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N. H. SWANSON

2,258,074

FLASHLIGHT

Filed June 12, 1939

Fig. 1.

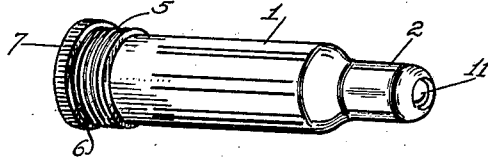


Fig. 2.

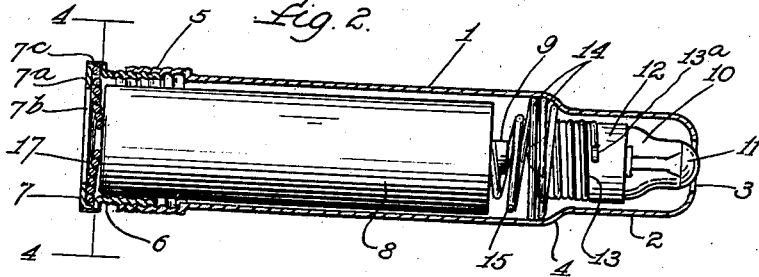


Fig. 3.

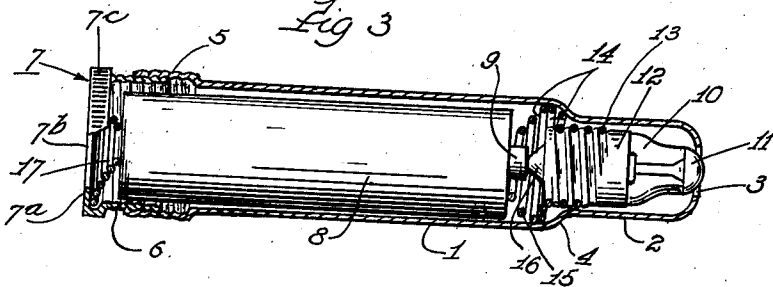


Fig. 4.

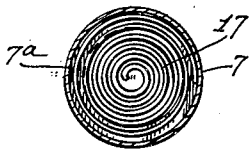


Fig. 5.

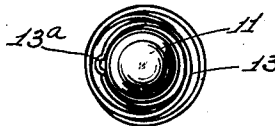
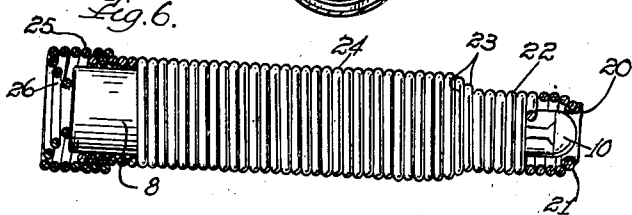


Fig. 6.



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UNITED STATES PATENT OFFICE

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FLASHLIGHT

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5 Claims. (Cl. 240—10.68)

This invention relates to a portable flashlight, and one object of the invention is to provide a construction which shall be economical to manufacture and to assemble. Another object of the invention is to provide a mounting for a lamp whereby it is cushioned against shocks and thus safeguarded against the liability of breakage. A further object is to furnish a simple and efficient circuit-controlling means for the flashlight. The invention consists in certain features and elements of construction in combination, as herein shown and described and as indicated by the claims.

In the drawing:

Fig. 1 is a side view in perspective showing a flashlight embodying this invention.

Fig. 2 is an axial section of the flashlight taken on a larger scale and showing the parts in open circuit position.

Fig. 3 is a sectional view taken axially like Fig. 2 and showing the parts in circuit-closing position.

Fig. 4 is a transverse section taken as indicated at line 4—4 on Fig. 2.

Fig. 5 is a front end view of the lamp and its associated mounting spring removed from the casing.

Fig. 6 is a side elevation partly in section showing a modified form of casing for a flashlight of this type.

The construction embodying this invention is particularly adapted to extremely small portable flashlights dimensioned to be carried in the pocket or in a lady's handbag, but it will be evident that the same type of design would be applicable to larger sizes. As shown in Figs. 1 to 4, the shell, 1, is of tubular form, having a reduced portion, 2, at one end, with a light-emitting aperture, 3, in its end wall, and with a shoulder, 4, at the point where the diameter is reduced. At the other end the casing is formed with threads, 5, for connection with the threaded portion, 6, of a removable cap, 7. The dry cell battery, 8, is disposed in the larger portion of the tubular shell, 1, with its central contact element, 9, presented toward the reduced end portion, 2, of the shell.

