board from the inspector of the 12th District requests authority to have five marine clocks and four pendulum clocks repaired for supply to the stations.¹⁶ This request shows there were different types of clocks in use. Point Loma may have still had its original 1856 clock which was probably an E. Howard Company clock.

The only existing description of the Israel's dining table and seating furniture comes from the recollections of their niece, Emma Minter. She remembered the table as being made of rough boards with crude benches for seating.¹⁷ Several factors lend support to Emma's assertions. Furniture was scarce and expensive in San Diego, particularly before the coming of the railroad. The Israels had plain tastes according to their grandson, and they did not have a very high income.¹⁸ Therefore, they would have been unlikely to have purchased expensive furniture. As a young man Captain Israel was a chairmaker by trade and could have made such a table as Emma Minter describes. Finally, one of Israel's predecessors requested furniture-making tools from the Lighthouse Board. The lighthouse engineer wrote to the Lighthouse Board in 1865:

15. Letters Received, 12th District Engineer, 1881-82, Vol. 518, Part I, p. 332.

16. Letters Received, Inspector, 12th District, 1886, Part 2, p. 432.

17. Winifred Davidson, "No. 355", p. 49.

18. Recorded interview with Robert Israel (grandson) by Paige Lawrence and Emily Morse, Part 2, July 1968, Cabrillo National Monument.

The Lighthouse Keeper at Point Loma has applied to me for the following articles, one jack plane, one smoothing plane, one drawing knife, one twofoot square, one grindstone....The Keeper remarks that he has some lumber, and can make many desirable fixtures at his Light House if he had the necessary tools such as lamp stands, stands for oil fixtures, etc.¹⁹

This keeper may have made some of the basic necessities and left them at Point Loma since he was using government materials. There is evidence the grindstone at least was left behind. The Israels had an old one at the back door which they used to polish shells.²⁰

The Israel's grandson, Bert, remembered an oak cupboard in the Coronado home's kitchen.²¹ In another interview Bert recollected his grandmother had some handpainted plates which she treasured and kept in a three-sided corner cupboard in Coronado, with glass doors.²² Bert may have been referring to a second cupboard in addition to the oak one in the kitchen. A cupboard (painted white) with glass doors, now in the Point Loma collection, was reportedly used at the lighthouse. It was given to Point Loma by Mrs. Raymond Whitehouse, an Israel descendant.

19. Letters Received, Engineer and Inspector, 12th District, June 8, 1865.

20. Recorded interview with Robert Israel (grandson), and Mrs. Robert Israel by Emily Morse and Ross Holland, November 4, 1964, Cabrillo National Monument.

21. Robert Israel interview, July 1968.

22. Robert Israel interview, December 7, 1967.

Mrs. Israel also kept some silver teaspoons at the Coronado house.²³ Other table items used by Mrs. Israel at Coronado were: white tablecloth and napkins, a simple china with a green leaf and flower border, a cake plate, a kerosene lamp with a tin reflector, and on the table a lazy susan with cream and sugar, toothpick holder, a container of chili pepper sauce (with goose quill and cork top), and salt and pepper shakers.²⁴ Bert remembers they often used salt out of a dish because the shaker would get clogged. A blue and white pepper shaker given by the Israel family is now in the collection.

Several items of cookware used at Coronado were: a coffee grinder, a pepper grinder, and an olla.²⁵ Strings of chili peppers hung on the back porch at Coronado.²⁶ At the lighthouse they were probably hung in the lean-to addition.

In 1853, early in his married life, Israel bought at Whaley's store \$2.00 worth of plates, probably plain ironstone, and four tin cups for \$1.00.²⁷ Although he became a little more prosperous later in his career, the Israels, as their grandson recalled, were not "fancy" people.²⁸

23. Robert Israel interview with Paige Lawrence, January 31, 1968, Cabrillo National Monument.

24. Robert Israel interviews, July 1968 and January 31, 1968.

25. Ibid.

26. Ibid.

27. General Store Ledger C, April 1853, Robert Israel's account, Whaley Papers, The Whaley House, San Diego.

28. Robert Israel interview, July 1968.

The Lighthouse Service supplied the stations with set amounts of staples and fuel. Two examples of proposals for provisions for the "use of stations in the 12th District" for fiscal years 1885 and 1886 are:

For fiscal year ending June 30, 1885:

- Corned beef
- Preserved beef
- Family mess pork
- Flour
- Pilot-bread
- Rice - Carolina
- Beans
- Potatoes (60 bushel)
- Onions (52 to a bushel)
- Sugar, yellow
- Molasses
- Coffee, rio green
- Coffee, rio roasted
- Tea
- Butter
- Vinegar
- Pickles, mixed
- Tomatoes, 3" cans, per doz.
- Dried apples²⁹

For fiscal year ending June 30, 1886:

- Corned beef
- Preserved beef
- Pork (bbl)
- Codfish
- Flour
- Rice
- Beans
- Onions
- Yellow sugar
- Molasses
- Coffee, green and roasted
- Tea
- Butter

29. Letters Received, Inspector, 12th District, April 14, 1884.

Vinegar (gall.)
Pickles
Tomatoes
Dried apples³⁰

Portions of these items were probably kept in the lean-to with the remainder in the cellar. Fuel for the light and house lamps and the cookstove was also provided by the Lighthouse Service. For example, for the fiscal year ending June 30, 1882, the year the Point Loma Light was switched from lard oil to mineral oil, the tower lamp used 10 gallons of lard oil and 547 1/2 gallons of mineral oil and the house used 1 1/2 gallons lard oil and 27 1/2 gallons mineral oil.³¹ Initially coal was used in the cook stove but Keeper Israel requested wood instead because, he said, the coal smoke blackened the lantern windows. Annually they used 7 cords of wood until 1887 when they went back to coal.³² For the fiscal year ending June 30, 1888, they used 3 tons of coal.

Parlor

The south room in the 1855 lighthouse plans was designated as the parlor. During the early years of the lighthouse's operation before separate quarters were built in another building in the mid-1870s for the assistant keeper, the room may have been used as a bedroom. The parlor contained the Israels' best furniture and the collection of

30. Ibid., April 8, 1885.

31. Ibid., June 30, 1882.

32. Letters Received, Inspector, 12th District, 1884-85, Vol. 629, Part II, p. 562 and Letters Received, Inspector, 12th District, 1886-87, Part III, p. 972, December 4, 1886.

curios which they were fond of showing to visitors. In 1888 an article in the San Diego Union praised the Israels' collection:

Lighthouse Keeper Israel at Point Loma, has a fine collection of curios, metals, fossils, shells and other marine specimens at his lonely and isolated abode he has gathered during 27 years residence there, and the old man takes great pleasure in showing his many treasures.³³

One visitor taken on a tour by Mrs. Israel noted the "sitting room" was "literally filled" with the "interesting and curious things collected during many years by Mr. and Mrs. Israel."³⁴

The cupboard with the glass doors mentioned in the discussion of kitchen furnishings could also have been used in the parlor to display some of the knick-knacks along with Mrs. Israel's treasured painted china. Frenchmen visiting the lighthouse reportedly painted plates for Mrs. Israel.³⁵ A Frenchman named Daguerre (not the inventor of the daguerreotype) according to the Israel family spent several months in the assistant's quarters at Point Loma and taught young Joe to paint.³⁶ One of the Israel family certainly painted the center scenes in Mrs. Israel's shell-framed pictures and may also have painted a set of dishes. Painting ceramics was a popular lady's pastime and it may have been done by Mrs. Israel herself.

33. Interview with Robert Israel, December 7, 1967.

34. Ibid.

35. "Across the Bay," The San Diego Union, June 12, 1888.

36. The San Diego Union, April 27, 1890, p. 2.

Captain Israel made one furniture purchase at Whaley's Store in 1853--two clocks for \$24.00.³⁷ One of these may have been a parlor clock.

Maria Israel's shell-framed pictures, two of which are now in the collection, were probably hung on the walls in the parlor. Other accessory furnishings remembered by Bert Israel in the Coronado home which were probably also at the lighthouse were: braided rugs, rag rugs and antimacassars made by Maria, a black paisley shawl with raised figures of peacocks, a leather-covered album, a sewing basket with gourd-shaped darning egg, and plain handmade flower pots.³⁸

The furniture at the Coronado home, according to Bert Israel, was factory made, plain oak, consisting of a sofa, at least two rockers and an upholstered chair. Bert recalled a story told by his father about two of the brothers being caught smoking in the lighthouse cellar. Captain Israel made his sons sit in rocking chairs in the parlor with cigars for a long smoke to teach them a lesson. Bert described one rocker as having a small drawer underneath for sewing. One other piece of furniture mentioned by Bert was a captain's chair his grandfather claimed to have made himself. It had a cowhide seat fastened with roundheaded tacks. The Israels also had a magazine rack at Coronado.³⁹

37. General Store Ledger C, April 1853, Whaley Paper, The Whaley House, San Diego.

38. Robert Israel interviews, July 1968 and November 4, 1964.

39. Ibid.

Myrtle Israel, granddaughter of Robert and Maria, described Captain Israel's desk as a "field desk" which opened to provide a writing surface. She also recalled lace curtains at the Coronado home and a small desk belonging to Mrs. Israel.⁴⁰

Juana Machado, according to her great-grandchildren, had horsehair furniture.⁴¹ She may have given a piece of this to her daughter. Juana lived the last few years of her life with the Israels at Coronado.

A San Diego resident, the daughter of a friend of Robert and Maria Israel, Mrs. Laude Mustain describes their curtains as having drawn-work along the bottom edge. She also mentions that the Israels had picture frames with leaves on the corners.⁴²

Captain Israel liked to read during his watches and so it seems likely he would have requested the portable libraries from the Lighthouse Service. Books such as the following were included:

Bible
Prayer Book
Shipper's A Christmas at Sea
United Service Magazine
The Library of Choice Literature
Bishop's The Voyage of the Paper Canoe from Quebec to the Gulf of Mexico
Newcomb's Astronomy
David Porter's Memoirs of Commodore David Porter
Farragut's The Battle of Mobile Bay
United States Government
Reynaud's The French Lighthouse Service, translated

40. Interview with Myrtle Matilda Israel, granddaughter of Robert D. Israel.

41. Robert Israel interview, November 4, 1964.

42. Interview with Mrs. Laude Mustain, April 1964.

by Peter Hains
The Five Little Peppers and How They Grew⁴³

The libraries were an assortment of donated and specially purchased books with subjects ranging from naval memoirs to English classics. They were contained in wooden portable cases with shelves and brass handles (see Illustration 6). These portable libraries were first issued in the early 1880s to relieve some of the monotony of daily life for the isolated keeper. At first the keepers were able to keep the libraries for as long as they wanted. But in 1886 the Lighthouse Board set firm rules. The 12th District inspector wrote:

...it has been the custom of this office to change the libraries only when requested by the Keepers as it takes some of them a year to read all the books. In the future they will be changed every six months as directed by the Board.⁴⁴

See Appendix V for a list of books which were located in the 12th District Office of the Lighthouse Engineer in 1884.

Bedrooms

The two larger rooms on the second floor served as bedrooms. There is some evidence the small closet-like room was also a bedroom. One of Assistant Keeper Philip Savage's letters in 1886 complaining of Israel's treatment mentions these bedrooms:

43. Ross Holland, "Notes," quoted in S. Paige Lawrence Cruz, "Furnishing Plan-Old Point Loma Lighthouse," Cabrillo National Monument, 1975, p. 20.

44. Letters Received, Inspector, 12th District, December 13, 1886.

I swept only the upper flight of stairs down to his bedroom door...he called me...said, come right back here, and sweep this platform all round these bedroom doors,.... One of the rooms is often full of female guests....⁴⁵

Mrs. Laude Mustain thought her mother slept in the small room between the larger bedrooms when she came to visit the lighthouse.⁴⁶ Although it is possible a cot could have been placed in this room, the lack of ventilation would make the room uncomfortable for sleeping.

Emma Minter described sparse, simple furnishings for the bedrooms:

There were home-made bed frames.... It would be considered pretty rough carpentering, I suppose. But they were all comfortable.... Calico curtains across a corner protected our everyday clothes. Our best things were in chests.⁴⁷

Robert Israel remembered rope beds at Coronado which he described as cots of 2x4s and rope, with headboards, footboards and sideboards. He recalled they stuffed their own bedticks with seaweed and corn husks.⁴⁸ His description seems to confirm Emma's recollections. However, in another interview, Bert contradicted himself when he saw two fancier beds that had been donated to the lighthouse. He felt

45. Ibid., August 2, 1886, enclosure dated May 16, 1886, p. 88.

46. Mustain interview, April 1964.

47. Davidson, "No. 355," p.44.

48. Robert Israel interview, July 1968. In another interview, January 31, 1968, Bert mentions duck feather mattresses. Feathers would have been very expensive, therefore it seems more likely the mattresses were stuffed with corn husks and seaweed.

they were suitable.⁴⁹ He described the Israels' bed as similar to the spool bed in the collection only piled higher with mattresses. It seems likely the Israels' may have had a fancier bed than the children, but Emma's recollections were probably correct (at least for the children's room), considering the cost of beds and Israel's own ability to make what he needed. One must also take into account the influence of the interviewer and that the fancier beds were already in place.

Bert also remembered in the Coronado house a mirror over a dresser in his grandmother's room and a washstand with space for a pitcher and bowl, and chamber pot compartment beneath. Bert did not think a washstand would have been located in the boys' room because they could not have lifted the pitcher and bowl.⁵⁰ However, by the late 1880s the youngest son was a teenager and in 1888 Robert's wife went to live in the lighthouse to have a baby. The keeper's comment that there were often female guests indicates the other room certainly would have had its own bowl and pitcher and table, if not a washstand.

Accessory furnishings which might have been located in the bedrooms are items mentioned in the following reminiscences:

Ruth Cronyn Cairns, author of "Children of San Diego in the Eighties," remembers a visit to the lighthouse to see Emma Minter. She was very impressed by Emma's collection of pressed seaweeds,

49. Robert Israel interview, December 7, 1967.

50. Ibid.

dried starfish, pink shells, pebbles, polished abalone shells, and coral beads. Emma gave a string of coral beads to her visitor.⁵¹

Emma herself remembered playing with "Pretty shells, colored stones, and kelp babies."⁵²

The Israel boys played the violin, guitar and banjo.⁵³ The visiting Frenchman taught one of the boys to make a pinhole camera with a cigar box.⁵⁴

Rag rugs were placed near each bed in Coronado.⁵⁵ The washbowl and pitcher Bert remembers at Coronado were painted.⁵⁶

Mrs. Israel had a small desk at Coronado.⁵⁷ Mrs. Israel often wore a crocheted necklace with small black beads.⁵⁸

The plaster moon now in the collection was hung at the lighthouse.⁵⁹

51. Ruth Cronyn Cairns. "Children of San Diego in the Eighties," excerpt, Chapter 2, San Diego Historical Society.

52. Davidson, "No. 355," p. 49.

53. Robert Israel interview, December 7, 1967.

54. Ibid.

55. Robert Israel interview, July 1968.

56. Ibid., tape recording #7.

57. Myrtle Matilda Israel (granddaughter of R. D. Israel), interview tape #5.

58. Ibid.

59. Joe Israel (grandson of R. D. Israel), interview tape #4.

A crucifix and pocket knife were identified by Mrs. E. W. Israel as belonging to Maria Israel.⁶⁰

Captain Israel kept his Mexican War uniform in a chest.⁶¹ Mrs. Israel made patchwork and applique quilts--one of her mother's applique quilts may be found in the Serra Museum collection.⁶²

Storage Closet

The second floor's small center room should be furnished as a storage closet. Although there is evidence this room was used as a bedroom, there is also evidence of its use as a storage area. It seems likely this area was originally intended as storage space. It was usual for certain supplies, such as wicks and cleaning materials, to be kept near the lantern. After the storehouse was built in 1881, the keeper may have converted this room to another use, although it seems he would still have needed storage near the lantern.

In one of the letters from Assistant Keeper Savage to the Lighthouse Board, he recalls an occasion when Israel requested him to fetch a

60. Mrs. Everett W. Israel, interview tape #4.

61. Mr. and Mrs. Robert Israel interview, January 4, 1963. The uniform in question was the 1846-51 regulation service uniform of an enlisted rifleman in the U. S. Regiment of Mounted Riflemen, which at that time had no "dress" uniform. Examples of the forage cap, jacket, trousers and belts Israel would have worn are in the collection of the Division of Military History of the National Museum of History and Technology, Smithsonian Institution, Washington, D. C.

62. See Robert Israel interview, December 7, 1967, and Accession Records, Serra Museum.

one-half gallon measure. Israel told the assistant he would find it "in the office."⁶³ To which room he was referring is not known. It may have been this storage area, if not in one of the outbuildings.

References to lighthouse materials sent to Point Loma and found in the Lighthouse Board records, National Archives, are listed below in chronological order:

July 14, 1881. A 3rd order Mineral Oil lamp was received and shipped to the station [Point Loma] to be put in operation soon.⁶⁴

February 11, 1884. Some of the rivets in the chain of the "Hains Mineral Oil Lamp" in use at this station, were worn out. It was sent to this City, repaired and returned to the station.⁶⁵

July 30, 1884. The Lighthouse Inspector wrote to the Lighthouse Board about vouchers for ordering uniforms from Messrs. Wanamaker and Brown and Horstmann Bros. & Co., Philadelphia.⁶⁶

June 15, 1887. 100 feet of brass wire was ordered for \$1.50 for lantern curtains. The medicine chest was replenished for \$12.00.⁶⁷ [According to Ross Holland, medicine chests included items such as

63. Letters Received, Inspector, 12th District, August 2, 1886, enclosure dated May 16, 1886.

64. Letters Received, Engineer and Inspector, 12th District, Vol. 518, Part III, July 14, 1881, p. 532.

65. Letters Received, Engineer, 12th District, February 11, 1884.

66. Letters Received, Inspector, 12th District, July 30, 1884.

67. Ibid., June 15, 1887.

epsom salts, syrup of rhubarb, bandages, castor oil, mustard plasters, quinine and paregoric.]⁶⁸

November 19, 1887. Referring to the Board's letter of November 8 in which it is stated that tin rouge pans are no longer issued to light stations, their place being filled by the new brass service boxes, I would respectfully request that these new boxes be included on my annual requisition already forwarded and that I be furnished with one for each station.⁶⁹

See Illustrations 1-4 for examples of lighthouse equipment. Illustrations 1 and 2 date from 1865 and Illustrations 3 and 4 date from 1901. As the preceding entry indicates, the Lighthouse Service made some changes in 1887. The later illustrations probably show more accurately what was used at Point Loma during the late 1880s.

Savage's letter indicates Point Loma had an oil carrier, a half-gallon measure and a gallon measure.⁷⁰

Israel had a shotgun, possibly an unloading Winchester which he fired into the fog if he knew a ship was too close.⁷¹

Examples of supplies sent to the 12th District are:

December 22, 1884: Articles needed for use in District 12: Lime, Liverpool Salt, Toilet Soap, spirits Turpentine, Tallow, Morse Joint Drills.

68. Cruz, "Furnishing Plan," p. 11.

69. Letters Received, Inspector, 12th District, November 19, 1887.

70. Ibid., August 2, 1886, enclosure dated May 16, 1886, pp. 88-90.

71. Robert Israel interview, July 1968.

April 29, 1887: For Pt. Sur:		
100 lbs. candles, 14 oz.		11.00
6 tin candlesticks		.60
2 lard oil lanterns		1.70
1 coal oil lamp		3.50
6 chimneys for lamp		.72
wicks		

See Appendix IV for the 1881 List of Allowances to Lightstations and Outfit List which outlines annual supplies for all lightstations.

CHAPTER E: RECOMMENDED FURNISHINGS

The recommended furnishings for Point Loma are based largely on family recollections of the Israels' belongings. Where these remembrances have had to be supplemented, the main sources are surviving photographs of other light station interiors, period furniture catalogues, and household advice books. For a list of these and other source materials see the Bibliography.

PARLOR - ROOM A

Parlor Furniture

A-1 Desk, 1870-80, to be placed against the east wall. Robert Israel needed a place to keep his account books and logs. His grandson remembered a slanted drop-front desk in the Coronado home. One of the standard office desks available on the west coast during the 1870s and 1880s was a drop-front desk which opened to reveal pigeon holes.¹ A drop-front desk appears in Illustration 5, a photograph of the keeper's quarters at Fort Point Light Station, California. The 12th Lighthouse District records for 1886 indicate the Lighthouse Service furnished a desk as part of the standard equipment for a new building at Humboldt Light and Fog Signal Station.² This evidence shows desks were considered necessities for light stations.

A-2 On the desk should be placed sample log books, supply book, light list, pen, pencils, slate and slate pencil, paper, ink and inkstand. Israel's assistant, Savage, mentioned Israel using a slate and pencil for tabulating oil consumption.³ An inkstand appears among a 1900 list of supplies for Cape Mendocino Light Station (12th District).⁴

A-3 Whatnot, 1870-80, west wall. The Israel family was noted in San Diego for their collection of shells, fossils and marine specimens.

1. Abernathy Brothers Illustrated Catalogue and Wholesale Price List (Leavenworth, Kansas, 1872), p. 54.

2. Letters Received, 12th District Inspector, November 1, 1886, RG 26, National Archives.

3. Letters Received, Inspector, 12th District, August 2, 1886, enclosure dated May 16, 1886, p. 90.

4. Journal of the Light Station at Cape Mendocino, 1878-1920, RG 26, National Archives and Record Center, Suitland, MD.

A-4 Daybed, 1870-85, spool turned, with mattress covered in an appropriate period material and several matching pillows, to be placed against the north wall. In the 1870s the Israels took in their niece, Emma Minter. As space was at a minimum in the lighthouse it seems likely they would have had an extra sleeping space in the parlor, perhaps for one of their sons when he returned home or for an occasional guest. Even in more well-to-do homes at that time daybeds were considered practical additions to the sitting room or library.

A-5 Lighthouse Establishment traveling bookcase and table base, 1870-85; table to be plain and simply built, placed against the east wall. Illustration 6 is an example of a similar traveling bookcase made for the Lifesaving Service. See pages 37-38 and Appendix V for lists of appropriate books.

A-6 Two small oval and/or square wooden tables, 1855-85, to be placed against the south and west walls. Side tables were a necessity for the parlor and in this case serve as extra space for the knick-knacks with which the parlor was literally filled. See page 35, Chapter D.

A-7 One cane-seated side chair, 1870-80, (Illustration 7) to be placed in front of the west window. These chairs were inexpensive and extremely popular. They may be seen in a lightkeeper's quarters picture in the 19th-century photograph collection entitled The Tasteful Interlude.⁵

A-8 One platform rocker with horsehair seat and back, 1850-80, placed near the fireplace.

5. William Seale, The Tasteful Interlude (New York: Praeger Publishing, 1975), pp. 84-85.

A-9 One rocker, Boston-type (late windsor) with a drawer beneath, or a cane rocker, 1870-85, to be placed in front of the fireplace facing the daybed. The rocker to have cushions. See page 36, Chapter D. See also A-33, office chair.

Parlor Wallhangings

A-10 Shellwork pictures. Maria Israel's shell-framed pictures should be placed over the mantel and over the whatnot.

A-11 A small to medium sized map (reproduction) of the California coast showing the harbors should be tacked to the wall over the desk. Two maps are listed in a 1900 list of supplies for Cape Mendocino Light.⁶

A-12 A pair of framed lithographs, 1870-80, should be placed on either the south or west wall.

A-13 A framed photograph, 1870-80, possibly a copy of Mrs. Israel's photo, to be placed over the table on the west wall.

A-14 A large framed watercolor (seascape or landscape) should be placed over the daybed (to appear as if one of the Israels had made it), 1870-85.

A-15 Hanging wall pocket, 1870-80, to appear homemade, placed above one of the small tables on either the south or west walls. The Israels' grandson remembered his grandparents having what he described as a magazine rack. However, he also did not think they

6. Journal of the Light Station at Cape Mendocino, RG 26, National Archives and Records Service, Suitland, MD.

subscribed to any magazines. Wall pockets were used to store newspapers and books as well as magazines.

Parlor Window Treatment

A-16 According to one entry in the Lighthouse Inspector's records, window blinds were, at least occasionally, furnished by the Lighthouse Service. Point Conception was issued "2 blinds" as part of their building supplies in 1881.⁷ One 19th-century photograph of Point Loma indicates the windows did have dark shades. Green shades should be placed on all windows in the lighthouse.

Parlor Accessory Furnishings

A-17 One simple plant stand, 1860-85, placed in front of the northeast window with a palm on it (as in Illustrations 8 and 9).

A-18 Firescreen with a homemade embroidered or painted center, 1860-80, to be an example of Maria's handiwork. Firescreens were used to hide the fireplace in the summer and as protection against the heat of the fire in the winter. (Note the screen in the Fort Point interior photograph, Illustration 10).

A-19 Ceramic or japanned tin cuspidor by the fireplace, 1870-80.

A-20 Bracket shelf, 1860-80, to be placed in the southeast corner.

A-21 Several artificial plants in clay pots such as geraniums, ivys or palms in the windows. Plants were an important component of

7. Letters Received, Engineer, 12th District, 1881-82, Vol. 550, Part III, July 1881, p. 696.

interior decoration at this time and Maria Israel is known to have enjoyed gardening. (See pages 16-17, Chapter C).

A-22 - A-23 One braided or rag hearth rug and a piece of machine-made ingrain carpet. Mrs. Israel made braided and rag rugs, and there is evidence that carpeting was in use at other 12th District lighthouses. The keepers at Alcatraz Island "put down a stairs carpet" on January 7, 1884,⁸ and in 1891 the keepers at East Brother Island "laid stair and hall carpet."⁹ (See page 36, Chapter D).

A-24 Several embroidered, Berlin work, tatted, or appliqued sofa cushions, 1870-85, to be placed on the daybed and chairs. (Note pillows in Illustrations 8 and 9). Maria was reported to have sewn by lantern light during her watches and she may have produced items such as sofa cushions.

A-25 The whatnot, bracket shelf, and any remaining space on the tables should be covered with "curios, metals, fossils, shells and other marine specimens" (see page 35, Chapter D), and handpainted china plates, vases and unframed photographs.

A-26 One brass kerosene lamp with white glass shade, such as those provided by the Lighthouse Service as house lamps to be placed on the table against the south wall. See Illustration 11, an example of the lighthouse table lamp, and Illustration 12, which shows white glass shades stockpiled at the supply depot.

8. Journal of the Light Station at Alcatraz Island, January 7, 1889, RG 26, National Archives and Records Center, Suitland, MD.

9. Journal of East Brother Island Light Station 1874-97, May 19, 1891, RG 26, National Archives and Records Center, Suitland, MD.

A-27 A wicker sewing basket with thread, gourd-shaped darning egg and unfinished work, 1850-80, to be placed on the table with the lamp. See page 36, Chapter D.

A-28 Antimacassars should be placed on the two rockers. See page 36, Chapter D.

A-29 One parlor clock, 1850-60, should be placed on the mantel. See page 36, Chapter D.

A-30 All tables should have fringed table covers, handmade, ca. 1880. The mantel should also be covered with a fringed cloth such as the piano cover in Illustration 10.

A-31 A photo album should be placed on the table against the west wall. See page 36, Chapter D.

A-32 The lamp should have a lamp mat.

A-33 Office chair with low curved back, spindles, and a cowhide seat tacked with roundheaded tacks, 1860-80, to be placed near the desk.¹⁰ See page 36, Chapter D.

A-34 One reminiscence of the Israel furnishings described curtains with drawn-work edges. Lace curtains, (machine-made sheers) with a fancy border should be placed on the windows in the parlor. They should be hung on wooden rods supported by wooden brackets.

10. Letters Received, Engineer, 12th District, July 13, 1881.

PARLOR - ROOM A

List of Recommended Furnishings

<u>Item</u>	<u>Description</u>	<u>Source</u>
A-1	Desk, slant-front, 1870-80 (see Illustration 4)	acquire
A-2	Desk-top items: U.S.L.H.E. Log Book U.S.L.H.E. Light List pen, ink, inkstand, pencils, slate and slate pencil, paper U.S.L.H.E. Supply Book	acquire CABR
A-3	Whatnot or set of shelves, 1870-80	acquire
A-4	Daybed, 1870-85	CABR
A-5	U.S.L.H.E. traveling bookcase and table base -- bookcase to be reproduced	acquire
A-6	Two small side tables, 1855-85	acquire
A-7	One cane-seated side chair, 1870-80 (see Illustration 6)	acquire
A-8	One platform rocker with upholstered horse-hair seat and back, 1850-80	acquire
A-9	One additional rocker, a late windsor with drawer beneath, or a cane rocker	acquire

<u>Item</u>	<u>Description</u>	<u>Source</u>
A-10	Two shellwork pictures	CABR
A-11	One small to medium-sized map of the California coast, 1860-90	acquire
A-12	One pair framed lithographs, 1870-80 east of the stove.	acquire
A-13	One framed photograph, 1870-80 (possibly a copy of Mrs. Israel's photo)	acquire
A-14	One large framed amateur watercolor, seascape or landscape, 1870-85	acquire
A-15	One hanging wall pocket, 1870-80 (to appear homemade)	acquire
A-16	Window shades, green, for 6 windows	acquire
A-17	One plant stand, 1860-85	acquire
A-18	One firescreen, hand-embroidered or painted, 1860-80	acquire
A-19	Ceramic or japanned tin cuspidor, 1870-80	acquire
A-20	One bracket shelf, 1860-80	acquire

<u>Item</u>	<u>Description</u>	<u>Source</u>
A-21	Artificial plants in clay pots for parlor and kitchen	acquire
A-22	Ingrain carpet, 1870-90	acquire
A-23	Rag or braided hearth rug	acquire
A-24	Several handmade sofa cushions (see Illustrations 7 & 8)	acquire
A-25	Miscellaneous curios, fossils, shells, marine specimens, hand-painted china plates, vases and unframed photographs	acquire
A-26	One brass kerosene lamp with white glass shade (see Illustration 10)	acquire
A-27	Wicker sewing basket containing gourd-shaped darning egg, and unfinished work, 1850-80	acquire
A-28	Antimacassars (five)	acquire
A-29	Parlor mantel clock, 1850-60	acquire
A-30	Two handmade table covers with fringe; and one fringed mantel cloth	acquire
A-31	One photo album, ca. 1880	acquire

<u>Item</u>	<u>Description</u>	<u>Source</u>
A-32	One lamp mat	acquire
A-33	Office chair with low back	acquire
A-34	Lace curtains (machine-made)	acquire

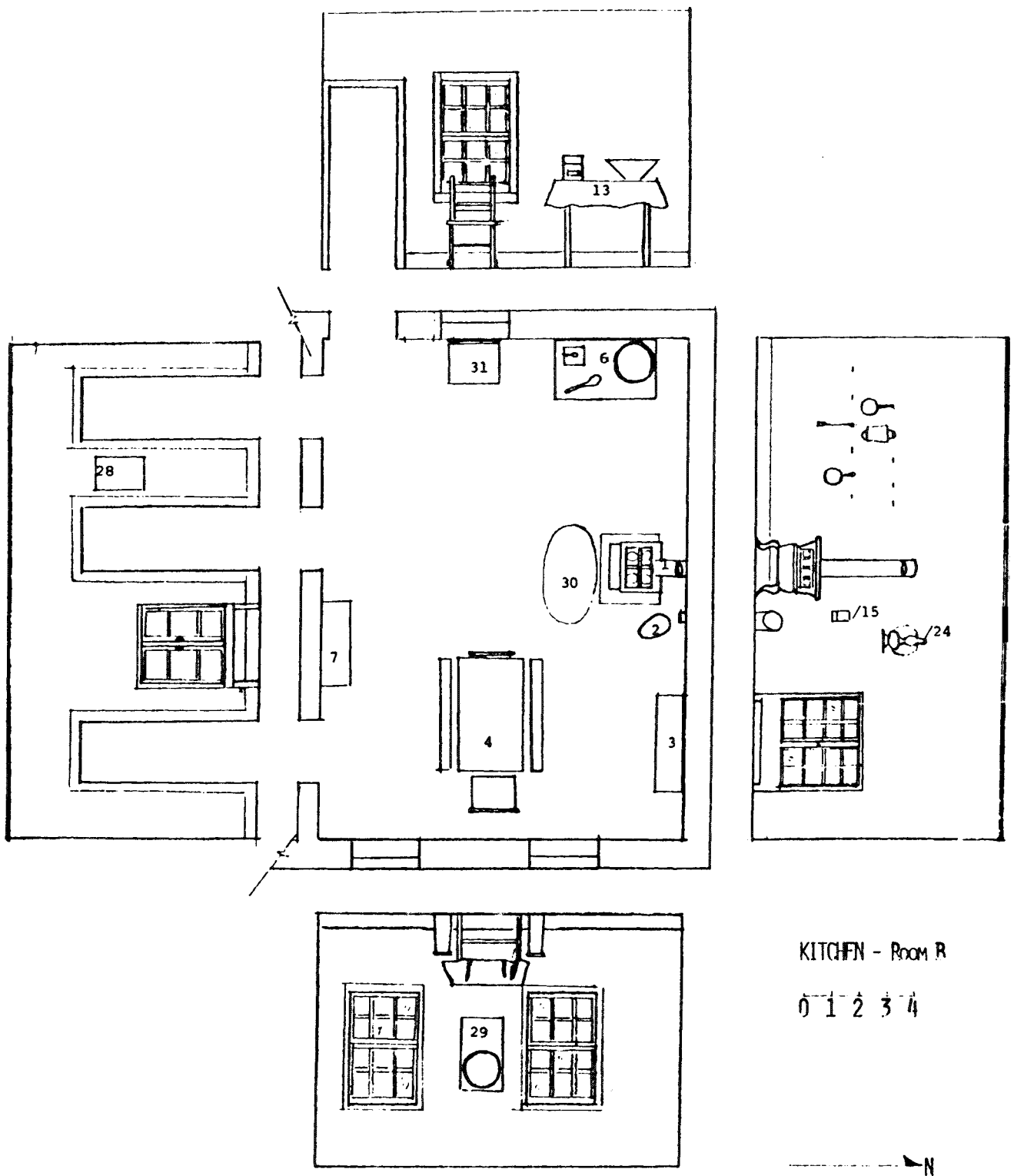


Figure 2. Kitchen Furnishings layout and elevations

KITCHEN - ROOM B

Kitchen Furniture

B-1 Cookstove, 1860-85, should be a Eureka range #7 or #8. If the stove is going to be used in interpretive demonstrations it should be a reproduction. A piece of zinc should be placed beneath the stove. See pages 27-28, Chapter D.

