Nov. 30, 1948. O. D. THURNELL ET AL 2,454,895

FLASHLIGHT

Filed April 18, 1946

Fig. 1

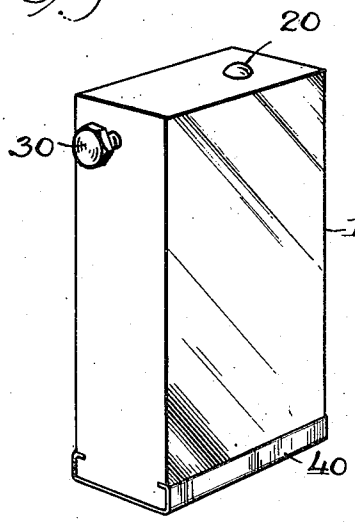


Fig. 4

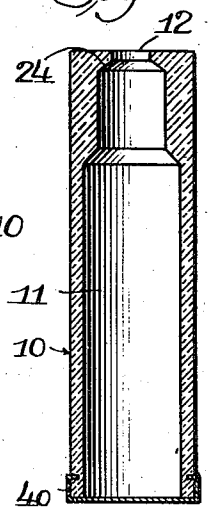


Fig. 5

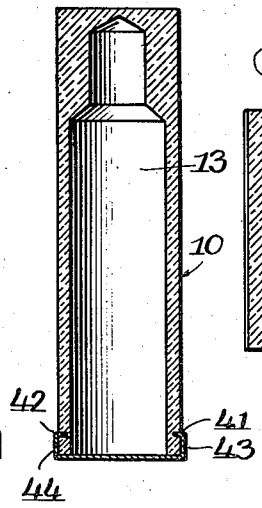
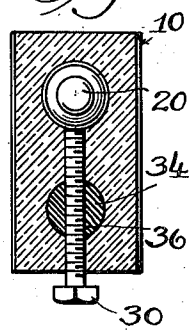


Fig. 6



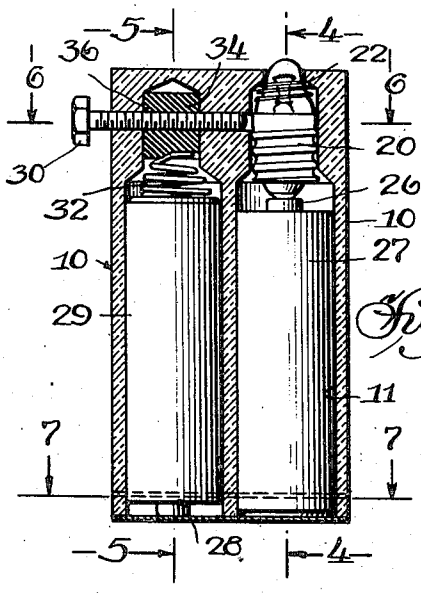


Fig. 2

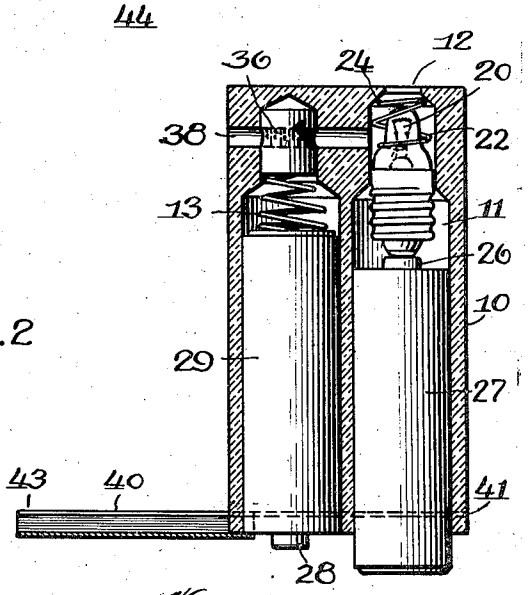


Fig. 3

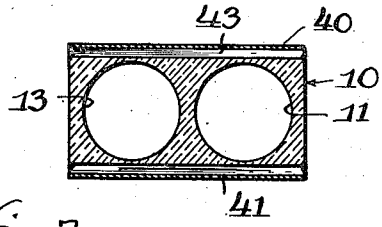


Fig. 7

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FLASHLIGHT

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3 Claims. (Cl. 240—10.65)

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This invention pertains to a new and improved type of a flashlight. More specifically it is directed to a small type of a portable electric light that can be conveniently carried about in a purse or about the person.

The usual type of electric pocket lights consists of a case or container having therein a provision to receive one or more battery cells. These are generally connected by direct or indirect contact with each other and the bulb thru some switch arrangement. Further, the usual type of pocket light contains many parts, the insulation is weak and its principal drawback is that the amount of light given off is small and restricted. Because they lack space, most of the flashlights have single bulbs of the prefocussed type which cast a rather fixed beam and do not provide sufficient light of a diffused nature for other purposes.

