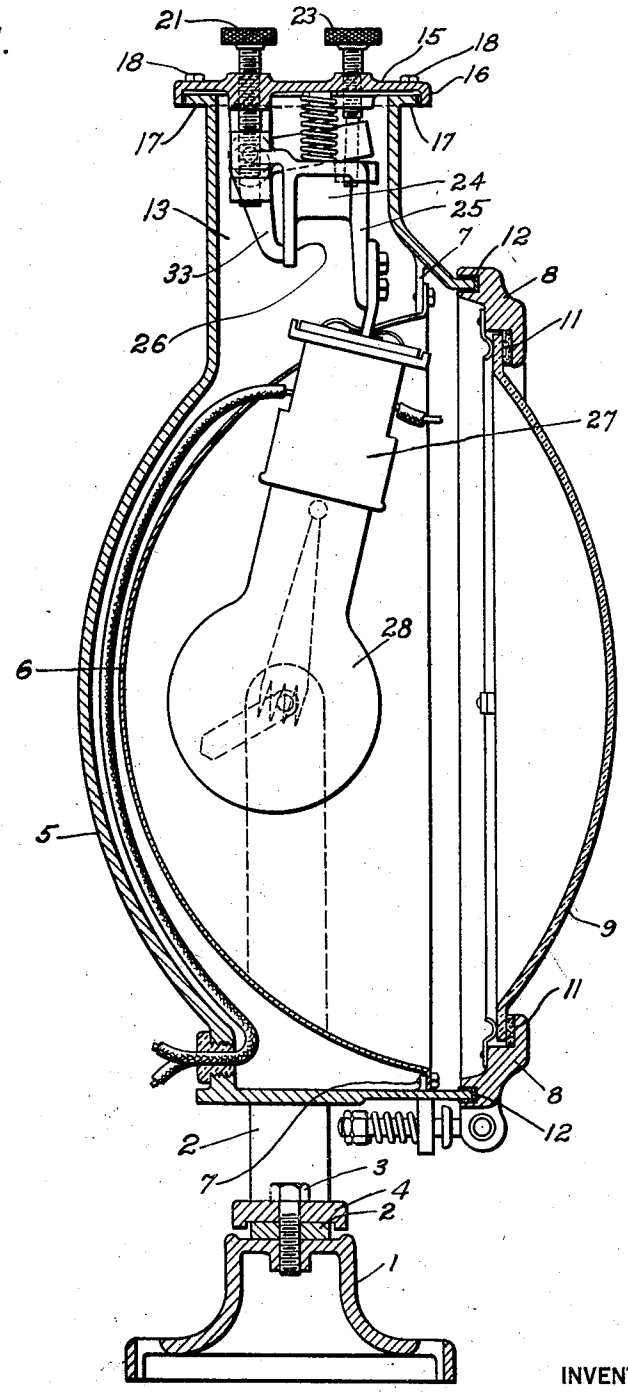
Jan. 27, 1931. O. WERNER 1,790,185

FOCUSING MECHANISM FOR LIGHTING UNITS

Filed July 14, 1928 2 Sheets-Sheet 1

Fig. 1.



INVENTOR
Oscar Werner.
BY
ATTORNEY

Jan. 27, 1931. O. WERNER 1,790,185

FOCUSING MECHANISM FOR LIGHTING UNITS

Filed July 14, 1928 2 Sheets-Sheet 2

Fig. 2.

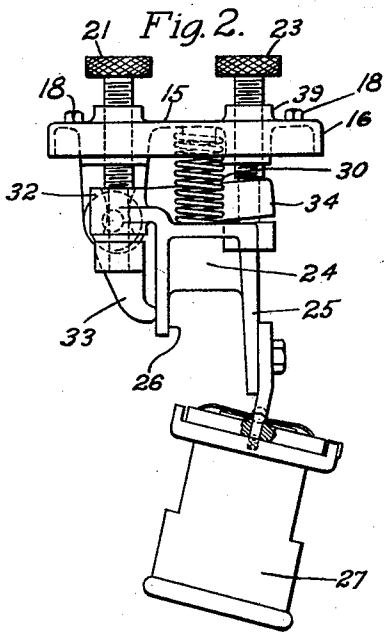


Fig. 3.