B-2 Coal hod, 1860-85, to be placed near the stove. Point Loma returned to using coal rather than wood in 1888.

B-3 China cupboard, 1870-80, to be placed against the north wall to the east of the range. As a cupboard designed for the display of china, etc., it would have been prominently placed in the room. This cupboard is said to have been in the lighthouse during the Israel occupancy. See page 31, Chapter D.

B-4 Dining table, 1870-80, to be simply made, rectangular, approximately 4' x 2' with square tapered legs, as if Israel had made it himself. Two small benches should be placed, one on each of the long sides. See page 30, Chapter D.

B-5 Two plank-seated cottage chairs should be placed, one at each end of the table.

B-6 Kitchen work table similar to the dining table, on north or west wall. Work tables were practical necessities for the kitchen.

B-7 Wood and tin meat safe, 1870-80, to be placed against the south wall. Food safes were often used for cooling foods after coming out of the oven, as well as to protect food from mice, flies--and children.

Kitchen Accessory Furnishings

B-8 Stove furniture to include: an iron tea kettle, two sauce pans, two frying pans, one wash boiler. The kettle and wash boiler are to be placed on the stove. An iron tea kettle, tin wash boiler and two frying pans were purchased for Point Reyes in 1883.¹¹ In the same year Cape Mendocino received sauce pans and tea kettles.¹² The frying pans, pots, and a broiler should be hung on nails or crude pegs near the stove. Two sad irons could be placed in the closet to be brought out for interpretive demonstrations.

B-9 - B-12 A coffee mill, olla, stoneware bowl, and wooden spoon, should be placed on the table. See page 32, Chapter D.

B-13 Oil cloth should cover the work table. The Lighthouse Records show the Alcatraz Light was issued 8 yards of oil cloth.¹³

B-14 Coal should be placed in the coal hod.

B-15 A match safe should be hung on the wall near the stove. Lighthouses were issued safety matches and they were not allowed to use any other kind. Lighthouse Keeper Jenkins purchased a match safe in 1867.

B-16 - B-23 The dining table should be covered with a cotton cloth and set for five with plain ironstone plates, cups and saucers, and wooden handled knives and forks and pressed glass tumblers. An

11. Letters Received, Inspector, 12th District, April 17, 1883.

12. Ibid., April 12, 1884.

13. Ibid.

ironstove water pitcher and two serving dishes should be placed at either end of the table. In the center of the table should be placed a cruet set, a bottle of hot chili pepper sauce (with a quill spout) and salt and pepper shakers. See pages 32-33, Chapter D.

B-24 A reflector lamp should be placed on the north wall to the east of the stove. See page 32, Chapter D.

B-25 A small hand kerosene lamp should be placed on the dining table.

B-26 - B-27 The shelves in the china cupboard should be covered with paper edging (see Illustration 8) and should be filled with additional ironstone ware. See Illustration 13 which shows ironstone which was issued to lighthouse tenders at the lighthouse Supply Depot. Several platters with decorative greenleaf and flower borders should be placed upright. See page 32, Chapter D. One or two silverplated items would also be appropriate for the cupboard such as a fancier cruet stand. Several other pressed glass items such as a cream and sugar set should also be placed in the cabinet.

B-28 A calendar for the year 1888 should be hung on the south wall.

B-29 A Lighthouse Establishment clock, 1856-80, should be hung on the east wall (if it is not feasible to place it in the hall). See Illustrations 2, 14, and 15, and pages 29-30, Chapter D. During the later 19th century, the 1880s and the 1890s, the type of lighthouse clock in use was a round wooden one sometimes with an additional for the pendulum. An 1885 photograph of a lightkeeper's parlor-dining

room shows a round wooden clock in the background.¹⁴ A 1901 photo of a lighthouse tender shows a round wooden clock on the wall.¹⁵ The lighthouse on St. Michael's Island, Maryland, as a late 19th-century E. Howard Company wooden pendulum Lighthouse Establishment clock in its collection (Illustration 14).

B-30 Small rag rugs should be placed in front of the stove and in front of the shelves in the lean-to. See page 36, Chapter D.

B-31 One additional cottage chair, 1860-80, to be placed against the west wall.

B-32 Geraniums in clay pots should be placed in the east windows.

14. Seale, Interlude, pp. 84-85.

15. Coast Guard Headquarters, Washington, D. C., Public Affairs Branch, Still Photographs Section, Miscellaneous, Lighthouse Tender.

KITCHEN - ROOM B

List of Recommended Furnishings

<u>Item</u>	<u>Description</u>	<u>Source</u>
B-1	Cookstove, Eureka range #7 or #8, reproduction, 1860-85	acquire
B-2	Coal hod, 1860-85	acquire
B-3	China cupboard	CABR
B-4	Dining table (and benches), 4' x 2' with square tapered legs (as if Israel had made it), 1870-80	acquire
B-5	Three plank-seated cottage chairs, 1870-80	acquire
B-6	One kitchen work table of similar make to the dining table (reproduction)	acquire
B-7	One wood and tin meat safe, 1870-80	acquire
B-8	Miscellaneous kitchen items: iron tea kettle two tin sauce pans two tin frying pans one copper wash boiler two sad irons of differing sizes	acquire

<u>Item</u>	<u>Description</u>	<u>Source</u>
B-9	Coffee mill	CABR
B-10	Olla	CABR
B-11	Stoneware bowl, ca. 1880	acquire
B-12	Wooden spoon	acquire
B-13	Oil cloth tablecloth	acquire
B-14	Coal	acquire
B-15	Match safe	acquire
B-16	Cotton tablecloth, 1860-90	acquire
B-17	Five place settings plain ironstone plates, cups and saucers, 1870-90	acquire
B-18	Five sets of wooden handled knives and forks, 1870-90	acquire
B-19	Five pressed glass tumblers, 1870-90 (do not have to match)	acquire
B-20	Ironstone water pitcher, 1870-90	acquire
B-21	Cruet set, plated stand	acquire

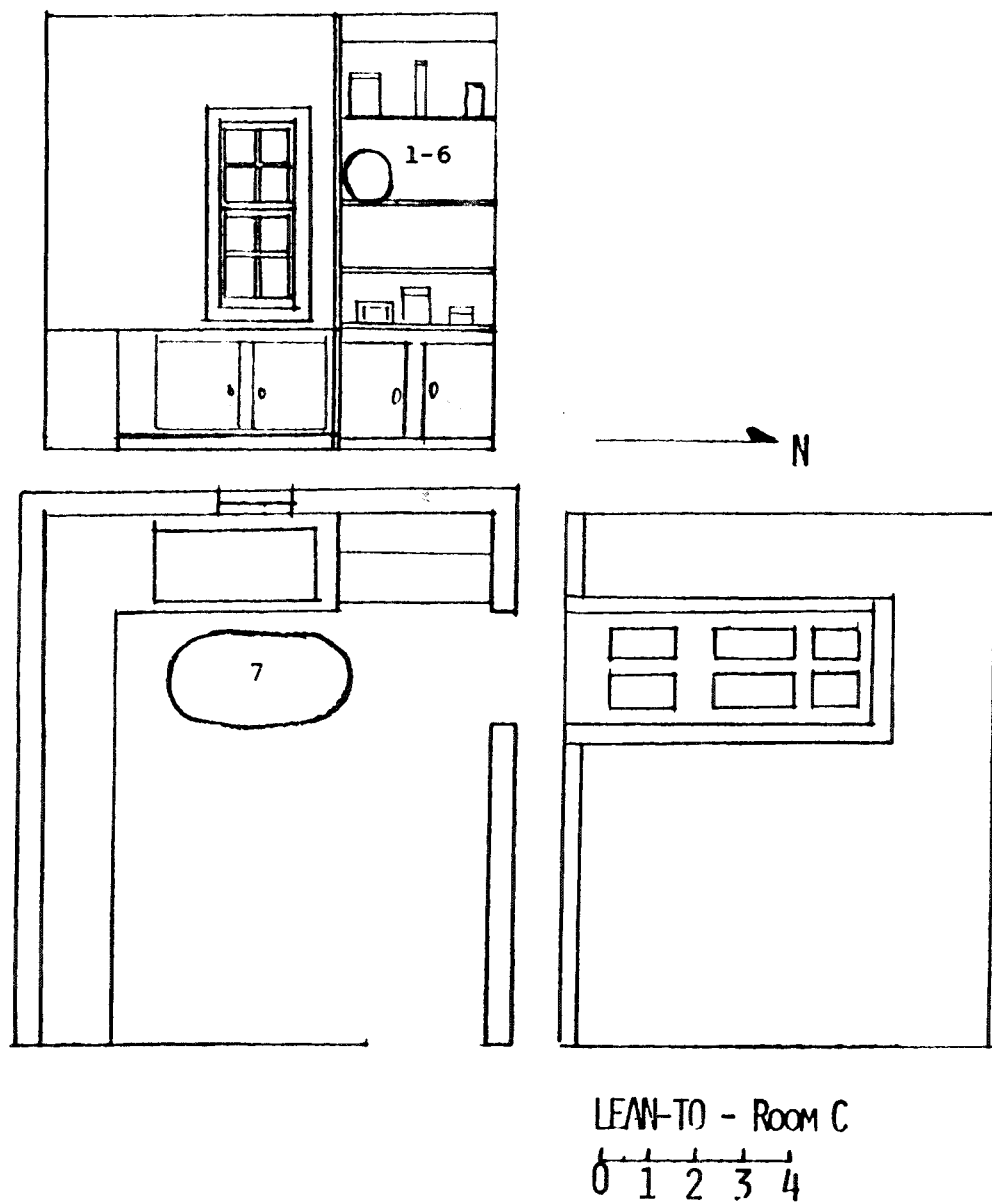


Figure 3. Lean-to Furnishings layout and elevations

<u>Item</u>	<u>Description</u>	<u>Source</u>
B-22	Bottle hot chili pepper sauce with quill spout	acquire
B-23	Set of salt and pepper shakers	acquire
B-24	Tin reflector lamp	CABR?
B-25	Small glass hand kerosene lamp	acquire
B-26	Paper shelf edging	acquire
B-27	Assorted ironstone including several platters with decorative green leaf and flower borders; several silverplate items such as a cake stand for the cupboard; and several pressed glass items such as a cream and sugar set.	acquire
B-28	1888 calendar	acquire
B-29	U.S.L.H.E. clock, 1856-80	acquire
B-30	Two small rag rugs, 1870-90	acquire
B-31	Cottage chair, 1860-80	acquire
B-32	Geraniums, artificial, and redware pot	acquire

Other items appropriate to the 1880-90 period should supplement the above. Selection could be made from the following list, a composite grocery list, compiled by Paige Lawrence Cruz, of lightkeepers' purchases at Whaley's Store.¹⁶

1 lb. tin of crackers	chocolate
butter	can of lard
sugar	mustard spills
bottle cinnamon	(small paper
3 papers coffee	containers of dry
3 1/2 lbs. tea	mustard)
whiskey	three papers
bread	cream of tartar
eggs	four bottles pickles
custard	3 bottles sweet oil
onions	worcestershire sauce
peppers	5 cans apples
1 bottle quinces	12 lbs. peaches
candy	2 lbs. pepper
alcohol	3 bottles pepper sauce
white sugar	1/2 doz. extracts
bottle of port	chicken
wheat	gal. of Eureka whiskey
bacon	5 cans oysters
milk	box of fish
21 lbs. apples	corn meal
2 bottles schnapps	rice
2 bottles brandy	vinegar
bitters	salt
box herring	museal (?)
club house gin	ale
essence of peppermint	mutton
9 1/2 lbs. cheese	tapioca
1/2 gallon syrup	can yeast powder
beans	best brandy, 1 bottle
sack of flour	peppermint
raisins	1 bottle pineapple

16. Paige Lawrence Cruz, "Furnishing Plan," Old Point Loma Lighthouse, Cabrillo National Monument, 1975, Appendix D.

LEAN-TO - ROOM C

Lean-to Furniture

Shelves should be filled with items usually found in a pantry during the 1880s. The Israels did not get to San Diego very often and so probably kept a good supply of necessities on hand.

Many items were provided for the Israels by the Lighthouse Service (see pages 33-34, Chapter D.) Mrs. Israel also did some canning and she dried fruit on the lighthouse roof. Therefore, the Israels probably purchased only the barest essentials. Even in 1853 Robert Israel's account at Whaley's Store showed only salt, sweet oil, tea, whiskey, sugar, and coffee. Coffee, tea and sugar were provided by the Lighthouse Service during Israel's employment. Most of the lighthouse-provided supplies were probably stored in barrels in the cellar. Smaller containers of those items bought by the Israels would have been located in the pantry.

C-1 The following containers and cooking items should be placed on the lower shelves:

- | | |
|-----------------------------|---------------------|
| Tin bread box | Tin spice box |
| Tin flour container | Tin sugar container |
| Mortar and pestle | Several crocks |
| Several clay cooking dishes | |

C-2 - C-6 The remainder of the shelves should be filled with the following items from the lighthouse provisions list and the remembrances of Mrs. Israel's canning activities:

- | | |
|---|---------------------|
| Several pounds of salt | One pound of pepper |
| Basket of potatoes | Canned tomatoes |
| 4 or 5 canning jars filled with various vegetables and fruits | |

LEAN-TO - ROOM C

List of Recommended Furnishings

<u>Item</u>	<u>Description</u>	<u>Source</u>
C-1	Reproductions of the following items: tin bread box, tin spice box, tin flour container, tin sugar container, several clay cooking dishes, several crocks.	acquire
C-2	Several pounds of salt	acquire
C-3	Basket of artificial potatoes	acquire
C-4	Pound of pepper	acquire
C-5	Canned tomatoes	acquire
C-6	Selection from the following list: 1 lb. tin of crackers, 1/2 gal. syrup, butter, beans, sugar, sack of flour, bottle cinnamon, raisins, 3 papers coffee, chocolate, 3 1/2 lbs. tea, can of lard, whiskey, mustard spills, bread, eggs, custard, onions, peppers, bottle quinces, candy, alcohol, white sugar, bottle of port, wheat, bacon, milk, 21 lbs. apples, 2 bottles schnapps, 2 bottles brandy, bitters, box herring, club house gin, essence of peppermint, 3 papers cream of tartar, 4	acquire

nuts
1 can honey
1 bottle lime juice
turkey
allspice
1/2 doz. cloves
vermicelli
macaroni
hominy
pork
1 bottle molasses
15 1/2 lbs. ha
mustard ginger
1 bottle orgeat (a
nonalcoholic drink
prepared from the
sweetened juice of
almonds and other
flavorings.)

1 box prunes
catsup
lobster
16 1/2 lbs. figs
hard bread
shrimp
3 bottles cordials
brandy peaches
3 turnips
cocoa paste
potatoes
messal (?)
conilles (?)
mackerel

C-7 Small rag rug should be placed in front of the shelves.

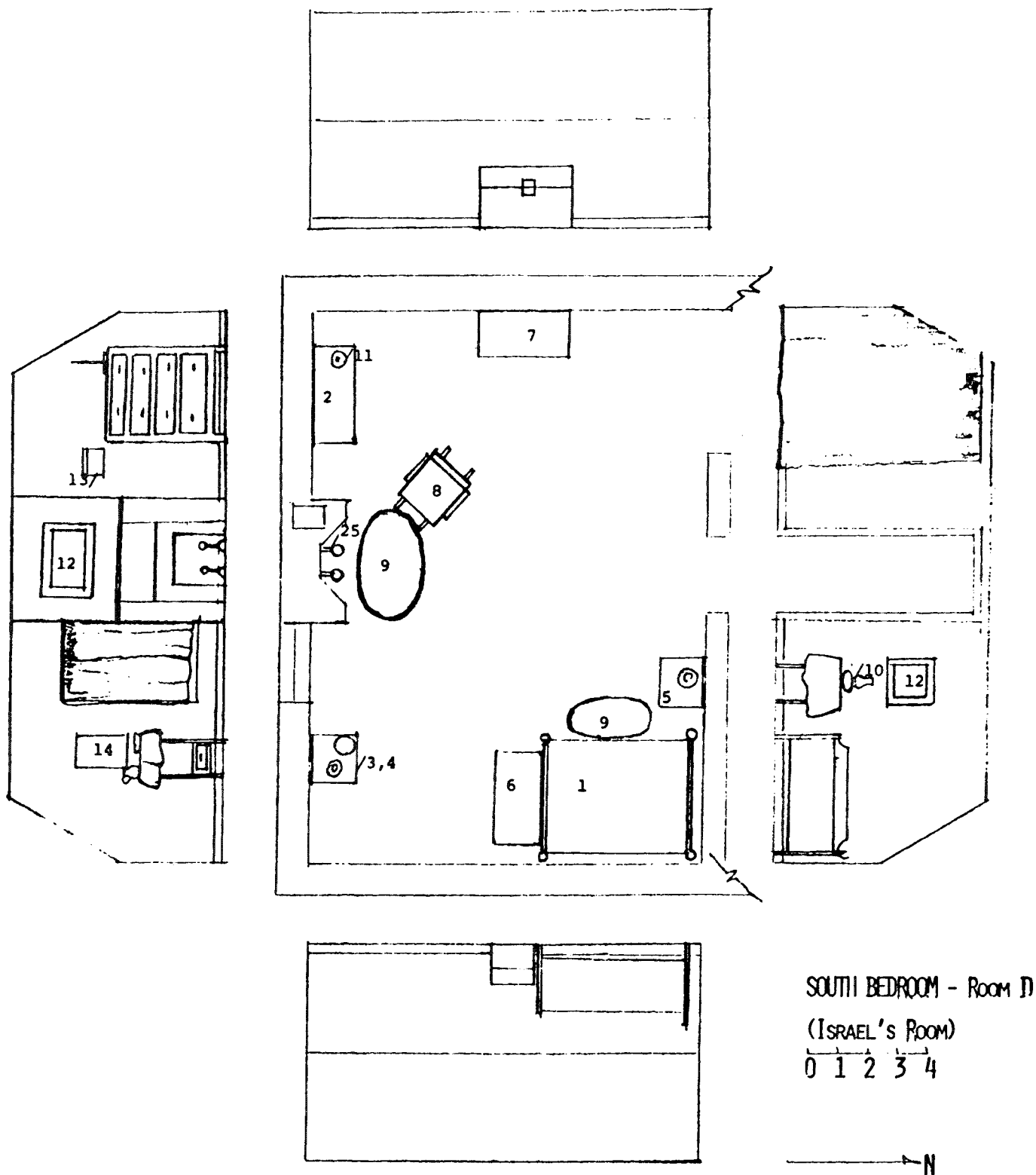


Figure 4. South Bedroom Furnishings layout and elevations

<u>Item</u>	<u>Description</u>	<u>Source</u>
	bottles pickles, 3 bottles sweet oil, worcestershire sauce, 5 cans apples, 12 lbs. peaches, 2 lbs, pepper, 3 bottles pepper sauce, 1/2 doz. extracts, chicken, gal. of Eureka whiskey, 5 cans oysters, box of fish, corn meal, rice, vinegar, salt, ale, mutton, 9 1/2 lbs. cheese, can yeast powder, bottle best brandy, peppermint, 1 bottle pineapple, nuts, 1 can honey, 1 bottle lime juice, hard bread, turkey, shrimp, allspice, 1/2 doz. cloves, vermicelli, macaroni, hominy, pork, tapioca, mustard ginger, 1 bottle orgeat, 1 box prunes, catsup, lobster, 16 1/2 lbs. figs, 3 bottles cordials, brandy peaches, 3 turnips, cocoa paste, potatoes, bottle molasses, 15 1/2 lbs. ham, mackerel.	
C-7	Rag rug	acquire

D-7 A wooden chest or small trunk, 1840-50, to be placed against the west wall. A Pennsylvania-Ohio blanket chest or a small trunk which might have contained Israel's belongings during his trip from Pittsburgh to California would be appropriate. (see pages 39, 42, Chapter D.)

D-8 Cane rocking chair with quilted cushions, 1850-70, should be placed near the fireplace. (see page 36, Chapter D.)

D-9 Two rag rugs, 1850-80, should be placed near the bed and the fireplace. (see page 36, Chapter D.)

South Bedroom Lighting

D-10 Kerosene hand lamp, 1870-80, should be placed on the bedside table.

D-11 Tin candlestick should be placed on the bureau, as there is evidence of Israel's purchase of tinware in the 1850s (see page 32, Chapter D). Older, more worn furnishings would have been relegated to the bedrooms.

South Bedroom Wallhangings

D-12 Two framed lithographs, 1860-80, should be hung over the bedside table and the fireplace.

D-13 A brush needlework or bead wallpocket, 1860-80, should be hung near the chest of drawers.

SOUTH BEDROOM - ROOM D

South Bedroom Furniture

D-1 A double bed, machine made, 1860-80, (with bedclothes), to be placed against the north wall. An appliqued quilt should cover the bed similar to the appliqued quilt made by Maria Israel's mother, in the Serra Museum collection. Although Emma Minter recalls crude handmade bedsteads, the Israels could have afforded at least one store-bought bed, which would certainly have been located in their own room.

D-2 A machine-made chest of drawers, 1860-80, placed against the south wall.

D-3 A washstand, 1860-80, with towel railings and drawer or compartment beneath, placed against the south wall. (see page 40, Chapter D.)

D-4 Pitcher, bowl, toothbrush holder, soap dish, slop pot and chamber pot and towels, 1860-80, should accompany the washstand.

D-5 A side table, 1860-80, with cloth cover to be placed beside the bed.

D-6 A trunk at the foot of the bed, 1860-80, for Maria Israel's belongings. (see pages 39, 42, Chapter D.)

SOUTH BEDROOM - ROOM D

List of Recommended Furnishings

<u>Item</u>	<u>Description</u>	<u>Source</u>
D-1	Double bed, machine-made, 1860-80, with bedclothes and quilt	CABR?
D-2	Chest of drawers, 1860-80	CABR?
D-3	Washstand, with towel railing and drawer beneath, 1860-80	acquire
D-4	Ironstone pitcher, bowl, toothbrush holder, soap dish, slop pot, chamber pot; and two towels, 1860-80	acquire
D-5	Side table, 1860-80 with cloth cover	CABR acquire
D-6	Trunk, 1860-80	acquire
D-7	Small wooden chest or trunk, 1840-50	acquire
D-8	Rocking chair, cane seat and back, 1850-70	acquire
D-9	Two rag rugs, 1850-80	acquire
D-10	Kerosene hand lamp, 1870-80	acquire
D-11	Tin candlestick, 1850-70	acquire

D-14 A small mirror, 1860-80, should be hung over the washstand or the chest of drawers.

D-15 Calico curtains should be hung at the window with string or a small wooden pole and brackets.

D-16 A calico curtain should be hung (on a string) across the recess to create a closet. (see page 39, Chapter D.)

South Bedroom Accessory Furnishings

D-17 - D-22 On the chest of drawers should be placed a bureau scarf, pin cushion (homemade), crucifix (wood or silver), rosary (1850-60), bead necklace, wooden comb and brush (1860-80).

D-23 A razor and strop should be placed on the washstand.

D-24 A woolen shawl should be placed on the rocking chair or over the trunk at the foot of the bed. The Israels' grandson reported that R. D. Israel made a shawl for his wife by weaving it over a frame.

D-25 Iron andirons should be placed in the fireplace and an iron shovel and poker, firewood basket and wood, beside the fireplace. A small vase with artificial dried flowers or pampas grass should be placed on the mantel.

<u>Item</u>	<u>Description</u>	<u>Source</u>
D-12	Two framed lithographs, 1860-80	acquire
D-13	Brush wall pocket, bead or needlework, 1860-80	acquire
D-14	Small mirror, 1860-80	acquire
D-15	Calico curtains, on a wooden pole supported by wood brackets	acquire
D-16	Calico curtain on a string to enclose the closet	acquire
D-17	Bureau scarf	acquire
D-18	Pincushion (homemade)	acquire
D-19	Crucifix, wood or silver	CABR
D-20	Rosary	acquire
D-21	Comb and brush, wooden	acquire
D-22	Bead necklace	acquire
D-23	Razor and strop	acquire
D-24	Woolen shawl	acquire

<u>Item</u>	<u>Description</u>	<u>Source</u>
D-25	Iron andirons, shovel, poker, firewood basket and wood, and a small vase with artificial dried flowers or pampas grass	acquire

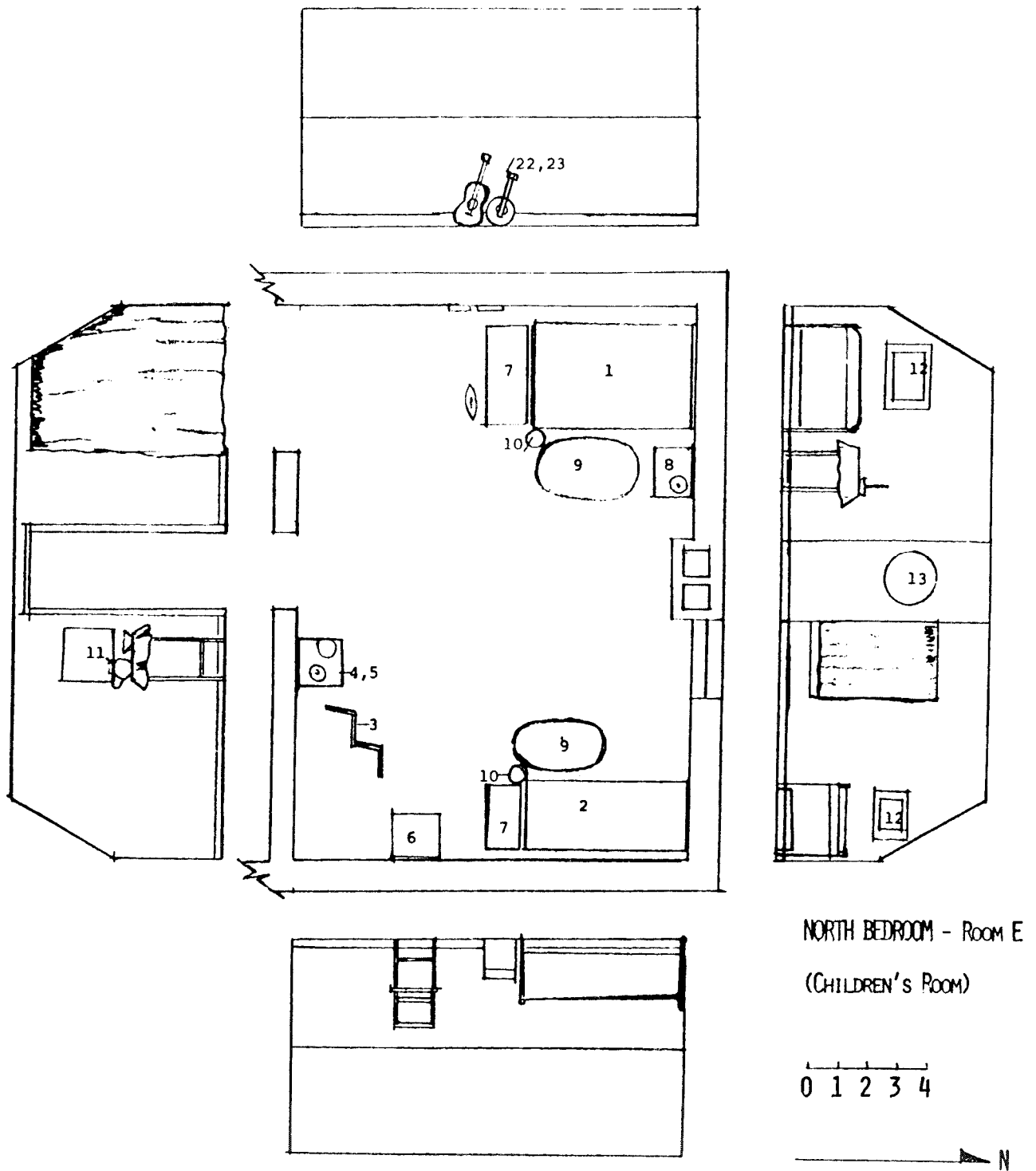


Figure 5. North Bedroom Furnishings layout and elevations

NORTH BEDROOM - ROOM E

North Bedroom Furniture

E-1 Wooden double bed with trundle bed beneath, 1850-70, to be placed in the northwest corner against the north wall (representing the Israels' sons beds). The beds are to be of very simple manufacture as if Israel had made them himself. (see page 39, Chapter D.)

E-2 Single bed or cot, wooden, 1870-80, placed in the northeast corner (representing Emma Minter's bed).

E-3 Three-fold wood and cloth screen, 1870-80, to be placed near the cot or near the washstand.

E-4 - E-5 Washstand, bowl, pitcher, soap holder, toothbrush holder, and slop pot, 1860-70, to be placed against the south wall.

E-6 One cane-seated chair, 1860-80, placed against the east wall.

E-7 Two trunks, 1865-75, one at the foot of each bed.

E-8 One small table, 1860-80, to be placed against the north wall.

E-9 Two small rag rugs, 1850-80, one beside each bed.

E-10 Two chamber pots, 1850-80, one at the foot of each bed.

North Bedroom Wallhangings

E-11 One small mirror, 1850-80, over the washstand.

E-12 Two lithographs with homemade frames, one over each bed.

E-13 The plaster moon, said to have come from the lighthouse, should be hung on the north wall. (see page 41, Chapter D.)

North Bedroom Accessory Furnishings

E-14 One tin candlestick, 1850-79, on the small table.

E-15 Several children's school books on the small table. Maria Israel bought a second grade reader for one of her sons in the 1850s. Emma would probably have been in 6th grade about 1886.

E-16 One plain white cotton cloth should cover the small table.

E-17 One wooden comb and brush should be placed on the washstand.