It, therefore is an object of our invention to provide an arrangement wherein a case made of certain material so that one lamp will serve not only a prefocussed beam but also supply a source of clear and diffused light that is of sufficient intensity and brightness to find objects and read by.

Another object of this invention is to provide an arrangement of batteries within the case so that positive contact between all live parts of the circuit is instantly available and without undue loss of electric power by resistance.

A further object of our invention is to provide a battery hand lamp having solderless connections which generally corrode and break off in course of use and time.

A still further object of this invention is to provide a new and novel method of mounting a prefocussed type electric light bulb within the case so that both beamed and diffused but clear light is obtained.

A still further and additional object of this invention is to provide an arrangement whereby it is impossible to accidently turn on the light within a purse or pocket and thus run down the life of the battery cells.

A still further and more important object of our invention is to provide a case of such material which acts as its own reflector and diffuser of light emitted by the incandescent bulb mounted therein.

These and other objects, adaptations, uses, modifications and variations will be readily apparent to one skilled in this art particularly in view of the lucid, definite and detailed description of the mechanism, the parts thereof and the

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fundamental elements underlying the principles involved in our invention as described hereinbelow and illustrated in the attached drawings forming a part hereof in which:

Figure 1 shows an illustration in perspective of the battery case and the external switching mechanism.

Figure 2 show a vertical section taken flatwise thru the center of the mechanism.

Figure 3 is a section somewhat similar to Figure 2, but partially opened to reveal the relationship of the various components within the case.

Figure 4 is a vertical section thru Figure 2 taken along line 4—4 with the battery and light bulb arrangement removed.

Figure 5 is a vertical section thru Figure 2 taken along line 5—5 with the interior components removed.

Figure 6 is a cross section of Figure 2 taken along lines 6—6 showing the arrangement of the switching assembly.

Figure 7 is another cross section of Figure 2 taken along lines 7—7 showing the arrangement of the sockets or recesses to receive the battery cells.

Like reference characters designate same parts wherever they occur in all of the figures.

Externally, the flashlight consists of a case or container 10, an electric light bulb 20 whose beam portion protrudes thru the base, a switch 30 and a channel like metallic bottom plate 40.

The working parts of the flashlight consists of a solid case or container 10 in which there are bored two parallel tubular stepped recesses 11 and 13. The upper part of the tubular stepped recess 11 opens into the top surface of the case 10 as an aperture 12, thru which protrudes the beam end of the incandescent electric bulb 20.

A spring 22 embraces the lower portion of the beam end of the bulb 20. One end of this spring 22 rests about the aperture 12 in a recessed collar 24 formed within the tubular recess 11. The other end of the spring 22 rests upon and embraces the lower portion of the beam section of the bulb 20. The pressure induced by the spring 22 keeps the contact base of the bulb 20 in firm contact with the electrode 26 of battery 27. Battery cell 27 fits into one of the parallel tubular stepped recesses 11. The bottom of cell 27 is in contact with the metallic channel or battery cell support 40. Likewise, battery 29, which is insertable in the other parallel tubular recess 13 rests on its electrode 28, in contact with the base 40.

To provide a good electrical contact and a tension, a coil spring 32 is used.

One end of a spring 32 rests on the bottom of the inverted battery 29, while the other end is crimped and pressed into screw block 34.

Screw block 34 is preferably made of some excellent electrically conductive material. To obtain an effective contact we prefer to have a slot milled in the bottom of the screw block, the end of the wire spring inserted therein and the block edges pinched together so that the wire is held therebetween by friction. Thus no solder is used and still an effective contact is obtained.

The screw block 34 fits into an upper stepped section of tubular recess 13. Thru the case 10 and the screw block 34, is bored a hole 38. This hole 38 extends transversely until it terminates in the upper part of the stepped tubular recess 11. A threaded bolt 30, extends freely thru the bore 38, in the case and engages the internal threads 36 in the screw block 34. By turning the head of the bolt 30, clockwise, electrical contact is made with the base of the incandescent electric light bulb 20, and the circuit is completed since all the cells are now in series arrangement. Likewise, by turning the head of the bolt 30 in a counter clockwise direction the electrical circuit is broken and the electric light bulb is extinguished.

