

Dec. 25, 1934.

G. B. PRATT

1,985,459

FLASH LIGHT

Filed June 14, 1930

2 Sheets-Sheet 1

FIG.1.

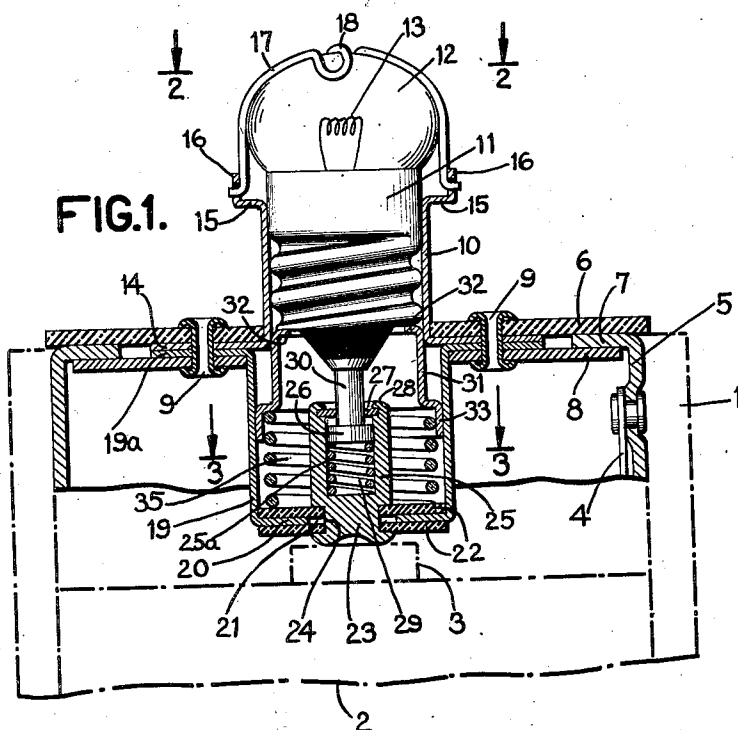


FIG.2.

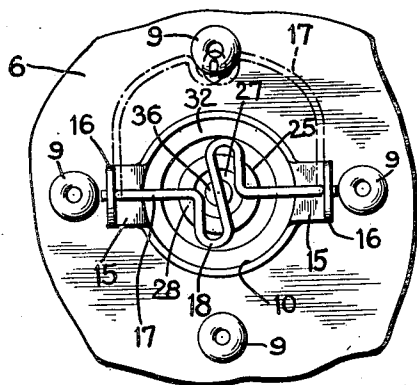
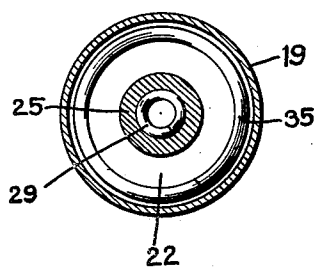


FIG.3.



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FIG. 4.

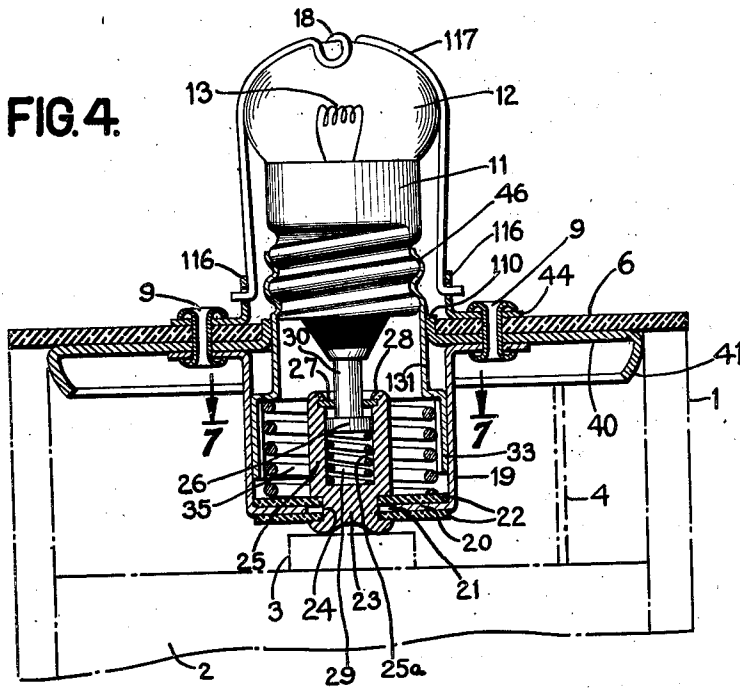


FIG. 5.

