

Sept. 26, 1944.

E. K. MADAN

2,358,867

FLASH-LIGHT

Filed Jan. 13, 1942

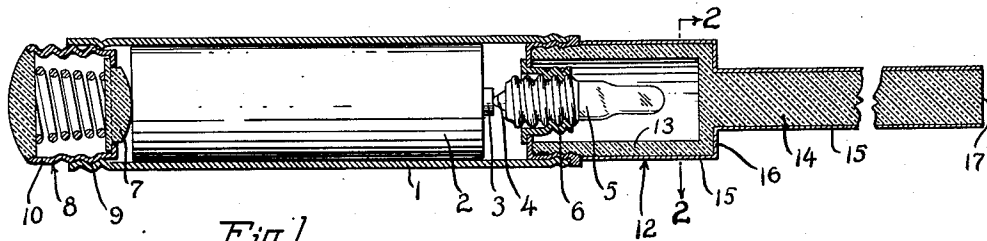


Fig. 1

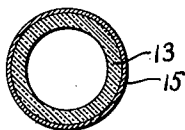


Fig. 2

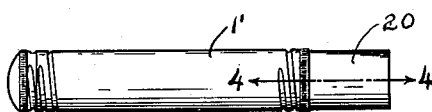


Fig. 3

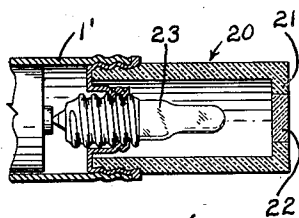


Fig. 4



Fig. 5

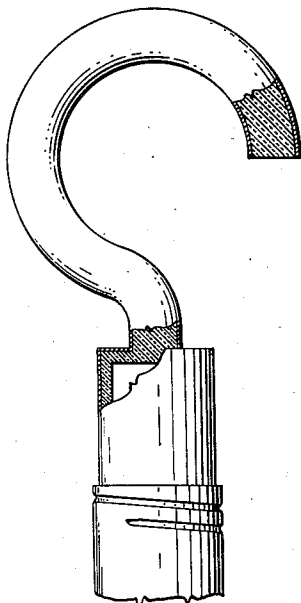


Fig. 6

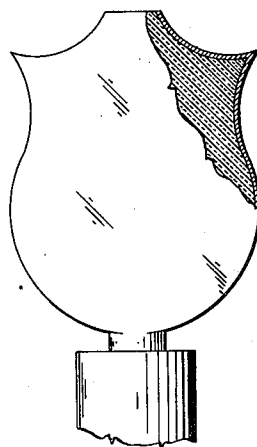


Fig. 7

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2,358,867

FLASHLIGHT

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Application January 13, 1942, Serial No. 426,567

1 Claim. (Cl. 240—6.4)

This invention relates to flash-lights, and more specifically to a flash-light for use during "black out" periods, that is, at times when, for various reasons such as during air raids or during practice air raid alarms, it is required that all lights be extinguished.

The primary object of the invention is to provide a flash-light embodying a lens member having a portion thereof coated with or embodying in its substance luminous or phosphorescent material that may consist of any of the phosphorescent compounds or the luminous sulphides which, upon excitation from a source of light absorb light, and after the extinguishing of the source of light excitation or charging give off a dull glow of light for a protracted period. The glow of light thus given off is visible for only a short distance, but is sufficiently distinct to be clearly visible so as to prevent collisions between persons or objects moving about in the dark and to a slight degree will illuminate objects in close proximity to the lens member.

Another object of the present invention is the provision of a flashlight as specified wherein the lens member is constructed and arranged so that it may be used as a regular flash-light during the interval of time prescribed between the "all clear" signal and the turning on of lights, or at other times when a flash-light is practical for use.

