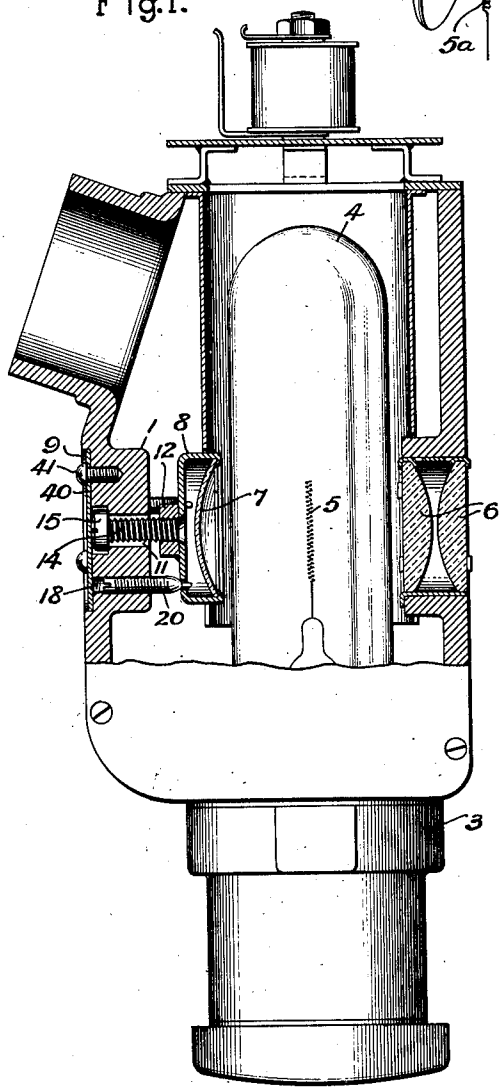
Feb. 19, 1935. R. P. MAY 1,991,861

REFLECTOR MOUNTING

Filed May 2, 1931

Fig.1.



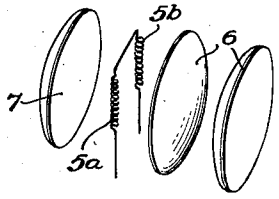


Fig.3.

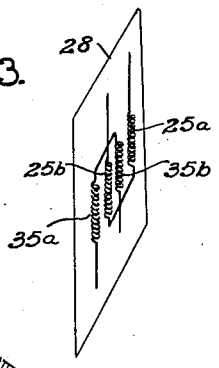


Fig.2.

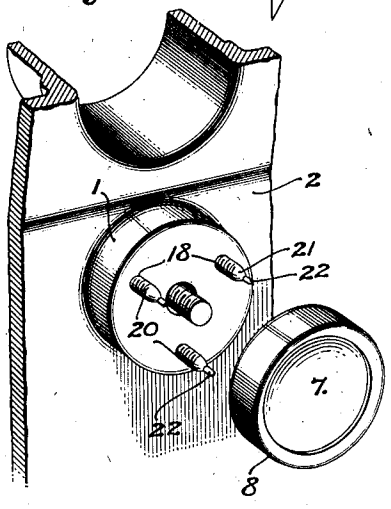
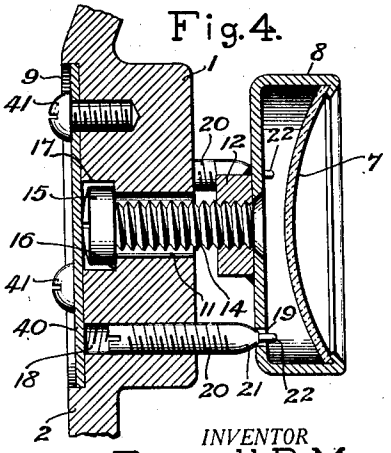


Fig.4.



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Patented Feb. 19, 1935 1,991,861

UNITED STATES PATENT OFFICE

1,991,861

REFLECTOR MOUNTING

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Application May 2, 1931, Serial No. 534,542

3 Claims. (Cl. 88—24)

My invention relates to moving picture apparatus and, more particularly, to a mounting for the reflector utilized in connection with the projector lamp.

In apparatus of this type, light from a suitable source is concentrated onto a moving film whereby images appearing on the film are projected onto a distant screen through a suitable optical system. Where the light source employed is in the form of an incandescent lamp, it is desirable, in order to increase the light efficiency, to employ a suitable reflector in connection with the lamp, so that not only direct rays, but also reflected rays will be projected onto the screen.

