Aug. 9, 1927. 1,638,716

L. O. SURLES

SPOTLIGHT

Filed Aug. 7, 1925 2 Sheets-Sheet 1

FIG. 1

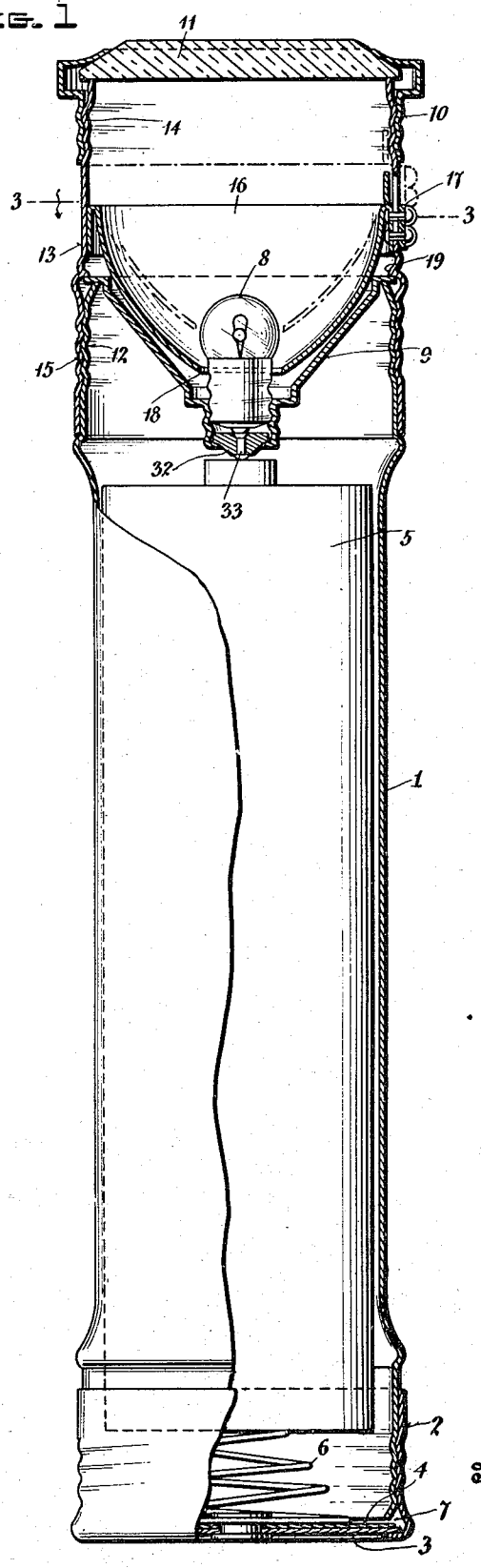


FIG. 2

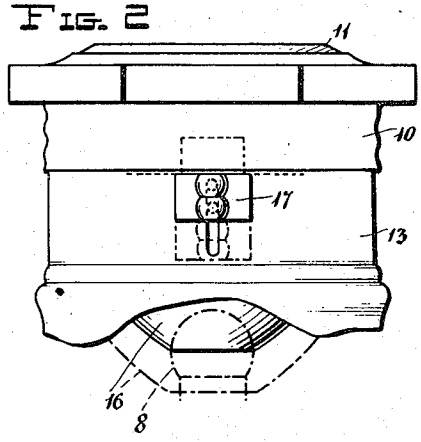


FIG. 3

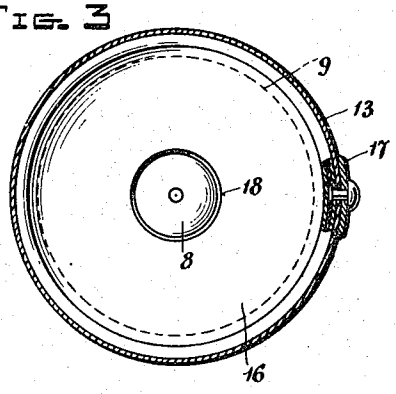
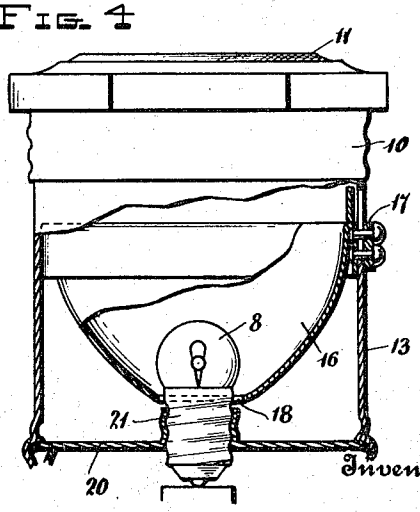