More specifically, the invention comprehends the provision of a flash-light wherein the lens member is made of a plastic, such as cellulose acetate, or preferably of a polymerized derivative of methacrylic acid commercially known as "Lucite" or "Polystyrene," which has the property of retarding the refraction or distribution of light transversely therethrough and directing a concentrated beam of light longitudinally therethrough, thereby providing a flash-light wherein the side or sides of the lens member will give off a dull glow occasioned by the luminous or phosphorescent material and a bright, concentrated light for spot-lighting purposes will be provided through the end of the lens member. In a flash-light so constructed, however, the lateral diffusion of light will be sufficient to charge or cause excitation of the luminous or phosphorescent material on or embodied in the lens member to provide the visible, dull glow when the bulb of the flash-light is extinguished.

The flash-light of the present invention lends itself readily to many variations in the size and shape of the lens member, permitting it to be readily made in the form of a walking cane or of various identifying shapes, whereby through particular shapes of the lens members various officers of the army, law or other organizations may be readily identified in the dark.

With these and other objects in view, as may appear from the accompanying specification, the

invention consists of various features of construction and combination of parts, which will be first described in connection with the accompanying drawing, showing a flash-light of the preferred form embodying the invention, and the features forming the invention will be specifically pointed out in the claim.

In the drawing:

Figure 1 is a longitudinal section through a flash-light constructed in accordance with the present invention.

Figure 2 is a cross-section on the line 2—2 of Figure 1.

Figure 3 is a side elevation of a modified form of the lens member in connection with the flash-light.

Figure 4 is a detailed longitudinal section through the modified lens construction shown in Figure 3.

Figure 5 is a side elevation of a modification of the flash-light showing it constructed as a walking cane.

Figure 6 is a view showing a still further modification in the shape of the lens member.

Figure 7 is a view showing another modification in the shape of the lens member, in the form of a shield such as might be used for identification of a police officer.

Referring more particularly to the drawing, the construction of the improved flash-light may be of any of the many approved constructions of flash-lights, without departing from the spirit of the present invention, with the exception of the lens member, and one practical construction is shown in Figure 1 of the drawing.

In this Figure 1, the battery containing shell 1 receives therein a battery or batteries 2, of the usual construction which may be purchased upon the open market, and the central electrode 3 of the battery contacts the central electrode 4 of the light bulb 5. The bulb 5 is threaded into a socket 6, which is in electric circuit conducting contact with the metallic shell 1. The electrical contact 3 of the battery is held in contact with the central contact 4 of the bulb at all times by the spring-pressed member 7 of the switch cap 8. The member 7 is constructed of non-conductive material. The switch cap 8 is threaded into the metallic shell 1, as shown at 9, and it embodies a metallic shell 10, so that when the switch cap 8 is threaded inwardly into the shell 1 a sufficient distance, the metallic shell 10 of the switch cap 8 will be brought into contact with the end of the battery 2, closing the circuit through the shell 10, shell 1, socket 6, bulb 5 and contacts 3 and 4, igniting the bulb 5.

In Figures 1 and 2 of the drawing the lens member 12, which is preferably constructed of "Lucite" or "Polystyrene," that is, a polymerized derivative of methacrylic acid, embodies a hol-

low cylindrical portion 13 which receives the head of the bulb 5 therein. It has an elongated wand 14 extending outwardly from the outer end of the hollow, cylindrical, bulb enclosing portion. The outer surface of the side portions of the cylindrical portion 13 and of the wand 14 are shown as coated with a coating 15 of luminous or phosphorescent material that may consist of any of the phosphorescent compounds such as sulphide of calcium, or any of the luminous sulphides of materials such as zinc, barium, uranium, magnesium, strontium, or others. The end portion of the cylindrical part 13 outwardly of the outer surface of the wand 14 is likewise coated with such luminous or phosphorescent material, as shown at 16. The end of the wand itself, however, is left free from coating, as shown at 17.

Plastics such as "Lucite" or "Polystyrene" have peculiar and particular light conducting properties in that the diffusion of light transversely through them is very materially retarded but is directed longitudinally through any piece or object of such material, resulting in a concentrated release of light through the end of the member, in contradistinction to the substantially uniform diffusion of light in all directions through glass or other similar materials. There is, however, sufficient light diffused laterally through the lens member 12 to cause excitation or charging of the phosphorescent or luminous coating on the side portions of the lens member, so that when the light bulb 5 is extinguished the luminous or phosphorescent coating will continue to glow for a protracted period.