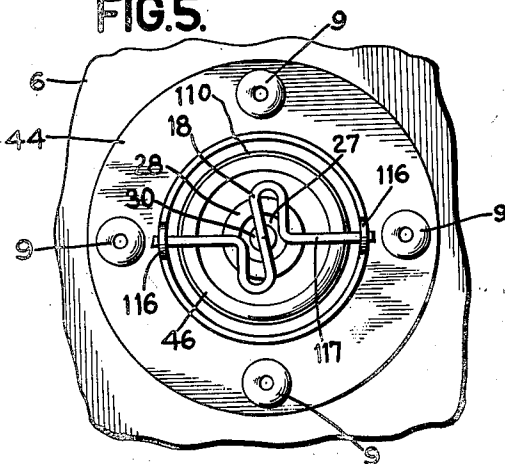


FIG. 6.

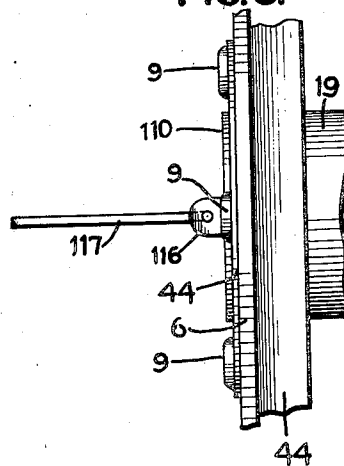
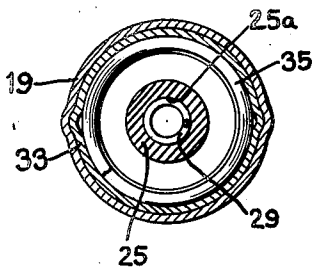


FIG. 7.



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FLASH LIGHT

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Application June 14, 1930, Serial No. 461,098

10 Claims. (Cl. 173—358)

The present invention relates to flashlights and other electric hand lanterns in which an incandescent filament lamp serves as the source of light. More particularly, the invention relates to an incandescent lamp supporting structure whereby the flashlight or lantern may be used in mines and other locations where explosive gases are present and which is so constructed that the electric circuit including the filament is automatically interrupted and the filament ceases to glow upon rupturing of the glass bulb enclosing the filament, in order to prevent access of the explosive gas to the incandescent filament with consequent danger of explosion.

While previous attempts have been made to provide flashlights and the like of this character, the resulting structures have fallen short of complete success from a commercial standpoint and although such designs have afforded constructions in which the lamp filaments have been extinguished automatically upon rupture of the bulb, various characteristics thereof have rendered them objectionable in one respect or another.

As an advance over the prior structures noted above, the present invention contemplates the provision of a lamp supporting structure, wherein the lamp may be readily replaced by a simple operation in which the likelihood of jamming is reduced to a minimum. In the replacement of lamps, the present structure is of such character that the reflector does not interfere with such replacement, thus avoiding scratching and marring thereof.

In accordance with the foregoing, an object of this invention is to provide a flashlight and the like so constructed that the lamp filament is automatically extinguished when the bulb is broken, such lamp being characterized by simplicity of design and effectiveness of operation.

A further object of the invention is to provide a light of the above character, the lamp of which is readily replaceable by a simple operation.

A further object of the invention is to provide a lamp of the above character in which the lamp may be tested before assembling the hood in position.

Further objects, not specifically enumerated above, will be apparent as the invention is described more fully hereinafter and the attainment of such objects is accomplished by a construction enabling a lamp to be normally maintained against a terminal, a yielding force normally being exerted on the lamp to eject the

same from the socket when the last named means is rendered ineffective due to the breaking of the bulb. To render the breaking of the circuit more effective, a limiting stop is provided for the yielding contact to prevent the same from following the lamp beyond a predetermined extent, thus causing the lamp to be instantly moved away from the contact, at the same time affording a desired degree of yield in the contact.

In order that the invention may be understood in greater detail, the same will now be described more specifically in connection with the accompanying drawings, wherein:—

Figure 1 is a view in section, showing a flashlight constructed in accordance with the present invention, the mounting of the lamp thereof being illustrated in detail.

Figure 2 is a plan view, taken on line 2—2 of Figure 1, and showing the manner of replacing the lamp of the flashlight shown in Figure 1.

Figure 3 is a view in section, taken on line 3—3 of Figure 1, and looking in the direction of the arrows.