Incandescent lamps used for this purpose are usually provided with filaments of two or three coils, and it has been found that with lamps of this kind, although the light efficiency is increased by the use of a reflector, it is, nevertheless, ordinarily difficult to obtain maximum light efficiency. This is due to the fact that the rays of light emanating directly from the lamp form one image of the lamp filament through the condenser lenses, while the light rays reflected by the reflector form a second image which, ordinarily, is superposed either partially or entirely on the first image. The result is that light is lost and streaks or spots of varying light are formed on the screen, a uniform distribution of the light becoming extremely difficult, if not altogether impossible.

The principal object of my invention is to obviate this difficulty, and I accomplish this by providing a focus adjusting means in connection with the reflector for focusing to control the intensity of the projected light, and a light distribution adjusting means whereby the projected light may be uniformly distributed over the screen, thus relieving eye-strain and permitting maximum enjoyment of the viewed pictures.

Another object of my invention is to provide an improved reflector mounting wherein the light distribution adjusting means may act as a guide for the focus adjusting means.

Still another object of my invention is to provide an improved reflector mounting wherein the adjusting mechanism will simultaneously lock the reflector in adjusted position once it has been adjusted.

A further object of my invention is to provide an improved reflector mounting wherein the reflector may be adjusted externally of the lamp housing even during operation, if desired, making it unnecessary to dismantle any of the parts once they are set up for use.

Still a further object of my invention is to provide an improved reflector mounting wherein, once the adjustments have been made, ready access to the adjusting means will be prevented so that they may not be tampered with or disturbed without removing a portion of the lamp housing.

Another object of my invention is to provide an improved reflector mounting of the type set forth which will be rugged, durable in construction and efficient in use, as well as being compact and well suited to the requirements of commercial manufacture.

The novel features of my invention are set forth with particularity in the appended claims, the invention itself, however, both as to its organization and its method of operation, together with additional objects and advantages thereof, being best understood from the following description of a specific embodiment, when taken in connection with the accompanying drawing in which

Figure 1 is a side elevation, partly in section, of a lamp housing provided with reflector adjusting means according to my invention;

Fig. 2 is an exploded perspective view of the adjusting means and reflector;

Fig. 3 is a diagrammatic view illustrating how the light may be evenly and uniformly distributed by means of my improved adjusting means, and

Fig. 4 is a detailed section of a portion of the adjusting mechanism.

Referring to the drawing wherein similar reference characters indicate corresponding parts throughout, my improved reflector mounting comprises a support or boss 1 formed on a lamp housing 2 in the base 3 of which is provided a socket for the reception of an incandescent lamp 4. The lamp 4 is provided with a filament 5 which may be of any suitable number of coils, only two coils, 5*a* and 5*b*, being shown in the drawing for the sake of simplicity. Light rays leaving the lamp 4 may pass directly through condensers 6 onto an intermittently moving film (not shown) whereby images appearing on the film are successively projected onto a distant screen (not shown) in a manner well known to those skilled in the art.

In order to increase the amount of light concentrated upon the film and eventually projected onto the screen, a suitable reflector 7 may be provided, the reflector 7 being mounted in a frame or casing 8 and positioned diametrically opposite to the condensers 6. Light rays leaving

the filament 5 and reaching the reflector 7 are then reflected back through the condensers 6, thus augmenting the rays passed directly through the condensers 6 by the filament 5.

The support or boss 1 is provided with a recess 9 and a centrally disposed bore 11, while the reflector frame or casing 8 is provided with a boss 12 which is internally threaded to receive a screw 14 extending through the bore 11, whereby the casing 8 is substantially aligned with the boss 1. It will be noted that the diameter of the bore 11 is greater than that of the threads of the screw 14 for a purpose indicated hereinafter. By manipulating the screw 14 within the bore 11, the reflector 7 will be moved along its optical axis for the purpose of focusing, the screw 14 being limited in its axial movement by the bosses 1 and 12 at one end and by its own head 15, in engagement with a shoulder 16 of a counterbore 17, at the other end. By reason of the bore 11 being larger than the cross sectional dimension of the screw 14, it will be obvious that the screw 14 may also be moved transversely of the bore 11 within the limits thereof.