The case 10 though shown as a rectangular prism can be of any shape. It is made of a transparent material such as glass, methacrylate resins, etc. The latter have some unusual optical properties which are utilized in our invention. It is preferred to use the methacrylate resins of the clear type. We have found that by permitting the beam section of the incandescent light bulb 20 to protrude slightly thru the aperture 12 in a methacrylate solid block case 10, that the powerful beam effect is retained. At the same time, the lower light portion of the bulb 20 which the spring 22 embraces sheds its light ray into the solid transparent plastic case 10. This important spreading or diffusing effect is further aided (1) by the position of the incandescent filament which is within the body of the clear plastic; (2) the coiled compressed spring 22 acts as a diffusing reflector of the straight light rays sent out by the incandescent filament and (3) the edge and top surfaces of solid methacrylate resin case block 10, are unpolished and act as internal mirrors, whereby any light rays falling on them are reflected principally thru the clear and polished faces of the flashlight case.

Along the bottom edge of the outside of each of polished wall faces of the solid block prism 10, we provide a groove parallel to the edge. These grooves 41 and 42 receive the inwardly turned flanges of the legs 43 and 44 of the channel or battery base 40. Since the springs 22 and 32 exert a pressure on the battery cells 27 and 29, they indirectly thru the cells exert pressure upon the channel 40 and grooves 41 and 42. Thus the entire assembly is held under internal tension.

In operation, the flash light when operating projects a powerful straight line beam thru the aperture 12 in the prism block case 10. Since the level of the incandescent filament is just below the unpolished top surface of the methacrylate block prism, light rays emitted therefrom will be reflected substantially from the inside of the unpolished edges of the prism and will come out along the polished wall surfaces. This light is clear and bright and evenly diffused so that no intense "spot light" effect is created.

Essentially our invention consists of utilizing a methacrylate prism block having at least one polished surface thru which internally created light can be emitted in a diffused form. One or more chambers are provided in the prism to receive battery cells as a source of power to an incandescent electric bulb preferably of the prefocused beam type. An aperture or window is provided in the unpolished surface thru which the beam of light generated from an incandescent bulb can be projected. A switching means to complete the electrical circuit is provided. It is important and vital that the source of light be created within the interior of the methacrylate resin prism, for otherwise no diffused light is obtained. It is also necessary that an aperture be provided for otherwise the effect of the beam is lost within the methacrylate prism.

It is obvious that by using the extremely simple construction and a solid methacrylate block we have produced a simple but highly desirable flash light that is characterized by a powerful beam light and a diffused light of high intensity. Further, it can be produced economically and quickly.

It is obvious that one skilled in this art can vary and modify greatly the above model which has been given purely as an example and not as a limitation of the fundamental concepts underlying the principles of our invention. It, therefore, is intended to claim as our invention all those modifications, variations and adaptations that come within the spirit and ambit of our invention as defined by the hereunto appended claims.

We claim:

1. An electric lamp adapted for pocket use comprising a solid electrically non conductive plastic case, the said case consisting of a clear methacrylate resin shape, the said shape having therein two bored cavities in parallel relationship to each other and adapted to receive battery cells, each of the said bored cavities having smaller diameter concentric bore extensions thereof in like parallel relationship, at least one of the said smaller bore extensions terminating in an aperture on the surface of said methacrylate resin shape, an incandescent light bulb protruding slightly thru said aperture, a means for closing and breaking the electrical circuit, a metallic base channel to make contact between the battery cells, upstanding flanges on said channel with inwardly disposed arms, and grooves on said plastic case in juxtaposition with said inwardly disposed arms, whereby said channel is slidably engaged by and retained in place.

2. The product of claim 1, wherein at least one of the said faces of said clear methacrylate resin shape other than the one with the said light bulb receiving aperture is polished.

3. A new and improved purse flash light characterized by a diffused, clear glow and also beam light from one source of light comprising a case consisting of a clear methacrylate resin solid shape, a pair of parallel large cavities bored therein, a pair of smaller cavity extensions of said large cavities concentric therewith, one of said smaller cavities having an internally collared opening onto a light diffusing surface of said methacrylate resin case, an incandescent light bulb tip nested in said collared opening, with the incandescent filament being below said diffusing surface, a spring means mounted on said light bulb, adapted to exert pressure on the collar of the case and the battery cell, the other smaller cavity containing a metallic block and a bore therein with internal threads, a transverse bore thru said case in juxtaposition with said threaded bore of said block, a means inserted

thru said case bore and threaded thru said block bore to make and break contact with the base of said incandescent light bulb, a spring means attached fixedly to said threaded metallic block, oppositely disposed battery cells mounted within said larger cavities, the positive electrode of one of the said battery cells in firm contact with the base of said incandescent light bulb under spring tension, the spring on said threaded metallic block in firm contact with the base of the other battery cell, the said cells mounted electrically in series thru a metallic channel, the said metallic channel having upstanding flanges in parallel and close juxtaposition relation to the exterior surface of said methacrylate resin shape, said flanges having inwardly disposed right angle longitudinal runners and grooves in said methacrylate resin shape in parallel juxtaposition with said longitudinal runners adapted to receive slidably said runners.

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