

July 2, 1963

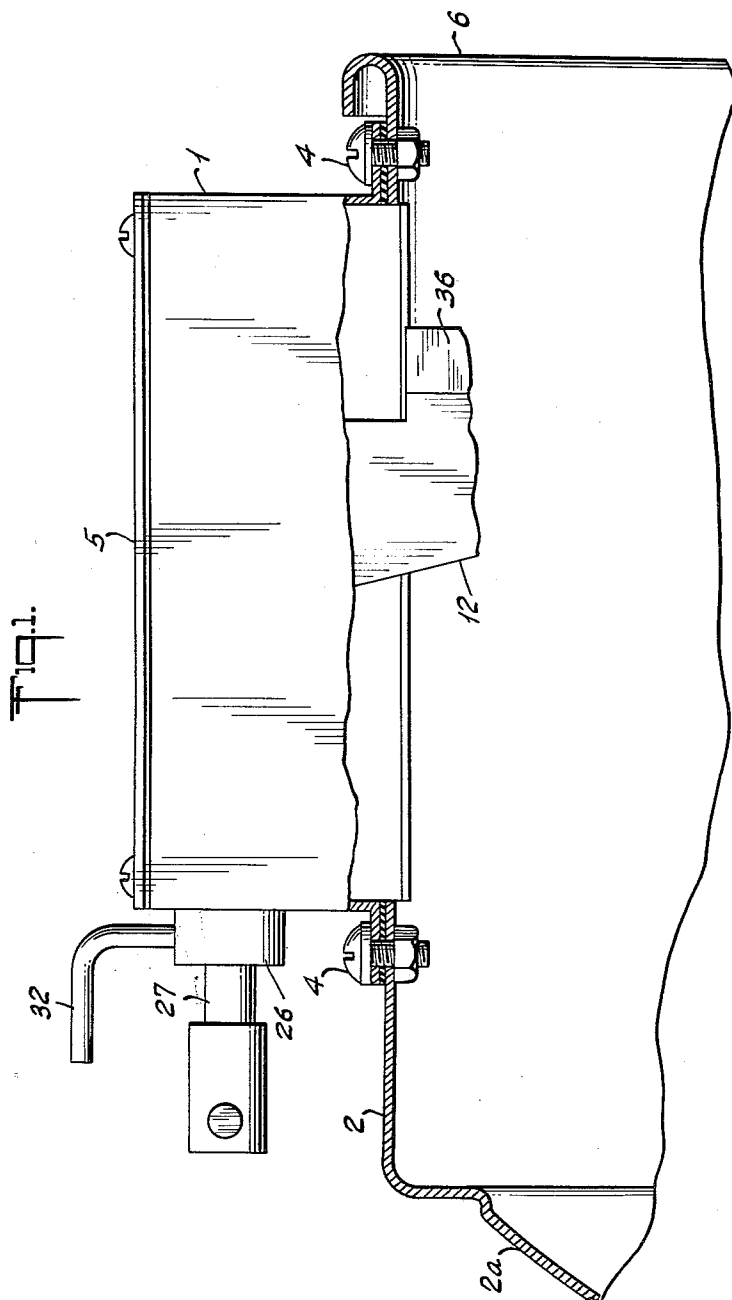
S. FELDMAN ETAL

3,096,031

LAMP POSITIONING MECHANISM FOR SEARCHLIGHTS

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6 Sheets-Sheet 1



BY

INVENTORS
SIDNEY FELDMAN
ALFRED J. LAWES

Max D. Farmer
ATTORNEYS

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S. FELDMAN ETAL

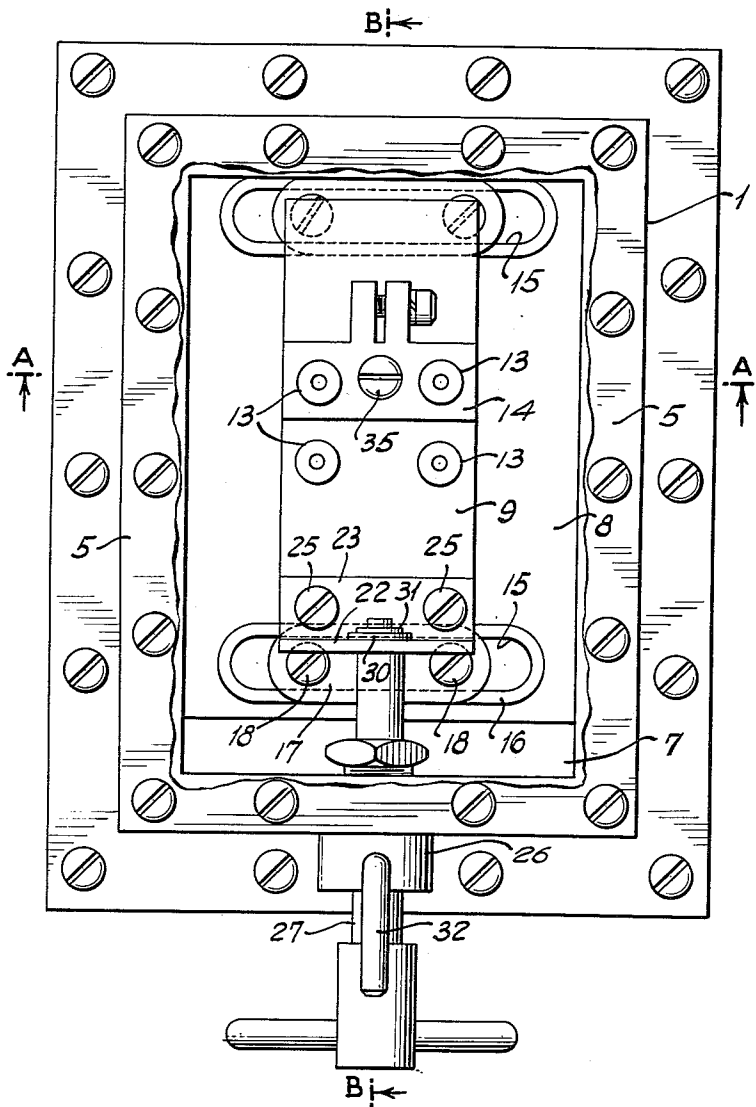
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Fig. 2.