E-18 Cotton towels should be hung on the washstand.

E-19 - E-20 Seashells, dried starfish, bright colored stones, and a string of coral beads and a homemade pinhole camera should be placed on the table and window sill. (see page 41, Chapter D.)

E-21 A homemade doll should be placed on the bed in the northeast corner. (see page 41, Chapter D.)

E-22 - E-23 A guitar and a banjo should be placed near the bed in the northwest corner. Joe probably took his instrument with him when he went to sea.

E-24 A calico curtain hung on a string should be placed across the recess to cover the closet area and calico or plain white muslin curtains should be hung at the window.

E-25 - E-26 Sheets, a patchwork quilt, a light blanket and pillows should be on each bed.

E-27 A young girl's cotton dress could be hung over the screen or placed on the chest.

E-28 A small carved wooden ship would be appropriate for placement on the table or on the floor near the trunk at the foot of the double bed.

NORTH BEDROOM - ROOM E
List of Recommended Furnishings

<u>Item</u>	<u>Description</u>	<u>Source</u>
E-1	Double bed with trundle beneath, wood, of very simple manufacture, 1850-70	acquire
E-2	One cot, wood, 1870-80	acquire
E-3	Screen, wood and cloth, 1870-80	acquire
E-4	Washstand, wood	acquire
E-5	Ironstone bowl, pitcher, soap holder, toothbrush holder, and slop pot, 1860-70	acquire
E-6	Cane-seated side chair, ca. 1860	acquire
E-7	Two small trunks, 1865-75	acquire
E-8	Small side table, 1860-80	acquire
E-9	Two rag rugs, 1850-80	acquire
E-10	Two chamber pots, 1850-80	acquire
E-11	Small mirror, 1850-80	acquire
E-12	Two lithographs with homemade frames	acquire

<u>Item</u>	<u>Description</u>	<u>Source</u>
E-13	Plaster moon	CABR
E-14	Tin candlestick, 1850-70	acquire
E-15	Several children's school books, to include a second grade reader and books at about the 6th grade level.	acquire
E-16	White cotton cloth table cover	acquire
E-17	Comb and brush, wood	acquire
E-18	Cotton towels	acquire
E-19	Miscellaneous from following list: seashells, dried starfish, bright colored stones, coral beads	acquire
E-20	Homemade pinhole camera	acquire
E-21	Homemade doll	acquire
E-22	Guitar, 1860-70	acquire
E-23	Banjo, 1860-70	acquire
E-24	Calico curtain for closet	acquire
E-25	Three patchwork quilts	acquire

<u>Item</u>	<u>Description</u>	<u>Source</u>
E-26	Six sheets, 3 blankets, 5 pillows	acquire
E-27	One girl's cotton dress	acquire
E-28	Small carved wooden ship	acquire

SUPPLY CLOSET - ROOM F

The Lighthouse Establishment supplies should be based on the 1881 List of Allowances to Light-Stations which replaced the 1880 List and was in effect until 1889 when it was changed slightly. See Appendix IV for the complete list. Any of the items listed below would be appropriate for the supply closet. A selection of the books, blanks, and stationery should be placed on the desk in the parlor with the remainder stored in the closet. The paint supplies would logically have been stored either in the outside storehouse or in the cellar with the mineral oil, as would the various oil containers listed under the Oil-Room or Cellar Outfit List.

General Supplies

F-1 1 Daily Expenditure Book, 1 General account book, 1 Journal or log-book, 1 Watch-book, 1 Fog-signal Record, 6 Absence Reports (Form 69), 36 Reports of Condition of Station (Form 65), 12 Vouchers for salary (Form 5), 3 Property Returns (Form 32), 3 Keeper's Receipt on Taking Charge (Form 31 or 35), 6 Expenditure of Oil, etc. (Form 33), 3 Abstract of Passing Vessels (Form 74), 12 Receipt for Extra Supplies (Form 27), 6 Shipwreck Reports (Form 70), 4 large-size envelopes, 8 post-size envelopes, 26 official size envelopes, 2 quires writing paper.

F-2 2 penholders, 1 pint ink, 6 slate pencils, 2 dozen steel pens, 2 black lead pencils, 1 slate.

Household Allowances

F-3 2 doz. wicks for tablelamp, 1 doz. wicks for hand lamp, 1 doz. wicks for hand lanterns, 20 chimneys for table lamp, 10 chimneys for hand lamp, 1 pargetized can [? possibly a decorated oil can], 30 boxes safety matches, 2 firebuckets.

Supplies for Third and Third-and-a-half Order Lights

F-4 10 yards wick of each number used, 24 boxes safety matches, 2 silver-plate brushes, 1 pane of each size of window glass.

Outfit List

F-5 1 brass service-box, 1 boxwood or satinwood foot-rule, 1 plummet and cord, 1 spirit-level (large or small), 1 circular-level (small), 1 dripping-pan, 1 or 2 dust-pans, 1 wick-measure or calipers, 1 wick-mandrel for each size burner in use [mandrel is conical in form, except for small part of base which is cylindrical and rabbeted to receive wick holder], 1 trimming hook, 1 sharp-pointed steel pricker with wooden handle, 1 lamp-feeder, 1 lucerne or lighting lamp, 1 valve-mold [kind of die by which the best form for the play of the pump is given], 1 set valve-leather punches [for making leather valves], 1 set jack-screws [these are formed by a screw or bolt which screws into 2 small moveable plates. The stem is increased in size at its center and pierced with holes in which a pin is passed to work them, capstan fashion], 1 glass chimney lifter (covered with buckskin), 1 tin match-box, 1 spare fly or governor, 1 spare sheet-iron damper and key, 1 set of four storm pane clamps, 1 rouge-box (made double, with close top, marked "ROUGE-POWDER"), 1 whiting-box (made with

close top, marked "WHITING"), 1 valve-leather box (made with close top, marked "VALVE-LEATHERS"), 1 box (made with close top, marked "WICKS"), 2 flat tin pans (made with lip), 1 set linen curtains, 1 white fine linen cover for illuminating apparatus, 1 cover for spare mechanical lamp, 1 linen apron (made to come below knees and close around neck, with long sleeves), 1 shade for table lamp and one extra shade for table lamp, 1 or 2 tin oil-carriers, 1 or 2 tin funnels, 1 brass funnel, 1 set standard liquid measure (made of tin, in 1 or 2 tin oil-carriers, 1 brass funnel, 1 medicine chest, which would have contained: 8 oz. sweet spirits of nitre, 8 oz. arnica, 8 oz. essence of Jamaica ginger, 100 quinine pills, 3 oz. saltpetre, 2 oz. sulphur zinc, 8 oz. cough mixture, 8 oz. fenna leaves [probably fennel as fennel water was used as a stimulant and carminative], 12 oz. Rochelle salts, 8 oz. castor oil, 4 oz. carbolated oil and laudanum, 2 oz. glycerine, 4 oz. choloform liniment, 1 oz. lactopeptin, 100 compound cathartic pills, 2 oz. laudanum, 2 oz. Calverts carbolic acid, 1 oz. iodoform, 1 lb. patent lint bandages, 100 opium and camphor pills, 1 oz. Dover's powders, 4 oz. spirits camphor.

This chest could be exhibited closed.

1 small wooden tool chest marked "TOOLS". This should be exhibited closed so the purchase of pliers, files, hammers, etc. will not be necessary.

F-6 Shelves of appropriate size and painted white should be built on site to accommodate supplies.

Keepers often built additional storage space for themselves as did Israel's predecessor. (see pages 30-31, Chapter D.) For example, the keeper at East Brothers Island made two entries in his 1890 daily log

book about the station's activities. On September 23, 1890, they made a "bench and closets in store room" and on December 15 they made "brackets for tools."¹ An entry in the Alcatraz journal¹ for October 15, 1888, read: "Employed in making shelves."²

1. Journal, East Brother Island Light Station, September 23, 1890 and December 15, 1890, RG 26, National Archives and Records Center, Suitland, MD.

2. Journal, Light Station at Alcatraz Island, January 7, 1889, RG 26, National Archives and Records Center, Suitland, MD.

SUPPLY CLOSET - ROOM F

List of Recommended Furnishings

<u>Item</u>	<u>Description</u>	<u>Source</u>
F-1	Daily expenditure book; Journal or log book; Fog-signal record; General account book; Watch-book; 6 Absence reports, Form 69; 36 Report of condition of station, Form 65; 12 Vouchers for salary, Form 5; 3 Property returns, Form 32; 3 Keeper's receipt on taking charge, Form 31 or 35; 6 Expenditure of oil, etc. Form 33, 3 Abstract of passing vessels, Form 74; 12 Receipt for extra supplies, Form 27; 6 Shipwreck report, Form 70; 4 Large-size envelopes; 8 Post-size envelopes; 26 Official-size envelopes; 2 quires writing paper.	acquire
F-2	2 penholders, 1 pint ink, 6 slate pencils, 2 dozen steel pens, 2 black lead pencils, 1 slate.	acquire
F-3	1 dozen wicks for tablelamp, 1 doz. wicks for hand-lanterns, 2 chimneys for hand-lamp, 15 boxes safety matches, 1 doz. wicks for hand lamp, 2 chimneys for table-lamp, 1 pargetized can, 2 firebuckets.	acquire

<u>Item</u>	<u>Description</u>	<u>Source</u>
F-4	10 yards wick of each number used, 24 boxes safety matches, 2 silver-plate brushes, 1 pane each size window glass.	acquire
F-5	Originals, or reproductions, if necessary, from the following list: 1 brass service-box; 1 plummet and cord; 1 spirit-level, large and small size; 1 dripping-pan; 1 or 2 dust-pans; 1 wick mandrel for each size burner in use; 1 lucerne or lighting-lamp; 1 set valve-leather punches; 1 glass chimney lifter; 1 spare fly or governor; 1 set of four storm pane clamps; 1 boxwood or satinwood foot-rule; 1 small circular-level; 1 wick-measure or calipers; 1 trimming hook; 1 sharp pointed steel pricker, with wooden handles; 1 lamp-feeder; 1 valve-mold; 1 set jack-screws; 1 tin match-box; 1 spare sheet-iron damper and key; 1 rouge-box, made double, with close top, marked "ROUGE-POWDER"; 1 whiting-box, made with close top, marked "WHITING"; 1 box, made with close top, marked "WICKS"; 1 set linen curtains, 1 cover for spare mechanical lamps; 1 shade for table lamp and one extra shade for table lamp; 1 or 2 tin oil-carriers; 1 brass funnel; 1 valve-leather box, made with close top, marked "VALVE-LEATHERS"; 2 flat tin pans, made with lip; 1 white fine linen cover	acquire

<u>Item</u>	<u>Description</u>	<u>Source</u>
	for illuminating apparatus; 1 linen apron, made to come below knees and close around neck, with long sleeves, 1 or 2 tin funnels; 1 set standard liquid measures, made of tin, in five pieces, 1 medicine chest and supplies.	
F-6	Shelves of appropriate size and painted white, built on-site.	acquire

CHAPTER F:

SPECIAL INSTALLATION, MAINTENANCE AND PROTECTION RECOMMENDATIONS

The parlor, kitchen, storage area and two bedrooms will require barriers since there will be no full-time interpreters in the house. The room barriers should be constructed in such a way that the visitor may enter a few feet into the room and the barriers should unlock easily for housekeeping purposes. Plexiglas is recommended because it is unobtrusive and allows the visitor maximum visibility while protecting the furnishings. The barriers should be doorway-height, allowing for ventilation at the top. They should also be designed so the top half can be opened when an interpreter is present in the room. Across the second floor stairway, a barrier which closely imitates the stair railing is recommended. These barriers should be backed up by an intrusion alarm system.

No special maintenance will be required other than the routine housekeeping as outlined in the Manual for Museums. A suggested maintenance schedule is as follows:

<u>Item</u>	<u>Task</u>	<u>Frequency</u>
Wood furniture	Dust according to directions in <u>Manual</u>	Daily (or as needed)
Silver or silver plate	Dust with 100% untreated cotton cloth, wearing white gloves.	Weekly (or as needed)

<u>Item</u>	<u>Task</u>	<u>Frequency</u>
	Polish and treat with lacquer. Consult regional curator for approved products	As needed, when coated; probably only once a year
Metal items	Dust with untreated cloth. Consult Division of Conservation, HFC, if rust develops on iron items	Weekly (or as needed)
Brass	Polish and treat with tarnish prohibitor as for silver, consulting regional curator for approved products	When tarnished (yearly)
Curtains	Vacuum using hand vacuum, upholstery attachment and screen; hold vacuum away from fabric, wear gloves	Quarterly
	If reproduction, wash by hand with mild detergent and press; consult textile conservator before cleaning	Once a year

<u>Item</u>	<u>Task</u>	<u>Frequency</u>
Mirrors and picture glass	Dust with untreated cloth; wash glass	Daily (or as needed)
Shell picture frames	Gently blow dust off	Monthly
Plexiglas	Wash with plexi-cleaner	Daily (or as needed)
Storage area	Dust and vacuum	Monthly
Clothing	Dry clean by a reputable textile conservator only	Once every two years
Upholstery, tablecloth, bureau scarves, bedspreads, etc.	(Same as curtains)	Weekly
Rugs	Vacuum (same as curtains)	Weekly
Displayed ceramics	Dust with untreated cotton cloth	Weekly
	Wash with mild detergent. (Do not wash unglazed ceramics.)	Not more than once a year

<u>Item</u>	<u>Task</u>	<u>Frequency</u>
Glass	Dust with untreated cloth	Weekly
	Wash with mild solution of ammonia and water	Not more than once a year
Books	Dust with camel's hair brush	Monthly
Artificial flowers	Blow dust off using hand hair dryer	Monthly
	Lightly steam flowers so they regain shape	As needed
Reproduction stove	Polish with commercial stove polish	Whenever used and as needed

Keeping the dwelling clean and in good order were part of the lightkeeper's regular duties.

A sun block (UV filter) is recommended for the windows in order to protect the furnishings from fading, particularly textiles. This protection will lengthen considerably the lifetime of the textiles. The light levels in all rooms are currently at a very high, unacceptable

level. Consult with regional curator for specific up-to-date recommendations. Currently, electrified period fixtures are being used to supplement the daylight when necessary. It is recommended that this system be continued.

ILLUSTRATIONS

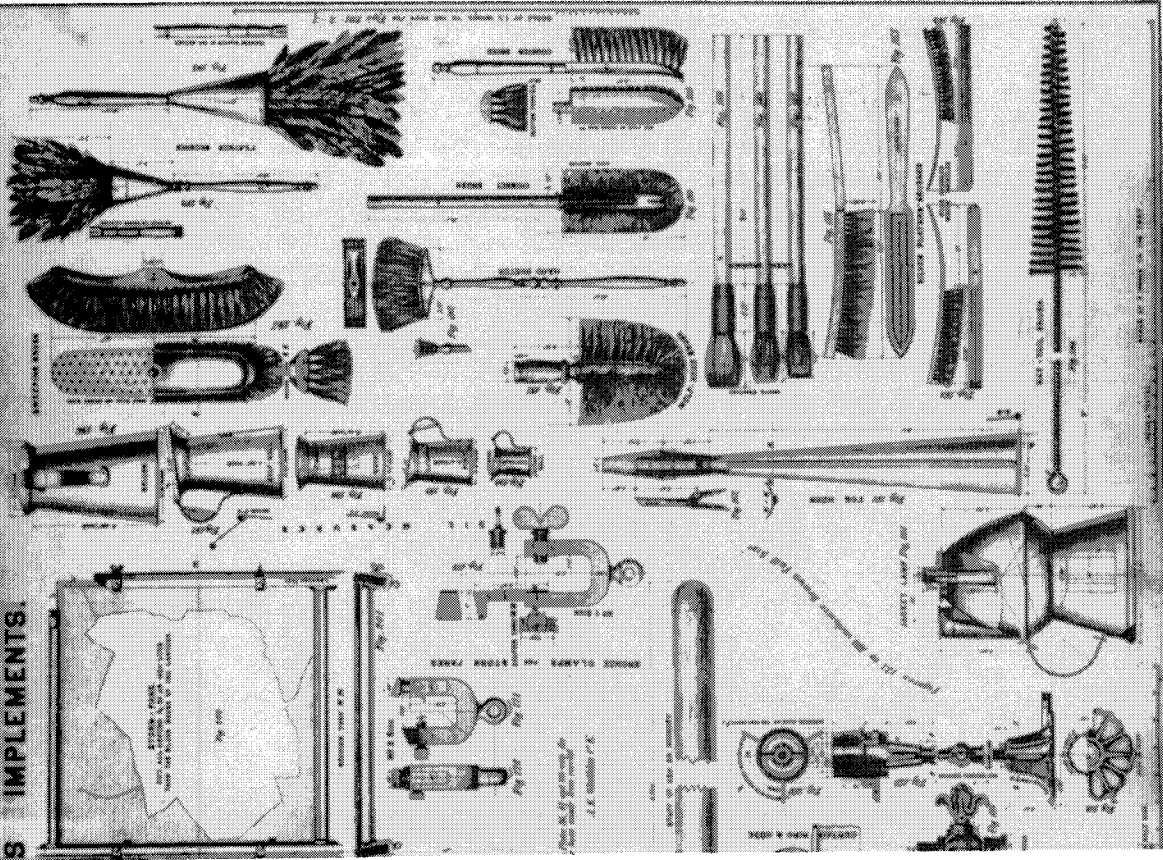
Figure 1.

Lightkeepers' Implements, ca. 1865. From U. S. Lighthouse Establishment Light Keepers Implements, Vol. 4, Plate 97, National Archives, RG 26.

Figure 2.

U. S. Lighthouse Establishment Light Keepers Implements, Vol. 4,
Plate 98, National Archives, RG 26.

8 IMPLEMENTS.



LIGHT KEEPER'S

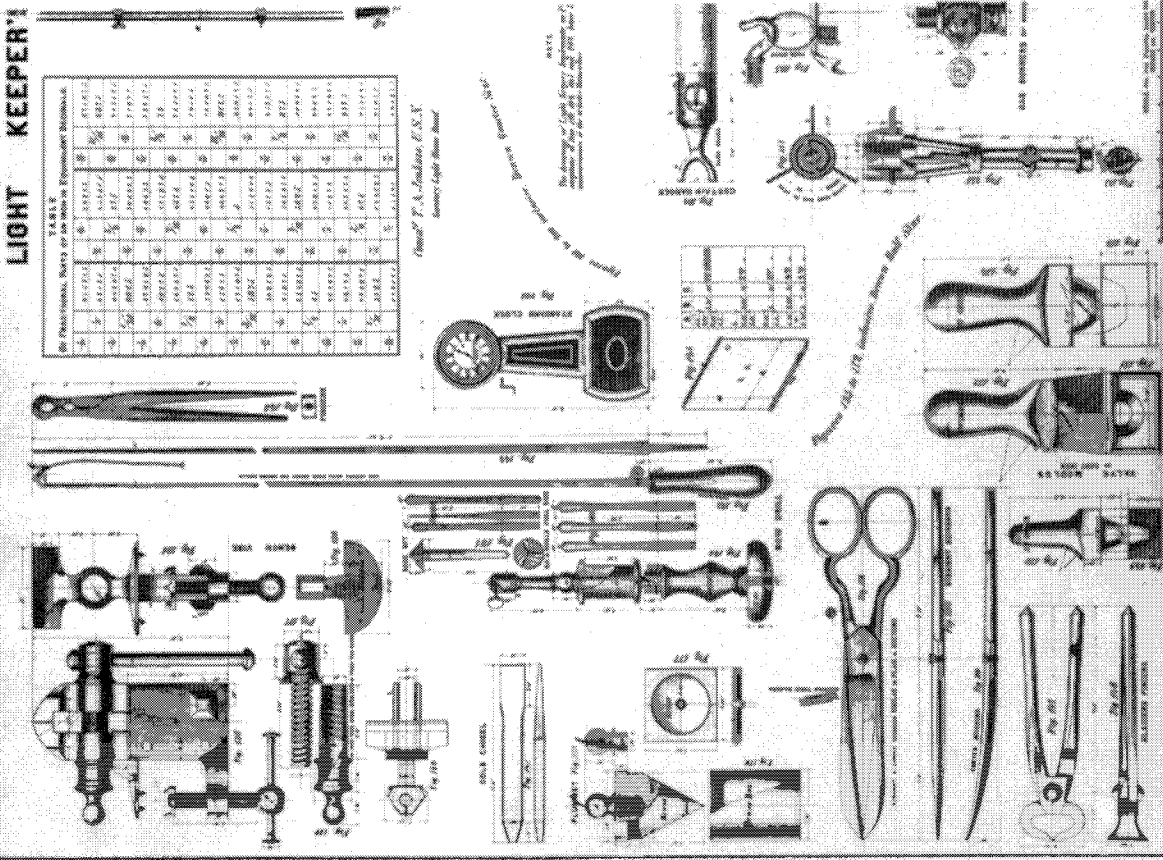


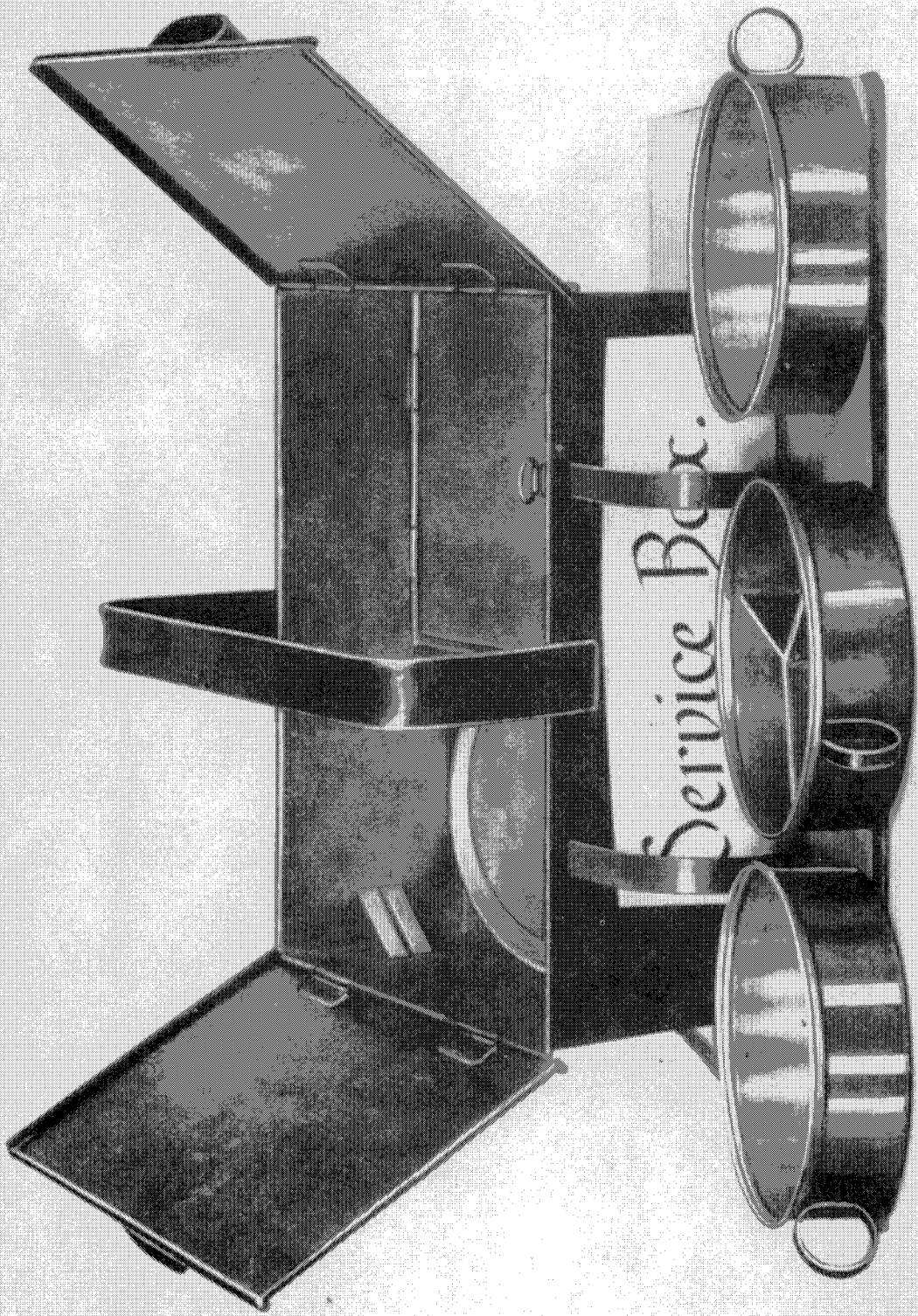
Figure 3.

Drip pan, measure, and oil feeder. From Price List of Standard Articles (for Lighthouse Purposes) Furnished from General Depot, Tompkinsville, New York, 1901, plate 57.



Figure 4.

Service box and contents. From Price List of Standard Articles (for Lighthouse Purposes) Furnished from General Depot, Tompkinsville, New York, 1901, plate 59.



polishing powder.

Miscellaneous.
for
cleaning

Scourer

Figure 5.

Keeper's office in new dwelling, Fort Point Light Station, 1909.
National Archives, Prints and Photographs Division, RG 26, U. S.
Coast Guard Prints, Box No. 64.



Figure 6.

U. S. Life Saving Service traveling library Cabinet. Courtesy U. S. Coast Guard Academy Museum, New London, Connecticut.

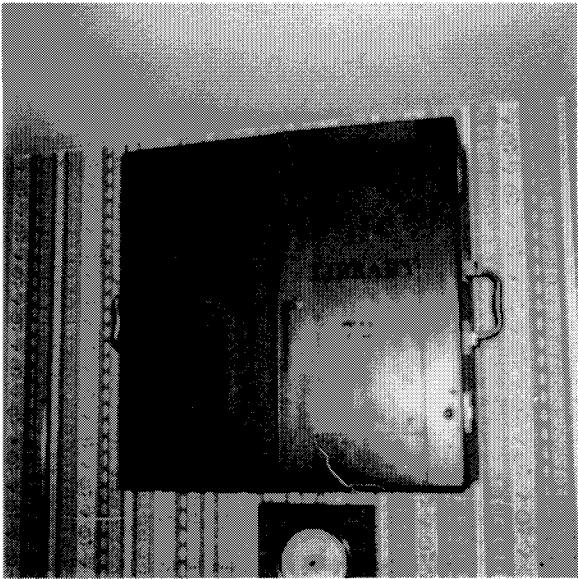
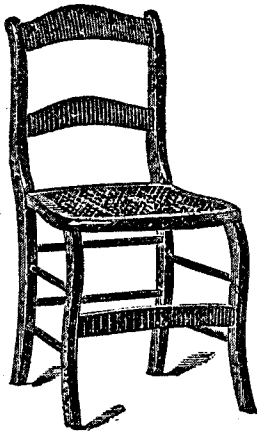
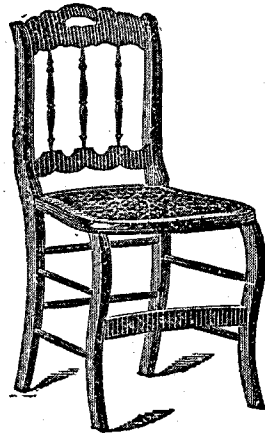


Figure 7.

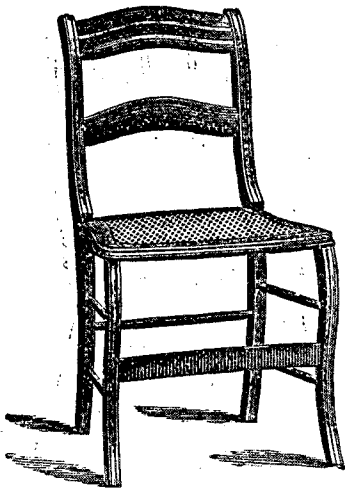
Cane-seated side chairs. From Abernathy Brothers Illustrated Catalogue and Wholesale Price List. Leavenworth, Kansas, 1872, p. 19.



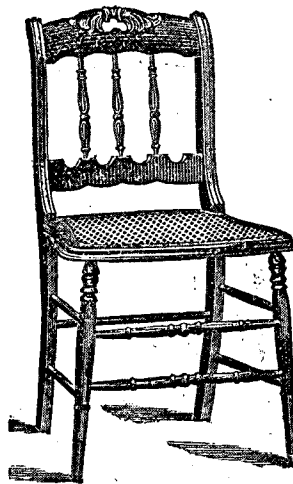
PLAIN BALL TOP CHAIR.
Walnut, set up or knock down and
boxed.
PER DOZEN.....\$
Maple, knock down.
PER DOZEN.....\$



SPINDLE BALL TOP CHAIR.
Maple, knock down,
PER DOZEN.....\$
Walnut.
PER DOZEN.....\$



MOULDED BALL TOP.
Walnut, set up or knock down.
PER DOZEN.....\$



CARVED BALL TOP SPINDLE.
Moulded Seat, Walnut, set up or knock
down.
PER DOZEN.....\$

Figure 8.

Dining Room, new keeper's dwelling, Fort Point Light Station, 1909.
National Archives, Prints and Photographs Division, RG 26, U. S.
Coast Guard Prints, Box No. 64.



Figure 9.

Dining Room, new keeper's dwelling, Fort Point Light Station, 1909.
National Archives, Prints and Photographs Division, RG 26, U. S.
Coast Guard Prints, Box No. 64.



Figure 10.

Parlor, new keeper's dwelling, Fort Point Light Station, 1909.
National Archives, Prints and Photographs Division, RG 26, U. S.
Coast Guard Prints, Box No. 64.



Figure 11.

Table lamp. From Price List of Standard Articles (for Lighthouse Purposes) Furnished from General Depot, Tompkinsville, New York, 1901, plate 95.

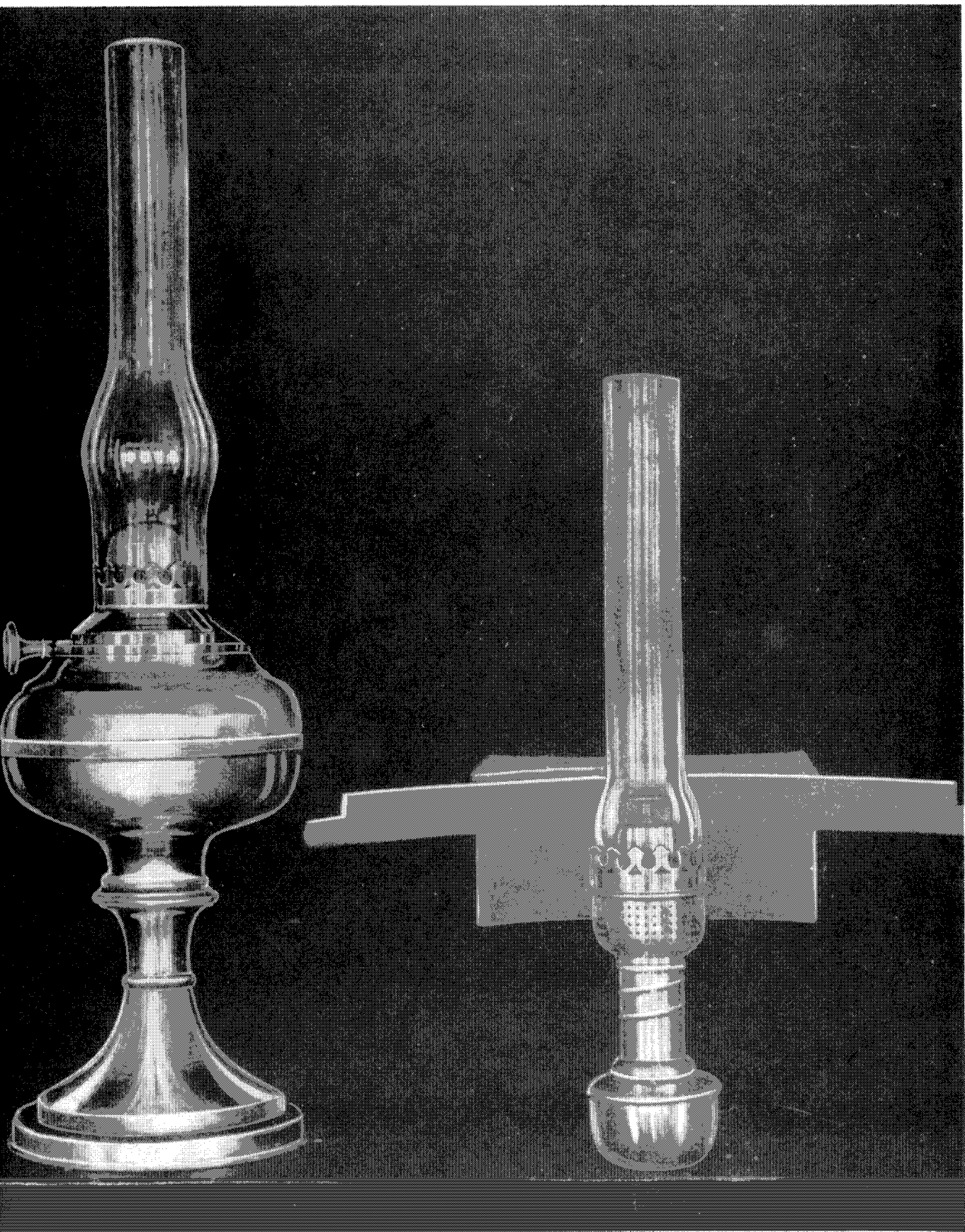


Figure 12.

