

Sept. 16, 1952

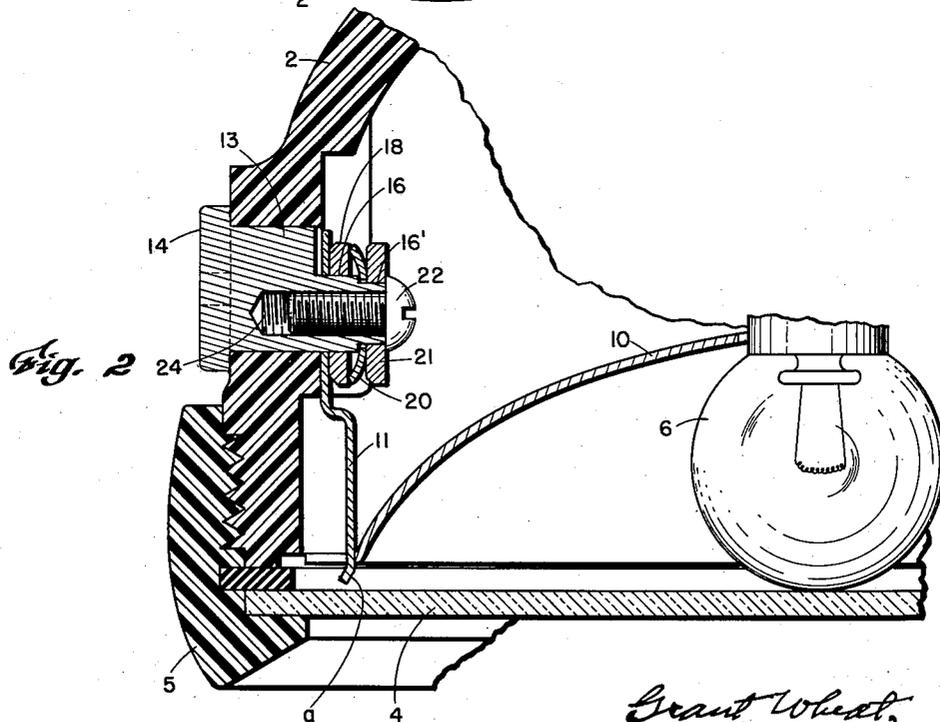
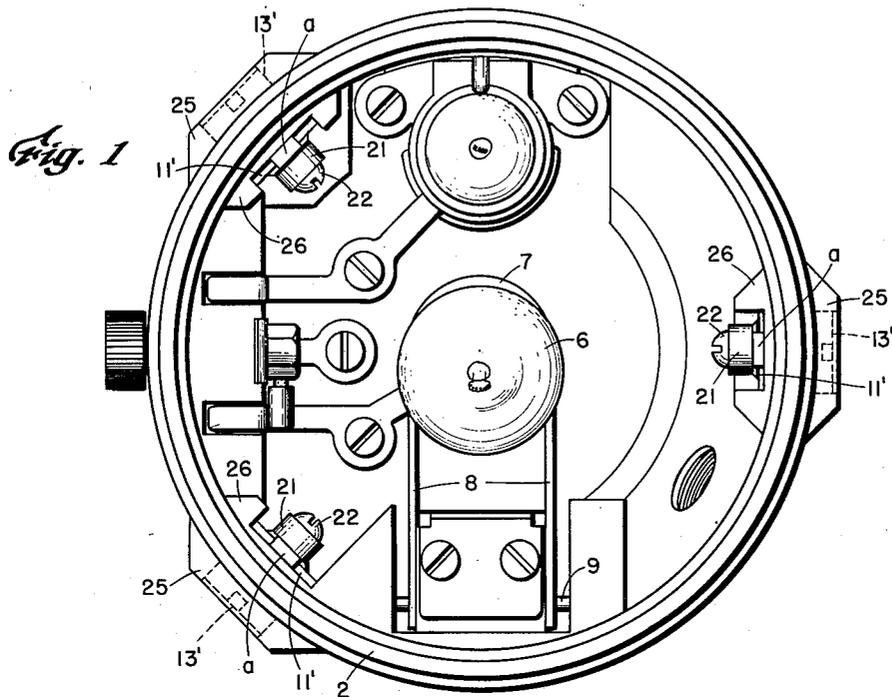
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2,611,073