INVENTORS
SIDNEY FELDMAN
ALFRED J. LAWES
BY

Max A. Parmer
ATTORNEYS

July 2, 1963

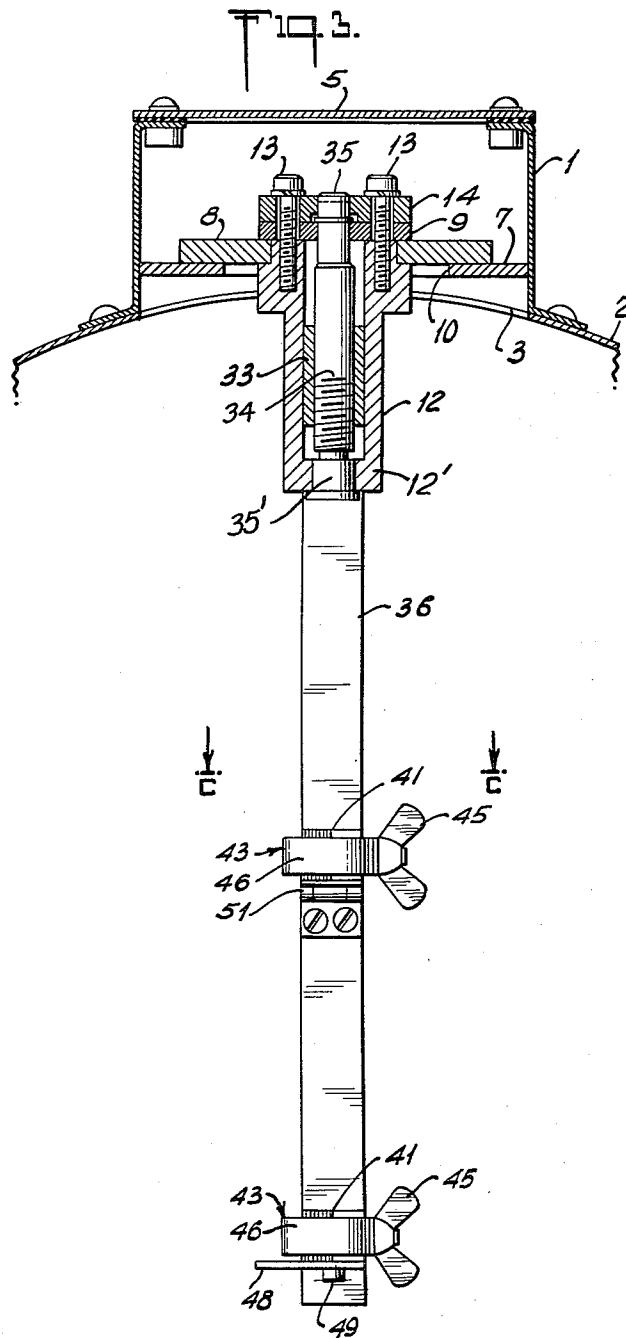
S. FELDMAN ETAL

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INVENTORS
SIDNEY FELDMAN