Lamp shades in Supply Room, east side. Buffalo Depot, N.Y., 1901.
National Archives, Prints and Photographs Division, RG 26, U. S.
Coast Guard Prints, Box No. 45.

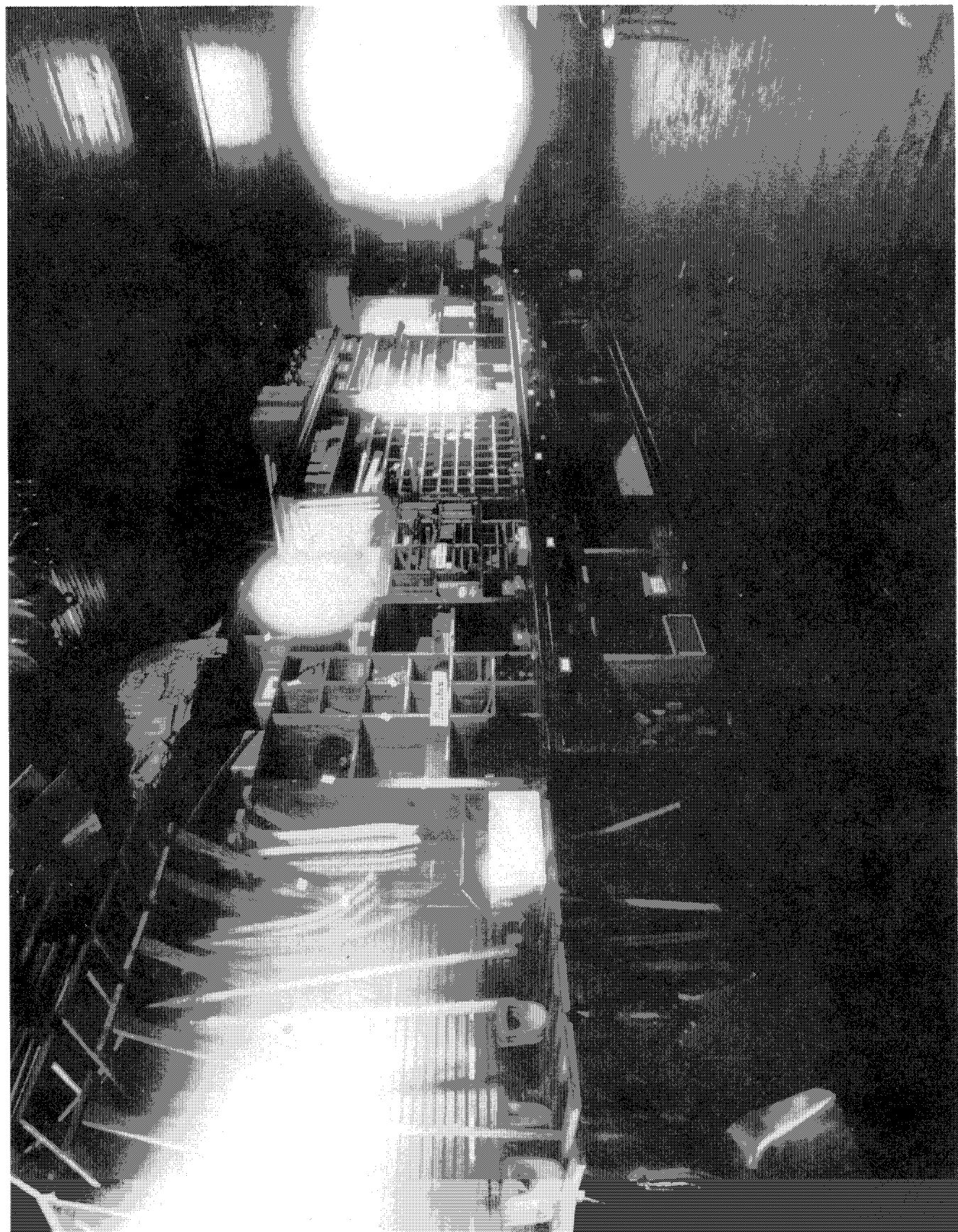


Figure 13.

Ironstone in Supply Room, Buffalo Depot, N.Y., 1901. National Archives, Prints and Photographs Division, RG 26, U. S. Coast Guard Prints, Box No. 45.

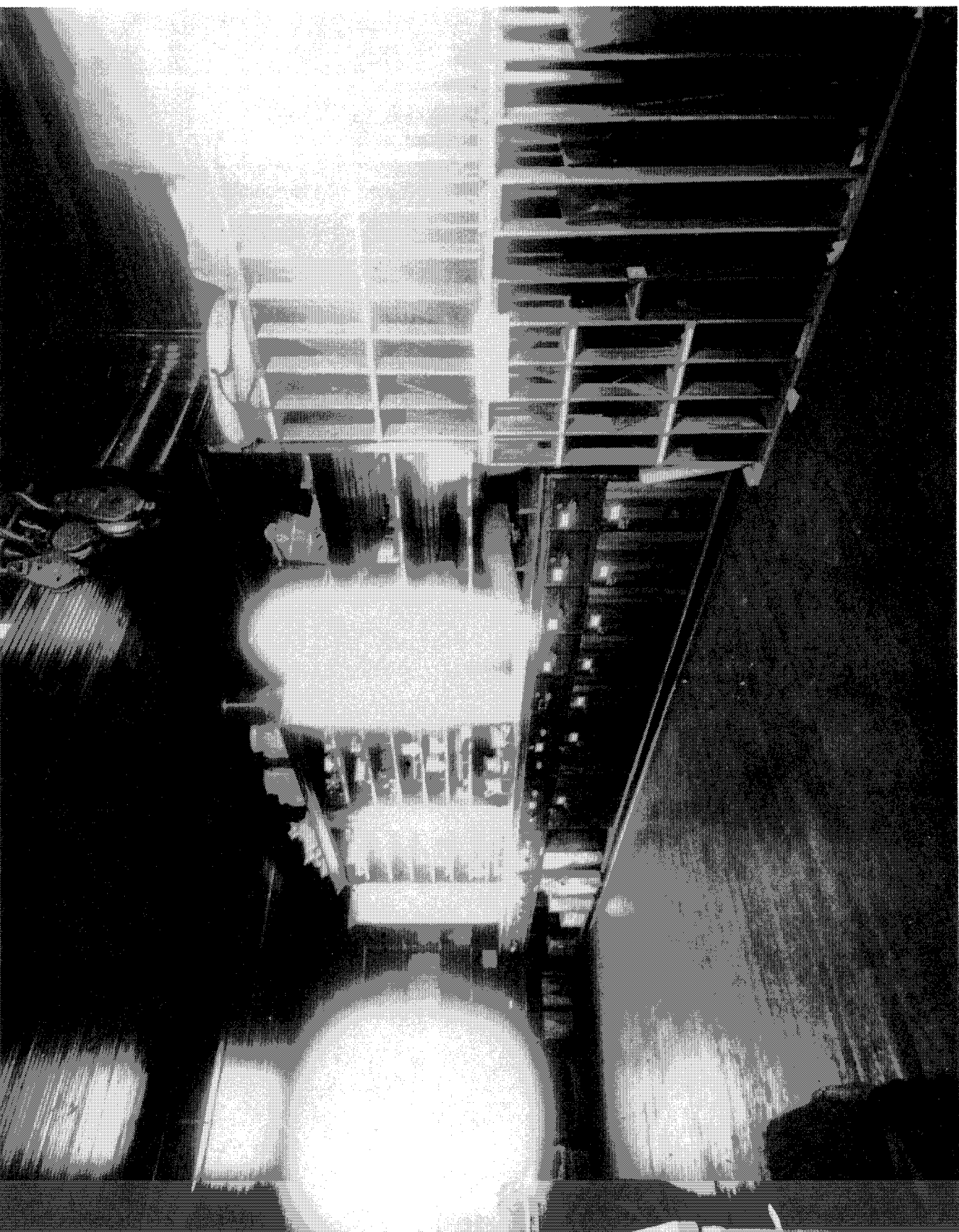


Figure 14.

U. S. Light House Establishment clock. Courtesy, Chesapeake Bay Maritime Museum, Navy Point, St. Michael's, Maryland.

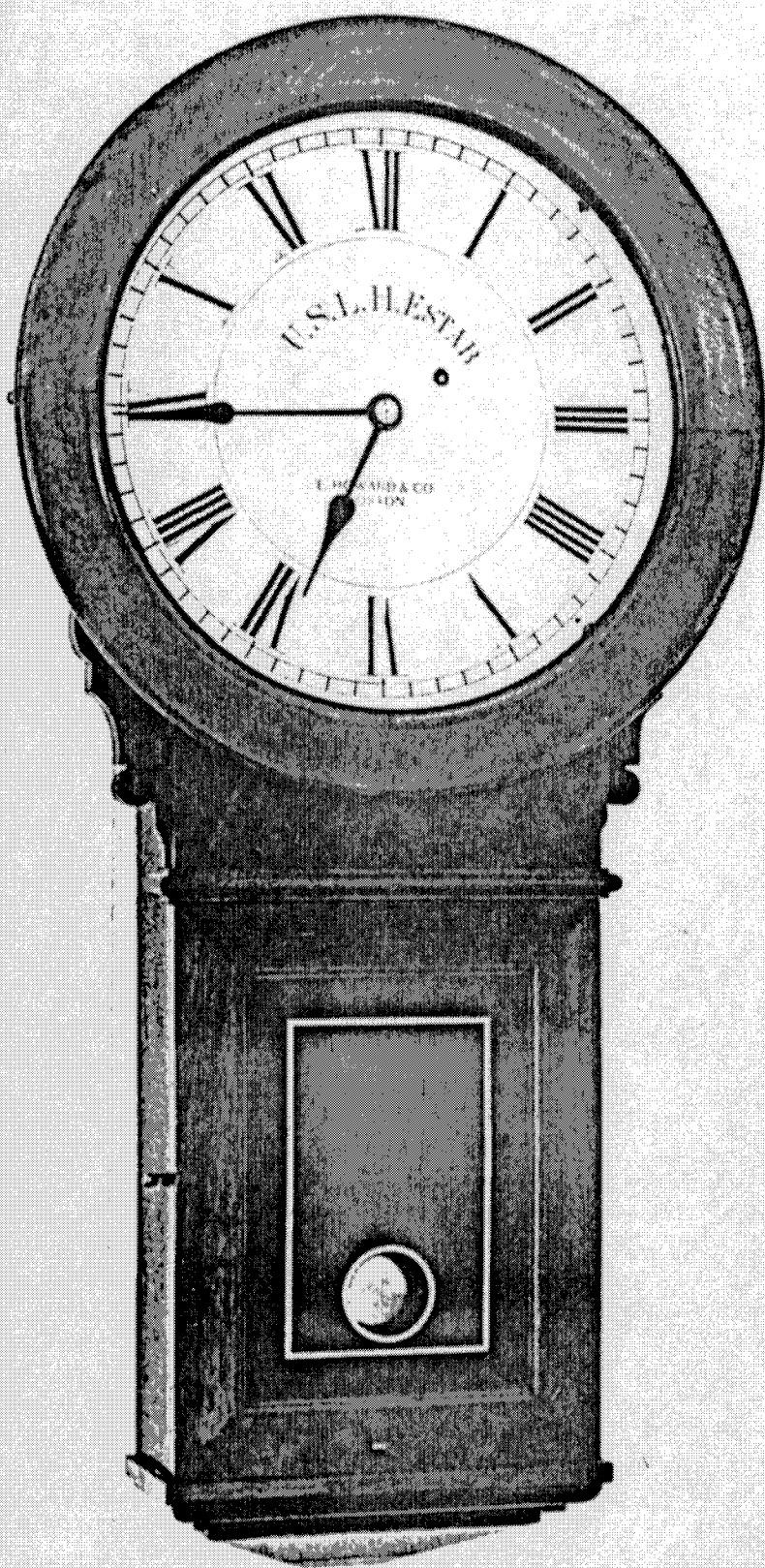


Figure 15.

Lighthouse clocks, 18th District, 1909. National Archives, Prints and Photographs Division, RG 26, U. S. Coast Guard Prints, Box No. 64.



APPENDIXES

Appendix I

Keepers, Point Loma Light Station, 1854-1894 from F. Ross
Holland, The Old Point Loma Lighthouse, San Diego, California,
Cabrillo Historical Association, 1978.

Keepers	Date Appointed	Date Vacated	Salary	Remarks
James P. Keating	Dec. 28, 1854	Feb. 1, 1859	\$1,000	Removed
H.C. Wiley	Feb. 1, 1859		1,000	Salary reduced to \$800 on Sept. 1, 1859
J.N. Covarrubias	Oct. 9, 1859	Mar. 13, 1860	800	Resigned
Joseph Reiner	Mar. 13, 1860	Nov. 16, 1860	800	Resigned
James P. Keating	Nov. 16, 1860		800	Resigned
W.C. Price	Feb. 16, 1861	Nov. 23, 1867	1,000	
J.D. Jenkins	Nov. 23, 1867	Apr. 24, 1871	1,000	Removed
Isaac Swain	Apr. 24, 1871	May 20, 1871	1,000	Declined
Enos A. Wall	May 20, 1871			
James J. Ferree	Mar. 5, 1872	June 27, 1873	1,000	Resigned
Robert D. Israel	June 27, 1873		1,000	Salary reduced to \$800 on Jan. 1, 1880
George P. Brennan	Jan. 29, 1893		800	Keeper of the new Point Loma light
Assistant Keepers				
George B. Tolman	Jan. 29, 1855	Jan. 29, 1856	\$ 650	Resigned
Anthony Genan	Jan. 29, 1855	Jan. 17, 1856	500	2nd assistant position discontinued
Julius Semen	Apr. 28, 1856		650	Salary reduced to \$500 on Sept. 1, 1859
W.C. Price			500	Resigned
Thomas Susk	Dec. 6, 1859	Dec. 31, 1859	500	Resigned
J.J. Serano	Dec. 30, 1859	Mar. 13, 1860	500	
W.C. Price	Mar. 13, 1860		500	
S. Fields	Feb. 16, 1861		500	
C.P. McAleer	Mar. 7, 1865		625	
Lewis McCoy	Feb. 5, 1867	Nov. 23, 1867	600	Resigned
Eliza Jenkins	Nov. 23, 1867	May 20, 1871	600	Removed
Robert D. Israel	May 20, 1871	June 27, 1873	600	Promoted
Mary A. Israel	June 27, 1873	Feb. 15, 1876	625	Removed
A.G. Walker	Feb. 15, 1876	May 19, 1876	625	Transferred
J.S. Craig	May 19, 1876	Aug. 13, 1877	625	Resigned
John Stone	Aug. 13, 1877	July 30, 1881	625	Salary reduced to \$600 on Jan. 18, 1880. Resigned
Victor H. Richet	July 30, 1881	Nov. 14, 1883	600	Resigned
James Maloney	Nov. 14, 1883	Sept. 15, 1884	600	Resigned
Philip Savage	Sept. 15, 1884	Aug. 14, 1886	600	Resigned
David R. Splaine	Aug. 14, 1886	Apr. 15, 1889	600	Transferred
Thomas W. Anderson	July 15, 1889	Oct. 25, 1891	600	Resigned
Edwin B. Cartwell	Oct. 28, 1891	Feb. 23, 1894	600	Resigned

APPENDIX II

CORRESPONDENCE REGARDING CONDUCT OF KEEPER ISRAEL AND ASSISTANT KEEPER SAVAGE

Letters Received by the Lighthouse Board from the Inspector, 12th District, 1886-1887, Record Group 26, National Archives. Letter dated August 2, 1886, with the following enclosures:

1. Transcript of Enclosure "A" - Keeper, Point Loma, to Inspector, 12th District, May 16, 1886, charging Assistant Keeper with misconduct
2. Enclosure "B" - Inspector, 12th District, to Assistant Keeper, Point Loma, May 21, 1886, relaying charges against him
3. Transcript of Enclosure "a" - Assistant Keeper to Inspector, June 5, 1886, answering Keeper's charges
4. Enclosure "C" - Keeper to Inspector, May 30, 1886, with new charges against Assistant
5. Enclosure "D" - Inspector to Assistant Keeper, June 2, 1886, relaying new charges
6. Transcript of Enclosure "b" - Assistant Keeper to Inspector, June 6, 1886, answering new charges
7. Enclosure "E" - Keeper to Inspector, June 1, 1886, further charges against Assistant

8. Enclosure "F" - Inspector to Keeper, June 16, 1886,
warning him and family to stop annoying his assistants
9. Enclosure "G" - Inspector to Assistant Keeper, June 16,
1886, warning him to obey regulations and lawful orders,
and offering a transfer to Farallon Islands Light Station

On a U.S. Exp. Zone property,

TWELFTH DISTRICT.

San Francisco, Cal.

TWELFTH DISTRICT.
San Francisco, Cal., August 2^d, 1886

Chairman Light House Board,
Washington, D. C.

Sir: In obedience to instructions contained in Board's letter of 21 July '86, I respectfully submit the following report of the circumstances attending the resignation of Mr. Philip Garage, U.S. Point Lema Light Station; together with a copy of my letter to him dated June 16th 1886.

Under date of May 16. 1886,
the Principal Keeper, R. D. Israel
reported Mr. Savage (original report
enclosed marked A.)

I addressed Mr. Sarna.

dated 21 May 1886. (Copy enclosed
marked B.)

Reply of Philip Garage to above
letter (marked A.)

On May 30th '86. the Principal
Keeper again reported Mr. Garage
(original enclosed marked C.)

Under date of 2 June '86. I
sent a second letter to Philip
Garage (copy enclosed marked D.)

Reply of Philip Garage to same
(marked E.)

On June 1st '86. the Principal
Keeper again reported Mr. Garage
(original enclosed marked F.)

On 16 June '86. I addressed
a letter to the Keeper (copy enclosed
marked F.) and one to the Assistant
(copy enclosed marked G.)

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In regard to his escaping oppression from the Keeper, I was under the impression that he neglected his duty; and owing to a bad personal habit, naturally incurred the displeasure of the Keeper.

As to my feelings in the matter, I tried to act in the interest of the Light House Service; and in regard to Mr. Garage, offered to send him to another station if he desired to go, as will be seen by the last clause of my letter (C.), dated 16 June. But instead of accepting a transfer, he resigned his position to rejoin his family on a ranch in Kansas; and to avoid further

trouble, with me. I gladly ac-
cepted his resignation.

Very respectfully,

Wm. M. Phillips

Comdr. U.S.N.

Inspector



Transcript of Enclosure " A "

Point Loma Light Station

May 16th 1886

To

Capt.

John W. Philip

Sir in acordance [sic] with your instructions I ordered the assistant to sweep down the tower stairs. he says he will not do it but when he sees fit and will not sweep the lower flight at all. I then ordered him to keep his watch in the Lantern. Which he refuses to do but sits in his Kitchen and visits the Light twice during his watch. I next ordered him to bring the oil carrier and draw the oil. Which he did but would not cary [sic] it up to the Lantern. he still sticks to the lie that he told me about you and says you told him [lies?]. he [even?] says he did not report me to you on the 8th. he will not tell the truth about any thing. on the 10th I told him I was going to town on Light House Business and to finish cleaning the Privy [sic] (I had done one half) and finish cutting weeds around the fence in all about an hours work. When he said he would do nothing unless I had my hand in it. on the 11th I finished the Privy and set him to whitewashing and I went to painting the Tower red. 16th he has whitewashed seven pannels [sic] of fence, the Stable and tank shed. Just what I do in one day. he is doing every thing he can to keep the work back and refuses to wash the Stairs down on Sunday morning when it is his watch.

Very

Respectfully

R.D.Israel

Enclosure "B" - Inspector, 12th District, to Assistant Keeper,
Point Loma, May 21, 1886, relaying charges against him

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TWELFTH DISTRICT.

San Francisco, Cal.,

May 21, 1886

Philip Savase,
Asst. Point Loma,

Sir: - Mr. Israel has reported
you for neglect of duty, dis-
obedience of orders, and a general
disregard of the "Instructions to
Light Keepers" - as you will
see by the copy of his report
which I enclose.

Be pleased to make answer
to each charge he brings against
you - your attention being called
to par. 1 + 4, page 5, "General
Instructions to Light-Keepers, July 1881."

Respectfully re.

(Signed) Wm. H. Phillips



Transcript of Enclosure " a "

Point Loma

Light Station

June 5th 1886

Comdr. John W. Philip U.S.N.

Light-House Inspector

12th District

Dear Sir, I am very thankful to you for having sent me a copy of those charges, the answers to them I herewith enclose, -- I do not remember anything that has caused me so much pain as the reading of those charges, -- they are enough to [illegible] than to do what he says Inspectors will do, expel an assistant without telling him why or what for and I have no doubt that it is just what he is expecting now. he has often told me that he can talk Inspectors into any thing that he wants them to do and how he has lied to them and that they could not tell the difference.-- I have not tasted as much as a glass of liquor of any kind since I have been on this station, nor failed on a single evening to be in time to do my lighting up, but I have had to light up for the Keeper many times, and keep part of his watch some time [sic] till ten oclock, but he always enters himself on the watch book as being at the station half an hour before sunset, it being the time for getting ready to light up, what can he not do!

The watch man down at the landing has known Mr. Israel for thirteen year, he also sends you a letter, he is a man of good report, he has told me often if he cannot get you out otherwise he will lie you out. I use to tell him I always behave myself in such manner, if it was possible for the Inspector see [sic] all my actions

manner, if it was possible for the Inspector see [sic] all my actions unseen he could not but approve of them.

I am your very respectful
and obedient servant

Philip Savage

P.S. still I do not think you would have approved of the system that I was made to adopt in watching the lights.

P.S.

[Enclosure with the above letter]

Answer to charges in report of R.D.Israel, Keeper at Point Loma Light Station against Philip Savage, Asst. Keeper. May 16th 1886

1st Charge. -- I have swept both flights of stairs all the time that I have been here when it was my light-out, up to the 25th of March last, at which time we had a big row, or dispute, because he refused to correct or stop the insults heapt [sic] upon me, by his family and guests, whenever I came near their dwelling; thereafter I swept only the upper flight of stairs down to his bedroom door, I think it was the second morning that I failed to sweep the lower flight, as I came down and passed their bedroom door, I heard whispering, I thought it to be his wife calling him. I had just got down the lower stairs, when he called in a pompous snarling voice (like a man uses when he wishes to train a dog, pointing with his finger likewise) said, come right back here, and sweep this platform all round these bedroom doors, and right down those steps [sic],

come right back! I said, I have dusted and swept &c in the lantern and the steps [sic] down to your bedroom door and as yourself and family occupy those bedrooms, you can sweep them yourselves. The reason for my not doing so is that he is of so slandering a nature, that he is able to say any thing, and one of the rooms is often full of female guests,--the work is nothing. He has not said a word to me about the stairs since that day.

2nd Charge. -- When I came here from the Farrallon Station, I had formed the habit of staying by the light till relieved, and wanted to pursue the same course here. But said he, "We don't do that here, its not wanted, when you light up you stay by the light and [gage?] it till it settles, that is till it is steady, which it will be inside of an hour, and it will stay like that all night, and then you can watch it occasionally from down in the yard. You can see the chimney just as well as if you were up there & see as well if the light rises too high, and the paint keeps cleaner than if the Keeper stays up there." When I called him to keep his watch, I waited for him to relieve me, he came after a long time, said he --"Never wait for me to relieve you, after you call me, go to your bed, [I'll?] see that the light is alright." Some days after he said to me, "I stay in my room, and read all my watch, I have a mark, the flagpole is my mark, the light shines on it, and by looking through the window, I can always tell when the light is alright, and you ought to get mark for yourself" which I did and followed his instructions to the letter, only in addition that I paid a visit twice up to the light during my watch, and it proved very satisfactory till I found that he was playing tricks on the light, at least I thought so, -- then I had to forego all my comforts, and walk the yards and balcony by spells, and many times I have staid my whole watch in the lantern, but all the gases from their rooms run up into the

lantern, and made me feel sick, and when I tried to get outside ventilation the place began to fill with great moths, as the light attracts thousands. Therefore I had to follow the course of going up and down by spells. He told me for the first time the evening of 8th of May that I must stay all my watch in the lantern, but I have done as above, being the best I can do, and do not stay in my room and read any more.

But the Keeper does not alter his old habit, as will be seen by what follows. On 27th ult. he had the first watch and should have called me at midnight. I awoke and thought that it ought to be midnight, and struck a match, but it wanted 10 m[inutes] so I waited for his call, but after a while and no call, I thought that something must be wrong, so I dressed myself and started for the lantern. As I entered the front door of his dwelling, his dining room door being open, I saw him sitting at his table, with his arms crossed on the table and his head laying on them, but the noise I made in opening the door made him get up, he came to look at the clock. And I, pointing at the clock, said 20 m. of one. He made no reply, but looked like a person who is caught doing something wrong, and I went up into the lantern to look after the light, but nevertheless he entered in the watch book that he left his watch at midnight. Some time ago after waiting what I thought to be a long time after midnight, I got up, it was half past two, I went and attended to the light, came down, opened his dining room door. There he was, in the above possition [sic] and in a sound sleep. I called him and said, You better go to your bed, you will be more comfortable, telling him the time of night. Another time it was one oclock, he was up, but knew nothing about the time, till I told him, he said that he was just going to get a lunch. He has called me many times well on to one oclock. While on my part, I have never called

him as late as five minutes after midnight, he has got me in a few places in the watchbook as calling him at 5 m of midnight. I have always observed that a person who keeps his watch well is not likely to let time slip in that manner.

3rd Charge. -- On 9th ult. at 10 a.m. he called in a manner that a man would use at a bad dog, "Bring that oil carrier along here." I came out of my room. There he stood swelled as big as he could make himself, said he, shaking his finger at me and fairly roared, I am going to make you tow [sic] the line from this out, remember! You reported me to the Inspector, and I said, I did not report to the Inspector the manner by which you measure and keep account of [your oil?], but I have reported to him a great deal of your rascality -- said he, come along to the oil room, we are going to measure the oil. When we got there he stood with his slate & pencil and said, One gallon of oil, which I measured. One half gallon. I said, we have no half gall. measure, none has been used since I have been here. Said he, "You will find one in the office, get it." I went for it and measured the half gall. required, all of which he marked on the slate. Then, pointing with his finger to the carrier, Pick up that oil (and showing me the way out) and carry it right up in the lantern. I said, Look here, it was your light out this morning, so just carry your own oil. Said he, It shall lay there. I said, It's your business, not mine, do what you please with it, tomorrow shall be my turn. -- I believe my action to be justified by par. 13, page 6 of our instructions. -- This is the first time and only time that an attempt has been made to measure oil since I have been here, before and since the quantity has always been taken by guess.

4th Charge. -- I told him that you had told me that they had appointed a man of San Diego to replace him, but that you told them that there was no vacancy at Point Loma. Sir, if my statement is not correct, I beg your pardon most respectfully, it is a mistake on my part, by not having paid due attention to what you said, but not a lie, because it is not willfull.

5th Charge. -- He told me to clean the privy, in the manner previously stated. I said, when you clean one half of that privy it shall be cleaned, and if you do not, it shall never be cleaned. Nothing had been taken out of it, and all his family watched so as to make fun of me. The next morning I saw him leave his house and go to it. I went at once to help him. He said, I dont want you to help me. I said, Let me help you, it is a nasty job, but I am willing to do one half of it. No, no, said he, there is only work for one. He then sent me to whitewash. His charge of idleness is untrue, if you had been watching me I could not have done any better. I also attend to duties when he goes away.

Last charge. -- He has never said a word to me about washing the stairs on sundays nor anything else.

Your very respectful
and obedient servant

Philip Savage
Asst Keeper

Enclosure "C" - Keeper to Inspector, May 30, 1886, with new charges against Assistant

Point Loma L Station
May 30 1886

To
Capt

John W. Philip U.S.M.
Inspector 12th District

Sir

on the
11th of this month the asst began
to Whitewash the fence and stable
and made it last untill the
25th when he stoped, and shut
himself up in his room. he said
nothing to me what ever. on the
27th I went to his quarters and
after some time knocking he
came to the door and I asked
him if he was sick, and if not
why he was not at work when
he told m he had done all
he was a going to do. that the
ballance was mine. that he had
no interest in the garden had no

Chickens, and no horse to put in
the corral, and for that reason
he would not Whitewash them he
was foretun days at it, at the
same time I Painted the Santum
red outside, White inside, the
Tower White inside from the top
to the bottom, Stairway, banister
and hall floor, also all the doors
facing the hall and tower, the
asst opers the work at anything
that he considers government work
(for he is a Sawyer) as long as I do.
but will not work if I am working
on the Light House as he considers
that my private dwelling, I have
declined to give him anything else
to do until he does the balance
of the fence, please let me know
what I shall do

Very Respectfully

R. D. Israel



Enclosure "D" - Inspector to Assistant Keeper, June 2, 1886,
relaying new charges

Copy
TWELFTH DISTRICT.

San Francisco, Cal.,

June 24, 1886

Philip Garage,
Asst. Point Lema,

Sir: I enclose a copy of a
second report made against
you by the Keeper for refusing
to obey his legal order to do
some whitewashing in the fence
and stable.

You are well aware that
the Principal Keeper alone is
responsible for the management
of the light and for the station
in general, and as an assistant
you are strictly enjoined to
render prompt obedience to
his lawful orders.

Therefore be pleased to inform
me why you refused to do the
necessary work of whitewashing
as charged by Mr. Israel?

Respectfully,
(Signed) Jno. H. Philip.
Comdr. U.S.N.,
Inspects,



Transcript of Enclosure " b "

Point Loma

Light Station

June 6th 1886

Comdr. John W. Philip U.S.N.

Light House Inspector

12th District

Dear Sir. -- I cannot thank you sufficiently for your kindness and advice to me in your letter of June 2d, and also for copy of second report of Keeper, which he would not give me. The whitewashing refered [sic] to is as follows. -- His chicken house is built against the east front of stable, and that part which forms one side of the inside is that which he wants me to whitewash, as also the chicken house & two large coops. And the fence refered to is his vegetable garden fence. What is raised in it they keep all for themselves. I get none of it. Therefore I think it just that he should take care of said fence, and also of his chicken house &c. I through [sic] out enough to feed two hens, they have never offered to give me as much as one single egg. Therefore I think it unjust for me to be made clean their places.

What I call private at the station is a room or rooms that a person uses for his own exclusive use, that he himself should keep said room or rooms clean and in proper order. I think it is in accordance with the custom of the service.

I began the whitewashing Tues. 11th [May], worked five days that week, on following Monday went to town for supplies, worked five days that week, and finished the following Monday, eleven days

from nine till twelve, three hours, in all 33 hours. I left off at noon to cook my dinner. Then after dinner took a nap so as to keep my night watch in a proper manner. He says that I have done no painting, but he alone is to blame for it, he never called me to it, but told me on 10 ult. "Don't think that I want you to do the work. I would much rather that you would tell me that you won't do it."

