Aug. 2, 1960 W. P. FOX 2,947,856

REMOTE CONTROLLED MOVABLE LIGHT UNIT

Filed Nov. 15, 1957 2 Sheets-Sheet 1

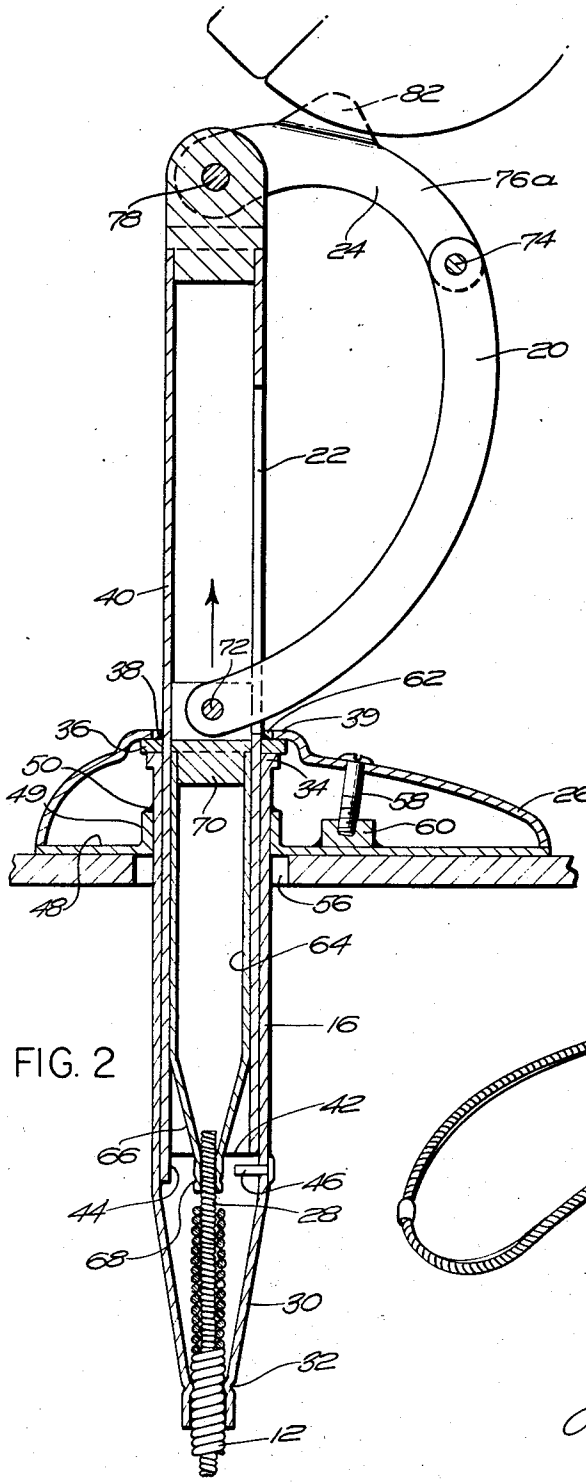


FIG. 2

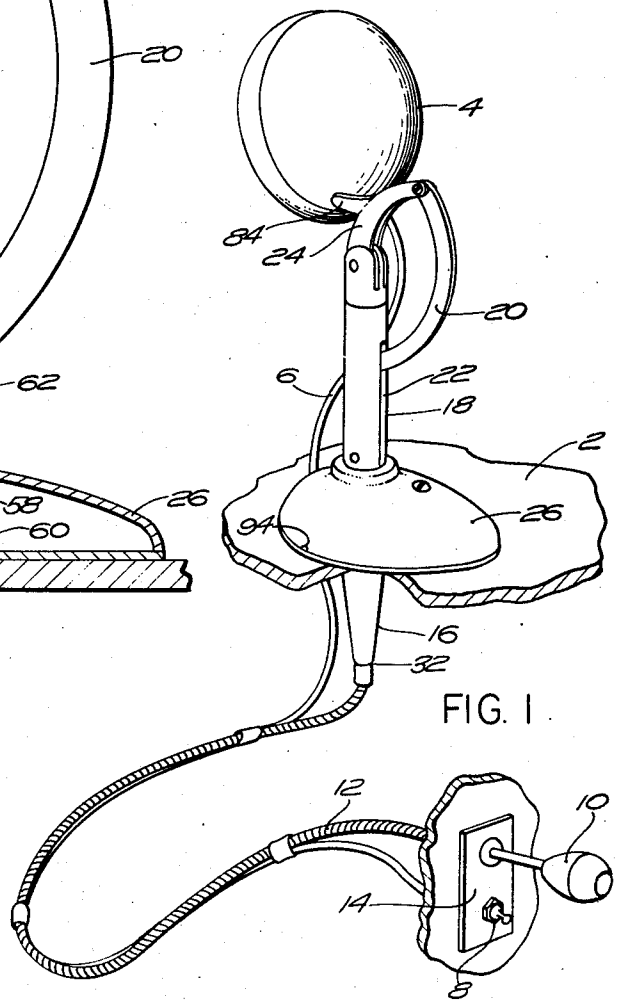


