Dec. 8, 1942. W. J. OFFICER ET AL 2,304,742

FLASHLIGHT

Filed Dec. 30, 1939

FIG.1.

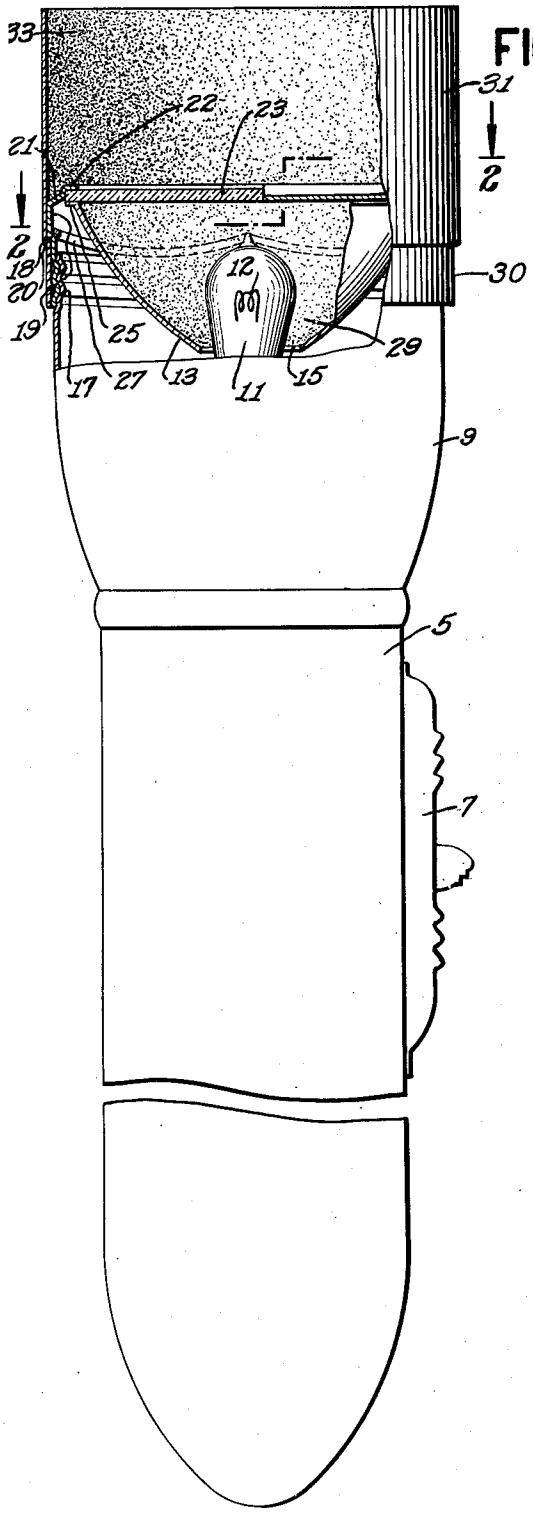


FIG.2.

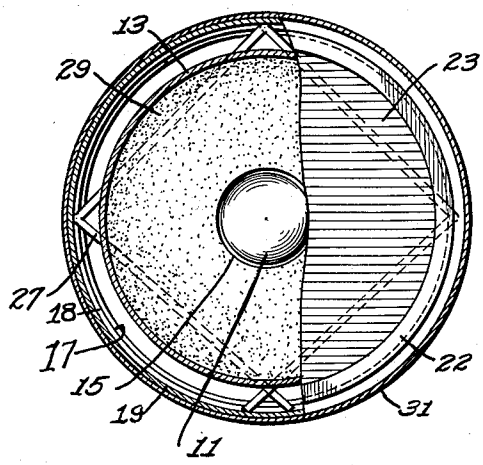
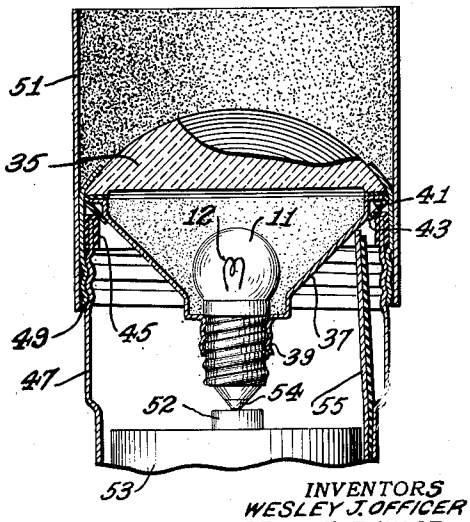


FIG.3.