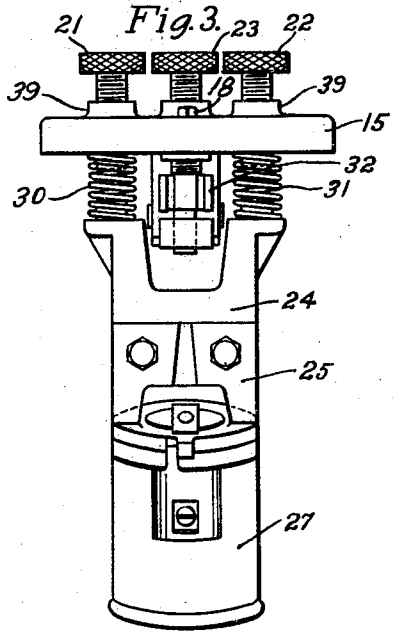


Fig. 4.

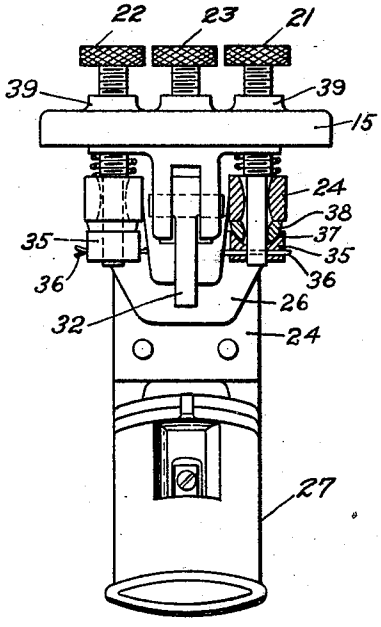
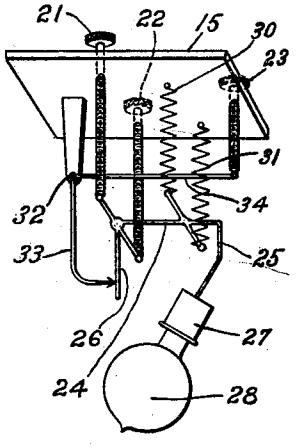


Fig. 5.



INVENTOR

Oscar Werner.

BY

Cooley & Sloan

ATTORNEY

Patented Jan. 27, 1931 1,790,185

UNITED STATES PATENT OFFICE

OSCAR WERNER, OF SOUTH BEND, INDIANA, ASSIGNOR TO WESTINGHOUSE ELECTRIC & MANUFACTURING COMPANY, A CORPORATION OF PENNSYLVANIA

FOCUSING MECHANISM FOR LIGHTING UNITS

Application filed July 14, 1928. Serial No. 292,783.

My invention relates to illuminating devices and more particularly to focusing means for floodlights and similar apparatus.

It is among the objects of my invention to provide a device of this character which shall be capable of positive, convenient and exact universal adjustability in reference to a reflector or its focal point.

It is a further object of my invention to provide such an enclosure of the operating parts of the apparatus that the members thereof may be readily and conveniently caused to function to universally and longitudinally adjust a lamp in reference to the focal point of a reflector by the actuation of means exterior of the reflector case; to provide a device of this character which shall be readily and delicately responsive to adjustment, and in which the adjustment of a single screw produces only a single movement of the lamp in a nearly straight line and not in a compound movement.

A still further object of my invention is to provide a device of the above-mentioned character such that the lamp cannot be forcibly moved against the reflector and broken.

In practicing my invention in connection with the flood lighting unit of the usual type, I provide a base member having three screws threaded therethrough. I provide a lamp support pivotally mounted on the lower ends of two of the screws and having two downwardly extending portions, one of which supports the lamp. A spring or plurality of springs is disposed between the base and the lamp support to bias the lamp support away from the base and a bell-crank is pivotally mounted on the base in such a manner that one arm of the bell-crank is pivotally engaged with the third screw and the other arm is disposed to abut against one of the downwardly extending portions of the lamp support.

