(No Model.)

W. E. HADLOCK.

SEARCH LIGHT.

No. 456,408. Patented July 21, 1891.

Fig. 1,

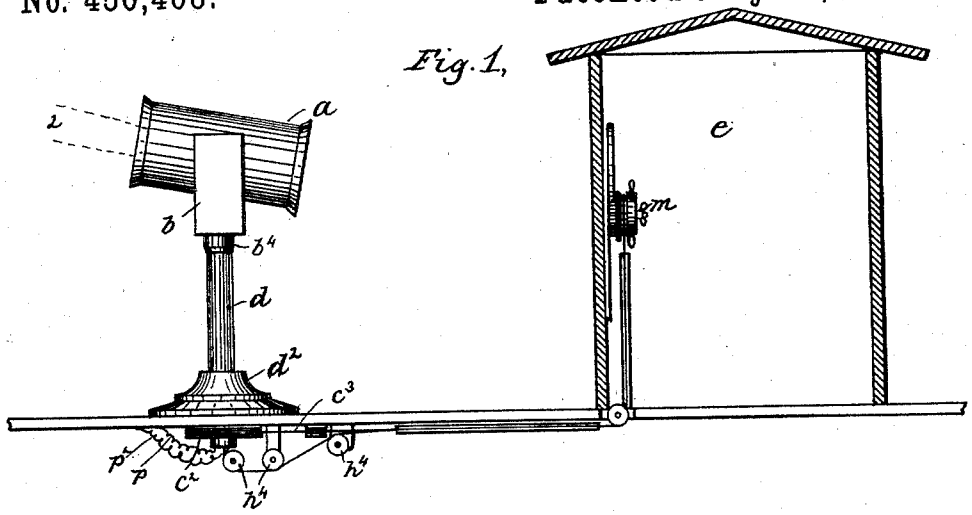


Fig. 2,

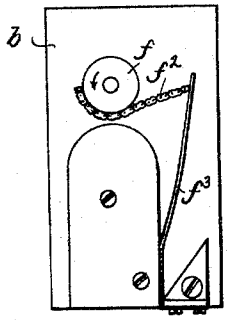


Fig. 3.

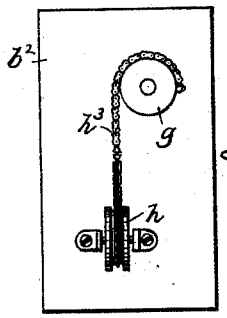


Fig. 4,

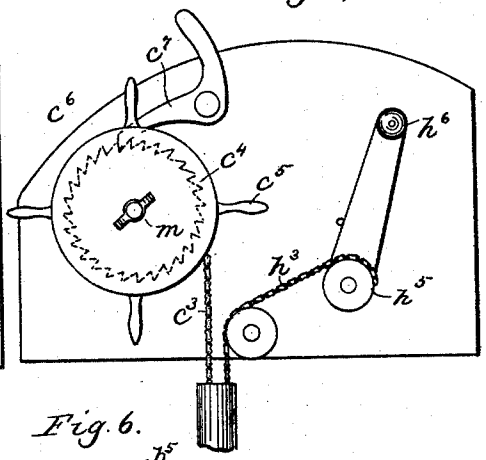


Fig. 5,

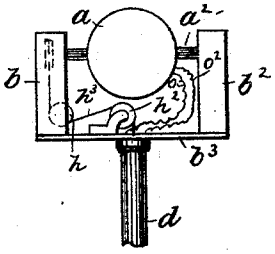
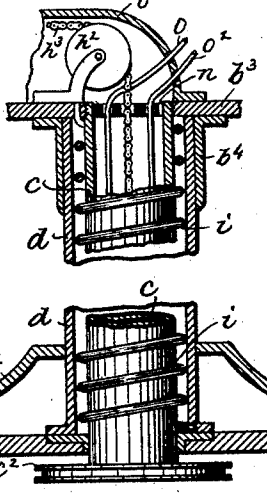


Fig. 6.



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UNITED STATES PATENT OFFICE.

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SEARCH-LIGHT.

SPECIFICATION forming part of Letters Patent No. 456,408, dated July 21, 1891.