REFLECTOR APPARATUS FOR MINERS' LAMPS

Filed June 30, 1949

2 SHEETS—SHEET 1



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2 SHEETS—SHEET 2

Fig. 3

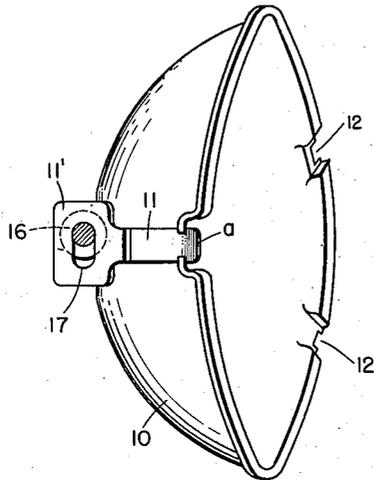


Fig. 4

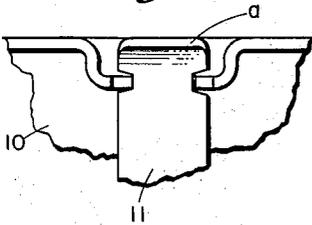


Fig. 6

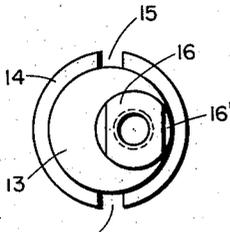
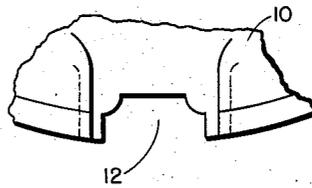
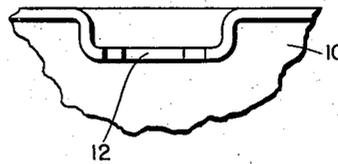


Fig. 5

Fig. 7



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UNITED STATES PATENT OFFICE

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REFLECTOR APPARATUS FOR MINERS' LAMPS

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5 Claims. (Cl. 240-44.1)

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This invention relates to reflector apparatus for miners' lamps of the type commonly referred to as "cap lamps" because they are customarily worn on a cap or hat. The invention will herein be disclosed as embodied in a lamp structure of the general type shown in my earlier Patent No. 2,312,613, granted March 2, 1943, although it is not limited in its application to lamps of this particular construction.

In miners' lamps of the general type disclosed in said patent, a reflector is mounted in a stationary position in the lamp chamber of the headpiece behind the lamp bulb, and the bulb also is supported in a substantially fixed position in the headpiece. In the particular lamp shown in said patent the bulb is held under spring pressure against the glass front or "lens" which closes the forward end of the lamp chamber so that if this front is broken the bulb will be moved forward and the contact between the lamp and one of its supply terminals will be interrupted, thus shutting off the flow of current to the lamp and eliminating the danger of an explosion, in the event that the accident takes place in an explosive atmosphere.

In order to ensure the proper focusing of the light beam delivered by these lamps, the lamp bulbs must be so selected that the filament will be correctly placed in the bulb so that when the bulb is in its operative position the filament will be located at the focal point of the reflector. This involves a pre-testing of a large number of bulbs in order to select those which will satisfactorily meet the requirements just outlined, and this testing and selecting process is time-consuming and expensive.

The nature of the invention aims to devise a miners' lamp in which a standard bulb can be used and the reflector can be so adjusted as to make its focal point coincide with the filament in the lamp bulb. It is also an object of this invention to produce the result just described without interfering in any way with the safety feature of the headpiece, as above described.

The nature of the invention will be readily understood from the following description when read in connection with the accompanying drawings, and the novel features will be particularly pointed out in the appended claims.

In the drawings,

Fig. 1 is a plan view of the interior of a headpiece embodying features of this invention, the view being on a large scale;

Fig. 2 is a fragmentary, sectional view showing on a still larger scale, some of the features of this invention;

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Fig. 3 is a perspective view of the reflector removed from the headpiece;

Fig. 4 is an elevation showing, in detail, the means for connecting the adjusting devices with the edge of the reflector;

Fig. 5 is a plan view of the inner end of the cam;

Fig. 6 is a plan view showing the manner in which the edge of the reflector is notched to receive an adjusting link; and

Fig. 7 is an elevation of the detail shown in Fig. 6, all of the foregoing figures being on a large scale.

The construction shown in the drawings comprises a casing or headpiece 2 essentially like that shown in the patent above referred to, except for features presently to be described. In this casing is a lamp chamber normally closed by a glass front or "lens" 4 held in place by a bezel 5 which is screw-threaded on to the end portion of the headpiece 2. Mounted in this chamber is an electric lamp bulb 6 of a common form supported in a standard socket 7 which, in turn, is supported on a pivoted holder 8 with which a spring is associated in such a manner as to force the holder and the lamp outwardly and to hold the bulb 6 firmly against the glass front 4. Or, the mounting for the socket may, itself, be of a resilient nature such as to produce this same result. Current is conducted to the lamp 6 through the socket, flows through the filament, and returns through a substantially stationary contact normally held in engagement with the end terminal of the lamp by the contact of the latter with the lens 4. This arrangement provides an important safety factor, as above mentioned, because if the glass front 4 becomes broken and the bulb also is broken, or if the bulb is fractured in any other manner, the spring mounting of the bulb will force the socket forward, thus breaking the contact between the end terminal of the lamp and the stationary contact.

So far as the features above described are concerned, the construction is essentially like that illustrated in my earlier patent.