I beg of you to believe me, Capt. Philip. It is out of nature to impose injustice on others, nor can I bear it, when applied to me by others. Also he and family would degrade me to the lowest mark & I [am?] too passive. The object is to drive the asst. out of the station and fill his place by one of his sons or some other relative, therefore where is the limit?

I am your very respectful
and obedient servant
Philip Savage
Asst. Keeper

E.
Point Loma Station
June 1st 1886

To

Capt John W. Philip, U.S.N.
Inspector 12th District

Sir

your letter
in regard to keepers wearing
uniform came to hand, on the
31st of May, and on the same
day I informed the assistant
keeper, that I had received
the Order from you. When he in
a very insulting manner asked
me where the Order was, I
told him it was in my pocket.
When he said with his ^{nose} turned
up that when he saw the
Order he would comply with
it, that he was not bound
to take my word for it. I do
not give him any more orders.

as he disputes every thing
I tell him. I am doing the
work as best I can myself.

Very Respectfully
R. P. Israel

June 2nd This Morning contrary
to his usual custom, and in
the face of your Instructions.
(I suppose to show me he would not
obey any order coming from me)
he went to Town without a
Sign of Uniform, he always
wears his cap to day he wore
nothing.

Very Respectfully
R. P. Israel



Enclosure "F" - Inspector to Keeper, June 16, 1886, warning him and family to stop annoying his assistants

copy
TWELFTH DISTRICT,
San Francisco, Cal., June 16, 1886

R. D. Israel,
Keeper, Point Loma,

Sir: Your reports against Mr. Savage have been received; also his replies, with a report from Henry Oerell, Watchman at Ballast Point.

From the evidence I do not think your actions, language or altogether praiseworthy; on the contrary, I believe that you and members of your family have annoyed this and other assistants. Now the time has arrived when all this must stop; and in the future all reports concerning

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you will be referred to the Board
and I give you a friendly warn-
ing, that if referred to the Board
you will lose your position in
the L. H. Service.

You will exact strict obedience
from your Assistant to all lawful
orders; at the same time see that
no member of your family meddling
or interferes in the least, with the
duties of the station:

If it is as the Assistant says,
that your "object is to drive the
Asst. out of the Station and fill
his place by one of his (your)
sons or some other relative," then I
inform you now that you never
can get your son appointed as
Assistant to yourself, no matter

119 3
how often a vacancy might
occur at your station.

You have the book of Instruc-
tions, and if you carry out
each order of the Board strictly,
you will not get into any
trouble.

Respectfully re.
(Signed) Jno. H. Philip.
Comdr. U.S.N.
Inspector



Enclosure "G" - Inspector to Assistant Keeper, June 16, 1886,
warning him to obey regulations and lawful orders, and offering
a transfer to Farallon Islands Light Station

copy,
Chief of U. S. Light House Inspector,

TWELFTH DISTRICT,

San Francisco, Cal.,

June 16, 1886.

Philip Garage,

Care R. D. Israel,

Sir: Your replies have been received. In them I notice you report the Keeper for sleeping on watch, neglect duty etc., as if in retaliation for reporting you. It is your duty to report any violation of the regulation, or neglect of duty etc., but you must not do it after you yourself have been reported - for reports in retaliation will not be considered.

The regulations of the L. H. Establishment are clear and explicit defining well the duties and ob-

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ligations of all employees, and if you
carry them out no trouble can arise.

In the future if you are re-
ported for neglect or disobedience,
I will simply refer the matter to
the Board, and if you are in the
wrong the chances are you will
lose your position in the service.

I intended to have come down
in the Tender to-day, but owing
to sickness in my family I had
to postpone my visit until a
later day.

Would you like to change
places with Mr. Rigg, 1st Asst.
at the Harbormaster; if so, let me
know and I will give you the
necessary orders. Respectfully re.

(Signed) Jno. H. Philip. Comdr. U.S.N.
Inspector.

APPENDIX III

U. S. Light-House Establishment, Instructions to Light-Keepers,
July 1881 (Washington, GPO, 1881)

UNITED STATES LIGHT-HOUSE ESTABLISHMENT.

INSTRUCTIONS

TO

LIGHT-KEEPERS.

JULY, 1881.

BY AUTHORITY OF THE LIGHT-HOUSE BOARD.

WASHINGTON:
GOVERNMENT PRINTING OFFICE.
1881.

NOTICE.

OFFICE OF THE LIGHT-HOUSE BOARD,
WASHINGTON, D. C., *July 1, 1881.*

The following Instructions are published for the guidance of light-keepers. They are required to read them carefully and attentively, and to refer to them whenever they have any doubts in regard to their duties or the manner of performing them.

Each keeper and assistant keeper will be furnished with a copy, *to be kept and used at the light-stations* where they are employed; to be handed over to their successors when they are relieved or discharged or left at the light-stations in case there should be no successors.

Each light-vessel keeper will be provided with two copies, for the use of himself and those of the crew who are charged with the management of, and attendance upon, the lights and fog-signals.

BY ORDER OF THE LIGHT-HOUSE BOARD:

JOHN RODGERS,
Rear-Admiral, U. S. N., Chairman.

CIRCULAR.

CONSUMPTION OF OIL AND LUMINOUS INTENSITIES OF LAMPS IN THE LIGHT-HOUSE SERVICE.

1881.

Department No. 109.

L.-H. Board, No. 4, of 1881.

Treasury Department,

OFFICE OF THE LIGHT-HOUSE BOARD,

Washington, D. C., November 7, 1881.

The following table of consumption of oil has been adopted by the Light-House Board, and will take the place of that published July 1, 1880. It should be pasted on one of the blank leaves of the book of Instructions to Keepers, at each light-station:

ORDER OF LAMP.	NAMES OF LAMPS.	No. of Wicks.	DIAMETER OF WICKS, IN INCHES.				INTENSITY, IN CANDLES.	CONSUMPTION.	
			No. 1.	No. 2.	No. 3.	No. 4.		Per Hour, in Gills.	Per Annum, in Gallons.
LARD OIL.									
1st.	Funck Lamp.	4	1 $\frac{1}{32}$	1 $\frac{7}{32}$	2 $\frac{5}{8}$	3 $\frac{1}{2}$	400. 00	6. 85	938
	Mechanical and Moderator	4	1 $\frac{1}{32}$	1 $\frac{1}{8}$	2 $\frac{11}{16}$	3 $\frac{9}{16}$	188. 00	6. 60	900
2d.	Funck Lamp.	3	1 $\frac{1}{32}$	1 $\frac{7}{32}$	2 $\frac{5}{8}$	.....	164. 00	4. 10	560
	Mechanical and Moderator	3	1 $\frac{1}{8}$	2	2 $\frac{7}{8}$	.....	130. 00	4. 10	560
MINERAL OIL.									
2d.	Funck Lamp.	3	1 $\frac{1}{32}$	1 $\frac{7}{32}$	2 $\frac{5}{8}$	.....	163. 00	4. 80	657
3d.	Funck Lamp.	2	1 $\frac{1}{32}$	1 $\frac{7}{32}$	.....	.....	78. 00	2. 00	270
4th.	Hains Lamp.	1	1 $\frac{1}{2}$	.....	.....	.....	32. 00	1. 00	137
	Locomotive Head-light	1	1 $\frac{3}{8}$	.....	.....	.....	54. 00	1. 33	180
	Do.	1	1 $\frac{1}{4}$	.....	.....	.....	50. 00	1. 25	171
5th.	Hains Lamp.	1	1 $\frac{1}{8}$	.....	.....	.....	18. 00	. 63	86
	Constant-level Lamp.	1	1 $\frac{1}{8}$	.....	.....	.....	20. 00	. 67	90
	Light-vessel Funck Burner.	1	1 $\frac{1}{8}$	.....	.....	.....	18. 00	. 50	68
6th.	Flat-wick Lamp.	1	1	.....	.....	.....	12. 54	. 50	68
	Mississippi River Lantern.	1	$\frac{7}{8}$	.....	.....	.....	12. 22	. 30	40

The foregoing are the largest quantities of oil that the respective lamps can consume when they are clean, properly and constantly attended, and their flames kept during the entire time at the prescribed heights. With lower flames and bad attendance, much less oil will be consumed, and consequently inferior lights produced.

Those keepers who come nearest to the actual consumption of the largest quantity of oil that the lamps can consume, will, as a rule, be found to keep the best lights; while those who report a larger quantity than the lamps are capable of consuming, must either waste or dispose of the excess; and those who do not consume nearly the maximum quantity, must necessarily keep bad lights.

BY ORDER OF THE LIGHT-HOUSE BOARD:

JOHN RODGERS,

Rear Admiral, U. S. Navy,

Chairman.

(TO FACE PAGE 5, INSTRUCTIONS TO LIGHT KEEPERS.)

Table giving candle power of each of lamps used in the Light-House Service and approximately its intensity when used in its appropriate lens apparatus.

Illuminating Apparatus.	Name of Lamp.	Candle Power of Lamp.	Candle Power of Fixed Light.	Candle Power of Flashing Light.	No. of Wicks.	Size of Wicks in Inches.					Expenditure of Oil per Quarter.				Consumption of Oil	
						No. 1.	No. 2.	No. 3.	No. 4.	No. 5.	1st Qr.	2d Qr.	3d Qr.	4th Qr.	Per Hour.	Per Annum.
1st.....	Funck's Float Lamp.....	500	8780	63830	5	1"	1 1/8" 2 1/8"	3 1/8" 4 1/8"	596	413	475	642	16	2156		
2d.....	do.....	163	4790	33350	3	1"	1 1/8" 2 1/8"		182	135	145	195	4.80	657		
3d.....	do.....	163	2210	19010	3	1"	1 1/8" 2 1/8"		182	135	145	195	4.80	657		
3d (old).....	do.....	78	1530	15380	2	1"	1 1/8"		75	54	60	81	2	270		
3 1/2.....	do.....	78	1620	11720	2	1"	1 1/8"		75	54	60	81	2	270		
4th.....	Funck-Heap Lamp.....	52	598	2842	1	1 1/4"			59	44	47	64	1.50	214		
5th.....	Funck's Tubular Lamp.....	38	298	1200	1	1 1/8"			37	28	30	40	1	135		
Lens Lantern.....	do.....	32	263		1	1 1/8"			26	20	21 1/2	27 1/2	0.70	95		
No. 1 Range Lens.....	do.....	38	3915		1	1 1/8"			37	28	30	40	1	135		
Locomotive Headlight Lantern.....	Funck-Heap Lamp.....	52	3092		1	1 1/4"			55 1/2	41 1/2	44 1/2	60 1/2	1.50	202		
Tubular Lantern.....			12		1	7/8"			10 1/2	8 1/2	9 1/2	11 1/2	0.30	40		
Light-Vessel Lantern.....	Funck's Tubular Lamp.....	38	1275		1	1 1/8"			37	28	30	40	1	135		
Lamp with reflectors.....																
Old Light-Vessel Lamp with reflector.....		18	760		1	1 1/2"			19	13	16	20	0.50	68		

NOTE.—Candle power of 1st, 2d, 3d, and 3 1/2 order fixed and flashing lights was obtained by calculation; the candle power of all others in above table was obtained by actual measurement.

GENERAL INSTRUCTIONS TO ALL LIGHT-KEEPERS.

- X 1. The keeper is responsible for the care and management of the light, and for the station in general. He must enforce a careful attention to duty on the part of his assistants; and the assistants are strictly enjoined to render prompt obedience to his lawful orders.
 Keeper responsible for.
- X 2. In the absence of the keeper his duties will devolve upon the assistant present who is next in rank. No keeper shall leave his station without informing the assistant present who is next in rank of his intention, and of the probable length of his absence; and no assistant shall leave without the previous knowledge and consent of the keeper; but this regulation will not justify the keeper in denying an assistant any proper leave of absence.
 Duties of keeper to devolve on assistant; when.
3. An accurate report of absences, with the reasons therefor, must be forwarded monthly to the Inspector by the keeper.
 Report of absences.
4. Watches must be kept at all stations where there is an assistant. The keeper on watch must remain in the watchroom and give continuous attention to the light while he is on duty. When there is no assistant, the keeper must visit the light at least twice during the night between 8 p. m. and sunrise; and on stormy nights the light must be constantly looked after.
 Watches to be kept when there is an assistant.
Duty of keeper when there is no assistant.
5. No keeper can excuse an assistant from his regular share of duty, except on account of disability. When such disability continues, immediate report thereof must be made to the Inspector.
 No keeper to excuse an assistant except for disability.
- X 6. Light-keepers may leave their stations to attend divine worship on Sundays, to procure needful supplies, and on important public occasions. As no specific rules can be established limiting the times and durations of absences, keepers will be held to strict account for any abuse of privileges.
 Absence.
7. In case of sickness, keepers must provide efficient attendants for the lights; but when a keeper is, or is likely to become, incapable of duty, the Inspector must be informed at once of the need for assistance.
 Sickness.
8. All keepers must acquaint themselves with the workings of the apparatus in their charge. Upon any doubtful point questions must be asked. When the station is visited by an officer or employé of the Light-House Establishment, especially while the machinist or lampist is there, the keepers must take pains to acquire knowledge of every detail regarding the mechanism of the apparatus. Ignorance upon any point will not be considered as an excuse for neglect of duty.
 To be conversant with the apparatus.
9. The keeper is responsible for the careful management and expenditure of stores and supplies. He must practice the strictest economy compatible with maintaining at all times the best possible light; and he must be careful to prevent waste, theft, or misapplication of light-house property.
 Responsibility for stores.
10. Keepers having assistants will, in the presence of an assistant, attend personally to the daily issues. Keepers who have no assistants are required to take from the oil and store rooms, daily, the necessary articles and quantities of supplies for that day's use. At the time of doing so they must enter them correctly in the expenditure
 Issue of stores.

book. The exact quantity taken at the time must be entered, and not the average of each day's use.

No light-house
to be left with-
out some one in
charge.

11. A light-house must never be left wholly unattended. Where there is a keeper and one or more assistants, either the keeper or one of the assistants must be present. If there is only one keeper, some member of his family, or other responsible person, must be at the station in his absence.

Watches.

12. Where there are assistants, the watches must be divided so that an equal share of work shall fall to each keeper. A watch book must be kept and signed by each person when he comes off watch. He must record in the book the condition of the light and the hour when he left the watchroom. If there is a fog-signal at the station, and it is in operation, he should also so state, and specify its condition.

Keeper to
share duty.

13. The keeper shall take an equal share in all the work and duties of the station with the assistant keepers.

Neglect of
duty of keeper.
Assistants to re-
port.

14. When a keeper neglects his duties, it is the imperative duty of each assistant at the station to report the facts, without delay, to the Inspector. The reported keeper must be informed of the complaints made against him, so that he may, if he sees fit, transmit a statement to the Inspector with the report.

Traffic at light-
stations forbid-
den.

15. Light-keepers must not engage in any traffic on light-house premises, and they must not permit it by any one else. They must not carry on any business or trade elsewhere which will cause them to be often absent from the premises, or to neglect, in any way, their proper duties.

Visitors.

16. Keepers must be courteous and polite to all visitors who conform to the regulations, and show them everything of interest about the station at such times as it will not interfere with their light-house duties. Keepers must not allow visitors to handle the apparatus or deface light-house property. Special care must be taken to prevent the scratching of names or initials on the glass of the lanterns or on the windows of the towers. No visitor should be admitted to the tower unless attended by a keeper.

Intoxicated
persons.

17. Keepers must under no circumstances allow an intoxicated person to enter a light-tower, nor to remain on the premises longer than is necessary to get him away by the employment of all proper and reasonable means.

No fees al-
lowed.

18. Keepers must not make any charge, nor receive any fee, for admitting visitors to light-houses.

Assistance to
laborers.

19. Keepers must render every assistance in their power to laborers employed in making repairs or alterations at light-stations. In all cases where keepers are able to make repairs they are expected to do the work themselves. All the mechanical skill of a keeper should be exercised in keeping his station in good order.

Change in col-
or of buildings;
when made.

20. Keepers must make no change in the color of towers or buildings without written orders.

Neatness de-
manded.

21. The utmost neatness of buildings and premises is demanded. Bedrooms, as well as other parts of the dwelling, must be neatly kept. Untidiness will be strongly reprehended, and its continuance will subject a keeper to dismissal.

Keepers' fami-
lies only allowed
at light-stations.

22. Only members of keepers' families may reside at light-stations. The Light-House Board alone can grant any exception to this rule.

Wrecks.

23. Keepers must report promptly to the Inspector, on the proper form, all wrecks which take place in the vicinity of their stations. All the facts relating to the wreck (whether or not the light was seen, &c.) must be ascertained and the account embodied in the report. It is the duty of light-keepers to aid wrecked persons as far as lies in their power.

Precautions
against fire.

24. Every precaution must be taken against fire. Fire-buckets, when provided, must be kept filled with water and ready for use in a fixed place. In case of the ignition of mineral oil, it can be better extinguished with sand or ashes than with water.

[TO FACE PAGE 7, INSTRUCTIONS TO LIGHT-KEEPERS.]

A copy also to be sent with each lantern issued for service.

Instructions for use of Funck lanterns.

To fill the lamp, take out the lamp and fill it full of oil through the filling hole. Screw in the cover of the filling hole, and wipe the lamp clean. Trim the wick slightly concave rather than straight or rounded. Light and replace the lamp in the lantern. After it has burned for a few minutes, observe through the flattened surface of the lens that the flame is to the full height it can be carried without smoke. Once a week empty all the oil out of the lamp and rinse with a little fresh oil. Put in a new wick once a week. Take the lantern apart once a month, and thoroughly clean it inside. To take the lantern apart, take out the three large screws near the top of the lantern, marked "A" on plate, which will release the inside dome, which can then be taken out and cleaned. To take out the lens, unscrew the five thumbscrews at the bottom of the lantern (marked "B" on plate), and lift the top part clear of the lens. The lens, lantern, and lamp must be kept clean and bright.

The light must be lighted and the lantern in position at sunset. The light must be extinguished at sunrise, and the lantern cleaned and gotten ready for use early in the day. The lantern must be kept under cover during the day. The spare lanterns must be used alternately with the others, so that all lanterns will be known to be in good order and ready for use.

Where a box or room is provided, the oil and other supplies must be kept in it, and the lanterns must be kept in it during the day. This house must be kept locked, except when the keeper is present.

Where no box or house is provided, the lantern, oil, and supplies must be kept in a safe, dry place, and so that they may be readily inspected by the Inspector. Empty oil cans must be kept under cover, in a dry place.

[TO FACE PAGE 7, INSTRUCTIONS TO LIGHT-KEEPERS.]

SALUTES.

Keepers of light-stations and light-vessels provided with bells will salute, with three strokes of the bell, light-house tenders upon their approach to and departure from such stations and vessels. The salute will be returned by the tender with three blasts of the whistle or by three strokes of the bell.

In case of a passing tender one salute, as above prescribed, will be given and returned.

The salute will also be given to all vessels of the United States Government, and to any vessel which is known by the keeper to have on board any person entitled to the courtesy of a salute.

In case the bell has no inside clapper which can be rung by hand, the connecting rod to the machine should be detached before using the striker for salutes.

INSTRUCTIONS FOR USE OF EIGHT-DAY LANTERNS.

Take off reservoir, turn it upside down and fill it completely with oil.

Put reservoir back, light the lamp, let it burn for half an hour and see that it does not smoke.

Once a week put in a new wick, throw out oil in body of lamp and rinse with a little fresh oil, put in a clean wire-gauze strainer.

To clean strainers boil in concentrated lye.

These lanterns will not go out in the wind, but are liable to be extinguished by a shock, so when the lantern is hung up care should be taken that it cannot strike the support.

When convenient, it is better to place the lantern on a shelf on top of a post.

25. Fires and lights in keepers' dwellings must never be left unattended.

Fires and
lights not to be
left unattended.
Boats.

26. Boats are furnished to light-stations where they are necessary for communication with the mainland, to obtain household supplies, &c., or they are supplied that keepers may perform their public duties properly. They are not provided for personal benefit and convenience. Keepers are forbidden to use boats thus placed in their charge for any other than light-house purposes. The boats must not be used for freighting, wrecking, fishing with seines, ferrying, or for carrying goods or passengers for hire. Keepers must make good all damages to boats or their equipments caused by their carelessness or neglect.

27. When a keeper resigns or is removed, a correct inventory of all public property under his charge must be made in the presence of his successor. Three copies of this inventory must be made and signed by his successor; one is to be retained by him, one is to be kept by the retiring keeper, and the third is to be transmitted by him to the Inspector. On the death of a keeper, his widow, or whoever has been left in charge of the light, must turn over the public property to the new keeper as above required.

Change of
keeper.

28. No keeper who resigns or is removed, and no representative of such keeper, shall receive any balance on account of salary until he shall have accounted satisfactorily for all public property in his charge.

29. No keeper should sign receipts upon entering on his duties, or at any other time, for any supplies until he is satisfied that the articles and quantities are correctly stated. Keepers will be held pecuniarily responsible for all for which they receipt.

Receipts.

30. Condemned articles, and articles no longer of use at light-stations, must be delivered to the master of the supply vessel. Keepers must obtain duplicate receipts for these articles, retain one, and forward the other to the Inspector.

Condemned ar-
ticles.

31. Monthly or special reports of the condition of a light-station must state explicitly what is wanted, in case any repairs or changes are needed. All measurements, estimates, &c., must be given so fully that the Inspector or Engineer will not have to write for further information. Failure to do this has caused much inconvenience and delay.

Monthly re-
ports.

32. Keepers of stations situated where navigation is closed by ice in winter, will exhibit their lights so long as any vessel is running in that vicinity. Lights may be extinguished when navigation is entirely suspended, but must always be shown if it is at all possible for vessels to benefit by them. Report must be made to the Inspector of the time of discontinuance and also of the time of relighting.

Lights to be
put out when
ice suspends
navigation.

33. Keepers at island stations on the northern lakes must be governed in exhibiting their lights by the action of those on the mainland. Those who cannot reside at their stations during the winter, or who are permitted to be absent by special authority, must continue their lights as long as possible in the fall without endangering their lives by being caught in the ice; and must return to their stations as early in the spring as the ice will permit.

CARE OF LIGHTS AND THEIR APPURTENANCES.

34. Lights must be lighted punctually at sunset, and must be kept burning at full intensity until sunrise.

35. All preparations must be made early, that there may be no delay in lighting.

Punctuality
demanded.

36. When the light is extinguished in the morning the keeper must hang the lantern curtains and immediately begin to put the apparatus in order for relighting. While doing this the linen aprons provided for the keeper's use must be worn, that the lens may not suffer from contact with the wearing apparel. The illuminating apparatus must be carefully covered before the cleaning is begun.

Morning du-
ties.

37. The lens and the glass of the lantern must be cleaned daily and always kept in the best possible condition. Before beginning to clean the lens it must be brushed

Cleaning lens.

with the feather brush to remove all dust. It must then be wiped with a soft linen cloth, and finally polished with buff-skin. If there is oil or grease on any part it must be taken off with a linen cloth, moistened with spirits of wine, and then polished with a buff-skin. *Under no circumstances must a skin which has been wet or damp be used, as this will scratch the lens.*

How to prepare and use rouge.

38. Rouge must be used for polishing the lens whenever necessary. When it is used it should be broken up, put in water, and reduced to a smooth mixture. To do this the rouge should be put into about a pint of water and stirred with a *perfectly clean* stick. Let it rest for a few moments to allow any gritty particles it may contain to settle; then pour it off into another vessel, allowing the grit to remain in the first; then leave it to settle for about half an hour, and then pour off the water. The rouge so prepared must be spread with a camel's-hair brush, or a piece of soft linen, over the entire surface of the glass to be cleaned. When this coating of rouge has become dry, rub it off with a piece of buff-skin until it is all removed. Rouge must be freshly prepared each time it is used.

Whiting.

39. Whiting is prepared and used in the same manner as rouge.

Rotten-stone.

40. To use rotten-stone for polishing brass work, pulverize it carefully in a tin pan and mix it with water or oil until it becomes a thin paste. Use it with a woollen cloth, free from dust or grit. After rubbing with the rotten-stone finish with whiting, using a soft, clean rag.

Care of reflector.

41. To clean reflectors, first dust them and then rub with a buff-skin, lightly dusted with rouge powder, kept in a small double bag of muslin; then rub lightly with another skin, and finally with a third, which should be passed over the reflector in a light, quick manner with a circular motion. Leakage of gas from the pipe of the stove used in the watchroom should be carefully guarded against, as this gas will badly tarnish a reflector. Silver-plated reflectors are much more easily injured than glass, and require great care.

Care of chimneys.

42. To clean the chimneys they must, if soiled by smoke or oil, be rubbed with a rag or a small piece of soft wood dipped in oil, then wiped off and cleaned with whiting. If this does not remove discolorations they should be rubbed with a wet cloth and a little soda or common salt; but they must be washed in warm water afterwards, as any adhering salt will cause breakage.

Material for cleaning and polishing.

43. Keepers are forbidden to use any other materials for cleaning or polishing purposes than those supplied by the Light-House Establishment.

Dust to be avoided.

44. Keepers are forbidden to clean the floors of the lanterns or the stairs and floors of towers with any material by which dust may be produced. All materials used must be damp, and be carefully removed before they are dry. All sweeping must be done with care, and chiefly with hand brushes.

Place for utensils.

45. Utensils of all kinds must be kept in their proper places. While the light is burning, everything which does not belong in the lantern must be removed from it.

Clock-work.

46. The revolving clock-work must be kept carefully from dust; it must be oiled with clock oil whenever necessary, care being taken to remove any old and gummy oil before new oil is applied. All parts made of iron or steel must be rubbed with a cloth greased with tallow. *The use of salted grease is forbidden.* The foot of the fly-shaft must be examined occasionally to see that it is not cutting or wearing.

Chariot.

47. The chariot or carriage upon which the lens revolves must be carefully wiped and the rollers kept properly oiled. If it is necessary to take off the rollers and clean them, this must be done with great care. The rollers must be removed one by one, and put back without changing the number of washers previously in use, as the carriage will turn irregularly if all the rollers are not exactly the same distance from the center. When there is any serious trouble with any part of the revolving clock-work or machinery the Inspector and Engineer must be at once informed, and a machinist will be sent to remedy the difficulty.

[TO FACE PAGE 9, INSTRUCTIONS TO LIGHT-KEEPERS.]

At its meeting on October 17, 1888, the Light-House Board ordered that the Journal kept at Light Stations, in accordance with the requirements of paragraph No. 51 of its Instructions to Light Keepers, shall be considered as the official record of the Light Station where it belongs, and that no entries or signatures shall be made in it by any person or persons except the Keepers of the Station, the Officers of the Light-House District, and Officers of the Light-House Board.

18. When not in use, the weight must always be kept upon its rest, that the strain on the cord may be relieved. Weight.

49. Keepers must replace the broken glass of the lantern as quickly as possible. To replace broken panes.
 They must learn how to use the cutting-diamond, so as to be able to cut the glass when necessary. When glass is cut, its edges should be ground level and smooth by rubbing it upon a cast-iron plate covered with sharp wet sand. In placing the glass, about one-twelfth of an inch play should be left all around between it and the iron frame. If it touches the iron, great risk of its being broken by the oscillation of the lantern in high winds will be incurred. Thin cleats of lead or soft wood must be used to rest the glass upon when in place. In joining two pieces of glass which rest one upon the other, the upper edge of the lower piece should be covered with putty about two-tenths of an inch in thickness; on this two small strips of lead should be placed, upon which the upper plate should rest; the weight will press out any excess of putty, which excess should immediately be taken off with the glazing-knife. The putty on the outside of the frame should be laid evenly and flush with the face of the sash. In replacing the outside slats of the sash, a small quantity of putty should be put over the head of each screw after it has been screwed home, as this will serve to keep the screw in place.

50. The following-named returns must be made by keepers of light-houses: * Returns.

Monthly: Report of condition of station, both to Inspector and Engineer.

Fog-signal report.

Absence report.

Quarterly: Expenditures of oil, &c.

Vouchers for salary.

~~Abstract of passing vessels.~~

Annually: Property returns.

When necessary: Receipt for extra supplies.

Keeper's receipt for property on taking charge.

Receipt for delivery of supplies.

Shipwreck report.

Report of any damage to station or apparatus (this to be made both to the Inspector and Engineer).

Any unusual occurrence.

The vouchers for salary must be so sent that they will arrive at the Inspector's Office at least a week before the end of the quarter.

51. The following books must be kept at all stations: Books.

Daily-expenditure book.

General-account book.

Journal.

A watch book must be kept also at all stations where there is more than one keeper, and a fog-signal record where there is a fog-signal. In keeping the journal, two pages (the right and the left), are to be used for one month. The events of the day must be written on one line across both pages. As a general rule, if carefully written, one line will be found sufficient. The visits of the Inspector or Engineer, or of the lampist or machinist, and an account of any work going on or delivery of stores, must be noted; as also any item of interest occurring in the vicinity, such as the state of the weather, or other similar matter. The books must be kept in ink, with neatness, and must always be kept up to date.

INSTRUCTIONS TO KEEPERS USING THE FUNCK LARD-OIL FLOAT-LAMP.

52. Fill the upper reservoir, first closing the stop-cock in the supply-tube; then open the stop-cock and allow the oil to completely saturate and overflow the wicks, after which close the stop cock until ready to light. Filling the reservoir.

* The returns required from keepers of light-vessels are given on page 16.

Burner to be
carefully leveled
and focused.

53. Before lighting, and after all connections are made, see that the burner is perfectly level and in the focus. This must be done carefully, as the screwing on of the supply-tube is apt to throw the burner out of adjustment. Failure to level the burner is apt to cause breakage of chimneys; and the light will not burn so well when the oil is higher on one side of the burner than on the other. It is also absolutely necessary that the light should be in the focus, as if it is not so it cannot show well outside. Great care and attention must be given by keepers to these two essentials of a good light.

Lucernes

54. Keepers are forbidden to use anything but the lucernes, or the small hand lamps, in lighting the lamps, as if paper or matches are used, parts are liable to fall into the burner and retard the flow of oil.

Lighting.

55. When lighting up, light the inner wick of the burner first. Having the wick turned up about one-third of an inch, hold the lucernes at two opposite points, lighting the wick in two places at once. When the wick is burning all around, turn it down low and proceed to light the second wick, and so on until all the wicks are lighted.

How to man-
age the flame.

56. After first lighting, the flame must be kept low, and the chimney above its proper position, so that it will be slowly heated; turn the wicks up slowly, and gradually lower the chimney until the full height of the flame is reached. This ought to be at the end of half an hour, at which time the flame should show a height for a first-order lamp of from $3\frac{1}{2}$ to $3\frac{3}{4}$ inches; for a second order of from 3 to $3\frac{1}{2}$; for a third order of from $2\frac{1}{2}$ to $2\frac{3}{4}$. [See Plate 6.] A gauge is furnished, showing about what this height should be. The wicks, when the light is at its full intensity, should be turned up until the flame can be raised no higher without smoking.

Color of flame;
chimney.

57. The flame must be throughout as *white* as possible. If it is of a reddish tint it shows that the chimney is too high, or that the damper does not allow sufficient draught, or that the ventilation is not sufficient. If the chimney is too low a white flame will be obtained, but the flame will not be high enough. When the wind is light, a portion of all the ventilators may be opened; if strong, only those to the leeward. They must be managed so that the light will burn clearly and steadily.

Ventilation.

Broken chim-
ney.

58. If a chimney breaks, turn down the light immediately and put on a spare one, four of which must always be on hand.

Trimming
wicks.

59. If the wicks need trimming, turn the light as low as possible, and trim them without removing the burner. In removing the chimney to do this, wrap it in the flannel cloth provided for the purpose, so that it will not cool too suddenly.

Spare burner.

60. A spare burner must always be at hand, ready for use, in case one of the wicks gives out, or in case the service burner is in any way out of order. When it becomes necessary to replace the service burner, dip the spare burner in oil before putting it in place, so as to saturate the wicks, after which it may be adjusted.