Referring more particularly to the drawings, in which like figures indicate like parts:

Figure 1 is a sectional view of a floodlighting unit with my focusing mechanism mounted therein;

Fig. 2 is a side elevational view of the focusing mechanism shown in Fig. 1;

Fig. 3 is a front elevational view of the focusing mechanism;

Fig. 4 is a rear elevational view of the focusing mechanism; and

Fig. 5 is a schematic diagram showing the operation of the focusing mechanism.

Referring more particularly to Fig. 1, my device is adapted to be mounted in the usual flood-lighting unit comprising a base member 1 to which a yoke member 2 is slidably attached by means of a bolt 3 and washer 4. The yoke member is adapted to engage the projector housing 5 at the sides thereof at diametrically opposed points. The usual reflector member 6 is fastened within the housing by bolting it to a suitable flange member 7 on the inside of the housing. A door or cover 8 in which is fastened a lens 9 is provided which, by reason of resilient sealing means 11 and 12, is adapted to maintain a water-tight closure of the projector housing.

My focusing mechanism is mounted in an upwardly extending chamber 13 of the housing 5. The base of the focusing mechanism comprises a base plate 15 provided with a flange 16 adapted to engage and cover a coacting flange 17 on the projector housing and the base plate is secured to the housing flange by means of bolts 18.

My focusing mechanism may best be explained by reference to the diagrammatic perspective view shown in Fig. 5. The base 15 is provided with three triangularly disposed adjusting screws 21, 22 and 23, upon two of which is pivotally mounted the lamp support 24, of U-shape, having two downwardly extending portions 25 and 26. One of the downwardly extending portions 25 constitutes a mounting for the lamp socket 27 and lamp 28, while the other, 26, constitutes what may be termed a bearing plate, the use of which is hereinafter explained.

Two springs 30 and 31 are located between the base 15 and the lamp support 24 and are adapted to force it outwardly about the ends of adjusting screws 21 and 22 as a pivot.

A bell crank lever 32 is pivotally mounted on the base in such a manner that one arm 33 abuts against the bearing plate 26 of the lamp support while the other arm 34 of the

bell crank is movably engaged to the end of the focal adjustment screw 23.

It may be readily understood that vertical adjustment of screws 21 and 22 in the same direction and identical in degree, results in a vertical movement only of the lamp 28 in a plane parallel to the reflected rays, while adjustment of screws 21 and 22 in opposite direction but identical in degree results in lateral movement of the lamp only. This lateral movement, because of the sliding engagement of arm 33 and bearing plate 26 is a simple movement and not a compound one. This means that a focal adjustment, once secured, is not materially affected by lateral or by vertical motion of the lamp.

Focusing of the lamp by movement in and out parallel to the reflected rays with reference to the reflector is accomplished by movement of the focal adjustment screw 23. Thus, the operator when replacing lamps can, by the manipulation of screws 21 and 22 so adjust the lamp vertically and laterally that its filament is in the center axis of the reflector without materially affecting the focal distance of the lamp with reference to the reflector, since this focal adjustment is controlled solely by the adjustment of screw 23 regardless of the position of screws 21 and 22.

By reference to Fig. 5, it may be readily understood that a movement of screw 21 or screw 22, while the lamp support 24 is in a horizontal position, results in only a simple circular movement of the lamp, since the bearing plate 26 slides from side to side on the bell-crank arm 33. Also, if the lamp support is in a horizontal plane, movement of the screw 23 results in a simple circular motion of the lamp from right to left, or left to right, in accordance with the adjustment of the screw 23. There is no compound movement of the lamp for the reason that the lamp support tilts about the ends of the screws 21 and 22.