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FLASHLIGHT

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3 Claims. (Cl. 240—48.2)

This invention relates to lamps or other sources of illumination and particularly to flashlights and electric hand lanterns of the kind in which a removable battery of dry cells is connected and disconnected at will to an incandescent lamp from which the light is reflected in a given direction, although not so limited.

An electric hand lantern or flashlight has heretofore been proposed in which the light from the lamp may be selectively thrown as a beam or as a spotlight, that is, concentrated on one spot or diffused over a wider area. This has been accomplished, in some situations, by a sleeve comprised, say, of frosted glass, which sleeve is movable between a position between or surrounding, as the case may be, a lamp with respect to a reflector whereby the light rays are diffused, and a position in which the light rays are not intercepted by the screen so that the light rays are directed as a beam.

It has also been proposed to so mount a lamp with respect to a reflector that the filament of the lamp, which, of course, is the light source, is definitely fixed against displacement at the focus of the reflector.

In modern warfare, with its attendant air raids and bombing not only of fortified areas but defenseless open towns thronged with inhabitants going about their daily affairs, it is necessary to minimize the danger of night air raids by what is commonly known as a "black-out" in which no lights are permitted on the streets of the community and no lights visible from the windows of the buildings. Many accidents have occurred and casualities resulted from the effort on the part of the populace to use the streets of a city at night because vehicles travel without lights and injuries and death of pedestrians occur frequently. No satisfactory solution has been proposed which will afford pedestrians, cyclists and vehicles the means to illuminate their path without at the same time creating such an illuminated area as to be visible from a bombing plane overhead.

The primary object of the present invention is to provide a beam of light of such reduced intensity as to give only sufficient illumination of the path followed by the carrier of the light source for safety when travelling at slow speeds and to be visible to those in close proximity thereto or in the path of the light beam but insufficient illumination to counteract or nullify the "black-out."

In carrying the invention into effect, light radiating from a light source is reduced in intensity and then is simultaneously diffused and reflected. The light so diffused is preferably further reduced in intensity. Desirably, also the beam thus reflected, diffused and reduced in intensity is further confined within a narrow area by a light absorbing shielding element. Thus when the invention is applied to a flashlight or electric hand lantern the light emanating from the filament, say, of an ordinary miniature incandescent lamp energized, for instance, by a two cell battery, will give just sufficient illumination to accomplish the purpose at hand without defeating the object of a "black-out."

The invention also seeks reducing means for the intensity of light from a suitable light source which is practical from the standpoint of ease and cheapness of manufacture and convenience and durability in use.

These and other objects of the invention and the means for their attainment will be more apparent from the following detailed description, taken in connection with the accompanying drawing illustrating various embodiments by which the invention may be realized, and in which:

Figure 1 is a view in side elevation and partly in section showing a flashlight or electric hand lantern to which the invention is applied;

Figure 2 is a transverse sectional view taken in the planes indicated by the broken lines 2—2 of Figure 1 and looking in the direction of the arrows; and

Figure 3 is a fragmentary longitudinal sectional view showing a modification of the invention of Figures 1 and 2 particularly applicable where a bullseye lens is used.

A flashlight or hand lantern to which this invention is applied is illustrated as comprising a generally cylindrical casing 5 of any desired configuration and provided with a circuit closer indicated in outline at 7 to represent any suitable circuit closer. The casing 5, at its upper end, is shown as increasing progressively in diameter, as at 9, to serve as an integral hood within which is disposed the reflector and lamp socket support, shown in this instance as of a type in which the lamp 11, 12 is supported independently of the reflector 13 and enters the reflector through an axial aperture 15 in it smaller end. The open end of the hood 9 is threaded, as at 17, to removably receive, over its outer surface, a threaded annulus 19. The annulus 19 is threaded at its lowermost portion and is offset outwardly immediately thereabove to provide an upwardly facing shoulder 18. It is formed, at its outer end, with

an inwardly and then upwardly bent portion 21 which is then inwardly deflected as a lip or flange 22 forming a bezel for a lens 23, in this instance, a plane disc-like sheet of light transmitting material conveniently of a light absorbent color. The reflector 13 is formed with an outwardly directed lip 25 adapted to engage the underside of the lens 23 and be held thereagainst by a spring 27 bent three times in form like a square and which fits around the reflector 13 and is held, by its tendency to expand, supported on the shoulder 18 so as to rigidly retain the bezel, lens and reflector as a unit.