FIG. 1

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REMOTE CONTROLLED MOVABLE LIGHT UNIT

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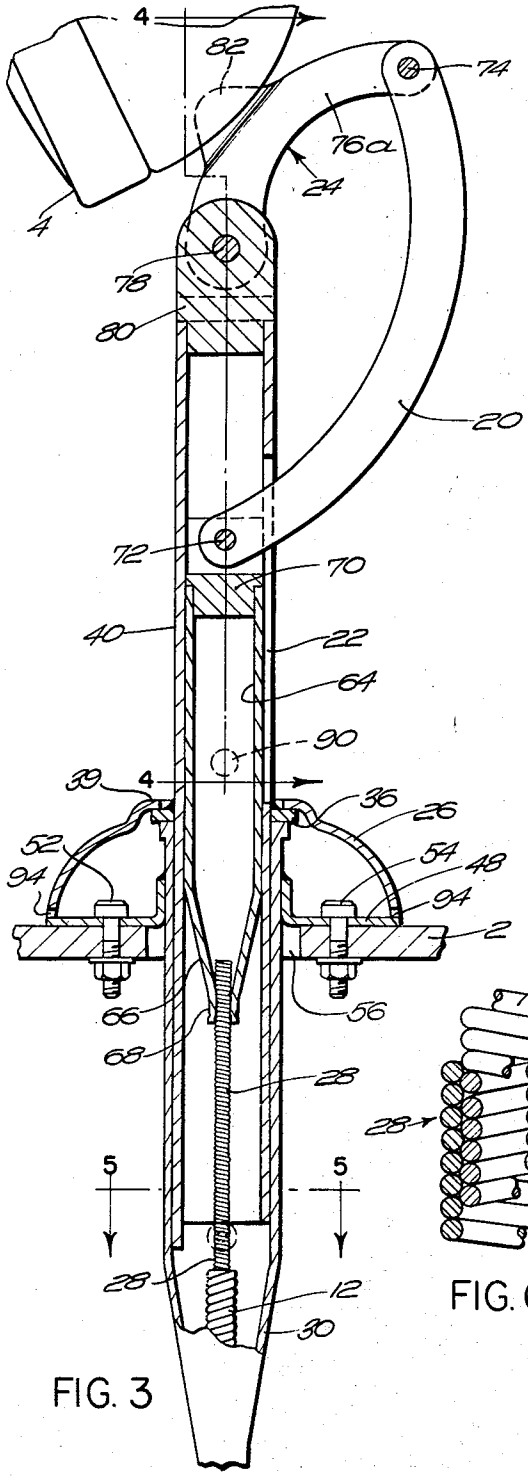