Application filed March 12, 1890. Serial No. 343,661. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM E. HADLOCK, of Wenham, county of Essex, and State of Massachusetts, have invented an Improvement in Apparatus for Operating Search-Lights, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

My invention relates to search-lights such as are employed on vessels; and it consists in means for giving a universal movement of the lamp, whereby the beam of light thrown from the said lamp and its reflector may be turned in any direction by a person at any required distance from said lamp—as, for example, in the pilot-house of the vessel—the said lamp being supported at some point outside the pilot-house—as, for example, at the bow of the vessel.

The invention is embodied in a lamp supporting and operating apparatus comprising a standard or upright for supporting the lamp, which may be firmly secured to the deck of the vessel or other part of the structure in which the lamp is to be used, the said upright containing a shaft capable of rotary movement therein, which shaft is connected with bearings for a horizontal shaft or axle, upon which the lamp is directly supported, and suitable connections are provided by which the lamp may be turned upon its horizontal axis to any required inclination to a vertical plane, while the upright shaft may be turned to throw the beam of light from the lamp to any desired direction in the horizontal plane, the combination of the two movements, which are made independently of one another, giving a universal movement to the lamp, by which the beam of light may be thrown in any desired direction.

Means are provided for affording an electrical connection between the lamp and conductors supported on the stationary part of the structure, so that an electric-arc lamp or any other required form of electric lamp may be used for producing the light.

Figure 1 is a side elevation, partly in section, of a search-light and apparatus for operating the same embodying this invention; Fig. 2, an enlarged detail showing one of the bearings of the horizontal axis of the lamp and means for moving the same; Fig. 3, a similar view of the other bearing for the horizontal axis of the lamp and mechanism co-operating therewith; Fig. 4, a front elevation of the appliances which are directly acted upon by the operator for manipulating the lamp; Fig. 5, a front elevation of the appliances for supporting and operating the lamp; and Fig. 6 a longitudinal sectional detail, on a larger scale, of the standard and adjacent parts for supporting and producing the horizontal movement of the lamp.

The lamp proper, with a suitable reflector for throwing the light in a substantially parallel beam, is inclosed in a suitable case a, provided with lateral projections a^2, constituting a horizontal axle upon which it turns in bearings in uprights b b^2 at the ends of a cross-piece b^3, connected with a tubular shaft c, (see Fig. 6,) which extends through a tubular standard or upright d, which is securely fastened on the structure on which the lamp is to be used—as, for example, upon the deck of a vessel.

The lamp itself may be of any desired construction, as the means for producing the illumination form no part of the present invention, although provision is made for the use of an electric-arc lamp supplied with current from conductors suitably supported on the stationary part of the structure.

It will be understood that by turning the lamp-case a on its horizontal axis a^2, and by turning the supporting-frame b b^2 b^3 for said axis on the vertical axis of the tubes c d, a universal movement is afforded for the lamp by which the beam of light may be thrown in any desired direction. These movements are produced by the operator at any convenient point—as, for example, in the pilot-house e of the vessel—by the following mechanism:

In one of the bearing uprights, as b, (see Fig. 2,) the axle a^2 of the lamp-case has fixed upon it a pulley f, having connected with it a chain f^2, which is connected with a spring f^3, tending to turn the shaft a^2 in the direction of the arrow and to thus throw the beam of light, the direction of which is indicated in dotted lines at a^2 in Fig. 1 downward. In the other bearing-frame the other end of the axle a^2 has fixed upon it a pulley g, having connected with it a chain h^3, passing over a