While the lens member 12 is shown in the drawing as being coated with the luminous or phosphorescent material, it is to be understood that by making the lens member of plastic material such as heretofore referred to the luminous or phosphorescent material may be incorporated in or mixed with the material forming the lens member, without departing from the spirit of the present invention.

By leaving the end 17 of the wand 14 clear or untreated, the flash-light may be used as an ordinary flash-light, providing a spot-light effect of light diffusion through the end of the lens member.

Figures 3 and 4 of the drawing show a modified form of construction wherein the lens member 20 does not have a wand or elongation thereof, constituting merely the hollow, cylindrical lens head 20 which is threaded into the battery enclosing shell 1', this construction of the flash-light being adaptable for carrying about in a lady's handbag or man's pocket.

The lens head or member 20 is shown, in Figure 4, as constructed of a main body portion constituting the sides and a part of the end, constructed of "Lucite" or "Polystyrene" or other suitable plastic material impregnated with or embodying in its construction the luminous or phosphorescent material. The end of the main body portion 21 of the lens member 20 is provided with a central opening in which a plug 22 of clear or unimpregnated plastic is inserted, providing a clear lens which allows the use of the flash-light as an ordinary flash-light, when desired, and still provides sufficient surface embodying phosphorescent or luminous material which will glow after the bulb 23 of this modified form of the flash-light has been turned off. It is to be understood, of course, that if it is so

desired the lens member 20 may be made in one piece, having the outer surface of its sides and a part of its end coated with the luminous or phosphorescent material, leaving the central portion of the end free from coating, as in the preferred form shown in Figures 1 and 2.

The construction and arrangement of the present flash-light lends itself readily to various shapes and arrangements of the lens portion, and one such variation is shown in Figure 5 of the drawing wherein the lens piece 25 is shown in the form of a walking cane or stick, and the battery containing housing, switch head and bulb, all of which may be of the same construction as shown in Figure 1 of the drawing, constitutes the head 26 of the cane. In such a construction it is understood, of course, that the tip end of the cane is left clear so that the cane may be used as an ordinary flash-light when desired.

In Figure 6 a further modified construction of the lens portion is shown, illustrating how, by the use of "Lucite" or "Polystyrene," the lens member may be bent or shaped to assume various forms and still provide a spot flash-light, by leaving the end of the lens member free from the coating of luminous material, by reason of the light conducting properties of those particular plastics. In this form shown in Figure 6, wherein the lens member may assume any of a desired number of individual identifying shapes, it is understood, of course, that all of the lens member, with the exception of the ends, are coated or treated with a luminous or phosphorescent, as in the case of all of the other forms of the lens member, since the uncoated or untreated end of the lens member adjacent to the light bulb receives the light while the outer end distributes the light.

Figure 7 of the drawing shows a still further possible form of the lens member illustrating a shield shape, which might be provided for police officers so that they might be readily identified in the dark by reason of the individual shape of the glowing lens member. This of course is only one of the many possible shapes which may be provided for the purpose of providing individual identification of various officers of the Army, law enforcement or other authorized organizations. A particular shape might be provided for air raid wardens, others for various ranks of officers of the Army, Navy, police forces, etc.

It will be understood that the invention is not to be limited to the specific construction or arrangement of parts shown, but that they may be widely modified within the invention defined by the claim.

What is claimed is:

As a new article of manufacture, a flash-light embodying a battery-containing shell having an open end, a light bulb mounted in said shell at said open end, means for energizing and de-energizing said light bulb, a substantial cylindrical lens member attached to said open end and having a hollow contour for receiving said light bulb, an elongated wand comprising a continuation of said lens member, said lens member and said wand having light transmitting properties, said lens member and said wand being treated with a phosphorescent material adapted to be activated by light from said light bulb when the latter is energized, and a portion of said wand being untreated with said phosphorescent material to provide a limited area for the passage of light.

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