FIG. 4



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2 Sheets-Sheet 2

Fig. 5

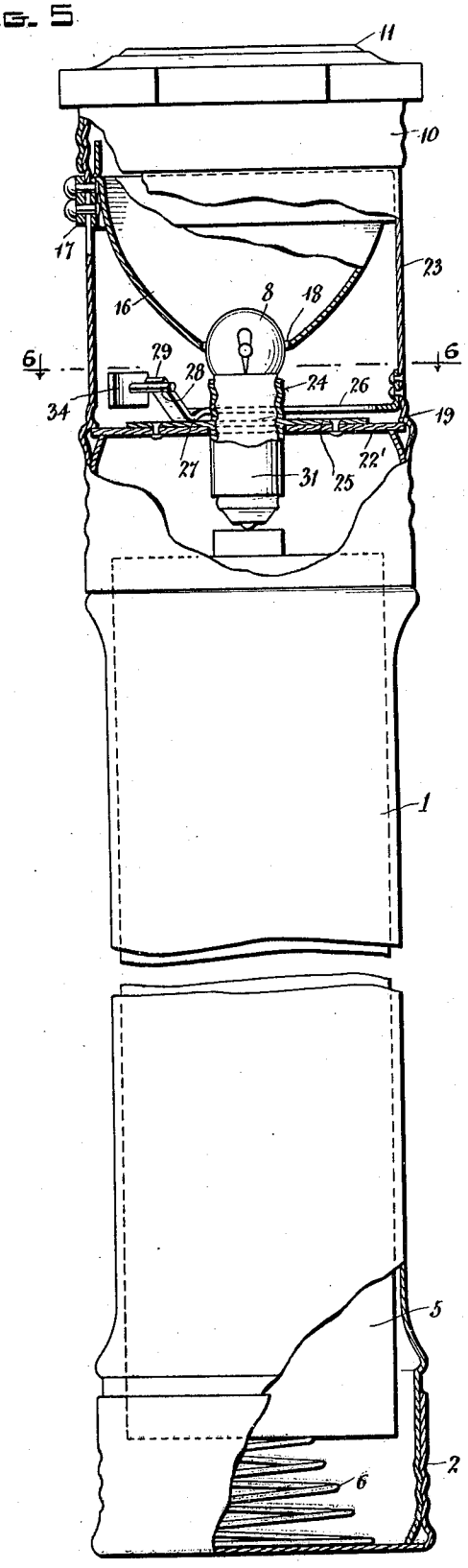


Fig. 6

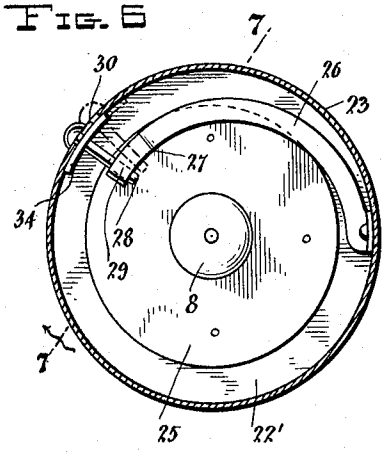
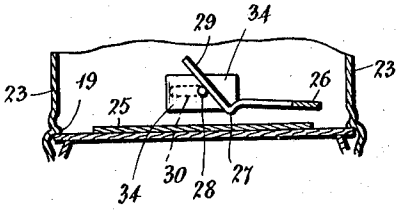


Fig. 7



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UNITED STATES PATENT OFFICE.

LAWRENCE O. SURLES, OF ATLANTA, GEORGIA.

SPOTLIGHT.

Application filed August 7, 1925. Serial No. 48,861.

This invention relates to spot-lights and has for its principal object the provision of novel means for producing the relative longitudinal movement between the lamp and reflector involved in the focusing of the spot-light.

Another object of the invention is to provide a focusing attachment for converting ordinary flashlights into spot-lights structurally so organized as to be readily adapted to co-ordination with any of a number of various types of flashlights.

Still another object of the invention is the provision of an attachment for flashlights which combines in a single structure the lighting switch and focusing mechanism.

Other objects of the invention will appear as the following description of illustrative embodiments thereof proceeds.

In the drawings:—

Figure 1 is a front elevation, partly in section, showing a commercial type of flashlight with my invention applied thereto, converting the flashlight into a focusing spot-light.

Figure 2 is a side elevation of the upper end of the flashlight, a portion thereof being broken away.

Figure 3 is a section taken along the line 3—3 of Figure 1.

Figure 4 is a front elevation, partly in section, showing the invention applied to a commercial flashlight, with an alternative form of lamp support.

Figure 5 is a front elevation, partly in section, showing a slightly modified form of the invention.