Stoppage of oil.

61. If the oil does not flow freely, or if the supply is entirely cut off, it must, in nearly all cases, be from a stoppage in the float-chamber. When this occurs, remove and clear the float chamber. An accident such as this, however, can scarcely happen with a careful keeper, as it can only occur when the apparatus is clogged with dirt.

Putting out
lights.

62. In putting out the light at sunrise, care must be taken to prevent a sudden cooling of the lamp. Care must also be taken not to heat it too quickly on lighting. To put out the light, the wicks must be slowly turned down, beginning with the outer one. When the light is finally extinguished and the chimney after a time taken off, the chimney must be wrapped in the flannel cloth, that it may cool slowly.

Dismounting
and cleaning
lamp.

63. Once in six months dismount the lamp and thoroughly overhaul it, putting the spare one in its place. Boil the burner and strainer in strong soap-suds, then thoroughly wash all parts of the lamp, rinse them in clean hot water to remove the soap, putting the tubes and burner near a hot stove to dry out the moisture; wipe out the reservoir with a clean towel. Examine the washers of the pump carefully.

Examine float-
chamber.

64. Examine the float and float-chamber once a week at least. Lint or woollen fiber is frequently found in the oil, which collects around the pin and clogs the passage of

(To face page 11—Instructions to Keepers.)

INSTRUCTIONS TO KEEPERS USING THE FUNCK-HEAP LAMP.

To prepare for
lighting.

Lamps are always sent out with new wicks in place. Remove chimney-holder, wet the wick with a little oil, replace chimney-holder, light the lamp, put on the chimney and allow the flame to burn itself out, then blow off the ashes from the wick, or rub it smooth. Wicks should never be trimmed with scissors, but should be rubbed off smooth with finger, and care be taken to remove any charred pieces of the wick which may fall off.

To fill lamp.

Remove chimney-holder, pull back pinion, raise outer tube with gear-wheel, pour in oil until lamp is full. push down outer tube with gear-wheel, push pinion back carefully, seeing that it engages properly with gear-wheel, replace chimney-holder.

To light lamp.

When wick is carefully and smoothly trimmed and lamp filled, it may be lighted and the chimney put on; the wick should then be turned up until the flame is even with the button.

This should be done at sunset; about 15 minutes later the wick should be turned up gradually as high as possible, without making the flame smoke.

To replace wick.

Remove chimney-holder, pull pinion back, raise wick by turning outside tube by hand until the wick is free of spiral tube, take out outside tube, take off old and put on new wick; replace parts in original position.

the oil; nothing sharp or hard must be used to clean the valve-seat; a piece of soft wood should be used for this purpose.

65. In placing the lamp, the cross threads provided for the purpose must be used to center the burner and to get it into focus. There is a small wooden gauge furnished which fits in the center of the burner; the lower reservoir (the burner being in place) must be moved until the center of the gauge is just under the intersection of the cross-threads and touching them. The spirit-level must then be used to show that the burner is level, and the burner or reservoir must be moved or changed until the burner is exactly level and the center of the wooden plug or gauge is at the proper point. The light will never show well unless it is properly leveled and focused.

Placing lamp.

66. Lard-oil butts must be kept tightly covered, their gutters filled with oil, and their air-cocks closed, or the oil will become rancid. A drip-can must always be hung on the draw-off cock to catch all drippings. In drawing off the oil, first turn the air-cock to admit air; otherwise the oil will not flow, but the air-cock must be closed again as soon as the drawing of the oil is finished. When a butt has been emptied, it must be thoroughly cleaned and washed out and wiped quite dry; the gutters must then be filled with oil and the cocks all closed.

Lard-oil butts.

67. The oil found in the lower reservoir after the light has been put out in the morning is to be drawn off as low as it will run through the cock, and any remaining oil must be taken up with a clean sponge or towel and squeezed into the oil-carrier. To this oil add a sufficient quantity from the butt to refill the lamp. When ready to refill, the oil must be drawn into a clean carrier and from thence poured into the reservoir. The actual quantities consumed must constitute the daily expenditures; no guessing or averaging will be permitted.

68. In cold weather, heat the oil before putting it in the reservoir. Its temperature should be raised to about 90° or 100° (Fahrenheit), or until it is a shade too hot to bear to hold the hand in it. If too hot it will injure the pump-leathers. If it is unusually cold the precaution may be taken of wrapping flannel about the float-chamber, as it is there the oil is most likely to chill.

Oil in cold weather.

69. Oil which has any sediment in it must be put in a separate butt used to hold impure oil. From this butt must be taken all the oil used for house lamps. After the oil in this butt has well settled, the clear oil may be drawn off again and used in the light-house lamp.

Impure oil.

INSTRUCTIONS TO KEEPERS USING THE FUNCK MINERAL-OIL FLOAT-LAMP.

70. Fill the reservoir until the oil is visible in the strainer through which it must be poured. When it is full, close the faucet and wind the plunger up to its full height.

Filling reservoir.

71. Open the faucet about ten minutes before it is time to light the lamp.

72. To light the lamp, raise the damper-tube D (see Plate 2) into the connecting-tube K, and let it rest on the locks 19; then raise the chimney-holder close up to the surface of the burner. Immediately after lighting, adjust the chimney and the damper-tube so as to prevent any smoke. The flame should be kept low at first and the chimney high, so that the chimney may be slowly heated. Raise the wicks gradually and lower the chimney until the flame is at its best, which should be at the end of about half an hour.

Lighting.

73. The damper must be so managed that the flame will burn clear and at its full height and with no smoky points. This must have much and careful attention.

Use of damper.

74. About ten minutes before sunrise, close the faucet, open the damper, and let the flame burn itself out. Then remove and wrap the chimney in flannel until it is entirely cooled. Then simply wipe the ash from the wick; no other trimming is required. With a goose feather or any feather sufficiently long, clean the whole length of the air-spaces in the burner.

Extinguishing and trimming lamp.

(To face page 12—Instructions to Keepers.)

INSTRUCTIONS TO KEEPERS USING THE TUBULAR ARGAND BURNER.

Directions for
use.

Remove the burner from the lamp, saturate the wick with oil, turn it down nearly even with the tube, then light, place chimney on, and let it burn out. This gives a perfectly even wick, which can not be obtained by trimming with seissors. Wipe off the ashes from top of wick, then screw burner into place and fill the lamp. After wick is saturated (about five minutes) light, turning up wick gradually to prevent breaking of chimney. Do not again trim wick, but wipe the crust at the top only as often as necessary to get a perfect flame. Always refill the lamp before relighting.

To remove and
replace wick.

Remove chimney holder, turn up the wick until it is free of spiral tube, then press gently the lower part of slotted tube to relieve wick holder; replace the wick in same manner, and trim as per directions. Keep burner and air passages clean and free of crust by washing, when necessary, in kerosene.

To fill 5-day
reservoirs.

Take off and reverse reservoir, setting it on a slightly inclined surface, having the side to which the tube is attached the highest, so that all air can escape. Then fill the reservoir and tube entirely full, pull up valve, reverse reservoir, and set it in place.

To clean lamp.

When the oil in the reservoir is exhausted that remaining in the lamp should be thrown away, the lamp rinsed out with oil and refilled, and the burner cleaned. New wicks should be inserted about once a month.

- Changing burner.** 75. If it is necessary to remove and replace the burner during the night remove the chimney, close the faucet 10 (see Plate 2); unscrew nut 9 and screws 15; then slide the burner forward to detach it from the float-chamber connection.
- To remove float.** 76. To remove and replace the float, unscrew the cap 14 of the float-chamber F; take out the float-support 13 with the float; hold the latter with one hand and with the other unscrew steel pin 12, which will release the float. Before replacing the float, blow through the supply-tube G, and if it is not free from obstruction it must be made so by washing in hot soap-suds. The strainers must be cleaned with hot soap-suds. In cleaning the valve-seat, use a clean piece of soft wood; no wire or hard substance must be used.
- Fitting wicks.** 77. In fitting the wicks, be careful to prevent them from extending below the rings.
- To remove plunger.** 78. To take out the plunger, first dismount the burner and float-chamber; take out small weights; remove the oil with the siphon; unfasten the screws which hold the top plate of the reservoir. Then wind the crank until the plunger is at the upper end of the cylinder, when it is easily removed by taking hold of the bridge to which the chain is attached. Take out the small screw which holds the upper end of the chain, and let it slip through the top plate.
- To fit packing.** 79. If new leather packing is required, take out the six small screws holding the leathers and the iron ring 4; then remove the first leather ring without disturbing the second one, which serves only as a protection to the outer one. In replacing, fix the leather so that the holes in it will fall exactly over the screw-holes; then put on the iron ring and screw it down gradually all around so as to make a tight joint.
- New valve-leather.** 80. To put in a new valve-leather, unscrew the top nut of the valve and take the old one out and replace it with a new one.
- To replace plunger.** 81. To replace the plunger, slip the tin ring over the plunger, partly covering the leather ring to prevent its spreading. Introduce the plunger, being careful to have the chain turned in the proper direction, and then remove the tin ring. Connect the supply tube G; pull up the plunger by hand and close the faucet; the compressed air will then hold the plunger up until the upper end of the chain can be secured in place. The small weights can be put in the plunger through the opening in the top plate.
- Strainers.** 82. Every precaution must be taken to keep the strainers in good order. Mineral oil always contains a quantity of lint and woolen fiber, which must be carefully kept from getting into any part of the lamp.
83. For care of mineral oil, see the following instructions:

INSTRUCTIONS TO KEEPERS OF FOURTH, FIFTH, AND SIXTH ORDER LIGHTS.

- Lamps.** 84. The lamps are of two kinds, viz: The Hains or low-reservoir and the constant-level lamps. The Hains lamp has the oil-reservoir immediately below the burner, to the crest of which the oil is drawn by capillarity; it is in two parts—the base or stand and the oil-bowl. The constant-level lamp has the reservoir on one side of the burner and is connected with it by means of a tube through which the oil passes. The lamps should be filled nearly but not quite to the top, a little room being left to allow for the expansion of the oil when heated.
- Filling lamps.**
- Lighting.** 85. The service lamp must be placed inside the lens in its place, and then lighted. The flame must be kept low for the first half hour, in order to avoid heating the chimney too rapidly. The wick, if turned up before the chimney and burner are somewhat heated, is liable to smoke.
86. The service lamp when filled and ready for use in the evening should, if the weather is very cold, be kept in a room of a moderate temperature to prevent the chilling of the oil.
- Regulating the flame.** 87. The flame is chiefly regulated by raising or lowering the chimney. This must be done until the best effect is obtained. The most useful portion of the flame is

nearly all above the button; the position of the button must not be changed. When points or irregularities in the flame appear, they can sometimes be made to disappear by simply turning the chimney around its axis to a new position.

88. The Hains and flat-wick lamps must be changed at midnight, as when the oil burns low it does not give so good a light. The new lamp should be lighted before the other is removed. Constant-level lamps do not need to be changed as a rule, as they will burn with undiminished brilliancy so long as there is any oil in them. Changing lamps.

89. In extinguishing lights at sunrise, turn the wick down slowly, so as not to cool the chimney too suddenly; when very low put it out by blowing across the top of the chimney; it is dangerous to blow down the chimney of a mineral-oil lamp. When the chimney is taken off, keep it wrapped in flannel until cooled. Extinguishing the light.

90. To trim the lamp, after blowing out the light pour out any oil that may remain in the reservoir, then relight and let it burn out of itself, which it will do in about half an hour; then simply rub off the light ash remaining on the wick. No other trimming is required. This is the only way to get a perfectly level wick. Trimming.

91. *Under no circumstances shall oil be poured into the lamp while it is lighted, nor shall it be filled in the vicinity of any light or fire.* Care of oil.

92. No smoking shall be allowed in the oil room, nor shall any uncovered light be taken there. In case the oil catches fire, it can be extinguished more easily with sand or ashes than with water. Precautions against fire.

93. The oil must be drawn only by daylight. Under no circumstances should it be drawn at night. The cans should be kept tightly closed and the oil room cool and well ventilated. The pargetized can is furnished to stations as a vessel of supply. The oil for filling the lamps and other daily service must be drawn from it. It must be filled from the transporting or store cans whenever necessary. Drawing oil.

94. The boxes containing the transporting cans must always be kept right side up. Keepers must not put anything into empty cans. All empty cans must be turned in to the master of the supply vessel when she arrives, and a receipt taken, as prescribed by paragraph 108 of the Regulations of the Light-house Board. Care of transporting cans.

INSTRUCTIONS TO KEEPERS OF LIGHT-SHIPS.

95. The keeper of a light-ship is responsible for her efficiency in every regard. He must exact from every person on board, under his command, a strict and careful attention to duty; and must promptly report to the Inspector any derelictions on the part of any of the crew. Responsibility of keepers.

96. A log-book must be kept in which all the duties of the vessel and occurrences of importance must be noted, stating the condition of the lights, the times at which it was necessary to trim them, &c.; the length of time which intervened between the lowering and hoisting of the lantern, &c., the number of men on duty in each watch, the direction and strength of the wind, the state of the weather at 8 p. m., midnight, and 8 a. m., and, during gales, as much oftener as may be required to make a useful record; the times at which moorings were examined, and their condition; the overhauling of the hold, and in fact every item of importance with relation to the ship's duties. This log must be copied from the slate into the book by the keeper or mate, and signed by the person in charge of the watch for the time being. Log to be kept.

97. The keeper is responsible for the safety and good order of all stores, utensils and apparatus of every description. He must observe the strictest economy compatible with showing the best light possible. Care of stores.

98. A keeper must, immediately after taking charge of a new light-vessel or succeeding a former keeper, take an inventory of all anchors, cables, boats, stores, materials and supplies of all kinds; a copy of which inventory, duly signed by him, he must transmit to the Inspector. Inventory.

Account of
stores.

99. The keeper must keep a daily account of all stores expended. At the end of each quarter he must send a copy of this account to the Inspector, on the blanks furnished for the purpose, with such remarks from the log as are necessary to make a complete abstract of the weather, and special occurrences during that time.

Keeper to at-
tend to receipt of
stores.

100. The keeper must attend at the receipt of all stores, and give his assistance; he must satisfy himself as to the quantity and condition of the stores received. He must make a report of the quality of the stores in the quarterly report succeeding their receipt, or must make a special report earlier if circumstances render it necessary.

Signals.

101. Keepers must frequently exercise the crews in the signals, when any are placed on board.

Keepers and
mates must be
able to find lati-
tude by observa-
tion.

102. Keepers and mates must make themselves thoroughly conversant with all nautical instruments and charts on board their vessels, and must be able, at least, to find the latitude by meridian observation of the sun.

Wrecks.

103. In case of any wrecks taking place in the vicinity of a light-ship, its keeper must, if possible, learn whether the light was seen by any one on board the wrecked vessel, and whether it was recognized, and how long it was seen before the vessel struck. All other circumstances of interest must be embodied in the wreck report the keeper sends to the Inspector.

Account of
passing vessels.

104. A book containing an account of the vessels passing the light-vessel must be kept, and an abstract showing the number of passing vessels in each quarter must be sent to the Inspector.

Watches.

105. The keeper must see that the watch is set and everything in order before leaving the deck at night.

106. A regular watch must be kept at all times. The pump-well must be sounded at least once during any watch at night, and in bad weather, every hour. In case the light-ship makes more water than usual, the fact must be reported at once to the keeper.

Fire-buckets
and precautions
against fire.

107. Fire-buckets must be kept on deck in the most convenient place for use, and when the temperature will permit, filled with water at sunset every day. They are on no account to be kept between decks at night.

108. Every precaution must be taken against fire; no matches, lighted lamps, candles or fires must be left unattended or in exposed places.

109. Two draw-buckets must be kept properly strapped and fitted (one on each side), and the end of the bucket rope made fast to the vessel when there is no wash-deck pump.

Pumps.

110. The wash-deck pump must be examined frequently, and kept in good order.

Lightning con-
ductors.

111. The lightning conductors (if fitted with outriggers and not let down to the copper) must be rigged out and led clear of everything, every day at sunset, and rigged in at daylight, excepting in bad weather, during the continuance of which they must be kept rigged out.

Special care in
bad weather.

112. In bad weather the keeper must give constant personal attendance to the affairs of the ship; he must see the spare anchor kept ready for letting go, and a proper range of cable on deck, bitied and stoppered to bring the vessel up in case she drags; and a sufficient watch must be kept to meet any emergency.

In case of drag-
ging.

113. The deep-sea lead must be kept overboard in heavy weather, and a hand stationed by it whenever there is danger of the vessel dragging; should she drag such a distance as to deceive passing vessels in regard to their position, the lights must be extinguished and day marks carefully concealed.

Never to leave
station.

114. Under no circumstances, except those of extreme and imminent danger, shall the light keeper permit the vessel to be moved from her proper station.

Examination
of chains.

115. Every month the riding-chain must be hove in, until the point where it is shackled to the bridle is above water; the chain must then be carefully examined and

its condition noted in the log. A report of any injury or bad condition must be made at once to the Inspector.

116. Keepers must be careful to vary the scope of chain according to the weather; in mild smooth weather the chain must be hove in to a moderate scope; in heavy and tempestuous weather, and in gales, it must be veered to its full scope.

Varying the scope of riding-chain.

117. In case of heavy drift ice, keepers are recommended to shackle a shot of chain from the upper hawse pipe to the riding-chain, and then veer until part of the strain comes on this chain. The chain from the upper pipe serves to cut the ice before it masses against the ship's bows.

Precautions in time of ice.

118. A report of the examination of moorings, and also a report of absences, must be transmitted at the end of each month to the Inspector.

Report of moorings.

119. The ballast must be moved, and the hold thoroughly cleaned out at least once in six months.

Cleaning hold.

120. The ship must be pumped out daily; any water which cannot be removed by the pumps must be bailed out with buckets and swabs. Every precaution must be taken to keep the vessel well ventilated; windsails must be kept up in summer. In hot weather, awnings must be spread to keep the vessel cool between decks.

Ventilation, &c.

121. Wet clothing or wet bedding must not be kept below; once a week all bedding must be carefully aired in summer, and at least once a month in winter.

Care of bedding and clothing.

122. During the stormy season sails must be kept bent; they must be frequently loosed to dry when the weather will permit.

When sails must be bent

123. Great care must be taken of the boats and their equipments.

Boats.

124. Prompt information must be sent to the Inspector when there is danger that supplies or stores will run short.

Information to be sent regarding stores.

125. The keeper is prohibited from carrying on any trade or business whatever which will take him from the light-ship, or in any way cause him to neglect his public duties. Nothing whatever shall be kept for sale on board the light-ship.

Prohibition of traffic.

126. No malt, vinous, or spirituous liquors must be kept or used on board of any light-ship, except those belonging to the medicine chest, which must be reserved for cases of actual illness.

No liquor to be kept or used on board.

127. The keeper must hail all vessels, which by hovering too near the light-ship may prevent the lights from being seen, and request them to keep off. Under no circumstances shall he permit any vessel to make fast to the light-ship.

Vessels to be warned off.

128. Keepers shall not permit the vessels under their charge to be made a rendezvous for pilots; every proper courtesy must be shown pilots, as well as all other persons, but no undue use of the light-vessels or their boats shall be permitted to any one.

Light-vessels not to be made a rendezvous for pilots.

129. The keeper and mate are prohibited from being absent from the ship at the same time; one of the two must always be on board.

Either keeper or mate to be always on board.

130. Crews of light-ships will be allowed all reasonable and proper indulgences in visiting their friends and families ashore. During the milder seasons of the year, two of the crew, besides the keeper or mate, may be ashore at a time, if the ship carries a complement of eight persons all told. If but six persons or less are attached to the ship, one only, beside the keeper or mate, may be allowed to be absent. During the stormy seasons of the year, one only of the crew, in either case, shall be absent, and if the season is especially tempestuous, all hands must remain aboard as a rule; short absences only being allowed under such circumstances. Any abuse of these privileges on the part of any one must be promptly reported to the Inspector by the keeper.

Regulations governing leave.

131. Keepers, mates, and crews are all required to live and mess on board the light-ships to which they are attached. No rations or provisions purchased with commutation money for rations shall be taken out of the ship.

Messing.

132. Commutation, not exceeding one-third of the whole number of rations allowed on board any light-ship, may be permitted at the current contract price of the rations,

Commutation of rations.

upon satisfactory assurances being given to the Inspector that this commutation money will be used in purchasing fresh provisions or fruit for the use of the messes on board, and that the money shall not be applied to any other purpose. No division of this money will be allowed amongst the individuals of the crew to make separate purchases. This commutation is only permissive, and any failure to comply with these requirements will insure the withdrawal of the permission, and subject the keeper to dismissal.

133. For care of mineral oil, see pages 12 and 13, "Instructions to Keepers of fourth, fifth, and sixth order lights."

Returns, &c

134. The following returns shall be made by keepers of light-vessels to the Inspector:

Monthly: Mooring reports.

Fog-signal reports.

Quarterly: Expenditures of oil, &c.

Muster-roll.

Report of absences.

Pay-roll (to be sent in fifteen days before end of quarter).

Abstract of passing vessels.

Annually: Description and inventory of vessels.

Whenever necessary: Shipping articles.

Shipwreck reports.

DIRECTIONS AND INSTRUCTIONS FOR THE USE AND MANAGEMENT OF FOG-SIGNALS.

Keepers strictly accountable.

135. The keepers of stations provided with fog-signals will be held to a strict accountability for the proper care, attention to, and management of fog-signals.

Inspection of signal.

136. The principal keeper of the light station must satisfy himself, by a thorough, careful, personal examination and inspection of the engine, boiler, and the entire machinery of the fog-signal, before attempting to put it in operation, that it is in complete and satisfactory working order, and when it is not in operation all its parts must be dusted daily, and, if necessary, cleaned and wiped off. When the engine is not in operation it must be covered with a tarpaulin or canvas cover, to keep dust out of the journals and off of the friction surfaces.

Accidents to be reported.

137. In the event of accident to or derangement of any part of the machinery, unless the injury be of such a kind that the keeper is able to make the necessary repairs himself, it must be reported immediately to the Light-House Engineer or Inspector of the district, accompanied by such detailed report as will enable the officer to whom the report is made to provide the necessary assistance and materials for putting the fog-signal in efficient working order in the shortest time. Hand force-pumps with pipe connection cocks, &c., should be provided for every steam fog-signal boiler.

Cleanliness and care.

The engine-room must be kept clean, the unpainted parts of the machinery kept free from dust, dirt, and rust, and the painted parts wiped dry at all times and well oiled. No dirty waste, cotton, or woolen rags, or cloths saturated with oil, are to be left in boxes, corners of the room, or elsewhere, where they might become ignited from spontaneous combustion, but when the wiping off of the engine and machinery has been finished, these articles are to be thrown into water in buckets for washing, or, if unfit for further use, to be thrown into the furnace of the boiler to be burned.

Machinery in operation never to be left.

138. Whenever the apparatus is in operation, a keeper must be in the engine-house, in charge, and awake. It will not answer to leave the machinery alone for a single moment. If it should be necessary for the keeper immediately in charge to quit the engine-house, some competent person must temporarily relieve him.

Firing up.

139. Should the steam-boiler have a heater attached to it for keeping the water in it warm preparatory to raising steam, fire should be made under it as soon as there is

any indication of a necessity for using the fog-signal, which fire must be continued, with the draught so regulated as to raise the temperature of the water in the boiler from 190° to 210° Fahrenheit as speedily as possible. The water being at this temperature fire should be cautiously made in the furnace as soon as it is seen that the fog-signal will be required, and when there is sufficient steam for operating the fog-signal effectively and continuously, according to its distinguishing character, it should be put in motion. The time, state of the weather, &c., should be duly noted.

140. Whenever the fire is allowed to go out, or is drawn from the boiler, the furnace and ash-pit should be thoroughly cleaned, kindling wood placed in the furnace, and everything made ready for lighting when it shall be again needed. In starting the "getting up steam" in the boiler, the fire should be controlled to burn moderately, and the safety-valve kept open until the steam escapes freely, when the valve may be closed and the fire permitted to burn to full activity. Preparatory precautions.

141. In cold weather, with indications of fog or snow, the water in the boiler should be kept at 190° to 210° Fahrenheit by the heater; but great care must be taken in firing not to force the heater so much as to run the risk of so rapidly evaporating the water as to burn it. Precautions during cold weather.

142. After the heater is in full action, there will be nothing to fear in "forcing" the heater, if the connecting pipes are of proper size and clear. These pipes should be occasionally examined to see that they are unobstructed. Connecting pipes to be examined.

143. If in any case the attendant finds the temperature increasing in the heater, so that steam is making, and there is no increase of temperature of the water in the boiler, there will be reason to apprehend that there is some obstruction in the circulation between the heater and the boiler, and the fire should be hauled or allowed to die out in the heater, the fire having at the same time been started in the boiler. As soon as the use of the boiler ceases for the occasion, an examination should be made, to ascertain if any, and what, obstruction there was to the circulation. When heaters are not provided, the above results may be obtained by banking the fires in the fog-signal boiler. Obstructions.

144. While the keeper is getting up steam, he must be careful to oil all the working parts of the machinery, and by close inspection see that all the oil-holes are clear, and that they take oil freely. As often as once a month (as there may be opportunity) the several wearing parts must be taken apart and carefully cleaned and oiled. Oiling.

145. At all times, while the engine is in operation, see that there is, as near as may be, in boilers of the locomotive type, two cocks of water, and in upright boilers one and a half cocks. The aim should be never to have less than two cocks of water in the former or one in the latter. Quantity of water.

146. Should the water in the boiler foam, prime, and rise at any time while the signal is in operation or while raising steam, shut off for a few moments for the foaming to subside, then ascertain the quantity of water left in the boiler, when open again and increase the quantity of feed water to supply deficiency. If the boiler shows a disposition to foam or prime, the valves should not be opened suddenly but gradually, or if necessary to open suddenly for short blasts, it should be closed quickly before the foam can rise to obstruct the flow of steam. (In the whistle-machines the opening of the whistle-valve is always sudden, and cannot be closed except suddenly, and after the full duration of the blast, without changing the characteristics of the signal.) Foaming.

147. Boilers that foam must be pumped up or fed with great care, yet observing the safer course of pumping enough, and never allowing the water to get out of sight. If it should occur that, from any cause, the water should fall below the gauge-cocks and glass, do not haul fires, and do not put on the feed, or change any valve, nor open the safety-valve, but charge the furnace full of the finest coal at hand, so as to completely deaden the fire, leave the fire-door open and close the damper partially. Keep everything in this condition till the boiler cools off, occasionally sprinkling water on Feeding foaming boilers.

the fire, if necessary, to keep it deadened. After the boiler has cooled down, refill the water to the proper height, examine to ascertain if the pump is out of order, or from what cause the water has fallen too low in the boiler, clear out the furnace, recharge with kindling, and prepare everything for again lighting fires.

Gauge-cocks. 148. The gauge-cocks must be kept in good order at all times, and while the machine is in operation, or steam raising for work, they must be frequently tried. They must be kept open, and answer properly whenever tried. The glass gauge must not be wholly depended upon.

Glass gauge. 149. The glass gauge must be frequently "blown out," to see that all the passages and valves are clear.

Safety-valve. 150. The safety-valve must be kept in good working order at all times, and be frequently examined while the machine is in operation. The safety-valve must be taken apart once a month, to see that it is in good order and clean, and that it works freely.

Pumping. 151. Regular and continuous pumping is essential to the economical consumption of fuel, which can be easily done by giving a little attention, and by partially closing the cock in the pipe which supplies the pump, but no pipe between the pump and the boiler should be closed at all. A few trials will enable the keeper to determine the proper point at which the supply-cock should be closed, which point, when satisfactorily ascertained, must be marked, to serve as a guide afterwards. The keeper must not rely upon the fact that the valve is open which supplies the water to the pump, but must frequently examine the glass gauge and try the gauge-cocks, as, although the supply-valve to the pump is open, the pump may cease working, and the fact not be discovered till the water is too low in the boiler.

Regulation of draught. 152. The furnace-door should be kept closed as much as possible, governing the fire mainly by the damper in the chimney. While firing, and during work, keep the ash-pit door open, but close it when work ceases.

153. The furnace-doors of tubular boilers must not be opened wide for "cooling down." The sudden admission of cold air will contract the tubes too suddenly and fracture them, causing leaks; but they may be partially opened to aid in cooling down the boiler.

Daily attention to ash-pit, boiler, and flues. 154. The space below the grate-bars in the ash-pit must be kept free from ashes and cinders; should they be allowed to come in contact with the grate-bars they would soon melt. When the engine is at work, the ash-pit must be cleaned out at least as often as once a day. The boiler and flues should be brushed clean daily, if possible, and although no positive rule can be laid down for periodical cleaning, it must not be forgotten that they are never to be foul. After 30 or 36 hours' firing (and oftener if the draught is found to be sluggish), the necessity for brushing out the flues, to remove ashes and soot, will be apparent. When the engine is stopped, clean the boiler and flues and put everything in order at once for starting the signal again.

Difference between pressure-gauge and safety-valve. 155. In case there should be at any time a difference in the indications of the steam-pressure gauge and the safety-valve, lose no time in ascertaining the cause and apply the proper remedy to the defective instrument at once.

Quality of water. 156. As the water used in the boilers may be of a different quality at different stations, special attention should be given to it. When the water used holds salts in solution, or mud, or sediment in suspension, more frequent blowing off will be necessary than if the water is pure and entirely free from those impurities. Care and good judgment are required in the management of boilers under these circumstances; but, above all, it is necessary to be very careful to prevent the deposit of mud, lime, salt, or other solid matter in the bottom of the boiler, inasmuch as such deposits endanger both life and property. Deposits of mud will be readily seen by its accumulation about the gauge-cocks and by the "spatter" from the cocks being foul.

Water-blow. 157. The "water-blow" should be opened once in twelve hours, if but for a moment, simply to start the sediment, and longer if the water "blows foul," taking care, how-

ever, to shut the valve or cock before the water is too low in the boiler. Do not leave the blow-cock for an instant, while open, but be sure to shut before leaving it.

158. In case sea water is necessarily used continuously, frequent but light blowing off should be resorted to, in preference to occasional exhaustive blowing off, as the latter course necessarily prevents uniformity of work by the engine. Sea water.

If sea water is used, blow off, for a short time, every two hours, and as often as the boiler is cooled down and opportunity offers. Open the boiler and examine the tubes to see if there has been any scale or deposit made upon them; if so, the amount of water blown off has not been sufficient and must be increased.

159. When fresh-water tanks are furnished, from which the boiler can be refilled without the use of a pump, the boiler should be blown out at the end of any protracted fog, but care should be taken to fill the tank before the blowing out. Fresh water.

160. Instructions as to the pressure of steam to be used will be given by the district officers. Pressure of steam.

161. Great care must be exercised to avoid the effect of freezing weather. Fire must be constantly kept in the heater; all the pump "pet-cocks" must be kept open. If the weather is very severe it will be well to keep low steam (say five to ten pounds) on the main boiler, keeping the temperature in the engine-house, if possible, sufficiently high that a thermometer at the floor will not fall to the freezing point. Freezing.

162. When the apparatus is to be laid up for the winter, be sure that the water is all out of the pipes; leave all cocks open; take off the pump-doors and the check-valve cap; empty the tank. Winter precautions.

163. In firing with anthracite coal, the bed of fuel should be as thin as can be carried, so that there are no holes for cold air to pass through the fuel; as a rule, the smaller the coal, the thinner the fire. With bituminous coal, the fire must be thicker, to avoid air holes through it; also if the bituminous coal is "binding" coal, that is, runs or binds together, it must be occasionally broken or lightened up, with the "slice-bar," to keep the fire open. A well-constructed steam-boiler is fitted to do its work best when consuming a certain fixed quantity of fuel (coal or wood). Above or below this point there must be more or less waste, and there is as much above it as below it. Use of anthracite.

164. Haul all fire always before blowing down, and be careful to see that no fire is left under the boiler when blowing down is commenced. Keep the furnace and ash-pit doors closed to prevent too sudden cooling of the boiler and the consequent fracture by too sudden contraction of the tubes. Hauling fires.