FIG. 3

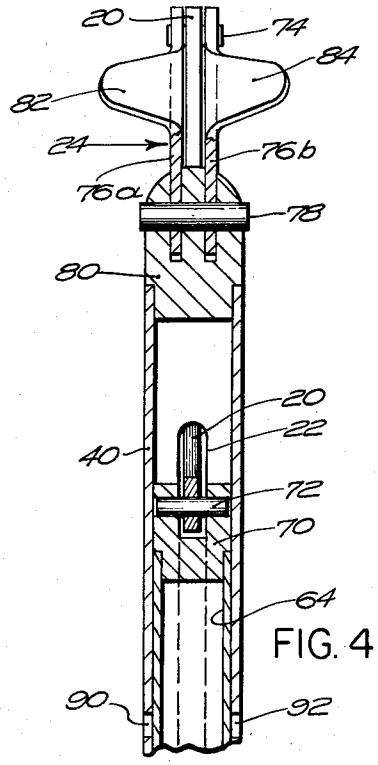


FIG. 4

FIG. 6

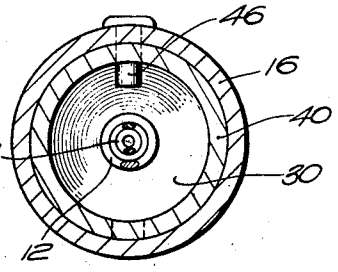


FIG. 5

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REMOTE CONTROLLED MOVABLE LIGHT UNIT

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1 Claim. (Cl. 240—61.13)

This invention is concerned with a new and novel type of remote controlled mounting for a searchlight or spotlight whereby the light may be rotated through an arc of close to 360 degrees and independently or simultaneously may be tilted vertically through an angle of approximately 90 degrees running from about 45 degrees above horizontal to 45 degrees below horizontal.

Considerable use for lights of the type in question is found in the operation of boats at night. The construction herein disclosed enables the light to be mounted at the most advantageous location as, for example, on the top of the cabin with the manual controls for swinging the light to the desired position extending to the helmsman's station or elsewhere as may be preferred.

It is essential in the construction of the mounting for this type of light that the parts be so arranged that they will be influenced as little as possible by rain and spray, and furthermore the construction should insure against water passing through the cabin or deck where the light may be located.

Accordingly, a further object of the invention is the provision of mounting means which will be substantially impervious to rain and spray so far as such moisture could affect the movement and operation of the various parts and also the provision of a construction for supporting the light on the selected surface in such manner that water cannot leak through to the underside.

Another object of the invention is to provide a light mounting which may be constructed of inexpensive readily available materials, such as tubing, bar stock and simple castings or stampings.

These and other objects of the invention will become more apparent as the description proceeds with the aid of the accompanying drawings in which

Fig. 1 is a perspective view of the complete assembly showing the light mounted on a selected surface and the controls running to a remote position.

Fig. 2 is a vertical sectional elevation showing the position of the parts when the light is tilted to maximum up position.

Fig. 3 is a vertical sectional view similar to Fig. 2 but with the parts shifted so that the light is tilted to the maximum down position.

Fig. 4 is a vertical section taken on the line 4—4 of Fig. 3.

Fig. 5 is a horizontal section taken on the line 5—5 of Fig. 3.

Fig. 6 is an enlarged sectional view showing the construction of a flexible shaft suitable for use in the actuation of the light supporting elements.

Referring first to Fig. 1, the complete unit is shown in installed position. In this case it has been mounted on any selected surface 2 which might be the top of the cabin or deck of a boat. The light housing 4 will ordinarily contain a sealed beam light adapted to be actuated by any suitable source of electrical power fed to it through the wires 6 which are controlled by a switch 8 located preferably near the operator.

A control handle 10 actuates a flexible shaft which extends throughout the length of the flexible housing 12 running from the panel 14 to the lower end of the mounting tube 16. The construction is such that when handle 10 is pulled out the lamp will be tilted upwardly, when handle 10 is pushed in the light will be tilted downwardly, and when the handle is rotated to the right or left the lamp will be turned to the left or right respectively. It will be understood that the handle may be simultaneously rotated in either direction while being moved toward or away from panel 14 so that a compound motion will be given to the light 4.