Figure 6 is a cross section taken along the line 6—6 of Figure 5.

Figure 7 is a fragmental sectional view, on the line 7—7, Figure 6, showing the lighting switch in circuit breaking position.

Referring now in detail to the several figures, the numeral 1 represents the metallic casing of a flashlight of that type in which the lighting switch consists of an open ended metallic cap 2 screwable upon the lower end of the casing and having a non-conductive push button 3 closing the open end of said cap and retained thereby, said push button carrying a conductive plate 4 in circuit with the negative pole of the battery 5 through a spring 6, said spring normally pressing the push button against the cap so as to maintain a gap 7 between the plate 4 and the end of the casing 1. When pressure is exerted upon the push button 3 the plate 4 is moved in opposition to the spring 6 against the end of the casing 1, thereby closing the circuit through the battery 5, lamp 8 reflector 9 and casing 1 producing an illumination of the lamp which persists while the push button is thus depressed, the circuit being broken by releasing the pressure upon the push button. In order to cause continuous illumination of the lamp, the cap 2 is screwed upon the casing, bringing the plate 4 into permanent contact with the end of the casing to close the gap 7. In the form in which this flashlight is ordinarily manufactured there is an upper cap 10 carrying a glass 11, which cap is screwable upon the threaded upper end 12 of the casing, thus clamping the reflector 9 in place.

The present invention, as applied to a flashlight includes a casing extension 13 threaded at both ends as shown at 14 and 15. A reflector 16 is mounted for longitudinal movement in said extension, said reflector being riveted or otherwise secured to a longitudinally slidable finger-piece 17 arranged externally of the extension, the rivets or other securing means passing through a longitudinal slot formed in the casing extension 13. The reflector is provided centrally with an aperture 18 of sufficient size to pass over the lamp 8. The position of the reflector within the casing extension is such that, when said extension is screwed down into final position upon the upper end 12 of the flashlight, the reflector will have a range of longitudinal movement sufficient to cause the focus of said reflector to travel from a point forwardly of the lamp filament to a point rearwardly of said filament. Ordinarily, when the focus of the reflector and the incandescent filament do not coincide the spot-light produces the diffuse illumination common to ordinary flashlights, but when the reflector is longitudinally shifted by longitudinal sliding movement of the finger-piece 17 until the focus of the reflector and the incandescent filament coincide, the rays of light emanating from the flashlight are concentrated into a brilliantly illuminated spot, the flashlight being thus converted into a spot-light. When the casing extension 13 is in place, the reflector 16 supersedes the original reflector 9 of the flashlight, robbing the latter of its reflective function so that it becomes merely a lamp holder. The casing extension is preferably formed with an in-

wardly directed flange 19 the purpose of which is to bear upon the flange of the reflector 9 and hold it rigidly in place. In applying the casing extension to the flashlight, the upper cap 10 with the glass 11 is removed from the casing and the extension 13 intercalated between said casing and upper cap, the latter being screwed upon the upper end of the extension. In order to locate the filament of the lamp in a position in which it will be in operative relation to the focus of the reflector 16, I have provided a plug 32 of insulation material having a central conductive pin 33 extending axially thereof and exposed on both the upper and lower surfaces, against one end of which pin the central terminal of the lamp may be made to contact by screwing the lamp to a final seat in its socket. The lower end of the pin 33 makes contact with the positive pole of the battery. Other expedients for properly locating the filament of the lamp may be substituted for the one herein described without departing from the invention.

It is apparent that no change or alteration in the construction of the commercial type of flashlight is required in order to apply my simple and efficient device for converting the flashlight into a spot-light.

If the flashlight were originally turned out from the factory with the spot-light attachment as a standard part thereof, the reflector 9 would probably be done away with and a cheaper and efficient lamp holder provided which might take the form of the plain disk 20 shown in Figure 4 having the threaded lamp socket 21 adjacent to its central portion, said disk being preferably made unitary with the casing extension, as shown. When this disk is made part of the casing extension the lamp socket is always centered so that a perfect focusing of the light is assured. This casing extension may be applied also to any standard length flashlight tube, as one complete part, accomplishing the conversion of the same to a spot-light with the assurance that the lamp will always be in the center of the reflector. It will be understood that when the disk 20 is made part of the casing extension it will be necessary to remove the upper cap 10 in order to insert a new lamp. If an unusually long casing is used it may be found necessary to provide the disk 20 with a downward extension, such as that shown at 31 in Figure 5 for bringing the central terminal of the lamp into conductive contact with the middle pole of the battery.

It is to be noted that, since the gap controlled by the lighting switch is at the rear end of the flashlight, in that type just described no problem arises relating to the insulation of any of the parts constituting my spot-light attachment, or with which it is directly associated, and that the attachment as described is merely adaptable for those commercial forms of flashlight in which a side lighting switch is provided.

