June 12, 1928. 1,673,325

C. E. GODLEY

FOCUSING DEVICE

Filed Oct. 9, 1926 2 Sheets-Sheet 1

Fig. 1

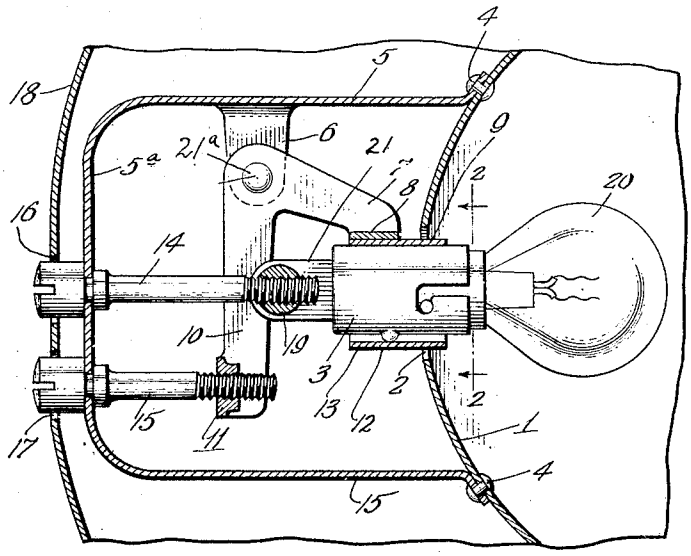


Fig. 3

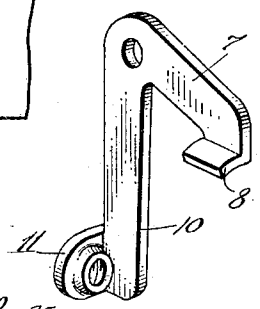


Fig. 2

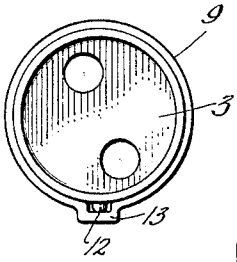
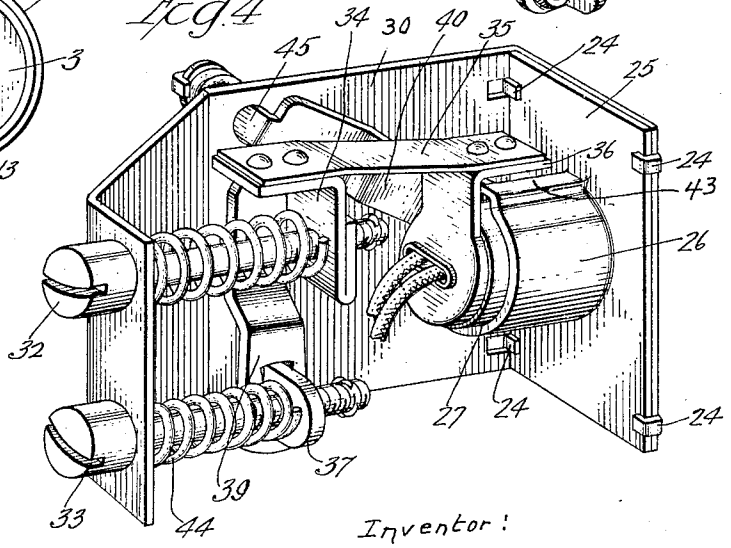


Fig. 4



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Filed Oct. 9, 1926 2 Sheets-Sheet 2