Further elements of the construction appearing in Fig. 1 which will be explained more in detail hereinafter are the pedestal tube 18, link 20, the lower end of which extends inwardly through a vertical slot 22 in pedestal tube 18, a two-part pivoted arm 24 to which is secured the light housing 4, and a housing cap 26 which not only provides an ornamental cover for the base but also serves to retain some of the various elements in proper vertical position.

Referring now more particularly to Figs. 2 and 3, it will be seen that the flexible housing 12 contains a flexible shaft 28 which is slidable and rotatable therewithin. The end of housing 12 is positioned within and secured to the small end a tapered portion 30 of a mounting tube 16. The crimping at 32 is sufficient to maintain the flexible housing immovable with respect to mounting tube 16. The mounting tube terminates at its upper end at 34, and resting thereon in rotatable relation is a circumferential extension in the form of a retainer ring 36 which is welded or soldered as at 38 to a pedestal tube 40. The pedestal tube fits comfortably within mounting tube 16 and is freely rotatable with respect to mounting tube 16 about its longitudinal axis. The lower end of pedestal tube 40 is indicated at 42, and at one side thereof there is a downwardly extending finger 44 which upon sufficient rotation of pedestal tube 40 within mounting tube 16 will engage pin 46 extending inwardly from and carried by mounting tube 16. In this manner rotation of pedestal tube 40 is limited to something less than 360 degrees.

While the retainer ring 36 resting on the upper end of mounting tube 16 acts to limit downward movement of pedestal tube 40 in mounting tube 16, there is also provided means for preventing upward movement of pedestal tube 40. This, in the form shown, comprises a base plate 48 having a flanged opening through which extends tube 16. The flange 49 is welded or soldered to mounting tube 16 at 50. The base plate 48 may be secured to the cabin top or deck 2 by bolts 52 and 54 shown in Fig. 3 with the mounting tube extending downwardly through a suitable hole 56. The housing cap 26 previously referred to is in turn secured to base plate 48 by the screw 58 which extends through a small hole in the housing cap and into the threaded boss 60 that is integral with the base plate 48. Housing cap 26 has a suitable aperture 62 therethrough, the periphery 39 of which surrounds pedestal tube 40 and overlies the outer portion of the upper surface of retainer ring 36. The parts are so designed that when housing cap 26 is in final position the pedestal tube and connected retainer ring may be rotated without undue friction against the upper end of mounting tube 16 and the under side of the overlapping part 39 of housing cap 26. By the aforesaid construction, pedestal tube 40, while rotatable, is maintained in fixed vertical relation with mounting tube 16.

Slidably positioned within pedestal tube 40 is a plunger 64, the lower end of which is swaged to a taper as at 66 and crimped at 68 about the end of flexible shaft 28. The connection is sufficiently secure so that

upon longitudinal movement of flexible shaft **28** the plunger **64** will be moved up or down within pedestal tube **40** and upon axial rotation of flexible shaft **28** the plunger **64** will be correspondingly axially rotated.

Secured to the upper end of plunger **64** is a plunger cap **70**. The upper end of plunger cap **70** is bifurcated to receive the lower end of link **20** which is pivotally secured thereto by pin **72**. Link **20** extends laterally through the slot **22**.

The other end of link **20** is pivotally connected at **74** to the two-part arm **24**, which in turn is pivotally secured at **78** to the pedestal tube cap **80** fastened within the upper end of pedestal tube **40**. The two elements of the two-part arm **24** are designated **76***a* and **76***b*, and these elements have laterally extending ears **82** and **84** to which the light casing is secured by soldering, riveting or otherwise.