My spot-light attachment may be applied to a flashlight having the ordinary metallic cap at the lower end and without the lighting switch mechanism illustrated in that form of the invention shown in Figure 1. When this is done, provision must be made to prevent closing of the circuit through the lamp which would otherwise occur incidentally to the screwing on of the casing extension 13 with the disk 20 shown in Figure 4 or against the reflector 9 illustrated in Figure 1. This is done by mounting the lamp socket upon a disk 22′ of insulation material forming a permanent gap between the lamp socket and casing or casing extension, and providing a switch-controlled gap in the casing extension itself. Referring now to the detail construction of Figure 5, the casing extension 23 screws upon the upper end of the casing 1 holding the fiber disk 22′ in place against the upper end of the casing. The reflector 16 is mounted to be movable longitudinally of the casing extension 23 in the manner previously described in connection with the form of the invention illustrated in Figure 1, and may be actuated by the finger-piece 17 arranged externally of said extension. The lamp socket 24 is preferably formed with an annular flange 25 riveted or otherwise secured to the insulation disk 22. A resilient switch blade 26 is secured in any suitable manner to the interior wall of the casing extension 23 in electrical continuity therewith, said switch blade being formed with a contact 27 normally held in spaced relation to the flange 25 of the lamp socket, by means of a pin 28 carried by an arcuate plate 34 circumferentially slidable along the cam-like terminus 29 of the switch blade 26. By moving the pin 28 in one direction the free end of the blade 26 is permitted to move toward the flange 25 to bring its contact 27 into circuit-closing relationship to the flange 25. The pin 28 extends through a circumferential slot 30 in the wall of the casing extension in adjacency to the finger-piece 17, so that both the lighting switch and focusing means are in position to be manipulated by the same finger. The slot 30 is covered at all times by the plate 34.

In order to accommodate my spot-light attachment to flashlight tubes of varying lengths, it is proposed to provide the lamp socket, where necessary, with an extension 31 reaching to the positive pole of the battery. This extension may be longer or shorter, or absent altogether according to the length of the battery tube.

While I have in the present invention illustrated what I believe to be practical and efficient means for carrying out my inven-

tion, yet it is to be understood that the physical means which I have chosen to illustrate the invention are in no sense to be considered limitations to the broadest interpretation of the claims permitted by the state of the prior art.

Having described my invention what I claim as new and desire to secure by Letters Patent, is:—

1. An attachment for converting into a spot-light a flashlight having a casing and a detachable glass carrying cap, including a casing extension adapted to be intercalated between the casing of the flashlight and the detachable cap thereof, a reflector carried by said casing extension and longitudinally movable therein, said reflector having an apertured end adapted to encompass the lamp of said flashlight to permit said lamp to come into and out of the focus of said reflector when the latter is moved, and means on said casing extension for operating said reflector.

2. An attachment for converting into a spot-light a flashlight having a casing and a detachable glass carrying cap, including a casing extension adapted to be intercalated between the casing of the flashlight and the detachable cap thereof, a reflector carried by said casing extension and longitudinally movable therein, said reflector having an apertured end adapted to encompass the lamp of said flashlight to permit said lamp to come into and out of the focus of said reflector when the latter is moved, and a longitudinally slidable finger-piece on said casing extension operatively connected to said reflector.

3. An attachment for converting a flashlight into a spot-light including an extension adapted to be secured to the upper end of a flashlight casing after the upper cap, glass, and reflector have been removed, lamp-socket carrying means adapted to be mounted between said extension and the upper end of the casing, a reflector longitudinally movable within said extension having an apertured end of such size as to pass over a lamp within said lamp socket, said reflector being so positioned with respect to said lamp socket as to permit the lamp to come into and out of the focus of said reflector by longitudinal movement of the latter, and a finger-piece externally of said casing extension for actuating said reflector.

4. An attachment for converting a flashlight into a spot-light comprising an extension adapted to be secured to the upper end of the flashlight casing, including a focusing reflector and a lighting switch, and reflector operating means and switch operating means arranged in convenient adjacency on the outside of said extension.

5. In a flashlight of that type having a metallic casing in circuit with one pole of the battery of the flashlight, focusing means therefor including an extension securable to the outer end of the flashlight casing, a lamp socket in fixed relation to said extension and normally insulated from said casing, a focusing reflector carried by said extension in operative relation to the lamp within said lamp socket, a lighting switch in electrical contact with said extension for closing the circuit through said lamp socket, and reflector operating means and switch operating means arranged in convenient adjacency on the outside of said extension.

In testimony whereof I have hereunto set my hand.

LAWRENCE O. SURLES.