ALFRED J. LAWES
BY
Max R. Farmer
ATTORNEYS

July 2, 1963

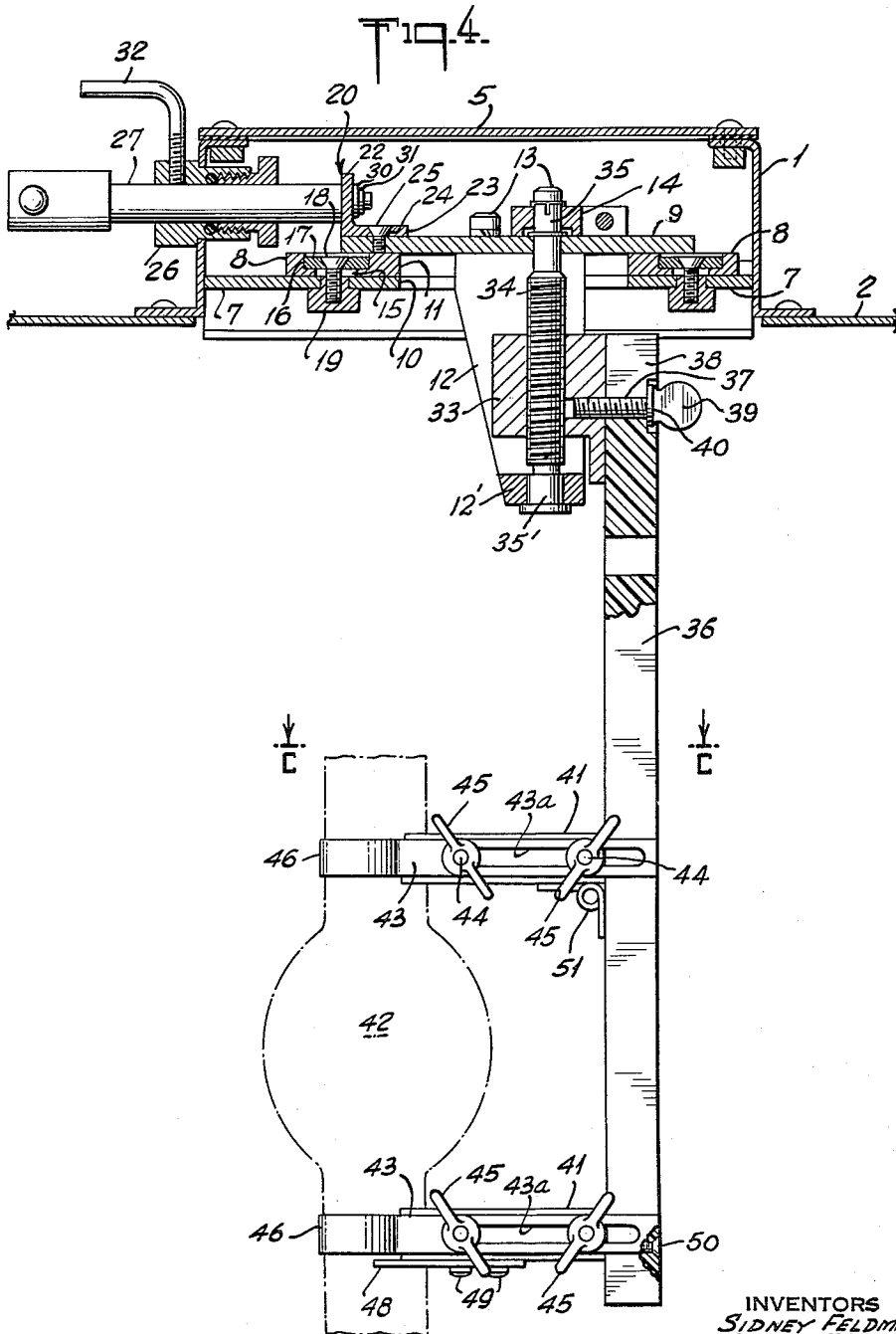
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INVENTORS
SIDNEY FELDMAN
ALFRED J. LAWES
BY
Max J. Farmer
ATTORNEYS