The flexible housing **12** is a conventional form available on the market and comprises a helical wire housing within which is freely slidable and rotatable the flexible shaft **28**. A detail of the flexible shaft is shown in Fig. 6 in which the flexible shaft consists of an inner wire **86** wound helically to form a left-hand thread and an outer wire **88** wound tightly thereon in the opposite direction and forming a right-hand thread. By combining oppositely wound inner and outer wires in this manner, the flexible shaft **28** will be effective in tension, compression and tortion, and it thereby provides an effective means for communicating longitudinal and rotary motion to plunger **64** through suitable movement of the associated handle **10**.

When the complete unit has been appropriately mounted as indicated in Fig. 1, it may be actuated in the following manner: By pushing handle **10** in, plunger **64** will be moved up within pedestal tube **40** to shift upwardly the position of link **20** thereby tilting the light housing forwardly and downwardly. Pulling out on handle **10** causes link **20** to be pulled downwardly which will swing arm **24** downwardly to tilt the light housing back and upwardly. Rotation of handle **10** to the right, for example, will cause corresponding rotation of plunger **64** and lever **20**. Since lever **20** passes through slot **22** in pedestal tube **40**, the pedestal tube will likewise be rotated to the same extent as plunger **64**. Thus the pedestal tube cap **80** carrying the light housing **4** is correspondingly rotated so that all of the linked elements **20**, **24**, and their corresponding pivots, **72**, **74** and **78**, remain in correct operating alignment.

From the foregoing explanation it will be seen that a construction has been provided in which a search or spot light or the like may be controlled from a remote position to be tilted up or down and to be rotated through almost a complete circle. The purpose of limiting rotation of pedestal tube **40** through engagement of finger **44** with pin **46** is to prevent excessive twisting of the electrical connection which would ensue if rotation were not limited.

In order to place pin **72** in position in the bifurcated ends of plunger cap **70** and through the hole in the end

of lever **20**, two small holes **90** and **92** are provided on opposite sides of pedestal tube **40**. These holes may subsequently be plugged if desired, but since they are small and located on the sides of the tube and, during ordinary operation, backed up by plunger **64**, there is little chance of water entering.

From a consideration of the construction heretofore described, it will be seen that no water can reach the interior of the boat. Any water entering between housing cap **26** and retainer ring **36** will land on base plate **48** to be drained away through drain holes **94**. Any water attempting to enter through slot **22** will be blocked by plunger **64** and no water can enter between pedestal tube **40** and mounting tube **16** because of the welded or soldered seal **38** on the upper side of retainer ring **36**.

It is my intention to cover all changes and modifications of the example of the invention herein chosen for purposes of the disclosure which do not constitute departures from the spirit and scope of the invention.

I claim:

A remote controlled movable light unit comprising a mounting tube, a slotted pedestal tube closed at its upper end and rotatably positioned within said mounting tube, means for securing said pedestal tube and said mounting tube against relative longitudinal movement, means for substantially preventing the entry of water between said mounting tube and pedestal tube, a plunger tube shorter than and wholly within said pedestal tube, said plunger tube being slidably mounted within said pedestal tube and having its upper end closed by a plunger cap, a light housing pivoted to said pedestal tube, a linkage extending from said plunger cap through the slot of said pedestal tube to said light housing for tilting said housing when said plunger tube is moved axially with respect to said pedestal tube and for rotating said pedestal tube and light housing when said plunger tube is rotated about its longitudinal axis, the lower ends of said mounting tube and plunger tube being tapered with the lower ends of the pedestal tube and plunger tube being within and protected by the lower end of the mounting tube, a flexible shaft and flexible housing extending through the tapered end of said mounting tube, the said flexible housing terminating below the downmost position of said plunger tube, the flexible shaft extending beyond said flexible housing and into the tapered end of said plunger tube, said mounting tube tapered end secured to said flexible housing and said plunger tube tapered end secured to said flexible shaft whereby axial movement of said flexible shaft with respect to said flexible housing will move said plunger tube axially with respect to said pedestal tube and rotation of said flexible shaft will cause rotation of said plunger tube, linkage and pedestal tube.

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