The movement of the lamp for focusing is usually not more than an inch or so in space, so that the compound movement, in case the lamp support 24 is not in a horizontal plane, may be ignored, as such movement in other than the desired direction would not amount to more than movement in an undesirable direction of the order of one-sixteenth of an inch.

If, in focusing the lamp, it strikes the reflector, the lamp is not pressed forcibly against the reflector and damaged, since the arm 33 of bell crank 32 leaves the face of the bearing plate 26 and the lamp is pressed against the reflector only by force of the springs 30 and 31. The springs 30 and 31 are of such dimensions that they are not strong enough to break the lamp.

Referring more particularly to Fig. 4, it is desirable that the lamp support 24 and the bell crank 32 be so pivoted on the adjusting screws that a full bearing surface be presented at all times and also so that the motion of one part on the other will be a smooth rocking motion rather than an irregular tilting motion, such as would result if the lamp support and bell crank rested directly on collars 35 of the adjusting screws.

In my preferred structure the collars 35 are fastened at the lower ends of the adjusting screws by means of cotter pins 36. Concave depressions 37 are provided in the collars and a hemispherical washer 38 is adapted to be fitted into the concave depression of the collar so that a suitably adapted member of the focusing mechanism, such as the lamp support 24, is slidably engaged with the upper surface of the hemispherical washer 38, and by reason of the movement of the hemispherical washer 38 on the collar 35 will have a full bearing surface at all times with the collars of the adjusting screws.

In the event that the lamp is permitted to be moved back against the reflector, the bell-crank is moved away from the depending portion of the lamp support and the lamp is permitted to rest against the reflector and to be held against it only by the pressure exerted by the two springs, which pressure is insufficient to break the lamp bulb.

The three adjusting screws 21, 22 and 23 are the only projecting portions of the focusing mechanism and since they are closely engaged with the base and the base is provided with upwardly extending bosses 39 surrounding the three screws, moisture cannot enter at this point. It is not necessary to remove the door in order to focus the lamp and therefore since the housing is tightly closed at all times, except when replacing the lamp, very little dust and moisture is permitted to enter the interior of the projector housing.

The focusing mechanism is simple and sturdy and permits a universal adjustment of the lamp.

Although I have described a specific modification of my invention, I do not wish to be limited thereto since various modifications may be made by those skilled in the art without departing from the spirit and scope of my invention as set forth in the appended claims.

I claim as my invention:—

1. In a lighting fixture, the combination with a substantially fixed base, a lamp and a support therefor, of a plurality of adjusting screws upon two of which the support is pivotally mounted, spring means disposed between base and support to bias the support about the two first-named adjusting screws and a bell-crank lever pivoted on the base, one arm of which is pivotally engaged on the third adjusting screw and the other arm of which engages the lamp support to move the support about the two first-named adjusting screws against the biasing action of the spring means.

2. In a light fixture, the combination with a substantially fixed base, a lamp and a support therefor, of a pair of spaced adjusting screws extending through the base and pivotally connected to the support, a pair of spaced compression springs extending between the base and the support, the adjusting screws and the springs being located in parallel-extending parallel planes, a bell-crank lever pivotally mounted on the base and having one end operatively engaging the support, and a third adjusting screw extending through the base and pivotally connected to the other end of the lever.

3. In a light fixture, the combination with a substantially fixed base having three screws extending through the base, a lamp support pivotally mounted on the lower ends of two of the screws and having two downwardly extending portions, one of which supports the lamp, a spring disposed between the base and lamp support and a bell crank pivoted on said base, one arm of which is pivotally engaged by the third screw and the other arm of which is disposed to abut against one of the downwardly extending portions of the lamp support.

4. In a lighting fixture, a focusing device therefor including a base, three adjusting screws, a lamp, a lamp support, including a plate, a spring disposed between the base of the lighting fixture and the lamp support, the lamp support being tiltably mounted on two of the screws and biased away from the base by the spring and means operable by the third adjusting screw and having sliding engagement with a face of the plate to move it against the biasing action of the spring.

In testimony whereof, I have hereunto subscribed my name this 10th day of July, 1928.

OSCAR WERNER.