The boss 1 is also provided with a plurality of screw-threaded openings 18 circumferentially disposed thereon about and radially spaced from the bore 11. In the drawing, three such openings are shown spaced 120° from each other. The casing 8 is provided with a similar number of openings 19 aligned with the openings 18. Threaded in each opening 18 is a screw 20 having a reduced or rounded end portion 21 bearing against the back of the casing 8 and terminating in a still further reduced extension 22 which fits into the correspondingly aligned opening 19 of the casing 8. The openings 19 are of slightly greater diameter than that of the extensions 22 for a purpose to be hereinafter described.

By reference to Figures 1 and 3, the operation of my improved mounting and adjusting means will now be made clear. The light rays emitted by the coils 5*a* and 5*b* of the filament 5 directly toward the condensers 6 are projected onto a distant plane 28 to form an inverted image 25*a*, 25*b*. Light rays emitted by the coils 5*a* and 5*b* toward the reflector 7 are reflected thereby and pass through the condensers 6 to form an upright image 35*a*, 35*b*. In order to obtain the brightest image on the screen, the screw 14 may be manipulated to adjust the reflector 7 along its optical axis until an image is focused on the plane 28, the casing 8 moving along the extensions 22 which act as guides therefor. However, this adjustment alone does not prevent the images 25*a*, 25*b* and 35*a*, 35*b* from being superposed, either partially or entirely over one another, and in such case, light loss results and there appear streaks of light on the screen during picture projection, the light being non-uniformly distributed thereon and being tiresome to the eyes of the observer.

In order to obviate this condition, I have provided the adjusting screws 20. These screws may be manipulated individually to tilt the reflector 7, by reason of the reduced ends 21 bearing on the casing 8, thus changing the direction of the optical axis of the reflector 7 until the images 25*a*, 25*b* and 35*a*, 35*b* are staggered and evenly spaced with respect to each other, as clearly shown in Figure 3. This results in increased light efficiency, and the screen becomes uniformly illuminated by virtue of the even and uniform distribution of light thereover.

When the reflector has been so adjusted, it is simultaneously locked in adjusted position by the screw head 15 bearing against the shoulder 16 and the reduced ends 21 of the screws 20 bearing against the rear of the casing 8, the openings 19 and the bore 11 permitting free and easy adjustment, since they are respectively larger than the extension 22 and the screw 14. This adjustment will, of course, be maintained until disturbed. In order to prevent ready access to the screws 14 and 20 and thus, possibly, accidentally disturbing this adjustment, a cover plate 40 may be inserted into the recess 9 and held therein in any suitable manner, as by screws 41.

It will thus be seen that I have provided a reflector mounting wherein the adjusting means may be easily and quickly operated for focusing and uniformly distributing on a screen the light emitted by the lamp of a projector in such a manner as to produce maximum results and optimum enjoyment of the viewed pictures. It will further be seen that I have provided a reflector mounting wherein dismantling of any of the parts is unnecessary when it is desired to adjust the position of the reflector, the reflector being locked in adjusted position automatically once it has been adjusted, and to which ready access is prevented, thereby eliminating accidental displacement or disturbance of adjusting members.

Although I have shown and described a certain specific embodiment of my invention, I am fully aware that many modifications thereof are possible. Furthermore, although I have shown my invention as applied to a reflector mounting utilized in connection with the projector lamp of moving picture apparatus, it will be obvious that my improved reflector mounting may be employed in many other types of apparatus. My invention, therefore, is not to be restricted except insofar as is necessitated by the prior art and by the spirit of the appended claims.

I claim as my invention:

1. The combination with a reflector and a casing therefor of a mounting for said casing comprising a support, means loosely fitted in said support and engaging said casing for adjusting said reflector lineally, and means threaded in said support and loosely engaging said casing for tilting said casing and reflector.

2. The combination with a reflector and casing therefor of a mounting for said casing comprising a support, a screw loosely fitted in said support and threadedly engaging said casing for adjusting said casing and reflector lineally relative to said support, a plurality of screws threaded in said support about said screw and arranged to engage said casing adjacent the periphery thereof for tilting said casing and reflector relative to said support, and means on said support for preventing ready disturbance of the adjustment of said screws.

3. The combination with a reflector and casing therefor having a plurality of apertures circumferentially disposed thereon of a mounting comprising a support, a screw loosely fitted in said support and threadedly engaging said casing for adjusting said casing and reflector lineally relative to said support, and a plurality of screws threaded in said support about said loosely fitted screw and having reduced ends fitted within said apertures to form guide means for said casing in its lineal movement relative to said support.

RUSSELL P. MAY.