Surrounding the bezel 19 is a tubular member, the lower portion of which is of decreased diameter, as at 29, to engage and be secured to the bezel in any convenient fashion as by solder or welding while that portion 31 of the tubular member which extends beyond the lens 23 is of increased diameter relative to the part 29 to provide a tubular passage through which light from the filament of the lamp 11 passes and is confined as a relatively narrow beam.

The electrical circuit of course, may take any desired form wherein the two lamp terminals, not shown, are in electrical connection with the respective terminals of a battery 53 within the casing 5 and the circuit controlled by any convenient circuit closer illustrated generally by the circuit closer 7.

To initially reduce the intensity of the light emanating from the filament 12 of the lamp 11, the globe 11 thereof is conveniently translucent say by being formed of a blue glass or other partially light absorbing material.

Light from the lamp filament 12 passing through the partially opaque globe 11 strikes the reflector 13. This reflector is conveniently provided with a surface by which the light rays are partially broken up. To this end, the surface of the reflector may have a mat surface, such as indicated by stippling 29. The diffused light rays from the reflector 13 then pass through the lens 23 where it is again reduced in intensity, say, by forming the lens 23 to be partially opaque, say, by being composed of a blue colored glass or other transparent material such as a synthetic resinoid or the like. The beam of light emerging through the lens 23 which would otherwise diverge as a conical beam, is confined within the tubular portion 31, the interior surface of which is coated with a light absorbent material, as indicated by the darker stippling 33, so that the light emanating from this flashlight or hand lantern emerges generally as a light beam which is diffused and of greatly reduced intensity.

In Figure 3, the invention is shown as applied to a hand lantern having a bull's-eye lens 35. The reflector 37 is shown as formed at its inner end with a lamp socket portion 39 and the rim is bent upwardly, then outwardly as at 41 to provide a lens supporting surface. An annular insulatory member 43, angular or channel shaped in cross-section, encloses the rim portion 41 and rests upon insulation 45 on the end of the casing 47. The bull's-eye lens 35 resting upon the flange 41 is held in position by a lens ring 49 to which is secured, preferably permanently, the cylindrical tubular member 51 corresponding in function with the tubular member 30—31 of Figure 1. By this construction the lens retaining ring 49 and the tubular member 51 are removed as a unit to release the lens 35 and permit access to the reflector. In this embodiment, the central terminal 52 of the battery 53 is shown directly in contact with the central terminal 54 of the lamp, the circuit being completed from the other terminal of the lamp through the reflector 37 and circuit closer contact 55 which in turn is in electrical connection with the other terminal of the battery 53.

As before, the globe 11 of the Figure 3 modification is partially light absorbent, say a blue color. The reflecting surface of the reflector 37 is partially light diffusing as by a mat finish. Again the lens 35 is partially light absorbing as by being dark colored and the interior of the shield 51 is light absorbent.

The tubular shield also serves the useful purpose of obscuring view of the light source or the lens illuminated thereby except from the very front of the lantern. As viewed from the front, the light appears only as a pale blue disc of light. Similarly, the limited area illuminated by the lamp is not brightly illuminated, but is illuminated only sufficiently to discern objects in the limited area on which the light falls while the intensity of the illumination is insufficient to render either the light beam or illuminated object visible an appreciable distance away.

Various modifications will occur to those skilled in the art in the selection of the light absorbing and light diffusing media and in the number of steps in the reduction of intensity of the light and no limitation is intended by the phraseology of the foregoing description or illustrations in the accompanying drawing except as indicated in the appended claims.

What is claimed is:

1. In a black-out flashlight, in combination, a light source, a blue globe surrounding the light source, a reflector having a light diffusing reflecting surface in the rear of the light source, a blue lens before the reflector and receiving the light therefrom, and a tubular shield mounted in front of the flashlight and having a light absorbing inner surface through which shield the light from the lens passes and confining the light rays therefrom.

2. In a black-out flashlight, in combination, a light source having a globe passing only light of shorter wave lengths, a diffusing reflector in rear of the light source, a lens of the same color as the globe mounted in front of the light source and the reflector, and shield means extending forwardly of the lens to confine the light from the flashlight; the inner surface of said shield means being light absorbent.

3. In a black-out flashlight, in combination, a light source, a globe surrounding said light source and passing only light of shorter wave lengths, a reflector having a light diffusing reflecting surface placed in rear of the globe, a lens of the same color as the globe mounted before the reflector and light source, and a tubular shield extending forwardly of the lens and having a light absorbing interior surface to confine the light which passes through the lens.

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