Fig. 5

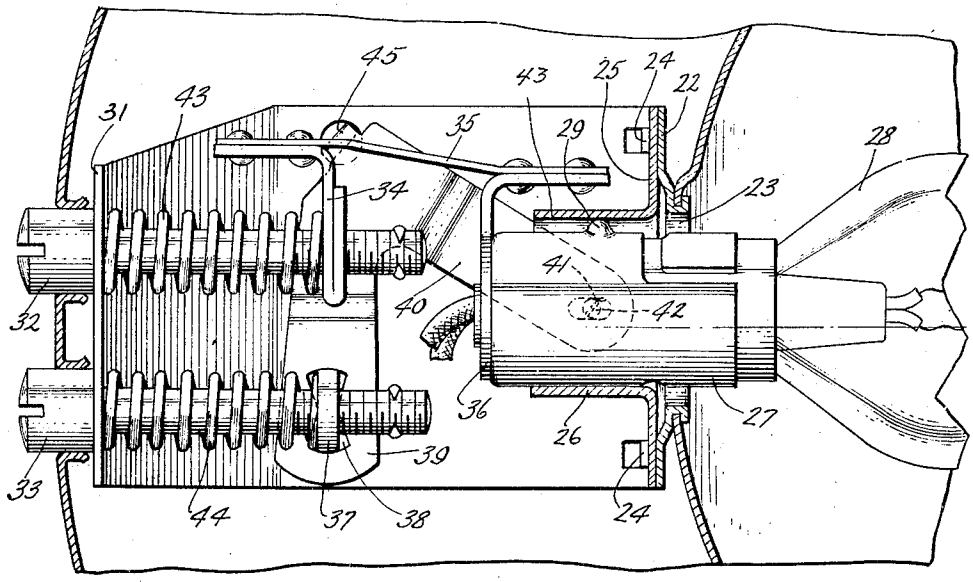


Fig. 6

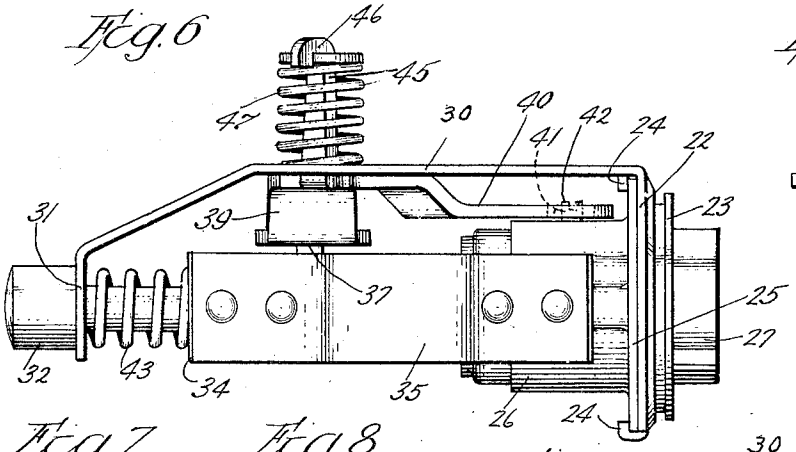


Fig. 9

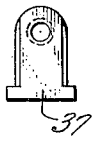


Fig. 7

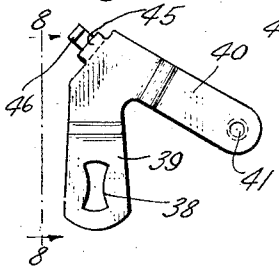


Fig. 8

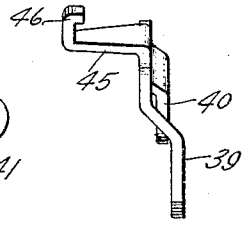
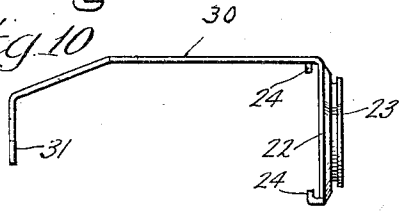


Fig. 10



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Patented June 12, 1928. 1,673,325

UNITED STATES PATENT OFFICE.

CHARLES E. GODLEY, OF YPSILANTI, MICHIGAN, ASSIGNOR TO EDMUNDS & JONES CORPORATION, OF DETROIT, MICHIGAN, A CORPORATION OF NEW YORK.

FOCUSING DEVICE.

Application filed October 9, 1926. Serial No. 140,609.

My invention relates to a lamp focusing device particularly suited for use in an automobile headlight for adjusting the position of the lamp filament both longitudinally of the reflector and in a given plane transverse of the axis of the reflector.

In some of its general aspects my invention aims to provide a focusing device for this purpose in which the entire mechanism is supported by the reflector of the lamp, so that the adjustments are made in positive relation to the reflector and so that this relation will not be modified by variations in the spacing of the reflector from the casing back through which the adjusting screws extend. Furthermore, my invention provides a device for this purpose which can initially be assembled in its entirety and afterwards attached as a unit to the reflector.