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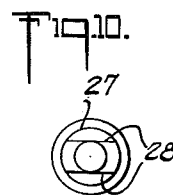
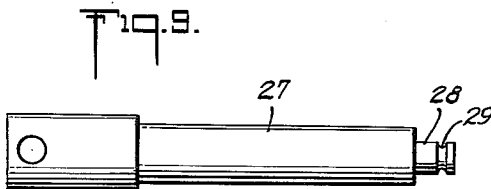
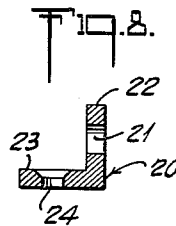
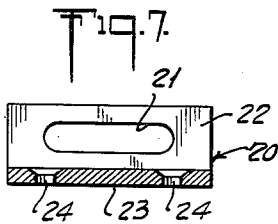
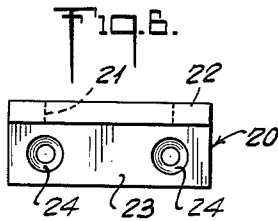
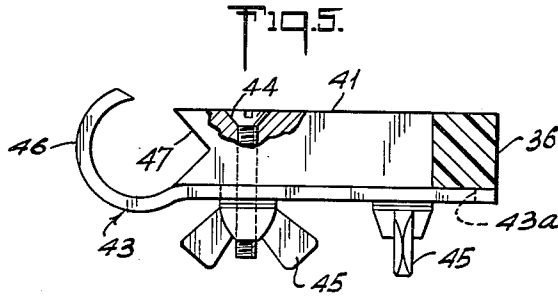
S. FELDMAN ETAL

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INVENTORS
SIDNEY FELDMAN
ALFRED J. LAWES
BY

Max Farmer
ATTORNEYS

July 2, 1963

S. FELDMAN ETAL

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Fig. 11.

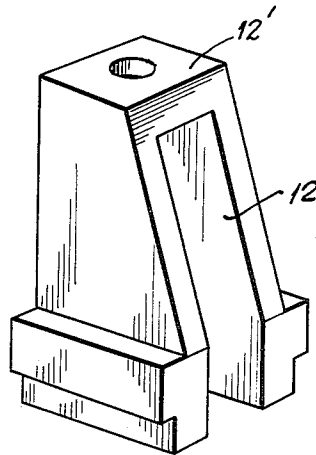
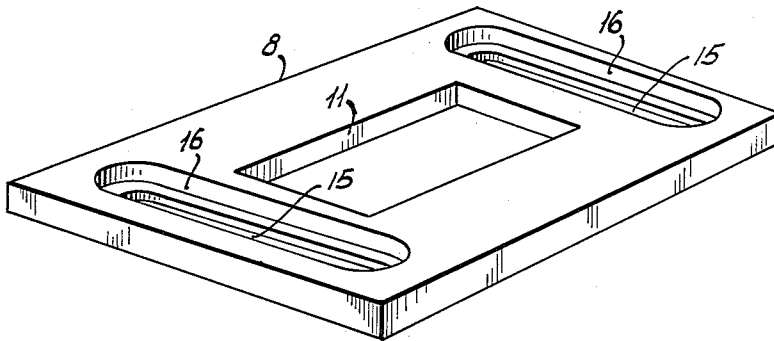


Fig. 12.

INVENTORS
SIDNEY FELDMAN
ALFRED J. LAWES
BY

Max D. Farmer
ATTORNEYS

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LAMP POSITIONING MECHANISM FOR SEARCHLIGHTS

Sidney Feldman, Riverdale, and Alfred J. Lawes, Flushing, N.Y., assignors to the United States of America as represented by the Secretary of the Navy
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13 Claims. (Cl. 240-44.2)

(Granted under Title 35, U.S. Code (1952), sec. 266)

The invention described herein may be manufactured and used by or for the Government of the United States of America for governmental purposes without the payment of any royalties thereon or therefor.