Figure 4 is a view, similar to Figure 1, but showing a modification of the structure wherein the reciprocating lamp engaging element is formed as a socket for the lamp.

Figure 5 is a plan view looking from above in Figure 4.

Figure 6 is a view, in side elevation, looking from the left in Figures 4 and 5.

Figure 7 is a view, in horizontal section, taken on the line 7—7 of Figure 4 and looking in the direction of the arrows.

While the invention is illustrated as applied to tubular flashlights of a well known type, it is to be understood that it is equally applicable to any form of lighting unit employing any source of electric current.

Referring to the above drawings, there is shown diagrammatically a fragmentary part of a casing 1 for the flashlight containing a battery 2 having a central terminal 3 in series with an incandescent lamp and a circuit closer, not shown. In the illustrated embodiment, a conductor strip 4, forming part of the electric circuit of the flashlight, is shown, in Figure 1, in electrical connection with a fitting 5 formed with parts 7 by which the lamp socket supporting structure of this invention is positioned.

The lamp socket supporting structure comprises a lamp socket supporting member or disc 6 shown as of insulating material, although it may be

made equally well of metal. The lamp socket support 6 is illustrated as supported upon the inwardly extending flange 7 of the fitting 5 and retained against displacement by means of portions of a conducting member or disc 8, preferably eye-
 5 letted to the lamp socket supporting disc 6 by means of eyelets 9, and which supports the lamp mounting elements in the manner to be described hereinafter. It will be obvious that any form of
 10 casing for a flashlight or other hand lantern may be provided with the lamp socket supporting structure of this invention as well as the means for removably securing the latter in respect of the casing, and Figure 1 illustrates very schematically
 15 an interconnection between the two.

A cylindrical guide 10 is formed of a suitable diameter to receive a lamp base 11 and/or lamp base engaging member 31, the lamp having a glass bulb 12 and a filament 13. The base may be of the
 20 standard type, being either threaded or plane, a threaded lamp base being illustrated herein. The lower extremity of the guide 10 is formed with an outwardly extending peripheral flange 14 which is conveniently secured to the disc 6, and in Figure
 25 1 is shown as secured between the discs 6 and 8 by means of the eyelets 9 passing therethrough. At the upper extremity of the fixed guide 10, outwardly extending arms 15 are formed with upwardly projecting nibs or ears 16 within which
 30 the extremities of a bail 17 are hingedly secured. The bail is preferably formed with a crimped portion 18 to render the same more resilient, also to engage more of the surface of the bulb, and permit the lamp to be retained thereby more effectively.
 35

Also carried with the end 6 is a downwardly extending cylinder 19, the upper extremity of which is formed with a peripheral flange 19a which is secured under the flange 14 of the guide 10 and
 40 between the discs 6 and 8 preferably also by the eyelets 9. At the lower extremity of the cylinder 19, an inwardly extending flange 20 is formed providing an aperture 21, and disposed upon opposite sides of the flange 20 are spaced insulating discs
 45 22 which mount a battery terminal contact member 23 of conducting material and prevent contact between such member 23 and the inwardly extending flange 20 of the cylinder 19. The contact member 23 is preferably formed with a peripheral
 50 groove 24 within which the inner extremities of discs 22 are received to maintain the contact member in position.

Contact member 23 is formed with an upwardly projecting preferably cylindrical extension 25 defining a cylindrical chamber or cylinder 25a. A
 55 plunger 26 of conducting material is slidably mounted within the chamber 25a and held against displacement therefrom by means of a disc 27 which serves as a closure for the chamber and
 60 which is perforated as a bearing for a contact extension 30 on the plunger 26. The disc 27 is mounted at the upper extremity of the extension 25 by means of the turned over edge 28. A spring 29, within the chamber 25 normally urges the
 65 plunger 26 against the disc 27 to cause the contact extension 30 of the plunger to be moved into its extreme outer position (i. e. toward the top in Figure 1), so as to normally have a tendency to yieldingly engage and follow the terminal of the
 70 lamp base 11.