For the purposes of this invention the reflector 10 is supported by three metallic straps or links 11, the upper end of each link being shaped as shown in Figs. 3 and 4. That is, the link has notches in the opposite sides thereof near its upper end so that it can slide laterally into another notch 12, Fig. 6, formed in the margin of the reflector. The inherent stiffness and resiliency of the link hold it in its operative position while still permitting its upper outwardly bent tip a to be pushed away far enough to break its inter-

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locking engagement with the reflector. Because the reflector is supported solely by these three links, the latter elements may be utilized in adjusting the reflector backward and forward relatively to the bulb in order to focus it. Preferably the reflector is made slightly smaller in outside diameter than the internal diameter of the end of the lamp chamber so that the reflector can be moved down into the chamber, when desired.

Adjustment of the reflector is made by means of three cams, one associated with each of the links 11. These cams are alike and one is shown in detail and much enlarged in Figs. 2 and 5. As there illustrated, it comprises a cylindrical body 13 provided with a flanged head 14 which is notched at opposite edges, as best shown at 15 in Fig. 5, to receive a spanner wrench by means of which the cam may be rotated in the bore formed through the lateral wall of the headpiece 2 and in which the body 13 fits snugly. Projecting from the inner end of this part 13, and integral with it, is an eccentric pin 16 which extends through the horizontal slot 17, Fig. 3, formed in the base 11' of the link 11. A washer 18 encircles the pin 16 and another washer 20, dished as shown in Fig. 2, bears on the first washer and is backed up by a third washer 21 which is keyed at 16' to the pin 16. A screw 22 threaded into a socket 24 formed in the cam holds these parts in their assembled relationship.

It will thus be seen that when one of the cams is turned in its bearing in the wall of the lamp chamber, it will move the link 11 associated with it inward or outward, depending upon the direction of rotation. The other adjusting devices can be operated in the same way. Thus the reflector can be adjusted to focus the lamp very accurately. Because all of the devices are accessible from outside the headpiece, the adjustment can be made easily whenever necessary and the parts will remain in their adjusted position because of the frictional resistance to change. Such resistance is provided by the tension washer 20, the outer margin of which is pressed against the washer 18 by the washer 21 and screw 22.

While the construction shown in Fig. 2 is suitable for some designs, that shown in Fig. 1 is preferable in most cases. Here the cams 13' are mounted in bosses 25 integral with the case 2 where they are completely protected but still accessible. Also, corresponding bosses 25 are provided on the inside of the case and they are shaped to receive and guide the opposite parallel edges of the bases 11' of the links 11.

Thus the invention provides a construction in which the reflector can easily be adjusted to position its focal point in the filament of the lamp, and the necessity for the laborious testing of lamps, as above described, is eliminated. Also, the adjusting devices are positioned entirely within the outside surface of the casing where they are completely protected and no parts of them are left projecting beyond that surface where they might catch on the hands or clothing of the user.

While I have herein shown and described a preferred embodiment of my invention, it will be evident that the invention is susceptible of embodiment in other forms without departing from the spirit or scope thereof.

Having thus described my invention, what I desire to claim as new is:

1. A miner's lamp comprising a headpiece provided with a lamp chamber, a light transmitting front plate closing the forward end of said

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chamber, spring means for resiliently supporting an electric lamp bulb in said chamber against said front plate, a reflector associated with said bulb to reflect light from it through said front plate, means for supporting the reflector in a position such that the lamp is free to move relatively thereto, said reflector supporting means including a plurality of eccentric adjusting devices connected with said reflector and operable from points outside of said headpiece to adjust said reflector relatively to said bulb.

2. A miner's lamp according to preceding claim 1, in which each of said eccentric adjusting devices includes a link releasably engaged with the rim of said reflector, and an eccentric element operatively connected to the link.

3. A miner's lamp according to preceding claim 1, in which each of said adjusting devices includes a slotted link releasably interlocked with the reflector and an eccentric element rotatably mounted in the wall of said headpiece and associated with said link to cause its rotative movements to move the link and the part of the reflector to which it is connected backward and forward in the headpiece.

4. A miner's lamp according to preceding claim 1, in which each of said adjusting devices comprises an eccentric element mounted in recessed relationship in the wall of the headpiece for rotative movement, and a link connecting said eccentric with the margin of the reflector.

5. A miner's lamp comprising a headpiece provided with a lamp chamber having a lamp therein, electrical contact means for completing an electrical path through said lamp, a lamp socket having the lamp secured therein, said lamp socket being resiliently mounted for movement in to and out of contact with the said electrical contact means, a front plate arranged to close the forward end of said lamp chamber, said front plate cooperating with the lamp socket to normally hold the lamp in contact with the electrical means, a concave reflector member associated with the bulb to reflect light from it, means for supporting the reflector in a position such that the said lamp socket is free to move away from the electrical contact means, said reflector supporting means including a plurality of slotted arms releasably engaged with the rim of the reflector, guideway means provided in the side wall of the headpiece at spaced-apart points for slidably containing the slotted arms, and a plurality of eccentric elements rotatably mounted through the side wall of the headpiece and said slotted arms for axially adjusting the reflector in the lamp chamber.

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