This invention relates to searchlights and particularly to the lamp mounting and positioning mechanism thereof for focusing the lamp and aligning the light beam with the searchlight sights. In prior standard searchlights an axial adjustment for focusing the lamp without provision for rapid adjustment of the beam spread was employed; there was no provision for aligning the light beam with the sights, they could not be focused while in operation, they required opening of the door of the searchlight housing and loosening of screws in the focusing mechanism which was inside and on the bottom of the housing. Operation of the focusing mechanism was impractical when a compact-arc electric discharge lamp was employed because of danger of explosion of the lamp, and it was impossible to focus the lamp while it was in operation.

Objects of this invention are to provide an improved searchlight, and particularly the lamp mounting means thereof, which can be used to safely, easily and quickly focus a lamp while it is in operation without danger from an explosion of the lamp, with which the focusing controls will be conveniently accessible from the exterior of the chamber in which the lamp is disposed, in which the beam can be easily aligned with the searchlight sights, thus ensuring that a narrow beam will be seen at the target, with which the beam spread can be easily varied and controlled, with which the positioning of the lamp may be accomplished without discomfort from glare and heat from the lamp, and which is relatively compact, simple, practical, convenient and inexpensive.

Other objects and advantages will appear from the following description of one embodiment of the invention, and the novel features will be particularly pointed out hereinafter in connection with the appended claims.

In the accompanying drawings:

FIG. 1 is an elevation, partly in section, of the upper part of the drum of a searchlight having lamp mounting means constructed in accordance with this invention;

FIG. 2 is a top plan of the casing and lamp mounting means, with the casing cover removed;

FIG. 3 is a sectional elevation on a smaller scale of the lamp mounting part of the searchlight, the section being taken approximately along the line A—A of FIG. 2;

FIG. 4 is a sectional elevation on the same scale as FIG. 3 of the parts illustrated in FIGS. 2 and 3, the section being taken approximately along the line B—B of FIG. 2;

FIG. 5 is a sectional plan on the scale of FIGS. 1 and 2 of a portion of the same, the section being taken approximately along the line C—C of FIG. 4;

FIGS. 6, 7 and 8 are respectively plan, elevation and end views on the scale of FIGS. 1, 2 and 5 of one of the parts used in adjusting the lamp;

FIGS. 9 and 10 are respectively front and end elevations on the scale of FIGS. 1, 2 and 5 of another of the parts used in adjusting the lamp; and

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FIGS. 11 and 12 are perspectives of certain parts of the device, separated from the other related parts.

In the illustrated embodiment of the invention, a casing 1 (FIG. 3) is mounted upon the top of the drum or housing 2 of a conventional searchlight, such as is used in the Navy, particularly for signaling. This casing 1 is secured over an opening 3 (FIGS. 1 and 3) in the top of the drum or housing 2 by screws 4 (FIG. 1). The casing 1 also has a removable cover 5 and adjustable lamp supporting means illustrated in FIGS. 2, 3, 4 and 5, part of which depends therefrom into the interior of the drum or housing 2 in front of the usual reflector 2a (FIG. 1), that is disposed at the rear of the housing interior and opposite from the usual shutter signalling mechanism carried on frame 6 on the front edge of the drum.

A plate 7 (FIG. 3) extends horizontally across the lower part of the interior of casing 1 and is secured to the side walls thereof. Superposed on the upper face of plate 7 is another plate 8 which abuts flat against plate 7 and is slidable thereon. Superposed on and abutting flat against the upper face of plate 8 is still another plate 9 which is slidable on plate 8 and also together with it on plate 7. The plate 7 has an aperture 10 (FIGS. 3 and 4) in its interior area, and plate 8 also has an aperture or slot 11 in its interior area. A yoke member 12 is secured to the underface of plate 9 by screws 13, two of which pass through a bar 14 that is disposed on the upper face of plate 9, and all of which screws 13 pass downwardly through plate 9 and are threaded into the upper ends of the arms of the yoke.