This reduced portion, 2, houses an electric lamp, 10, which may be of the type having a glass body formed with a lens portion, 11, at its tip for intensifying the light emitted from the lamp filament. The threaded metallic base, 12, is carried by a coil spring, 13, whose coils at one end are of such diameter that the

threaded base of the lamp can be screwed into the coils of the spring which thus serve as a socket for the lamp. The smaller coils of the spring, 13, are continuous, with two or three turns, 14, of larger diameter dimensioned to fit the inner diameter of the tubular body, 1, and to seat against the shoulder, 4, which divides the larger portion of the tube from the smaller end portion, 2. Finally, one or two turns, 15, of the spring may be of somewhat smaller diameter than the turns, 14, so as to seat against the end wall of the battery, 8. As seen in Figs. 2 and 3, the coils, 14 and 15, are somewhat compressed and thus support the smaller coils of the spring, 13, centrally within the reduced terminal portion, 2, of the shell but out of contact therewith, and support the lamp itself with its tip portion, 11, centered with respect to the light-emitting aperture, 3, but out of contact with the rim of the aperture. Thus, any shock experienced by the shell, 1, is transmitted to the lamp itself only through the resilient coils of the supporting spring, and such shocks will be largely absorbed by the spring, 13, 14, 15.

The removable cap, 7, carries a spirally coiled spring, 17, which contacts with the end wall of the battery, 8. This portion of the battery is an exposed metal surface which serves as the other terminal or electrode. The cylindrical side wall of the battery may be exposed to the metallic shell, 1, or it may be covered with a paper label which would act as insulation. But contact of the spring, 17, with the end wall of the battery insures completion of the circuit through the tubular shell, 1, and spring, 13, when the center contact, 16, of the lamp is engaged with the center contact, 9, of the battery. The flexible nature of the spiral spring, 17, permits this to be accomplished very simply by pressure of the finger upon the spring, 17, which forces it inwardly so that it assumes a form somewhat like that shown in Fig. 3, sliding the battery, 8, longitudinally in the shell, 1, to bring its terminal, 9, into contact with the part, 16, of the lamp. This movement takes place in opposition to the coils, 15, of the spring, 13, compressing them so that upon release of the finger pressure at 17 the coils, 15, expand and separate the contacts, 9 and 16, for extinguishing the light.

The spiral formation of the spring, 17, is convenient also in that the outer coil may be made slightly oversize as compared with the internal diameter of the cap, 7; thus, when the coil is

once fitted into the cap, it will be held frictionally in place, and will stay with the cap when the latter is removed. And, if desired, the parts may be formed as shown in Figs. 2 and 3, with the threads, 5, of the tubular casing, 1, pressed outwardly in the tubing so that the threads, 6, of the cap, 7, fit inside the threads, 5; then the outer end of the cap, 7, may be slightly expanded to form an annular channel in which the outer coil of the spring, 17, is lodged or pocketed. The annular end flange, 7^a, laps over only one or two coils of the spiral spring, 17, leaving a relatively large central opening, 7^b, through which the finger may be introduced for pressure upon the yielding coil, 17, in shifting the battery, 8, into circuit-closing position. To facilitate removal of the cap, 7, for changing the battery, the external wall of the channel portion may be knurled, as indicated at 7^c. And, preferably, the threads, 5 and 6, will be of sufficient extent so that the cap may be screwed inwardly far enough to shift the battery, 8, and carry its center contact, 9, into engagement with the center contact, 16, of the lamp. This adjustment will be made when it is desired to provide a continuous light for a considerable period and avoid the necessity of holding the battery in circuit-closing position by pressure against the coil, 17.

It sometimes happens that when a spring coil, such as that shown at 13, is employed as a threaded socket, there is some difficulty in unscrewing the lamp from the coil because the friction between the threads of the lamp base and the spring coil causes the coil to grip the threads when the lamp is turned in the direction for removal. However, this can be avoided if an end thrust can be introduced into the wire of the coil itself, and for this purpose I prefer to form the extreme end of the coil, 13, into an upstanding lug, 13^a, as seen in Fig. 5; this lug, 13^a, may then be engaged by the thumb nail of one hand, while the lamp is unscrewed by the fingers of the other hand.