Viewed in some of its further aspects, my invention aims to support both a socket-guiding sleeve and the needed two adjusting screws entirely upon a carrier member secured to the reflector, aims to mount the socket-guiding sleeve movably upon the carrier, aims to provide effective means for causing a rotation of one screw to move the sleeve vertically with respect to the carrier, and aims to connect the other screw to the socket in such a manner that the latter screw can afford a positive longitudinal sliding of the socket in the sleeve regardless of the position of the sleeve with respect to the carrier.

My invention also aims to provide a two-screw focusing device in which one screw is operatively connecter to the socket-guiding sleeve through a bell-crank lever which converts the horizontal screw-imparted movement into a raising or lowering movement, in which a resilient element interposed between the other screw and the socket allows for the changes in position of the said sleeve, and in which springs take up lost motion between connected parts.

More particularly, my invention aims to provide a focusing device of this type in which the socket-guiding sleeve is supported for vertical sliding movement, and in which a large share of the parts can be manufactured by simple punch press operations. Still further and also more detailed objects will appear from the following specification and from the accompanying drawings, in which

Fig. 1 is a fragmentary central, vertical and longitudinal section through an automobile headlight embodying a simple form of my focusing device, namely one in which the socket-guiding sleeve is fast upon a rocking lever.

Fig. 2 is a front elevation of the socket and guide sleeve of the embodiment of Fig. 1.

Fig. 3 is a perspective view of the lever employed in Fig. 1.

Fig. 4 is a perspective view of another embodiment of my invention, namely one in which the socket-guiding sleeve is mounted for vertical sliding movement, and in which spiral springs are employed for holding the adjusting screws in swiveling relation to the carrier member.

Fig. 5 is a front elevation of the embodiment of Fig. 4, partly sectioned.

Fig. 6 is a plan view of the same embodiment.

Fig. 7 is a front elevation of the bell-crank employed in the embodiment of Figs. 4 and 5.

Fig. 8 is a plan view of the same lever.

Fig. 9 is an elevation of the nut member through which the vertical arm of the lever is connected to the lower adjusting screw of Fig. 4.

Fig. 10 is a plan view of the carrier or support for the guide sleeve of Fig. 6, showing this before its forward end is clinched to the reflector.

Referring first to the embodiment of Fig. 1, this shows a reflector 1 provided with a rear end perforation 2 which is considerably larger in vertical diameter than the shell 3 of the lamp socket. Secured to the reflector by rivets 4 are the arms 5 of a generally U-shaped carrier member which has its back 5^A disposed at a considerable distance behind the reflector and which has a pivoting finger 6 formed upon the upper arm 5.

Pivoted to this finger is a bell-crank lever comprising a forwardly directed arm 7 provided with a finger 8 which is soldered to the guide sleeve 9, and a downwardly directed arm 10 provided with a threaded finger 11,

The lamp socket shell 3 extends slidably through the guide sleeve 9 and means are provided for preventing the socket shell from rotating in this sleeve, as by providing the socket shell with a nub 12 fitting a longitudinal channel 13 in the sleeve.

Swiveled upon the back 5^A of the carrier member are two adjusting screws 14 and 15, each of which presents its head behind this carrier member, so that each screw head projects through a larger diametered perforation (16, 17) in the back 18 of the casing which houses the reflector and the focusing mechanism. The upper screw 14 is threaded through a nut 19 swiveled upon a rigid arm 21 which extends rearwardly from the socket shell, while the lower screw 15 is rather loosely threaded through the finger 11 of the lever arm 10.

With the parts thus arranged, a rotation of the upper screw 14 will merely slide the socket longitudinally in the sleeve 9 which supports and guides the socket, thus affording any needed adjustment of the lamp bulb 20 along the axis of the reflector. By rotating the lower screw 15 the bell-crank lever is rocked about the pin 21^a which pivotally connects the lever to the finger 6 on the carrier member, thereby tilting the guide sleeve 9 so as to raise or lower the filament of the lamp bulb according to the direction in which the screw 15 was rotated.

Since the entire focusing mechanism is supported by the carrier member, this mechanism can be assembled as a unit before it is attached to the reflector, and its operation is also independent of any accuracy in the spacing of the reflector from the back of the lamp casing, so that it is well suited for automobile headlights of the well known type in which the reflector is pressed by springs toward the door of the lamp and in which the spacing of the reflector from the back of the casing may vary considerably.