The plate 8 is provided adjacent its front and rear ends with slots 15 that extend from face to face thereof, but are elongated in a direction from side to side thereof as shown in FIG. 2, and a marginal area 16 along this slot is countersunk as shown in FIG. 4. A small plate 17 much shorter than the slots 15 is disposed flush and endwise in each countersunk marginal area 16 for each slot so as to slide along the slot and be guided by the countersunk marginal area. Screws 18 (FIG. 4) pass downwardly through the plates 17 and a slot 15 in plate 8 and are screwed into nuts 19 that abut against the lower face of plate 7 and have reduced upper ends secured in apertures in plate 7. The screws 18, plate 17, and nut 19 at each end of plate 8, when the screws are tightened, serve to clamp plate 8 to plate 7 against sidewise movement thereon. When screws 18 are loosened, the plate 8 may be shifted in directions from side to side of the casing and drum. The yoke 12 depends through slot 11, and the front and rearwardly extending sides of the slot 11 slidingly engage with the sides of the yoke 12 and hold the yoke, and through it the plate 9, against independent sidewise movement on plate 8 in the slot 11, but permitting forward and rearward sliding of the plate 9 on the plate 8, guided by the engagement of the sides of the yoke with the sides of slot 11.

An angle member 20, shown separately in FIGS. 6, 7 and 8 has a slot 21 extending through and elongated lengthwise of one arm 22 of the member. The other arm 23 of this member has countersunk apertures 24. The angle member 20 is disposed upon the forward end of the plate 9, with its arm 23 disposed flat against the upper face of plate 9 and secured thereto by screws 25 which pass through the apertures 24 and are threaded into plate 9. The arm 22 is upright.

The front upright wall of the casing 1 has an aperture through which a sleeve 26 extends, with a head of this sleeve abutting against the outer face of the wall of casing 1. This sleeve is secured in position in the aperture in casing 1 in any suitable manner. An operating

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stem 27 slides endwise through the passage of the sleeve 26 and near its inner end has opposite flat parallel walls 28 which pass through and slide in the slot 21 of the upright arm 22 of angle member 20. The engagement of the flat sides 28 with the sides of slot 21 prevents rotation of stem 27 without limiting free relative sliding of the member 20 and stem 27 along the slot. The extreme inner end portion of stem 27 has an annular peripheral groove 29 just beyond arm 22, and then a short cylindrical end whose diameter is equal to the distance between the flat faces 28 so as to be able to pass through slot 21. A washer 30 (FIG. 2) slides over the flat sided end of the stem 27 and abuts against the back face of upright arm 22. It is confined on the stem by a split or spring washer or key 31 that is engaged in the annular groove 29 to lock the washer 30 on the stem and prevent removal of the stem from angle member 20.

An angle key 32 is threaded through the head of sleeve 26 so as to engage with the stem 27 and releasably hold it against endwise movement through the sleeve. By releasing key 32 and pulling or pushing on stem 27 one may shift plate 9 forwardly or rearwardly on plate 8 and carry with it the yoke 12. When the plates 8 and 9 are shifted together sidewise after screws 18 have been loosened, the plate 9 can move or be adjusted sidewise, with the inner end portion of the stem 27 sliding along the slot 21 of the angle member 20. The mounting of the yoke 12 so far described enables forward and rearward, and also sidewise adjustments or movements of plate 9 which carries the yoke 12.

Disposed between the arms of the yoke and slidable vertically on the yoke, while being guided and held against rotation by the yoke arms, is a nut 33. A screw 34 is threaded vertically through the nut 33 and at its lower end below the nut it has a cylindrical, unthreaded terminal 35' which is rotatably mounted in the cross part or base 12' of the yoke. The upper end of screw 34 is also unthreaded and rotatably extends upwardly through plate 9 and bar 14. It has an external annular peripheral flange confined in a recess in the lower face of bar 14, which limits endwise movement of screw 34 without limiting its rotation. The upper end 35 of screw 34 has a slot (FIG. 2) by which the screw 34 may be rotated; and since nut 33 is held against rotation but is free to slide upwardly and downwardly between the yoke arms, any rotation of screw 34 will cause the nut 33 to move upwardly or downwardly in the yoke, depending on the direction of rotation of the screw.

The nut 33 extends rearwardly beyond the yoke (FIG. 4) and to the rear vertical face of this rearward extension of the nut, an upright rigid bar 36 of insulating material such as of a phenolic type plastic, is secured in any suitable manner such as by a screw 37, so as to depend from the yoke. The upper end of the bar 36 may have a slot 38 along which the shank of screw 37 may slide, and the head 39 of the screw 37 has a circular flange 40 (FIG. 4) that rotates in a shallow circular recess in the rear face of bar 36 at the inner end of the slot 38. The flange 40 may be engaged in the recess in bar 36 to hold the bar against downward vertical movement along the nut 33, and the inner end of the slot 38 limits upward movement of bar 36 along nut 33. By unscrewing screw 37 enough to remove its flange 40 from the shallow recess, the bar 36 can be pulled downwardly to remove screw 37 from slot 38 and thus permit detachment of bar 36 from the nut.