Within the guide 10 and cylinder 19, a sleeve or lamp engaging member 31 is mounted. This sleeve is formed at its upper extremity with a lamp engaging portion in the form of an inwardly extending
 75 flange 32 or its equivalent, against which

the lamp base 11 seats, in this modification, at its outer periphery. The lower portion of the sleeve 31 is formed with a seat 33 for a spring 35 bearing against the bottom of the cylinder 19 and tending to urge the sleeve 31 within the guide 10
 5 towards the outer end thereof to eject the lamp from the socket and break the contact between the plunger 30 of limited movement and the lamp base. Preferably the seat takes the form of a portion 33 of enlarged diameter which fits or telescopes within the inner periphery of the cylinder 19 to slide therein.
 10

From the foregoing description, it will be apparent that a lamp bulb may be replaced by swinging the bail 17 to the position shown in dot
 15 and dash lines in Figure 2. The spring pressed ejecting sleeve 31 will at once eject the lamp. After removing the old lamp base a fresh one is inserted and forced downwardly against the flange 32 and pressure of the spring 35. After
 20 the lamp bulb has been depressed sufficiently, the bail 17 is swung into the position shown in full lines in Figure 2 and spring 35 is permitted to press the lamp bulb 12 against the bail 17, thus holding it in place. In this position, it will be
 25 noted that the plunger 26, 30, by which electrical connection is made with the lamp terminal, is almost at the upper extremity of its stroke, being urged thereto by the spring 29. In the event
 30 that the bulb 12 is broken, the sleeve under the influence of spring 35 immediately tends to eject the lamp base and thus moves the central terminal of the lamp bulb 12 away from the contacting extension 30. This contacting extension
 35 follows the central terminal for only a very short distance, and practically not at all, the movement possible being only sufficient to permit the contact to be yielding and afford a tolerance, the
 40 disc 27 limiting the outward movement of the plunger 26 and extension 30 and thus breaking the contact practically instantaneously and causing the filament to cease to glow so that should explosive gases enter the broken lamp bulb their ignition is not possible.
 45

In Figures 4 through 7 like parts of the modification there illustrated are indicated by like reference characters. Although this modification is applicable to a lamp supporting structure similar to that shown in Figure 1, the disc 6 is illustrated as resting upon the cylindrical casing 1 as before,
 50 but electrical connection with the conductor strip 4 is shown as made by means of an electrically conductive disc 40 carried therebelow and having a peripheral flange 41 inwardly directed or tapered to facilitate positioning of the lamp
 55 socket support on the casing 1 and the flange 41 makes electrical connection with the upper end of the conductor strip 4. As illustrated, this disc 40 is disposed below the end 6 and carries a guide 110 for the lamp base engaging member. In this
 60 modification, the guide 110 extends upwardly in the central aperture of disc 6 only to or a little above the top surface of disc 6, but serves as a guide or bearing for the lamp engaging member as before. Above the disc 6, there is disposed an
 65 annulus 44 having oppositely disposed ears 116 apertured to receive the outwardly turned ends of a bail 117. The only difference in bail 117 over bail 17 is in the length of the ends or arms which, because of the disposition of the ears 116 proximate the disc 6 must be longer.
 70

The same type of cylinder 19 is illustrated with this modification and the end 6, guide disc 40, cylinder 19 and the annulus 44 are shown as secured together by eyelets 9.
 75

The lamp engaging member 131 in this modification has a spring seat 33 similarly slidable in the cylinder 19, but the upper end engages the lamp base 11, not by means of a flange upon which the lamp base seats, but by being formed as a socket 46 into which the lamp base is disposed. While the connection between the socket and lamp base is shown as a screw connection, it will be apparent that it may merely rest therein upon a shoulder such as at 32 or be secured as by a bayonet slot joint or the like.

Here again when the bale 117 is turned through 90°, the lamp may be removed (by unscrewing it) and a new lamp inserted and the bail 117 replaced as shown in Figure 4.

It will be seen that the replacement of bulbs may be readily effected by a simple operation and all likelihood of jamming is entirely eliminated by the simple connections and mounting described herein. Furthermore, the lamp may be mounted in position with the electrical circuit completed without applying the hood, thus greatly facilitating testing of the battery and lamp.

It is not necessary to touch the reflecting surface of the reflector while inserting the bulb, thus preventing scratching and marring of such reflecting surface, and the elements, while being simple in construction and readily assembled, are highly effective and positive in operation.

Various modifications will occur to those skilled in the art in the disposition, configuration and composition of the component elements going to make up the lamp socket support of this invention as a whole as well as in its application, and no limitation is intended in the phraseology of the foregoing description or illustrations in the accompanying drawings save as defined in the appended claims.

What is claimed is:—

1. A lamp support comprising a guide for an axially movable lamp base, said guide having a flange formed at one end, a cylinder for a lamp base engaging member coaxial with the guide and of greater diameter than the guide, and having a flange, a supporting disc, a second disc, and means to secure the flanges and the discs together.