165. See that the cylinder waste-cock is open, and all the water in the cylinder from condensed steam is removed before starting the engine. As soon as the engine becomes warm, attend to the pump and see that it works well, to prevent any detention on account of a want of a proper quantity of feed water. Starting engine.

166. When there is no longer necessity for working the engine, open the drip-cock of the steam-cylinder (and in cold weather open also the cocks in the pipes) to allow all the water to run out of them to prevent damage by freezing. Stopping engine.

THE SIREN.

167. The following-named parts of this fog-signal are shown in Plate 7.

Figure 1 is a top view.

Figure 2 is a front view.

1. Gauge-cocks.

2. Water-gauge.

3. Safety-valve.

4. Man-hole.

5. Heater.

6. Feed and circulation pipes between heater and boiler.

7. Cylindrical chamber, provided with steam-ports, passages, and sleeve 11.

Description of boiler.

10. Flange, provided with ball-shaped collar.
12. Brass nut.
13. Stuffing-box.
14. Siren-shaft.
15. Siren.
16. Pulley on siren-shaft.
17. } Collars on siren-shaft.
18. }
19. Bearings for siren-shaft.
20. Siren-valve.
21. Wheel in gear with 20.
22. Shaft for opening and closing 20.
23. Lever connected with pitman-rod.
24. Pitman-rod.
25. Lever for closing 20.
26. Steam-gauge.
27. Trumpet.
28. Pulley on fly-wheel shaft.
29. Pulley on worm-shaft.
30. Worm.
31. Worm-wheel.
32. Carrier on 31.
33. Roller on 24.
34. Steam-valve for engine.
35. Governor.
36. Pet-cock.
37. Feed-pump.
38. Air-cock.
40. Suction-valve.
41. Discharge-valve.
42. Air-vessel.
43. Safety-valve for feed-pipes.
44. Stop-cock.
45. Elbow on blow-off pipe.
46. Blow-off cock.
47. } Unions on 6.
48. }
49. Elbow on 6.
50. } Elbows on steam-pipes.
51. }
52. Elbow on 6.
53. Cross on 6.
54. Elbow on 6.
55. Elbow on 53.
56. Elbow on 40.
57. Elbow on exhaust-pipe.
58. }
59. } Elbows for water-gauge.
60. }
61. Tee between 71 and 67.
62. Union between 34 and 35.
63. Governor-pulley on fly-wheel shaft.
64. Governor-pulley on governor-shaft.

- 65. Fly-wheel.
- 66. Oil-cup for siren.
- 67. Stop-cock for hand-pump.
- 68. Union between 67 and hand-pump.
- 69. Union on blow-off pipe.
- 70. Check-valve.
- 71. Union between 42 and 61.
- 72. Union for suction-pipe.

Through chamber 7 passes the shaft 14, upon one end of which the siren 15 is screwed and held in place by a lock nut.

On the other end of the shaft is placed a pulley (16), which is rigid, and motion is imparted to it by the fly-wheel of the engine. The collars 17, 18, keep the shaft in position. After loosening the collars the siren is regulated by bringing it as near as possible to the surface of the chamber, but not so near as to impede the movement by means of the set-screw of collar 18, which is rigidly secured to the shaft. The siren-shaft runs through both bearings 19, and through chamber 7, as above described.

The bearings are provided with lubricators filled partially with cotton, which, after being pressed tightly against the shaft, are saturated with oil. Two additional oil cups are provided for the shaft on the casing of the siren. The person in attendance must take special care to see that the shaft is always well supplied with oil.

In the shell of chamber 7 is a valve (20) which opens and closes the steam-ports. That valve is provided at its lower end with teeth which come into gear with the wheel 21. This wheel is on shaft 22, and motion is imparted to it by the lever 23 and the pitman-rod 24, which extends to the engine. Lever 25 is raised by means of a weight and thereby the valve is closed. A flange (10) is provided with a ball-shaped collar, which permits the downward movement of the trumpet 27, and furnishes a steam-tight connection with it.

168. A pulley (23) is on the fly-wheel shaft. The motion is transmitted from this to another pulley (29), which is placed on the same shaft with a worm (30). This worm imparts motion to the worm-wheel 31 to which is secured a carrier (32). This carrier pulls the pitman-rod 24 downwards, and causes the opening of the valve 20 whenever it comes in contact with a roller (33) placed at the lower end of the pitman-rod. The pet-cock 36 must be opened on starting the engine, and must remain open until there is no water in the cylinder. It must also be opened when the engine is stopped.

Description of engine.

The air-cock 38 must be opened whenever the pump is not required to feed. For the purpose of accelerating the suction of the pump, after it has been idle for some time, the air-cock and the water-cock are to be opened and water introduced into the pump through the latter until it reaches the air-cock. Then both cocks must be immediately closed.

By the safety-valve 43 the bursting of the feed-pipe is prevented, in case the stop-cock 44 should be closed. The stop-cock should always be open, and may only be closed in case it should become necessary to inspect the pump-valve while the pump is in operation, or the boiler water is blown off. The blow-off cock 46 is always closed except when it is necessary to blow off. The cock 67 stops the feed-pipe from the hand-pumps, and is opened when the boiler is to be fed by the latter.

169. The pressure of steam having reached twenty pounds, the engine and siren may be put into operation and continued.

Starting.

170. The steam pressure should be maintained uniformly as nearly as possible at seventy pounds, and never, if it can be avoided, to exceed eighty pounds.

Pressure.

171. In case of disarrangement of the valve-gear inside of the stand-pipe of the siren, take off the hand-hole plates, and see that the defects are remedied; that everything is secure inside, and that the keys and pins are in place.

Valve-gear.

THE STEAM-WHISTLE.

Description of
plates.

172. The following parts of this instrument are shown in Plate 8.

- A. Steam-drum.
- B. Stand-pipe.
- C. Chimney.
- C'. Damper.
- 1. Gauge-cocks.
- 2. Water-gauge.
- 3. Safety-valve.
- 4. Steam-pipe for engine.
- 5. Throttle-valve for engine.
- 6. Steam-cylinder.
- 7. Piston-rod.
- 8. Connecting-rod.
- 9. Fly-wheel shaft.
- 10. Crank.
- 11. Fly-wheel.
- 12. Cam-wheel shaft.
- 13. Slide-valve rod.
- 14. Slide-valve connecting-rod.
- 15. Slide-valve eccentric.
- 16. Vibrating eccentric.
- 17. Vibrating connecting-rod.
- 18. Vibrating ratchet-arm.
- 19. Ratchet.
- 20. Ratchet-wheel.
- 21. Cam-wheel.
- 22. Cam.
- 23. Cam-wheel arm.
- 24. Cam-wheel arm-shaft.
- 25. Whistle-valve lever, exterior.
- 26. Whistle connecting-rod, exterior.
- 27. Whistle-valve lever, exterior.
- 28. Whistle-valve lever, interior.
- 29. Whistle connecting-rod, interior.
- 30. Whistle-valve.
- 31. Valve seat and steam-outlet.
- 32. Steam-whistle.
- 33. Governor-pulley on fly-wheel shaft.
- 34. Governor-pulley on pulley-shaft.
- 35. Governor.
- 36. Pressure-gauge.
- 37. Pump eccentric.
- 38. Pump.
- 39. Steam-pipe for auxiliary pump.
- 40. Auxiliary pump.
- 41. Feed-pipe.
- 42. Suction-pipe.
- 43. Friction-wheel.
- 44. Hand-lever.
- 45. Exhaust-pipe.
- 46. Drip-pipe.
- 47. Hand-hole.
- 48. Hand-hole.

THE ERICSSON ENGINE AND DABOLL TRUMPET.

173. The following-named parts of this instrument are shown on Plate 9.

1. Grate.
2. Heater.
3. Supply-piston.
4. Supply-piston valves.
5. Supply-piston rockshaft.
6. Levers on supply-piston rockshaft.
7. Driving-piston.
8. Driving-piston valves.
9. Driving-piston rockshaft.
10. Driving-piston levers.
11. Connecting-rod for driving-piston.
12. Connecting-rod for supply-piston.
13. Crank.
14. Main shaft.
15. Fly-wheel.
16. Worm on main shaft.
17. Cam on main shaft.
18. Gear-wheel on main shaft.
19. Gear-wheel on governor-shaft.
20. Governor.
21. Cam-wheel arm.
22. Exhaust-valve.
23. Air-pump piston-rod.
24. Air-pump piston.
25. Air-pump piston-valves.
26. Pump-cylinder.
27. Valve.
28. Air-reservoir.
29. Pressure-gauge.
30. Safety-valve.
31. Reed-box.
32. Worm-wheel.
33. Worm-wheel shaft.
34. Gear-wheel on worm-wheel shaft.
35. Cam-wheel shaft.
36. Bevel gear-wheel on cam-wheel shaft.
37. Cam-wheel.
38. Cams.
39. Hand lever for gearing.
40. Reed-valve lever.
41. Reed-valve.
42. Reed.
43. Reed-tongue.
44. Starting-bar.
45. Starting-bar shaft.
46. Crank.
47. Ratchet.
48. Ratchet.

174. The engine and engine-room must be kept clean and free from dirt in all its parts, and the engine in condition, to have the fire lighted at a moment's notice. To do this the furnace must have been cleaned after last using, and fresh kindling placed upon the grate, ready to be lighted when needed. Cleanliness.

(To face page 24—Instructions to Light-Keepers.)

DIRECTIONS FOR USE OF GAMEWELL FOG BELL MACHINES.

Keep the machine scrupulously clean. Wipe all parts with slightly oiled waste or cloths.

Keep the machine dry. Stop openings in building through which spray or rain may fall.

Keep the bearings of machine and of hammer well oiled. Wipe off any excess of oil. Clock oil only must be used on clock movement, a very little at a time. Always remove winding crank when machine is wound up.

See that no obstruction is in the way of the chain, weight, hammer, or connecting rod.

Always let weight run down, or securely support it, before disconnecting any part of the machine. See that the chain, while winding up, drops off the back of sprocket so that it will not ride up on gathering side. Should it accidentally so ride, turn back slightly on crank, have a second person hold back the clicks, and turn back slowly until chain is free, then let go the clicks and gradually relieve strain on crank. Should large pawls fail to release, it shows that hammer head is too near the bell and should be adjusted back half an inch or until pawls drop freely.

Should the machine strike double blows, it shows that there is too much oil in the "Figure four" detent, or that the flat spring back of the "Figure four" is too weak. If the arm No. 47 does not drop with sufficient power to release the "Figure four" detent, tighten long spring No. 49, by turning nut No. 52 to the right.

Sometimes after long use the "catch" where the quadrant No. 25 locks on the "Figure four" becomes rounded, so that it will not lock, thus allowing the machine to run away. This may be remedied by filing this "catch" square again without putting in a new "Figure four."

Proportion weight to size of bell as follows:

No. 4 machine.	{	400 pounds weight for 1,000-pound bell.
		450 pounds weight for 1,200-pound bell.
		600 pounds weight for 1,500-pound bell.
No. 3 machine.	{	700 pounds weight for 2,000-pound bell.
		800 pounds weight for 2,500-pound bell.
		900 pounds weight for 3,000-pound bell.

The best results will be obtained when the hammer shaft stands at angle of 45°.

In ordering new parts give the number of the machine and the number and name of the parts required.

- Firing up.** 175. During the time of firing up, let the crank of the engine point towards the furnace-door.
- Height of fuel.** 176. Keep the fuel upon the grate at a uniform height, and never allow it to touch above the linings.
- Ashes and dirt.** 177. The ash-pit under the grate must be kept free from ashes and other dirt.
178. Ashes and dirt collected in the jacket around the cylinder should be cleaned out once each week; this can be done through the narrow door or loose plate under the ash-pit.
- Starting.** 179. The starting is effected by working the fly-wheel about half round by the starting-bar. Watch closely after lighting the fire, and start as soon as the engine will work. The time when it will work can be determined only by attempts to start it. If not started at the proper time, and too much delay takes place, the heater will be destroyed.
- Stopping.** 180. The engine is stopped by opening the exhaust-valve on the top of the cylinder; keep this valve open until the engine is at rest, and open the furnace-door before stopping.
- While at rest.** 181. While at rest, the furnace-door must be kept open, and the wheel turned so as to bring the piston full out; if this is not done, as directed, the heater will be destroyed.
- Oiling, &c.** 182. The cylinder is best greased with a swab dipped in melted tallow. The journals, and all joints and bearings, must be oiled with good clean oil. Never put oil upon the stem of the exhaust-valve.
- Use of damper.** 183. By the damper, combustion may be checked or increased, and the power of the engine governed thereby.
- Inspection.** 184. A thorough examination, both internal and external, must be made at intervals of two months, so that a correct knowledge of the condition of the motor may be had.
- New packing.** 185. When new leather packing is needed for the piston, cut a ring of good stont calfskin, one-half inch larger in diameter than the bore of the cylinder; this must be attached to the piston in the same manner as the old one was, with the flesh side of the leather turned outward towards the cylinder. In case the piston is too large, when the packing is new and cannot readily be put in the cylinder, make a very light fire in the cylinder, so that it may be expanded; but use great care, and do not get it so hot as to burn the leather.
- Stuffing-box.** 186. The stuffing-box through which the piston-rod works should be screwed moderately tight only. Lamp-wick, or any other elastic material, will answer for packing.
- The trumpet.** 187. The reed or tongue is the most delicate part of the trumpet. The trumpet needs only to be kept clean and free; any fracture which may occur from excessive vibration may be repaired with hard solder by the visiting mechanic.
- Fitting of reed.** 188. The tongue or reed should be fitted so as to get a satisfactory tone—if too flat, make the point thinner; if too sharp, make the back end thinner. By trial, the best results can be soon obtained. Also, try different reeds of different pressures; and use that pressure which gives the best tone with each particular reed. Duplicate reeds will be furnished at all times when needed by application to the proper authorities, and the station should never be without two or more in store.

STEVENS FOG-BELL STRIKING APPARATUS.

189. The following-named parts are shown in Plate 10:

1. } Striking pallets.
2. }
3. Guide for pallets.
4. Drum.
5. Ratchet-wheel or striker-wheel.
6. Ratchet-wheel or striker-wheel (small).
7. Drum-pawl.

8. Wire rope with weight attached.
9. Center shaft.
10. Balance-lever.
11. Balance-lever arm.
12. Balance-lever arm to bell.
13. Connecting-rod to bell.
14. Lever on hammer-shaft.
15. Hammer-shaft.
16. Hammer.
17. Spring.
18. Frame.
19. Lock-lever.
20. Lock-arm working in wheel 21.
21. Lock-wheel.
22. Lock-trigger.
23. Cam-lever.
24. Cam on cam-lever.
25. Cam-lever weight.
26. Pin-wheel.
27. Clock-work.
28. Pendulum.
- 29 and 30. Gear-wheels.
31. Winding-crank.
32. Motion-weight for clock-work.

190. Keep the machine clean and free from dirt and rust in all its parts. This can only be done by constant care and attention, in wiping with waste or cloths which are slightly saturated with oil; care must be taken not to use so much oil that passing particles of dirt will adhere to the surface. Cleanliness and care.

Care must always be taken to keep the machine as dry as possible, by stopping closely the opening in the side of the room or ceiling through which the connection between the hammer and the machine passes, so as to prevent rain or spray from passing in and wetting the machinery.

191. Before starting the engine, be sure that the machinery and the hammer are well oiled in all bearings and points of contact where friction exists by one surface moving upon another with some pure lubricating oil. Oiling.

Upon the clock-work, which regulates the intervals between strokes, a fine oil, such as is used upon clocks, would be preferable. Avoid putting on too much oil, for by that means the machinery and surroundings will become filthy, and catch and retain all flying particles which come in contact with it; yet be sure that enough oil is always on, so that the parts may not run dry and cut. Never leave this machine alone while running. Some competent person must be in constant attendance upon it, to rectify any irregularity and prevent accidents which might occur.

192. Always remove the winding-crank as soon as the machine is wound up, and see that no obstruction is in the way of the weight, whereby it might be prevented from acting equally at all times upon the machine. Winding.

193. Be sure that the hammer and the rod connecting it with the machine does not come in contact with any of its surroundings during the operation of striking. Hammer and rod.

194. If any part or parts of the machine are to be removed for cleaning or repairs, be sure always to run down or support the driving weight of the machine. Never disconnect any part of the machine until this weight is secured, so that it will not operate it. Removing parts.

195. Never let the wire rope which supports the weight which actuates the machine rub or chafe against any surrounding parts. Regulation of weight.

In case the clock-work has not enough power to throw off the falling lever or cam which liberates the striking weight, move the brass weight which actuates the clock-work farther from the center and toward the end of the lever. This will increase the power, and, moving the weight toward the center will diminish the power.

If the falling lever operated by the pins falls, but does not have the power to liberate the striking levers, the power may be increased by moving the brass weight toward the outer end of the lever, and if the weight is too great, move the weight toward the center or fulcrum of the lever.

Before making any alterations in the machine it would be well to examine it thoroughly, and see if the difficulty does not arise from some cause independent of the machinery.

Do not use any more weight to drive the machine than will give a good sharp blow or give the best result in tone and loudest sound from the bell struck.

The sections of the weight furnished weigh one hundred pounds each, except the section which has the hook attached, which is heavier. Three hundred pounds will strike a sharp blow, and four hundred pounds a very hard blow; proportion the weight and blow to the size of the bell to be struck.

"ANDERSON'S" HAND FOG-SIGNAL.

Cleanliness
and care.

196. This instrument should be kept clean in all its parts.

Avoid bruising or indenting the cylinders.

Should such accident occur, introduce a round piece of smooth wood, as large in diameter as the cylinder will admit, and with a small, round, hard stick rub and press the indented part until restored to its original form as near as possible. Avoid drawing the metal, which would permanently injure the instrument.

Reed.

Use great care to keep sand and all similar substances out of the instrument.

197. As long as the instrument gives good tone, do not meddle with the tongue or reed in any other way than to wipe and keep it clean. Observe when the instrument is in good order the position of the reed relative to the reed-seat; then, should accident occur to the reed, put it in the same relative position as it was originally, and try the tone of the instrument. This need only be done when no duplicate reeds are in store. When duplicates are at hand, replace the injured one with a new one, and preserve the injured one, that it may be repaired.

Packing of piston.

198. The packing upon the lower end of the piston-cylinder can be renewed when worn with lamp-wick or other similar material, which material should be filled with clean tallow when applied to the piston.

INSTRUCTIONS FOR PAINTING.

Inside work.

199. The whole interior of the light-house lanterns (dome, astragals, ventilators, smoke conductor, &c.), is to be painted white, and must be kept clean, free from soot and grease, and the white paint renewed as often as necessary.

The paint may be kept clean and free from soot and grease by occasional scrubbing and washing with clear, soft hot water and soap, followed by clean water. If from bad ventilation, neglect, or from any other cause, the interior of the dome, the astragals, &c., have become very dirty, and the soot and grease cannot be removed by scrubbing with hot water and soap, then the lye of wood ashes (oak or hickory) will remove it. In case lye cannot be had, then it may be washed with strong lime water, which will answer nearly as well as strong lye. Lye is not, however, to be used in cleaning wood work for painting or repainting.

In painting outside work the color must not be changed from that previously existing. (See paragraph 63 of the Regulations of the Light-House Board.)

[TO FACE PAGE 27, INSTRUCTIONS TO LIGHT-KEEPERS.]

At its meeting of October 17, 1888, the Light-House Board prohibited the use of coal-tar and asphaltum varnish in painting light-house structures, and to that end ordered that the note at the bottom of the order of the Board as to colors, which was made at the meeting of the Board held on November 10, 1888, and which faces page 27, in the book entitled "Instructions to Light-Keepers," be cancelled.

[TO FACE PAGE 26, INSTRUCTIONS TO LIGHT-KEEPERS.]

At its meeting of July 1, 1884, the Light-House Board directed that—

"All painting, whitewashing, and application of other washes that may be necessary for the cleanliness and good appearance of the structures at light-stations shall be done by the keepers and assistants of such stations, under the direction and supervision of the inspector of the district."

A proper economy must be used in the expenditure of paints for this purpose, and a record must be kept in the journal of the station of all the work done.

200. Paint will not adhere to and dry upon wood or metal which is not perfectly clean and entirely free from soot and grease. Outside work.
Preparation
for painting.

Soot must be removed by brushes and cloths or towels, and by washing with hot soft water and soap.

Oil and other grease on wood work must be removed by the use of spirits of turpentine and a worn or other stiff brush, rubbing the part vigorously until the stains are removed. When the above means have been resorted to without entire success, mix a thin whitewash, strain it, and give the parts to be painted a coat of it with a paint brush. When this whitewash becomes thoroughly dry, take a clean brush and with it remove all the whitewash, and the parts thus treated will be in proper condition for receiving the paint.

Iron, brass, copper, &c., must be cleaned so as to present a smooth surface. All blistered and cracked paint, and all rust on iron, must be carefully removed and the parts smoothed before putting on the paint.

201. A mixture prepared by the following recipe will remove paint from old iron: Removing
paint from old
iron.
Dissolve two pounds of potash in a bucket of water, add about one and a half pounds of slacked lime, and stir it well.

With a mop apply this mixture to the paint, and after a few minutes it may be easily removed by scraping.

As rapidly as the old paint is scraped off, rinse the iron with fresh water, and dry it. This will leave the iron clean and bright.

202. Take the necessary quantity of paint from the keg and mix spirits of turpentine with it until it is of the consistency of cream; then put in patent drying or Japan varnish in the proportion of one gill for each gallon of paint, and mix the paint, turpentine, and drying well together—the paint will then be ready for immediate use. When the paint in the paint bucket becomes thicker than cream, it must be thinned by adding small quantities of spirits of turpentine, and it may be necessary to add also a very small quantity of boiled linseed oil at the same time to increase its drying qualities. Preparation
for inside work.

Black paint for inside work will be greatly improved by mixing it with spirits of turpentine and copal or coachmakers' varnish. The varnish will give the paint when dry a gloss.

Black paint for inside work may be prepared with dry lampblack, mixed with copal or coachmakers' varnish and then thinned to the consistency of cream with spirits of turpentine. One pound of fine lampblack will require about half a gallon of varnish to prepare it to receive the spirits of turpentine.

No oil is to be mixed with paint which has been ground in oil in preparing paint for inside work.

Red lead is put up dry. Quantities required for immediate use only are to be mixed. If not used immediately after being mixed, it becomes hard and unfit for any use.

203. Paints for outside work are to be mixed with boiled linseed oil and the necessary quantity of patent drying or Japan varnish. Preparation
for outside work.

Black paint for outside work may be mixed with boiled linseed oil and copal or coachmakers' varnish.

No spirits of turpentine is to be used in mixing paints for outside work.

Iron work which has been neglected and rusty should be thoroughly cleaned by scraping and polishing, and then primed with one or two coats of red lead before the paint of the required color is put on.

Raw linseed oil is, as a general rule, only used for priming new wood work.

204. For gray or lead color add lampblack (or black paint ground in oil) in small quantities to white paint, ground in oil, until the desired shade is obtained. Hints for mix-
ing paints.

For yellow paint, chrome yellow and yellow ochre are in general use.

For straw color or buff: to chrome yellow or yellow ochre add, in small quanti-

ties at a time, white paint (ground in oil) until the desired shade is obtained, to which a small quantity of Venetian red may be added to soften the yellow gloss.

For brick color, mix yellow paint, red lead, and a small quantity of white paint.

Oak-wood color may be made with three-fourths of white paint and one-fourth of umber and yellow ochre. The proportions of umber and yellow ochre will be determined by the desired tint.

Portland-stone color is made with umber, yellow, and white paint.

In mixing all paints it must be remembered that the quantity of drying is to be in the same proportion, and that for inside work, or work not exposed to the weather, spirits of turpentine is to be used for thinning, and for outside work, exposed to the weather, oil is to be used without turpentine.

The following materials may be mixed with the paints as driers:

Patent drying, paste.

Japan varnish, liquid.

Litharge, in powder.

When litharge is used as a drier, it must be reduced to a fine powder; then, by means of a little oil, made into paste, and finally mixed thoroughly with the paint before using it.

Paint-brushes.

205. Paint brushes are round and flat, and of different sizes. Round brushes vary from one to two and a half inches in diameter.

The large paint brushes are used for putting on priming and in painting over large surfaces, which require considerable quantities of color.

The small brushes are used for parts to which the large brushes, from their size, cannot be applied.

Flat brushes are used for sashes, for varnishing, and for painting in lines or narrow spaces.

When the bristles of a brush get loose, drive a few thin wedges of wood inside of the binding twine or thread, which will render the whole fast again.

A different brush should be used for each color.

Brushes which have been used must not be left to dry with the paint in them. They should be put into a paint pot, or old paint keg, with sufficient water to come within half an inch of the binding of the brush. Care must be taken not to have too much water in the paint pot or keg, for if the binding of the brush is left in the water it will soon rot, and the brush will be useless. When short of brushes, they may be washed in oil or spirits of turpentine, and finally with soap and water, so as to render them fit for use in any color. The oil and spirits of turpentine used in washing brushes will do for mixing paint of the same color of the paint washed from the brushes.

Care of paints.

206. Paints of all descriptions must be put up in the best manner, and kept in a dry place.

Dryings, varnish, &c., must be kept in bottles or tins.

When a part of the paint is taken from a keg (ground in oil) the residue is to be covered with water to the depth of one or two inches, at least, and then the head of the keg is to be put in tightly. The paint must not be left to dry, nor exposed to the air or weather.

Putty must be put up and kept in bladders, under cover, and not exposed either to the sun or weather.

When too hard for use, it may be softened by mashing and rolling in the hands, aided by the addition of a little linseed oil.

To make putty: to four-fifths of pulverized Spanish whiting add one-fifth linseed oil, and work it into a paste.

Hints as to putting on paint.

207. In painting, durability is to be the first consideration.

The parts to be painted must be clean, smooth, and free from grease. All holes, cracks, nail-heads, &c., must be filled in with putty. If the wood is new, the first

coat should be put on thin, to serve as a priming. If new iron, then a thin coat or two of red paint should be put on as a priming.

A second coat of paint is never to be put on until the previous one is thoroughly dry and hard, which will never be the case whilst the least stickiness is felt on applying the hand to it.

Each coat should be of the same thickness throughout, otherwise the work, when done, 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, long strokes should be employed 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.

Sash brushes and pencils should not be dipped into the paint pots, but a small quantity of the paint should be placed upon a clean board, a piece of tin, or glass, to serve as a palette—the brush or pencil can then be worked into the paint, and fine lines drawn with it; but if dipped into the paint pot, the exterior of the brush only will be covered with paint, with which it will not be possible to do nice work.

RECIPES.

WHITEWASH.

208. 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; three 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.

CEMENT-WASHING THE OUTSIDE OF LIGHT-HOUSE TOWERS.

209. Take of fresh Rosendale cement three parts, clean sand one part, and mix them thoroughly with fresh water. 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 the 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.

TO PURIFY RAIN WATER AT LIGHT-HOUSE STATIONS.

210. Water contaminated with chloride of lead from salt spray resting on the leads of light-houses, &c., whence rain water is collected, does not lose its poisonous qualities either by boiling or by exposure to the air.

(To face page 30, Instructions to Light Keepers.)

At its meeting on April 3, 1899, the Light-House Board further amended paragraph 211 of the Instructions to Light Keepers so as to read as follows :

Table of weekly allowance per man for vessels of the Light-House Establishment.

Beef (corned).	1 pound.	Molasses	$\frac{1}{2}$ pint.
Pork	2 pounds.	Coffee	7 ounces.
Codfish.	1 pound.	Tea	1 $\frac{3}{4}$ ounces.
Mutton (fresh canned)	1 pound.	Butter	8 ounces.
Bacon	1 pound.	Vinegar	$\frac{1}{2}$ pint.
Ham	1 pound.	Pickles	$\frac{1}{2}$ pound.
Flour	4 pounds.	Tomatoes (canned)	8 ounces.
Pilot bread	2 pounds.	Corn (canned)	8 ounces.
Rice	$\frac{1}{4}$ pound.	Apples (evaporated)	2 ounces.
Corn meal	$\frac{1}{2}$ pound.	Peaches (dried)	2 ounces.
Oatmeal	$\frac{1}{2}$ pound.	Raisins	1 ounce.
Beans	1 pint.	Salt	6 ounces.
Pease (split)	$\frac{1}{2}$ pint.	Pepper	$\frac{1}{2}$ ounce.
Potatoes	12 pounds.	Mustard	$\frac{1}{2}$ ounce.
Onions	2 pounds.	Baking powder	1 ounce.
Sugar	2 pounds.		

To purify this water, and render it perfectly fit for all culinary and domestic purposes, it will only be necessary to put some powdered chalk or whiting into each cistern in which such rain water is collected, and to stir it up well, occasionally, after rain has fallen.

ALLOWANCES OF PROVISIONS.

211. At certain unusually isolated light-stations an allowance of provisions is granted by the special authority of the Light-House Board in each case.

A similar allowance, but necessarily greater in amount, is granted to the master and crew of light-vessels.

The articles are furnished in accordance with the following tables of allowances:

Table of quarterly allowance per man for vessels of the Light-House Establishment.

Pork	45 pounds.	Coffee	6 pounds.
Beef	45 pounds.	Butter	3½ pounds.
Flour	20 pounds.	Beans or pease	2½ gallons.
Rice	10 pounds.	Vinegar	¾ gallon.
Raisins	6½ pounds.	Molasses	¾ gallon.
Ship biscuit	65 pounds.	Pickles	6 pounds.
Brown sugar	14 pounds.	Potatoes	2½ bushels.
Tea	1½ pounds.	Onions	1 bushel.

Table of annual allowance per man for light-stations and fog-signal stations.

Pork	200 pounds.	Coffee (green grain)	24 pounds.
Beef	100 pounds.	Beans or pease	10 gallons.
Flour	2 barrels.	Vinegar	4 gallons.
Rice	50 pounds.	Potatoes	2 barrels.
Brown sugar	50 pounds.		

C I R C U L A R.

USE OF OIL AND MATCHES AT LIGHT-STATIONS.

1882.

Department No. 120.

L.-H. Board No. 6. of 1882.

Treasury Department,

OFFICE OF THE LIGHT-HOUSE BOARD,

Washington, D. C., October 28, 1882.

The following paragraph will be inserted opposite page 13 of the book of Instructions to Light-Keepers, it having all the force and authority of the other paragraphs of the book:

94a. No other oil and no other matches than what are supplied by the Light-House Establishment will be permitted under any circumstances to be used at light-stations.

BY ORDER OF THE LIGHT-HOUSE BOARD:

R. H. WYMAN,

Rear Admiral U. S. Navy,

Chairman.

APPENDIX IV

List of Allowances to Light-Stations, 1881, Washington, D. C.

LIST
OF
ALLOWANCES
TO
LIGHT-STATIONS.
1881.

WASHINGTON:
GOVERNMENT PRINTING OFFICE.
1881.

THE FOLLOWING LIST OF ALLOWANCES IS TO BE SUBSTITUTED FOR
 THAT OF 1880.

ANNUAL SUPPLIES.

Articles and quantities found actually on hand are to be deducted from the following allowances, except that a larger quantity of wicking and a larger number of lamp-chimneys than prescribed may be delivered, if found necessary.

Previous deliveries and expenditures must be satisfactorily accounted for, and worn-out and condemned articles must be so accounted for or delivered to the master of the vessel before new ones can be delivered.

The fact that an article appears on the allowance list is not authority for delivery unless it is actually needed.

The annual supplies are ample for the efficient maintenance of the lights and for keeping everything pertaining to the stations in perfect order. Keepers who make extravagant use of the supplies delivered to them, and require additional supplies during the year, will be held to a strict accountability, and the value of the excessive expenditure, if not satisfactorily explained, will be charged to them.

GENERAL SUPPLIES.

BOOKS, BLANKS, AND STATIONERY.

Each light-station must be provided with a copy of the latest edition of all books of laws, regulations, and instructions, and all old editions on those subjects to be removed at the time later editions are delivered.