A pair of arms 41, shown separately in FIG. 5, are secured to the bar 36 in vertically spaced positions thereon, extend forwardly therefrom, and in turn serve at their free ends to engage and support a lamp 42 shown in phantom by dash lines in FIG. 4. For this purpose each arm 41 carries a plate 43 secured to a side face thereof and adjustable lengthwise along the arm to a limited extent and secured in adjusted position by bolts 44 that pass through the arm and an elongated slot 43a (FIG. 4)

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in plate 43. Nuts 45 on the bolts 44 serve to clamp the plate 43 in different adjusted positions along an arm. The forward end of each plate 43 has a hook end 46 that engages partly around a stem of the lamp 42 and detachably confines it in a notch 47 on the forward end face of the arm 41 that carries this plate 43.

A plate 48 is secured by screws 49 against the under face of the lower arm 41 and at its free end is also notched to receive the lower stem of lamp 42. The lower arm 41 is secured to bar 36 by screws 50 (FIG. 4) and the upper arm 41 may be hinged to the front face of bar 36 by a hinge 51 to swing downwardly against bar 36 when not engaging the upper stem of a lamp 42.

With a lamp 42 mounted on bar 36, the vertical adjustment of nut 33, and with it bar 36, will shift the lamp 42 vertically in either of both directions. The forward and rearward, sidewise, and vertical adjustments of plates 8 and 9 and of the lamp, by the means accessible from the top and front of casing 1 enable one to accurately position the lamp in selected or proper position or focus before the usual light reflector while the lamp is in operation, and without opening the drum or housing 2 to do so.

It will be understood that various changes in the details, materials and arrangements of parts, which have been herein described and illustrated in order to explain the nature of the invention, may be made by those skilled in the art within the principle and scope of the invention as expressed in the appended claims.

We claim:

1. A searchlight for signalling which comprises a housing having a window in one side and a reflector with its center at the other side thereof, a supporting element, means carried by said housing between said sides and adjacent one side wall thereof for mounting said element for sliding movements selectively in rectilinear crosswise directions relative to the top wall of the housing that lie in a common plane that is parallel to that axis of the housing which extends between the approximate centers of said reflector and said window, a lamp supporting member carried by said element and extending therefrom in a direction approximately normal to said plane and radially toward said axis, and at its free end having means for detachably supporting a lamp approximately at said axis, said member being vertically movable in said direction normal to said plane for adjusting the position of a lamp carried thereby in a direction crosswise of said axis, and means accessible from the exterior of said housing and connected to said element for selectively adjusting said element and through it said lamp supporting member in directions toward and from said window.

2. A searchlight for signalling which comprises a housing having therein a window at one side and a light reflector near the opposite side from the window, a casing mounted on the exterior of one side wall of said housing, at its contact with the housing opening into the housing, and having within it an apertured partition extending across said opening in a plane approximately parallel to the theoretical line connecting the center of said window and said reflector, one member, means slidably confining said one member to a face of said partition for adjustment therein in opposite directions parallel to said plane and holding it in any of its positions, and having an aperture in its interior area that is elongated in a direction crosswise of the direction of its sliding movement, another member sliding along a face of said one member in directions parallel to the direction of such aperture elongation and to said plane, an element secured to the inner face of said another member and extending through said elongated aperture and guided thereby for sliding movements in the direction of such aperture elongation, means connected to said another member for moving it selectively back and forth in the direction of said aperture elongation, a lamp support in said housing, and means connecting said support to said another member through said element for movement there-

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with in both its said adjustment in said opposite directions and in said directions parallel to said aperture elongation and also operable for moving said lamp support thereon in a direction perpendicular to a plane parallel to said opposite directions and said direction of said aperture elongation.

3. The searchlight according to claim 2, wherein said means which is connected to said another member has a part extending exteriorly of said casing for operation from the exterior of said housing, said casing having a removable cover which when removed provides access to said one member for moving the latter in said directions crosswise to said direction of aperture elongation.