Fig. 6 illustrates a modified form of tubular casing which may be constructed very simply of a length of wire helically coiled upon a suitable mandrel to form a tubular housing similar in shape to the sheet metal tube of Fig. 1. The light-emitting aperture at one end of the coil may be defined by means of an eyelet, 20, about which the terminal coil, 21, is wrapped. The adjacent portion of the wire forms the housing, 22, for the lamp, 10, and the coils at 23 provide the shoulder against which the lamp-supporting spring coils, 14, may be seated. Beyond the shoulder portion, 23, the wire provides a cylindrical tube, 24, to enclose the battery, 8. An end cap, 25, may also be formed of coiled wire, with a spiral portion, 26, constituting the end wall and contacting with the end of the battery so as to perform the same function as the spiral spring, 17, of the previously described structure. The cylindrical coils of the cap, 25, will fit snugly upon the coils, 24, of the casing portion so as to serve as threads to render the cap readily removable for changing the battery or for engaging the center contacts of the battery and lamp to provide a continuous light. It will be evident that the presence of the battery, 8, within the coiled tube, 24, will afford sufficient stability for the assembly, and that by using the same type of mounting spring for the lamp, as in the structure of Figs. 2 and 3, the lamp will be suitably

cushioned and protected against shock, just as effectively in this type of housing as in the other.

While there is shown and described herein certain specific structure embodying the invention, it will be manifest to those skilled in the art that various modifications and re-arrangements of the parts may be made without departing from the spirit and scope of the invention, and that the same is not limited to the particular form herein shown and described, except in so far as indicated by the appended claims.

I claim:

1. In an electric flashlight, a tubular casing, a battery in the casing, a lamp bulb in the casing having a center contact and a threaded base, the casing having a central light-emitting opening at one end and a transverse shoulder facing away from that end and spaced therefrom, the battery having a central contact element, and cushioning means supporting the lamp comprising a coiled wire spring having coils at one end to fit the threads of the lamp base and additional coils of larger diameter fitting the tubular casing to center the lamp therein, said larger coils seating against the shoulder in position to prevent contact of the end of the lamp with the casing at the light-emitting opening, the battery in the casing having a center contact member disposed opposite the center contact of the lamp and the other end of the spring comprising a terminal coil seating against the end of the battery and normally holding the center contacts of the lamp and battery apart, together with a spirally coiled spring wire forming the end wall of the casing engaging the opposite end of the battery and being yieldingly depressible for shifting the battery longitudinally in the casing to engage said center contacts.

2. In an electric flashlight, a casing of tubular form composed of wire helically coiled to provide a cylindrical housing with a reduced end portion and a shoulder between the two portions of the housing, the end portion having a central light-emitting aperture, a light bulb in said portion having a threaded base, cushioning means supporting the lamp comprising a coiled wire spring having coils at one end to fit the threads of the lamp base and coils of larger diameter fitting the larger tubular portion of the housing to center the lamp therein and seating against the shoulder to support the lamp out of contact with the housing, and a battery in the larger tubular portion of the housing.

3. In an electric flashlight, a tubular casing, a battery in the casing and means for retaining the battery therein comprising threads formed on the casing adjacent one end, and a removable cap formed of wire helically coiled to fit the threads and having an end wall of wire continuous with the helical portion but coiled spirally and adapted to yield in axial direction in response to external pressure applied for shifting the battery in the casing.

4. In an electric flashlight which includes a tubular casing, a lamp bulb in the casing having a center contact, a battery in the casing having a center contact member disposed opposite the center contact of the lamp, and spring means normally holding said center contacts apart, a closely coiled spiral of spring wire substantially closing the end of the casing, with means supporting said spiral in said casing, the inner coils being yieldingly depressible in axial direction and independently of the coil-supporting means by external pressure applied to said inner coils of the

spiral for shifting the battery longitudinally in the casing to engage said center contacts.

5. In an electric flashlight, a tubular casing, a battery in the casing, a lamp bulb inside the casing having a center contact and a threaded base, the casing having a central light-emitting opening at one end and smaller than the diameter of the lamp and a transverse shoulder facing away from that end and spaced therefrom, the battery having a central contact element, and cushioning means supporting the lamp comprising a coiled wire spring having coils at one end to fit the threads of the lamp base and additional coils

of larger diameter fitting the tubular casing to center the lamp therein, said larger coils seating against the shoulder in position to prevent contact of the end of the lamp with the casing at the light-emitting opening, the battery in the casing having a center contact member disposed opposite the center contact of the lamp and the other end of the spring comprising a terminal coil seating against the end of the battery and normally holding the center contacts of the lamp and battery apart.

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