Daily expenditure book.....	1
General account book.....	1
Journal or log-book.....	1
Watch-book (for stations having more than one keeper).....	1
Fog-signal record (for stations having a fog-signal).....	1

Blank Forms as follows:

No. 65. Report of condition of station.....	36
No. 69. Absence report.....	6
No. 33. Expenditures of oil, &c.....	6
No. 5. Vouchers for salary (each keeper).....	12
No. 74. Abstract of passing vessels .. <i>Light-House Board</i> ..	3
No. 32. Property returns	3

No. 27. Receipt for extra supplies	12
No. 31 or 35. Keeper's receipt on taking charge	3
No. 70. Shipwreck report	6
No. 52. Mooring reports (for light-vessels only)	15
No. 50. Muster-roll (for light-vessels only)	6
No. 7. Pay-roll (for light-vessels only)	12
No. 53. Description and inventory (for light-vessels only)	3
No. 49. Shipping articles (for light-vessels only)	6
No. 66 or 67. Fog-signal report (for fog-signal stations only)....	24
Envelopes, large size, for quarterly returns	4
Envelopes, official size	26
Envelopes, post size, for each keeper and assistant	4
Envelopes, post size, for principal, for miscellaneous purposes...	4
Writing paper, quires	2
Steel pens, dozens	2
Penholders	2
Black lead pencils	2
Ink, pint	1
Slates	1
Log-slates, double (for light-vessels only)	2
Slate pencils	6

HOUSEHOLD ALLOWANCES.

To each family living in a separate apartment at a light-station.

Mineral oil for use in dwelling, gallons	25
Wick for table-lamp, dozen	2
Wick for hand-lamp, dozen	1
Wick for hand-lanterns, dozen	1
Chimneys for table-lamp	20
Chimneys for hand-lamp	10
Pargetized can	1
Safety matches, boxes	30

No other oil and no other matches than what are supplied by the Light-House Establishment will be permitted under any circumstances to be used at light-stations.

SPECIAL SUPPLIES.

FOR FIRST-ORDER LIGHT.

Lard oil, gallons, greatest consumption, and 5 per cent. additional for contingencies.	
Wicks for each of the Nos. 1, 2, 3, 4, yards	20
Wicks for lighting-lamps (lucernes), house-lamps, and hand-lan- terns, pound	1
Glass chimneys	100

Implements and cleaning materials—

Buff or chamois skins for cleaning lenses and plate-glass of the lantern	6
Linen towels	20
Spirits of wine for washing lenses and plate-glass, gallons	2
Rouge-powder for polishing lenses and the plate-glass, ounces ..	16
Whiting, for cleaning lenses and plate-glass, pounds	10
Soap, brown, pounds .	80
Crash or coarse linen for use on lantern-floor and watch-room, pieces of $1\frac{1}{4}$ yards each	8
Corn brooms	6
Corn brooms, for screw-pile light-houses	3
Rotten-stone for cleaning brass work of apparatus, &c., pounds.	2
Sponge, pieces	3
Cotton mops and handles for removing dampness from plate-glass of lantern	2
Curved scissors for trimming wicks	2
Straight scissors for cutting wick	2
Emery paper, sheets	18
Sand paper, sheets	18
Solder, pound	1
Rosin, pound	1
Muslin, yards	10

Brushes—

Chimney or bottle brushes	4
Flexible brushes for cleaning lamps	4
Flat brushes for spreading rouge and whiting on lenses and plate-glass	2
Sash-brushes	2
Paint-brushes (assorted) for painting the lantern inside	4
Coal-tar brushes	2
Whitewash brushes	3
Scrubbing-brushes for cleaning floors, stairs, &c.	4
Hand dusting or counter brushes	2
Feather brushes for dusting the lens apparatus and plate-glass.	2
Sweeping brush	1
Wolf's-head brush	1
Silver-plate brushes	2

Paints, oils, etc.—

White zinc paint, ground in oil, for painting the inside of the lantern, pounds	25
Boiled linseed oil for mixing paint for use inside the lantern, gallon	1
Spirits turpentine, for mixing paint for use inside of the lantern, gallons	3

Putty, for glazing purposes, pounds	10
Refined coal-tar, for the outside of the lantern, iron railings, and other iron work, but for no other use, gallons.....	5
Black paint for lead color for lantern floors, &c., pounds	10
Green paint for pedestals and oil-butts, pounds....	5
Red lead (dry) for outside of lantern (where required), pounds..	5
Yellow paint for floors (where required), pounds.....	5
Paints of the proper color for boats, pounds.....	10
Boiled linseed oil for colored paints, suitable quantity.	
Spirits turpentine for colored paints, suitable quantity.	
Drying for paints, suitable quantity.	
Window glass, of proper sizes, panes of each size.....	6

FOR A SECOND-ORDER LIGHT (LARD OIL).

The same as for a first-order light, except—	
Lard oil, gallons, greatest consumption, and 5 per cent. additional for contingencies.	
Wicks for lens-lamp, of each of the numbers 1, 2, and 3, yards..	20

FOR A SECOND-ORDER LIGHT (MINERAL OIL).

Mineral oil for light-house lamp, gallons	660
Wick of each number used, yards	10
Safety matches, boxes	24

All other supplies like a second-order lard-oil light, except that no curved scissors will be allowed.

FOR A THIRD AND THIRD AND A HALF ORDER-LIGHT.

Mineral oil for light-house lamp, gallons	275
Wick of each number used, yards	10
Safety matches, boxes	24
Glass chimneys.....	100

Implements and cleaning materials—

Buff or chamois skins for cleaning lenses and plate-glass .	4
Linen towels.....	12
Spirits of wine for washing lenses and plate-glass.....	1½
Rouge-powder for polishing lenses and plate-glass, ounces.....	12
Whiting for cleaning the lenses and plate-glass, pounds	6
Soap, brown, pounds	60
Crash or coarse linen for use on lantern-floors and watch-room, pieces of 1½ yards each	4
Corn brooms	4
Corn brooms for screw-pile light-houses	2
Rotten stone for cleaning brasswork of apparatus, &c., pounds ..	1½
Sponge, pieces	3

Cotton mops and handles	2
Straight scissors for cutting wicks	2
Emery paper, sheets	12
Sand paper, sheets	12
Solder, pound	1
Rosin, pound	1
Muslin, yards	8

Brushes—

Chimney or bottle brushes	4
Flexible brushes for cleaning lamps	4
Flat brushes for spreading rouge and whiting on lenses and plate-glass	2
Sash-brushes	2
Paint-brushes (assorted) for painting inside of the lanterns	3
Coal-tar brushes	2
Whitewash brushes	2
Scrubbing-brushes	3
Hand dusting or counter brushes	2
Feather brushes	2
Sweeping brush	1
Wolf's-head brush	1
Silver-plate brushes	2

Paints, oils, etc.—

White zinc paint, ground in oil, for painting the interior of the lantern, pounds	25
Boiled linseed oil for mixing paint for use inside of the lantern, gallon	1
Spirits turpentine for mixing paint for use inside of the lantern, gallons	3
Putty for glazing purposes, pounds	5
Refined coal-tar for the outside of lantern, iron railings, and other iron work, but for no other use, gallons	3
Black paint, pounds	10
Green paint, pounds	5
Red lead (dry) (where required), pounds ..	5
Yellow paint (where required), pounds	5
Paints of the proper color for boats, pounds	10
Boiled linseed oil for colored paints, suitable quantity.	
Spirits turpentine for colored paints, suitable quantity.	
Drying for paints, suitable quantity.	
Window glass, of proper sizes, panes of each size	6

FOR A FOURTH-ORDER LIGHT.

Mineral oil (when a capillary lamp), gallons	140
Mineral oil (when a constant level lamp), gallons	175

Wick, yards	10
Chimneys, number	100
Safety matches, boxes	24

Implements and cleaning materials—

Buff or chamois skins for cleaning lenses and plate-glass of the lantern	3
Linen towels	10
Spirits of wine for washing lenses and plate-glass, gallon	1
Rouge-powder for polishing lenses and the plate-glass, ounces	8
Whiting for cleaning the lenses and plate-glass, pounds	5
Soap, brown, pounds	50
Crash or coarse linen, in lengths of $1\frac{1}{2}$ yards each, for use on lantern-floors and watch-room, pieces	3
Corn brooms	3
Corn brooms for screw-pile light-houses	2
Rotten-stone for cleaning brass work of apparatus, &c., pound	1
Sponge, pieces	2
Cotton mops and handles	2
Straight scissors (of the best quality) for cutting wicks	2
Emery paper, sheets	8
Sand paper, sheets	8
Solder, pound	1
Rosin, pound	1
Muslin, yards	5

Brushes—

Chimney or bottle brushes	3
Flat brushes for spreading rouge and whiting on lenses and plate-glass	2
Sash-brushes	2
Paint-brushes, assorted, for painting inside of the lanterns	3
Coal-tar brushes	2
Whitewash brushes	2
Scrubbing-brushes	2
Hand dusting or counter brushes	2
Feather brushes	2
Sweeping brush	1
Wolf's-head brush	1
Silver-plate brushes	2

Paints, oils, etc.—

White zinc paint, ground in oil, for painting the inside of the lantern, pounds	12 $\frac{1}{2}$
Boiled linseed oil for mixing paint for use inside the lantern, gallon	$\frac{1}{2}$
Spirits turpentine for mixing paint for use inside of the lantern, gallons	2

Putty for glazing purposes, pounds	5
Refined coal-tar for the outside of the lantern, iron railings, and other iron work, but for no other use, gallons	2
Black paint (where required), pounds	5
Green paint (where required), pounds	3
Red paint (dry) (where required), pounds	3
Yellow paint (where required), pounds	3
Paint for boats, &c. (where required), pounds	10
Boiled oil for colored paints, suitable quantity.	
Spirits turpentine for colored paints, suitable quantity.	
Drying for paints, suitable quantity.	
Window glass, of proper sizes, panes of each size	6

FOR FIFTH AND SIXTH ORDER LIGHTS.

Mineral oil (when a capillary lamp), gallons	85
Mineral oil (when a constant level lamp), gallons	90
Mineral oil (when a flat-wick lamp), gallons	70

All other supplies to be the same as for a fourth-order mineral-oil light.

MINERAL-OIL BEACON-LIGHT.

Mineral oil for locomotive head-light burner, gallons	175
Wick, dozens	6
Chimneys	100
Safety matches, boxes	24

Cleaning material, etc.—

Rouge-powder, ounces	6
Whiting, pounds	3
Linen towels	4
Crash, pieces	2
Buff skin	1
Spirits of wine, gallon	$\frac{1}{2}$
Soap, pounds	20
Flat brushes	2
Scrubbing-brush	1
Straight scissors	1
Paint-brushes	2
Sash-brush	1
Feather brush	1
Chimney brushes	2
Corn broom	1
Muslin, yards	5

Paints, oil, etc.—

White zinc paint, ground in oil, for painting the interior of the lantern, pounds	12 $\frac{1}{2}$
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Boiled linseed oil for mixing paint for use inside of the lantern, gallon.....	1
Spirits turpentine for mixing paint for use inside of the lantern, gallons.....	2
Drying for paint, suitable quantity.	
Putty for glazing purposes, pounds	5
Refined coal-tar for the outside of lantern, iron railings, and other iron work, but for no other use, gallons.....	2
If a separate station, supplies as for a sixth order, except oil.	

FOR STAKE LIGHTS.

Mineral oil for signal lanterns, gallons.....	45
Wick, dozens.....	6
Safety matches, boxes	24

Cleaning material, etc.—

Rouge-powder, ounces.....	6
Whiting, pounds.....	3
Linen towels.....	4
Crash, pieces	2
Buff skin.....	1
Spirits of wine, gallon.....	1
Soap, pounds.....	20
Flat brushes.....	2
Scrubbing-brush	1
Straight scissors	1
Muslin, yards.....	5

FOR LIGHTS HAVING CLOCK-WORK.

Spare cords	2
Clock-work brushes	4
Clock-oil, vials.....	2

FOR LIGHTS HAVING MECHANICAL LAMPS.

Spare cords	2
Sets of valves (or the requisite calf skin)	3
Clock-oil, vials.....	2

FOR LIGHTS HAVING FUNCK'S FLOAT LAMP.

Spare floats	3
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FOR STEAM FOG-SIGNAL STATIONS.

Lard oil for lubricating, gallons	10
Cotton waste, pounds	20
Tallow, pounds	15

Hand-brush	1
Corn brooms	2
Emery cloth, sheets	24
Oilers	2
Files, large size, assorted	4
Soap, pounds	20
Coal shovels	2
Oil, paints, turpentine, and coal-tar same as for sixth-order lights, where required.	
Coal screen	1
Canvas cover for the signal	1

SPECIAL FOR STEAM-SIRENS.

Hemp packing, pounds	5
Red lead, pounds	10
Round belting ($\frac{5}{8}$ -inch), feet	24
Connections for belting, pairs	4
Belt lacings	6
Punch	1
Emery cloth (No. O), sheets	4
Rubber cloth ($\frac{1}{2}$ -inch), square yard	1
Rubber cloth ($\frac{1}{4}$ -inch), square yard	$\frac{1}{2}$

FOR STEAM-WHISTLES.

Red lead, pounds	10
White lead, pounds	10
Hemp packing, pounds	2
Rubber cloth ($\frac{1}{2}$ -inch), square yards	$\frac{1}{2}$
Rubber cloth ($\frac{1}{4}$ -inch), square yards	$\frac{1}{2}$

FOR FOG-BELLS.

Clock-oil for lubricating machinery, vials	2
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FOR LIGHT-VESSELS.

Mineral oil for eight burners, gallons	500
Glass chimneys, one lantern, number	200
Wicks, one lantern, yards	50
Wicking for hand-lanterns and binnacle-lamps, one or two lanterns, pounds	2
Wicks for hand-lanterns, dozens	3
<i>Implements, cleaning materials, etc.—</i>	
Straight scissors for cutting wicks	2
Linon towels for cleaning apparatus and lanterns, for each lantern	12
Whiting for polishing reflectors, for each lantern, pounds	5

Rouge-powder for polishing reflectors, for each lantern, pound ..	1
Rotten-stone for cleaning brass work and backs of reflectors, pounds	3
Buff or chamois skins for each lantern	4
Spirits of wine for each lantern, gallons	2
Crash, pieces 1½ yards long, for floor-cloths, for each lantern...	4
Soap, salt-water, pounds	40
Soap, brown, in bars, for each lantern, pounds	60
Silver-plater's brushes, for each lantern	2
Flat brushes for putting rouge and whiting on the silvered parts of the reflectors and the plate-glass of the lanterns, for each lantern	2
Feather-brushes for each lantern	2
Chimney or bottle brushes for each lantern	6
Whitewash brushes	6
Scrubbing or clamp brushes for cleaning decks and paint work.	12
Hand dusting-brushes	4
Hand-swabs	4
Squillgees for decks	3
Corn brooms	12
Hickory or ash brooms	6
White zinc paint ground in oil, for painting the interior of the lanterns, for each lantern, pounds	12½
Paint of the distinguishing color of the vessel, of the best quality, pounds	200
White lead, pounds	50
Black paint, pounds	20
Refined coal-tar, for anchors, chains, exterior of lanterns, and all other iron work, gallons	10
Boiled linseed oil for mixing paint, gallons	20
Spirits turpentine for mixing paint, gallons	7
Drying, a sufficient quantity for the paint delivered.	
Sash-brushes, for each lantern	2
Paint-brushes, assorted	6
Coal-tar brushes (long handles)	2
Coal-tar brushes (short handles)	3
Putty, pounds	10
Spare glass, of the proper sizes, for each lantern, panes	6
Cotton mops and handles	2
Holystones, large and small size	4
Oakum, from new materials, for calking decks and sides of vessel, pounds	10
Solder, pounds	3
Rosin, pounds	2
Sponge, for each lantern, pieces	2

safety matches, for each lantern, boxes	72
bleached muslin for wiping and cleaning lamps, for each lantern, yards.....	8.

NOTE.—Any additional articles coming under the head of OUTFITS, which may be required to supply losses and worn-out articles, will be delivered according to the OUTFIT LIST; but in all cases worn-out and unserviceable articles must be accounted for before others can be issued in their place. All such articles must be kept and turned in to the supply vessel and receipts taken therefor.

OUTFIT LIST.

Any articles in this list required but not sent in the supply-vessel for delivery must be asked for by the district inspectors, to whom they will be sent, or authority given to procure them for delivery. All the enumerated articles on the printed list are (as far as possible) to be of a uniform kind and quality, and therefore should, as a rule, be sent from the general depot of supplies on Staten Island, New York. They are not to be purchased in the districts, except to meet cases of pressing necessity, or by previous authority from the Light-House Board.

One service-box, fitted according to pattern, and with compartments.

One boxwood or satinwood foot-rule, graduated to inches and tenths of inches, for measuring the height of flames when fully developed, and for measuring the distance of the crown of the burner below the focal plane of the lens.

One plummet and cord for adjusting lamp and burner.

One spirit-level, large size, for adjusting revolving machinery.

One spirit-level, small size, for adjusting lamp.

One circular-level, small size, for adjusting lamp.

One dripping-pan, for lamp burner when removed from lamp.

One dripping-pan, large size.

One or two dust-pans.

One wick-measure or calipers, for measuring the size of wicks.

One wick-mandrel for each size burner in use, for placing the wicks on the burners.

Two trimming-hooks for removing char from wicks.

Two sharp-pointed steel prickers, with wooden handles, for removing "thieves" from wicks while burning.

Two lamp-feeders.

One lucerne or lighting-lamp.

One valve-mold for the valves of mechanical lamps, if such are in use.

One set of valve-leather punches if mechanical lamps are in use.

One set of jack-screws for raising the lens chariot of revolving lights so that it may be cleaned or adjusted.

Two glass chimney lifters, covered with buckskin, for removing hot lamp-chimney from the burner. For first, second, and third order lights.

Two cork-screws for mineral-oil cans.

One tin match-box.

One time-marker for revolving lights.

One spare fly or governor for regulating the movement of the clock-work.

One spare sheet-iron damper and key for each station.

One set (4) of storm pane clamps.

One rouge-box, made double, with close top, marked "ROUGE-POWDER."

One whiting-box, made with close top, marked "WHITING."

One valve-leather box, made with close top, marked "VALVE-LEATHERS," for stations with mechanical lamps.

One box, made with close top, marked "WICKS."

Two flat tin pans, made with a lip, for pouring off dissolved rouge-powder or whiting.

Two sets of linen curtains, to be used exclusively for hanging up inside of the lantern, and never in the keeper's house.

Two white fine linen covers for the illuminating apparatus.

Two covers for the spare mechanical lamps.

Two linen aprons, made to come below the knees, and close up round the neck, with long sleeves, for each keeper and assistant to wear while employed about the apparatus.

One standard clock.

One marine clock for screw-pile light-houses and light-ships.

To each family living in a separate apartment:

One table lamp.

One hand lamp.

One hand lantern.

Two shades for table lamp.

For keeping grounds in order, &c.:

One spade.

One shovel.

One garden hoe.

One garden rake.

One pick or mattock, at light-stations of newly-cleared ground, to remove stumps and stones.

One grubbing hoe, where needed.

One scoop shovel.

One wood ax.

One batchet and handle.

One wood horse and saw.

One saw set.

One tool chest, where actually needed, and fitted only with *necessary* tools.

Two mats for tower stairs and watch-room.

OIL-ROOM OR CELLAR.

The necessary number of 100-gallon or 50-gallon oil-butts, each one made with air-tight cover, air and draw-off cocks, according to regula-

tion, and to be placed upon wood. The number and size of the butts to be regulated by the allowance of oil for the particular light-station for one year.

One or two oil-butts of 10 gallons each, for keeping drippings and waste oil for use in the dwellings and hand lamps and lanterns.

At lights where mineral oil is burned the oil will be delivered in 5-gallon cans, which must be kept tightly closed and in a cool and well-ventilated place.

One pargetized oil can at stations burning mineral oil, to contain the oil for daily supply.

Dripping buckets, one to each oil-butt, to be hung under the draw-off cocks to catch the drippings.

One or two tin oil-carriers, as may be required.

One oil-strainer, draw-off cock, &c., complete for the order of lens.

One tin oil-pump.

One or two tin funnels.

One brass funnel for filling mineral-oil lamps.

One set standard liquid measures, made of tin, and consisting of five pieces, viz, one gallon, half-gallon, quart, pint, and gill.

ARTICLES FURNISHED BY ORDER OF THE BOARD SPECIALLY OBTAINED FOR EACH STATION BEFORE DELIVERY.

One medicine chest (allowed only at isolated light-stations) with suitable medicines for the place.

One cooking stove and fixtures.

One lantern or watch-room stove and fixtures.

One row-boat, of the proper size, completely equipped.

One sail-boat, of the proper size, completely equipped, but not larger than one man can manage in ordinary weather.

BY ORDER OF THE LIGHT-HOUSE BOARD:

JOHN RODGERS,

Rear Admiral U. S. Navy, Chairman.

OFFICE OF THE LIGHT-HOUSE BOARD,

Washington, D. C., October 1, 1881.

Appendix V

List of Books in Office of Light-House Engineer, 12th District, 1884.
U. S. Lighthouse Establishment Correspondence. Letters Received
from 12th District Engineer and Inspector, 1883-84, Vol. 600, Part
II, pp. 485-496, January 7, 1884.

Office of Light-House Engineer,
Twelfth District.
San Francisco, Cal., January 7th, 1884

Chairman of the Lt. Ho. Board,
Washington, D. C.

Sir:

In compliance with instructions in Boards letter of Dec. 21st, 1883, I have the honor to submit a list of books found in this office when I assumed charge of it and now on hand.

It is not known that all these books were furnished by the Board but they are all accounted for as public property on my Return of Office Furniture, Instruments, and Miscellaneous Articles.

Though all of these books are or may become useful here for purposes of reference any of them desired for the Boards library [may] be spared.

As will be seen by the list; there are several books of which I have more than one copy; but these cases are all of publications by the Light House Board.

	Vols.
Aids to Navigation 1881	1
Annual & Incidental Supplies	1
Brightly's Digest	2
Cost of Lens Ill. Apparatus &c	1
Descriptions of Funcks H. F. Lamp	1
" " F. Browns Pat. Fog Siren	1
Digest of Opinions of Judge Adv'te General	1
Documents Relating to Light Houses	
1789 & 1871	1
Extracts from British Lt. Ho. Reports	3

Executive order Relating to the Admissions to the L. H. Service	1
Extracts from Edinburgh Review of Light Houses 1880	1
General Orders Lt. Ho. Board	1
" Laws of State of Cali., 1850 to 1864	1
Instructions to Lt. Ho. Keepers 1881	2
Laws Relating to Acquisitions Title	1
Lists of Illuminating Apparatus	2
Laws of States Relating to Lt. Ho. Sites	2
Laws and Regulations Relating to L.H. Estb. 1880	1
Light House Papers 1861	1
Light House Laws & Appropriations 1789- 1855	1
Laws of U.S. Relating to Improvements of Rivers & Harbors	1
List of Allowances to Lt. Stations 1881	1
Light House Laws & Appropriations 1856 to 1869	1
Laws Relating to the Lt. Ho. Establishment	1
Light House Lists 1873	
L.H. Lists Atlantic, Pacific & Lake Coasts 1877-78 & 80	5
Laws of Oregon 1845-1866-1870-	3
" Relating to Treasury Department with Index	1
Methods of Distinguishing Lights - Babbage	1
[Illegible name] Upon Light House Illumination of the Coast of France	1
Management of Fog Signals	1

Organization & Duties of the L.H. Board	6
Pacific Encyclopaedia	1
" Coast Directory 1880-1881	2
Reports of Lt. Ho. Board 1872 to 1882	11
Rules & Reg. U.S.L.H. Estb 1863-1870	2
Regulations Relating to the Life Saving	
Service	1
Revised Statutes U.S. 1878	1
Specifications of Lt. Ho. 1871	1
Sailors Pocket Book	1
Specifications for Keepers dwellings	
[illegible] Sta.	1
Statutes of California 1865-1872	4
San Francisco Directory 1881-82-83	3
U.S. Treasury Register 1875 & 1879	2
U.S. Light House Establishment Extracts	
from Appletons Encyclopaedia	1
United States Government	1
[Illegible name] Military Dictionary	2
Websters Dictionary	1
" Royal Octavo Dictionary	1

Very respectfully
Your Obed't. Serv't.
A. H. Ayton
Capt of Engrs
Engr 12th L.H. Dist.

Appendix VI

Report on Catch-Water Structure, Point Loma, 1891. U. S. Lighthouse Establishment Correspondence, Letters Received from the 12th District Engineer, 1891-92, Vol. ?, pp. 107-117.

U. S. Light-House Engineer

Twelfth District,

Room 89, Flood Building,

San Francisco, Cal., Nov. 25, 1891

Subject: Water shed at Point Loma light station Cal. refers to false reports of Keeper Israel concerning same.

The Light house Board

Washington, D. C.

Sirs:

In consequence of authority granted to the Board, I commenced during the past summer, to build a catch-water area at Point Loma Cal. light station containing about 6400 square feet of area - for this purpose I hired an expert mason and a couple of laborers, bought the best cement available on the Coast, and sent men and material to this light station with detailed instructions of what was desired to be done. The work was completed on or about Oct. 30th 1891. Frequent detailed reports from the mason in charge of the work were made to my office, so that [illegible] of the character, condition and [illegible]. On Oct. 31st I received a telegram from Keeper Israel of Point Loma light station, asking me not to pay the mason for work done until I again heard from him (Israel) by mail. On or about Nov. 2d 1891, the mason reported at my office the completion of his work and furnished me with a rather long written description of same and made statements concerning Mr. Israel's interference as well as intermeddling with the work and with some of my employees. On Nov. 3d a letter of which the enclosed is a copy reached me, and is the letter referred to by Keeper Israel in his telegram of Oct 31st.

On showing this letter to Mr. Glanz; the mason herein referred to, I asked for an explanation of same, he informed me

that there was no explanation, that either Israel was lying or that the catch-water blocks therein referred to had been broken by force or with malicious intent since he Glanz had left the station on Oct. 28th 1891. Glanz even offered [sic] to go to Point Loma with me at his own expense to prove [illegible] had been well done. I therefore [illegible] Point Loma as soon as practicable after the [receipt of?] Israel's letter, sent another first class mason to the station with 12 barrels of identical brand of cement as that from which the catchwater had been constructed to make the necessary repairs and went personally to the station to see for myself the character of work done and to investigate matters asserted or insinuated in Israel's letter. I reached Point Loma on Nov. 9th accompanied by my mason, the 12 barrels cement reached the station about the same time - I found the catch-water structure to be so perfect and satisfactory both in workmanship and material as to have no hesitation in pronouncing it by far the finest piece of work in the district and superior to any thing of the kind that I have ever seen in the United States. I found six blocks of the cement covering (which was only half an inch thick) with the corners cracked, the cracks being so small that I could not get the point of the blade of my penknife into them, and each crack being from three to seven inches in length. None of these cracks would admit a single drop of water into or through them or could be of [illegible] to the catchwater. The cracks [illegible] in the side walls, were as diminutive as those [in] the catchwater proper and are due to a little too rapid drying of the cement in an exceptionally dry climate in hot weather. After spending several hours in a critical examination of this work, there was nothing to do, except to send my mason back to San Francisco, return there myself and wonder at the lying capacity of Keeper Israel. There were absolutely no repairs that could be made or to be made on this catchwater basin.

It may seem strange to the Board that I should go to Point Loma, take a mason and cement with me, to make repairs until I knew what repairs were necessary, but the explanation is this; the station was practically out of water, there had been no rain for six months or more, it was already past the time for rains to commence, and if the catchwater was broken up as Keeper Israel had reported it, it must be repaired immediately, as the cost of the repairs would be insignificant compared to the cost of hauling water to this station from the nearest available point about 10 miles distant. The falsehoods contained in Mr. Israel's letter [illegible] The San Diego papers [made] of the matter, pronounced the work and cement [bad?] and altogether threw discredit on the Light House Establishment. The light house Inspector was en route to San Diego on his quarterly inspection and supply tour, and I wrote him fully about the catchwater structure, also sent him a copy of Keeper Israel's letter and asked him to examine the work. This morning I saw Lt. Commander Percy and he speaks in highly commendatory terms of the catchwater. I enclose a letter from Mr. Bolan, the mason whom I sent to Point Loma, to make the supposed necessary repairs. Mr. Bolan has built nearly all the catchwater basins in the 12th district, and would probably have built this one, but he was engaged at the time on North-West Seal rock lighthouse.

While at Point Loma I made photographs of the catchwater basin from various points some copies of which are enclosed.

I have also to report that a few weeks ago Keeper Israel sent up to this office [illegible] of oil of his lamps. The supply pipe to the float chamber at its junction with the [illegible] was completely closed so as to be air tight. It had evidently been closed by means of a cold chisel within the reservoir, as the marks of the chisel were perceptible on the pipe. In one minute with an ordinary centre punch, the supply pipe was reopened in this office and

returned en route to the station. I also charge Keeper Israel with deliberately cutting out the concrete from the bottom of one of the privy [illegible] connected with his house at the new station and failing to replace the same, though notified by the Inspector to do so, about 3 months prior to my recent visit to the station.

In conclusion, I can see no excuse for Keeper Israel's conduct in the matters herein referred to, and there is certainly nothing to warrant him in deliberately making a false official report concerning the condition of the water shed.

As to Mr. Israel's report about the mason putting up a "job on me" about the cement, all I have to say is that the mason did recommend a Portland cement to [illegible] per barrel, a cement which the [illegible] until he placed his trowel in it at Point Loma and which I pronounce superior to any cement I ever saw and which has a tensile strength of over 700 lbs. per square inch.

Respectfully submitted,

H. H. Heuer

L. H. Engineer

[illegible] Nov. 11th 1891

Major W. H. Heuer

U. S. Engineer

L. H. Engr.

Sirs:

By the keepers report in regard to the new watershed at Point Loma, it was supposed that the shed would require some work and material to put it in good order for the purpose for which it was intended. In accordance with your orders I have been to the Station and examined the shed. I have to say that the shed was in first rate order, and did not require any labor or material to change the condition of it.

The workmanship is good, and the cement appeared to be as good a quality as any on the coast. I consider it the best piece of work in the way of water-shed of any in this District. [illegible] was made with [illegible] to haul the twelve barrels of cement shipped to San Diego to the Light Station [at] \$4-per ton and to get a receipt from the Keeper that it has been delivered, and to send bill to your office.

Respectfully

(signed) G. W. Bolan

A true copy

W. H. Heuer

Major of Engineers U.S.A.

Engr 12th Lt. Ho. Dist.

[Enclosure: Keeper Israel's letter of November 3, 1891. First page missing.]

[illegible] left side cracked and [illegible] J. S. Rennolds in walking over [illegible] them [illegible] under his feet, placing the balls of his feet on the corners of two blocks and shaking him self up and down broke them both off, the wall is also cracked in many places [illegible] he is an agent for the sale of this cement and he wanted Thompson to act as agent under him [I] hear and take a share of the per centage and told him how he put up the job as he called it on you to induce you to buy this cement. he Glanz says he first sent a Jew to you to recommend it to you. Then a day or two after he came to your office and when you spoke to him about it he recommended it and you bought it. now all the cement men in San Diego say that it is a very poor cement and are wondering that the Government should buy it in place of a good article [illegible] told that he said the [illegible] left that he would swear to any thing in the world to houst [?] me out of hear, well let him do it. I did not report the water shed in good order and as [?] my witness the water shed remains hear, dont take my word for this. Send a man from there or name any one hear let him come and examine for you and I will prove everything I have said.

Very Respectfully

(signed) R. D. Israel

A true copy

W. H. Heuer

Major of Engineers, U.S.A.

Engineer 12th Lt. Ho. Dist.

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As the nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural and cultural resources. This includes fostering wise use of our land and water resources, protecting our fish and wildlife, preserving the environmental and cultural values of our national parks and historical places, and providing for the enjoyment of life through outdoor recreation. The department assesses our energy and mineral resources and works to ensure that their development is in the best interests of all our people. The department also promotes the goals of the Take Pride in America campaign by encouraging stewardship and citizen responsibility for the public lands and promoting citizen participation in their care. The department also has a major responsibility for American Indian reservation communities and for people who live in island territories under U.S. administration.