However, I desirably avoid the loose threaded connection of the lower screw 15 to the bell-crank lever, which looseness is required in the embodiment of Fig. 1, and preferably employ spring means to allow for certain relative movements of the connected parts while avoiding both looseness and a possible rattling. I also desirably arrange the guide sleeve so that it will effectively close the perforation in the reflector, thereby preventing dust (which may enter the back of the casing around the heads of the two adjusting screws) from entering the reflector.

Thus, Figs. 4 to 6 show another embodiment of my invention, in which the carrier member includes a perforated front plate 22 provided with a forwardly extending collar 23 which extends through the perforation in the reflector and which has its forward end flared outwardly so as to clinch the carrier member to the reflector as shown in Fig. 5. The front plate 22 of the carrier member is provided with fingers 24 which extend rearwardly and then towards each other from opposite edges of this plate to afford guides for a sliding plate 25 formed upon the forward end of the guide sleeve 26. The socket 27 which carries the usual lamp bulb 28 extends slidably through this guide sleeve and is kept from rotation by a nub 29 sliding within a correspondingly enlarged part 43 of the guide sleeve.

The carrier member also includes a side portion 30 connecting one lateral edge of its front plate 22 with a rear plate 31 which extends across the axis of the guide sleeve and upon which two vertically spaced adjusting screws 32 and 33 are effectively swiveled. The upper screw 32 is threaded through an angle-shaped nut 34 which is connected by a flat spring 35 to an angle-shaped bracket 36 secured to the rear end of the socket 27. The screw 32 preferably extends parallel to the axis of the reflector and the spring 35 extends in the same general direction with this axis, and the spring is of such stiffness as to transmit longitudinal pulls or thrusts without bending, thereby causing rotation of the screw 32 in either direction to slide the socket to a corresponding extent longitudinally of the guide sleeve.

The companion screw 33 is threaded through a nut 37 which extends through a slot 38 in one arm 39 of a bell-crank lever pivoted to the side plate 30 of the carrier member. This slot 38 has a medial portion of a width corresponding to the thickness of the nut 37 and has its opposed vertical sides bowed toward each other to widen the slot both upwardly and downwardly, thereby permitting the nut to rock on the lever without introducing lost motion. The other arm 40 of the bell-crank lever extends alongside the guide sleeve 26 and has a perforation 41 entered by a laterally projecting pin 42 on this sleeve, so that a rocking of the lever will cause the said pin to slide the guide sleeve vertically.

As an effective method of swiveling the two adjusting screws to the rear plate 31 of the carrier member, I preferably extend the shank of each screw through a perforation of corresponding size in this rear plate, and interpose compression springs 43 and 44 respectively between this rear plate and the two nuts 34 and 37. Thus arranged, each spring draws the head of the corresponding screw against the back of the said rear plate and also takes up any lost motion in the threaded connection of the corresponding screw and the nut associated with it.

To restrict the movement of the bell-crank lever to a vertical plane, I desirably also provide spring means associated with its pivotal connection to the carrier member. Thus, I

am here showing the lever as having at its bend a laterally projecting arm 45 which extends through the side plate 30 to serve as an axis for the lever, and this arm has its free end recurved to form a hook 46. A compression spring 47 interposed between this hook and the outer face of the side plate 30 holds the lever snugly against this plate, thus preventing any looseness or rattling and avoiding the need of a separately forming pivoting pin.

However, while I have illustrated and described the preferred embodiment of my invention as including certain desirable features—such as the slide-guiding fingers and the compression springs—I do not wish to be limited to these or other details of the construction and arrangement thus described, as many changes might obviously be made without departing either from the spirit of my invention or from the appended claims.

I claim as my invention:

1. In a lamp, a reflector having a perforation, a sleeve supported by the reflector and slidable transversely of the axis of the reflector, a lamp socket extending slidably through the sleeve and the reflector perforation, a carrier member fast upon and behind the reflector, adjusting means mounted on the carrier member and connected to the socket for sliding the socket in the sleeve, and a second adjusting means mounted on the carrier and connected to the sleeve for sliding the sleeve transversely of the axis of the reflector; the first named adjusting means including a resilient strip extending longitudinally of the socket, the said strip being formed so as to be substantially rigid longitudinally of the socket regardless of the sliding of the sleeve transversely of the axis of the reflector.