pulley h near the lower end of said bearing-frame, and another pulley h^2, supported over the end of the standard d, as shown in Fig. 5, said chain h^3 passing down through the vertical tubular axis c of the frame and over suitable guide-pulleys h^4 into the pilot-house e, where it is connected with a hub or drum h^5, (see Fig. 4,) provided with a crank-handle h^6, which may be turned by the operator in the direction to wind the chain h^3, and thus cause the lamp to be turned in the direction to throw the beam of light upward, this operation winding the chain f^2, Fig. 2, upon the pulley f and straining the spring f^3, which turns the lamp in the opposite direction when the operator permits the handle h^6 to be turned in the direction to incline the chain or connector h^3. By these means the lamp may be rocked or turned in a vertical plane about a horizontal axis a^2, and as the flexible connector h^3 passes through the axis of the supporting-upright d such movement may take place independently of and be unaffected by the movement of the entire frame $b\ b^2\ b^3$ in a horizontal plane or about the vertical axis, which movement is produced as follows: The tubular axle c, that is connected with the frame b^3, passes wholly through the stationary tubular upright d, and is provided at its lower end with a pulley c^2, having connected with it a chain c^3, which passes over suitable guide-pulleys and is connected with a winding drum or pulley c^4, provided with suitable handles c^5, to be manipulated by the operator, thus turning the drum c^4 in the direction to wind the chain thereon, tending to turn the tubular axis c and the frame $b\ b^2\ b^3$ in one direction to shift the direction of the beam of light horizontally. The said parts are turned in the opposite direction by a spring i, (see Fig. 6,) having one end connected with the tubular axle c and the other end made fast—as, for example, at the lower end of the upright d—the said spring tending to turn the axle c^2 in the direction to unwind the chain c^3 from the drum c^4, and thus to turn the lamp in the opposite direction in the horizontal plane to that in which it is turned by winding the chain upon the drum c^4. If desired, the said drum c^4 may be provided with a ratchet, as shown in dotted lines at c^6, (see Fig. 4,) co-operating with a pawl or dog c^7, which prevents the lamp from turning under the stress of the spring i until the said dog is released by the operator and the drum c^4 permitted to turn back under the action of the spring i.

If desired, a clamping device, as m, (see Figs. 1 and 4,) may be employed to lock and retain either one or both of the chain-winding drums c^4 and h^5 in any desired position until occasion arises to change the direction or the beam of light from the lamp.

The frame b^3 is provided with a downwardly-projecting hood or collar b^4, (see Fig. 6,) covering the upper end of the tubular standard d and protecting the joint from the weather, and the chain h^3 may be covered by suitable casing, as shown at b^5, Fig. 6.

In order to provide suitable means for conveying an electric current into the lamp-case a when an electric light is used, the tubular shaft c is provided with any desired number of washers n, (see Fig. 6,) of insulating material, each provided with a central opening for the chain h^3 and other openings for electric wires, which are thus incased in the upright but insulated therefrom. At the upper ends of said uprights the said wires may be connected by suitably-flexible portions $o\ o^2$ to the lamp-case a, said flexible portions accommodating the movement of the lamp on its horizontal axis, while at the lower end of the tube c the conductors may be provided with suitably-flexible portions $p\ p^2$ for accommodating the movement of the lamp on its vertical axis, the said flexible portions being connected with stationary conductors leading to the generator of electricity by which the lamp-operating current is produced.

The herein-described mechanism affords a very efficient and durable means for operating search-lamps on vessels and other structures requiring a universal movement of the lamp for varying the direction of the light at will, the said lamp being manipulated by an operator stationed at any desired distance from it.

I claim—

1. The combination of the stationary tubular upright with the tubular axle working therein, the cross-piece connected with the upper end of said tubular axle, provided with uprights, the lamp supported on the horizontal axle having its bearings in said uprights, and the sleeve connected with said cross-piece and extending down over the upper portion of the stationary upright, substantially as and for the purpose described.

2. The combination of the stationary tubular upright with the tubular axle working therein, the frame supported on said axle, the lamp supported on a horizontal axle having its bearings in said frame, the spring connected with the said horizontal axle and tending to turn it in one direction, and the chain extending through the vertical axle and connected to turn the horizontal axle in the opposite direction, substantially as described.

3. The combination of the stationary tubular upright with the tubular axle working therein, the frame supported on said axle, the lamp supported on a horizontal axle having its bearings in said frame, the said vertical tubular axle being provided with a pulley and a chain connected therewith, and a spring tending to turn the said vertical axle in the direction to wind the said chain on said pulley, substantially as described.

4. The combination of the stationary tubular upright with the tubular axle working therein, the frame supported on said axle, the lamp supported on a horizontal axle having

its bearings in said frame, chain passing through said vertical axle and connected with said horizontal axle, electric conductors passing through said vertical tubular axle and connected with the said lamp-case, and insulating-washers in said vertical axle having openings for the said conductors and chain, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WILLIAM E. HADLOCK.

Witnesses:
JOS. P. LIVERMORE,
JAS. J. MALONEY.