4. The searchlight according to claim 2, and said casing having a removable cover which when removed exposes said one member for manual movement.

5. A searchlight which comprises a housing having a window and a reflector spaced apart, also a light chamber and an opening in a side wall thereof between the window and the reflector, a casing bridging said opening and secured to the housing exteriorly of said chamber, a lamp mounting in said chamber of said housing, one means extending from said casing into said chamber, carrying said lamp mounting and having parts exposed outside of said housing to selectively shift said mounting in directions toward and from said means and in directions approximately radially toward and from a theoretical axis line connecting the centers of said window and reflector, another means for mounting said one means for rectilinear movements in a plane approximately parallel to said axis and in opposite directions relative to the top wall of the housing crosswise of the direction of movement of said lamp mounting on said one means and having a part extending from outside of said casing and housing into said casing for operation from the exterior of said chamber, said casing having a removable cover and means connected to said another means and exposed, when said casing cover is removed, for securing and releasing said another means for its said movements, whereby said lamp mounting may be selectively shifted in three different directions all crosswise of one another within said housing while a lamp in said mounting may be in operation.

6. The searchlight according to claim 5, wherein a rotatable screw forms part of the connection between said lamp mounting and said one means, and rotation of said screw causes movement of said lamp mounting in directions toward and from said one means.

7. A searchlight which comprises a housing having a window and a reflector spaced apart therein, also therein a chamber between the reflector and the window for a lamp mounting and an opening in a lateral wall of said chamber, a casing covering said opening on said housing and disposed exteriorly of said chamber, said casing having an interior wall extending across said opening and having an aperture from face to face thereof, one member confined to one face of said casing wall for sliding movement in opposite directions thereon and having an aperture from face to face thereof elongated in a direction crosswise of the direction of said sliding movement of said member, another member having face to face sliding movement against a face of said one member and also carrying a part extending therefrom through said aperture and guided by said aperture for independent back and forth movements of said another member on said one member in directions crosswise of said first mentioned crosswise directions, a lamp mounting in said housing chamber, means connecting said lamp mounting to said part and supporting said lamp mounted for trans-

lation movements with said two members and also for additional adjustments of said lamp mounting thereon in directions crosswise of all the movements of said members which is in directions radially of an axis connecting the centers of said window and said reflector, said casing having a removable cover which when removed exposes said means connecting the lamp mounting to said part for operation from outside of said chamber.

8. The searchlight according to claim 7, and means connected to said another member and extending exteriorly of said casing for selective manual operation while a lamp on its mounting may be operating.

9. A searchlight according to claim 7, wherein said means connecting said lamp mounting to said part includes a screw rotatably carried by said part, and a nut slidably but non-rotatably carried by said part and attached to said lamp mounting, whereby rotation of said screw will move said lamp mounting toward and from said another member.

10. A searchlight according to claim 9, wherein said screw extends through said another member into said casing and there is accessible for manual rotation.

11. A searchlight according to claim 7, wherein said lamp mounting has spaced arms extending therefrom, with notches in their free ends to receive stems of a lamp to be mounted, and also, has hook members movable on said arms to engage the lamp stems at sides thereof opposite from the notches and draw the lamp stems into said notches and confine them therein.

12. A searchlight according to claim 7, and means adjustably carried by said casing, and having a sliding connection to said another member for moving the latter on said one member with its said sliding connection enabling independent sidewise movement of said another member with said one member.

13. A searchlight for signalling which comprises an enclosure, with a window in one side and a reflector at the side opposite to said one side, a member disposed adjacent another side of said enclosure between said reflector and said window, means mounting said member on said another side of said enclosure between said reflector and said window for sliding rectilinear movements selectively in crosswise directions in a plane approximately parallel to the axis between the centers of said window and said reflector, an element extending from said member into the space between said reflector and said window, and a lamp support carried by said element and adjustable thereon in directions approximately normal to said plane, said element having a guide part, a nut mounted on said guide part to slide thereon and held against rotation thereon, an adjusting screw rotatably mounted on said guide part and threaded through said nut, said lamp support being coupled to said nut, said lamp support including a bar with a slot opening through one end of the bar and extending in a direction lengthwise of the bar, a coupling screw passing through said slot and threaded into said nut and having a turning handle and a flange at the base of the handle, said bar having a recess in the exposed face of its slotted end to receive said flange and lock said bar against sliding on the nut when said coupling screw is tightened.

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