2. A lamp support comprising a guide for an axially movable lamp base, said guide having a flange formed at one end thereof, a cylinder for a lamp base engaging member coaxial with the guide and of greater diameter than the guide and formed with a flange, a disc and means to secure the flanges and the disc together.

3. A lamp support comprising a guide, a cylinder coaxial thereto and of greater diameter than the guide to form an abutment, a resilient contact carried by the cylinder, means to limit the movement of the contact toward the guide, a sleeve slidably mounted in the cylinder and having a restricted portion slidable in the guide and comprising a lamp base contacting portion, a shoulder on the sleeve to engage the abutment, and a spring in the cylinder seated within the shoulder to urge the sleeve toward the guide.

4. A lamp support comprising a guide, a resilient contact, means to limit the movement of the contact toward the guide, means to retain a lamp in the guide normally, a sleeve slidable in the guide and having an inwardly extending peripheral flange contacting with the bottom of the lamp base and a spring normally urging the sleeve against the base.

5. A lamp support comprising a guide for an

axially movable lamp base, a cylinder coaxial thereto, a contact carried by the cylinder, a sleeve slidably mounted in the cylinder and having a lamp base contacting portion, a spring normally urging the sleeve into the guide, a stop on the sleeve, a cooperating stop member carried with the guide to limit relative movement of the sleeve and means to retain a lamp base in the guide.

6. A lamp support comprising, in combination, a tubular guide for a lamp base axially movable therein, a cylinder coaxial with the guide, means to fix the guide and cylinder against relative movement, a resiliently supported lamp base advancing member comprising at least a portion slidable in the guide for contact with the lamp base, means to limit movement of the advancing member, a contact for a lamp base terminal and means acting through the lamp bulb for holding the lamp terminal in electrical contact with said contact in opposition to the action of the advancing member.

7. A lamp support comprising the combination with a lamp, of a guide to slidably receive a lamp base, a conductor bearing with spring pressure against the center terminal of the lamp, a conductor resiliently urging the lamp in the same direction as said first named conductor does, means acting through the lamp bulb to support the lamp in opposition to said conductors, said conductors being constructed and arranged to travel in unequal distances in case the lamp is deprived of said support by the breaking of the bulb whereby the last named conductor will move the lamp out of contact with the first named conductor and will thereby open the circuit, said means comprising a U-shaped guard formed with a crimp across the front of the bulb to form a seat for the bulb and arms carried with the guide with which the ends of the guard are pivotally connected, respectively, to move through an angle in a plane about its pivots to release the lamp.

8. A lamp support comprising the combination with a lamp, of a guide to slidably receive a lamp base, a conductor bearing with spring pressure against the center terminal of the lamp, a conductor resiliently urging the lamp in the same direction as said first named conductor does, means acting through the lamp bulb to support the lamp in opposition to said conductors, said conductors being constructed and arranged to travel in unequal distances in case the lamp is deprived of said support by the breaking of the bulb whereby the last named conductor will move the lamp out of contact with the first named conductor and will thereby open the circuit, said means comprising a U-shaped guard across the front of the bulb to form a seat for the bulb and arms carried with the guide with which the ends of the guard are pivotally connected, respectively, to move through an angle in a plane about its pivots to release the lamp.

9. A lamp support comprising, in combination, a tubular guide for a lamp base axially movable therein, a cylinder coaxial with the guide, a lamp base advancing member having at least a portion slidable in the guide for contact with the lamp base, resilient means urging the advancing member in contact with the lamp base, means to limit movement of the advancing member when urged by the resilient means, a contact for a lamp base terminal, resilient means urging the contact into electrical connection with a lamp base terminal, means permitting movement of the

contact for a lesser distance than the advancing member and means acting through the lamp bulb for holding the lamp terminal in electrical contact with said contact in opposition to the resilient means.

10. In a lamp socket support for a flashlight, the combination with a lamp, of a conductor bearing with spring pressure against the center terminal of the lamp, a conductor resiliently urging the lamp in the same direction as said first named conductor does, means acting through the lamp bulb to support the lamp in opposition to said conductors, said conductors being construct-

ed and arranged to travel in unequal distances in case the lamp is deprived of said support by the breaking of the bulb whereby the last named conductor will move the lamp out of contact with the first named conductor and will thereby open the circuit, said means comprising a U-shaped guard pivoted at its ends and movable through an angle in a plane about its pivot to release the lamp and formed with a succession of reversely curved loops across the front of the bulb to form a substantial seat for the bulb.

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