2. In a lamp, a reflector having a perforation, a sleeve supported from the reflector and slidable transversely of the axis of the reflector, a lamp socket extending slidably through the sleeve and the reflector perforation, a carrier member supported by and rigidly fastened to the reflector, a casing having its back disposed behind the carrier, shifting means mounted on the carrier for sliding loosely the sleeve transversely of the axis of the reflector, and two adjusting screws swiveled upon the carrier and both projecting through the back of the casing, the screws being threadedly connected respectively to the socket and to the shifting means.

3. A lamp construction as per claim 2, in which the threaded connection between the socket and one of the screws includes a nut threaded upon the screw, and connecting elements interposed between the nut and the socket, the said connecting elements including a resilient part which is substantially rigid longitudinally of the socket and which is adapted to flex during the sliding of the sleeve.

4. A lamp construction as per claim 2, in which the shifting means include a bell-crank lever pivoted upon the carrier, one arm of the lever being operatively connected to the sleeve, and the other arm being threadedly connected to one of the screws.

5. A lamp construction as per claim 2, in which the shifting means include a bell-crank lever pivoted upon the carrier, one arm of the lever being operatively connected to the sleeve, and a nut threadedly connected to one of the screws, the nut being mounted on one arm of the bell-crank lever with freedom for rocking movement about an axis transverse of the axis of the last named screw, the other arm of the lever being connected to the sleeve.

6. In a lamp, a reflector having a substantially axial perforation, a carrier member comprising in integral formation a front plate fastened to the reflector, an intermediate side portion extending rearwardly from the front plate, and a rear web extending transversely across the axis of the reflector, a sleeve slidably mounted on the front plate for movement transversely of the said axis, a socket slidable in the sleeve, two screws each effectively swiveled upon the rear web, a connecting member fast upon the socket and threadedly connected to one of the screws, and a shifting member threadedly connected to the other screw and operatively connected to the sleeve for causing rotation of the last named screw to slide the sleeve upon the carrier, the shifting member being pivoted upon the said side portion.

7. In a lamp, a reflector having a substantially axial perforation, a carrier member fast upon the reflector and having a side wing extending rearwardly from the reflector at one side of the axis of the latter and a rear wing extending transversely of the reflector across the said axis; a sleeve alining with the perforation in the reflector; a pair of adjusting screws carried by the rear wing of the carrier member and extending parallel to the axis of the reflector; a threaded connection between one of the screws and the socket whereby rotation of that screw slides the socket in the sleeve; and means pivotally mounted on the side wing of the carrier member on a pivot axis transverse of the axis of the reflector and operatively interposed between the other screw and the sleeve for moving the sleeve in a plane medial of the reflector.

8. In a lamp, a reflector having a rear end perforation; a carrier member comprising a forward wing secured to the reflector and having a perforation alining with the perforation in the reflector, a side wing extending rearwardly from the forward wing at one side of the axis of the said perforations, and

a rear wing extending transversely of the axis of the reflector across the said axis; a slidable member including a part engaging the said forward wing and a sleeve alining with the said perforations, the forward wing having guides engaging the guide member to restrict the guide member to vertical movement; a lamp socket slidable in the sleeve; a pair of adjusting screws swiveled on the rear wing; instrumentalities interposed between one of the screws and the guide member for causing rotation of that screw to slide the guide member vertically; and connecting means interposed between the other screw and the socket for sliding the socket in the sleeve.

9. In a lamp, the combination with a reflector having a rear end perforation, and with a lamp bulb, of a bulb supporting and adjusting mechanism attachable as a unit to the reflector; the said mechanism including a carrier member equipped at its forward end for attachment to the reflector, the carrier member having a rearwardly extending portion and having a rear wing extending across the axis of the reflector; a sleeve supported from the carrier member and alining with the reflector perforation, a socket slidable in the sleeve and holding the lamp bulb; threaded means interposed between the said rear wing and the socket for sliding the socket in the sleeve; and means interposed between the said rear end part and the sleeve for moving the sleeve to vary the height of the lamp bulb with respect to the axis of the reflector; each of the said means presenting a portion behind the said rear wing whereby it may be actuated; and a casing having a back freely spaced from the said rear wing and provided with spaced perforations through each of which one of the said rear portions projects.

Signed at Detroit, Michigan, September 23rd, 1926.

CHARLES E. GODLEY.