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3,079,492

FLASHLIGHT

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FIG. 1.

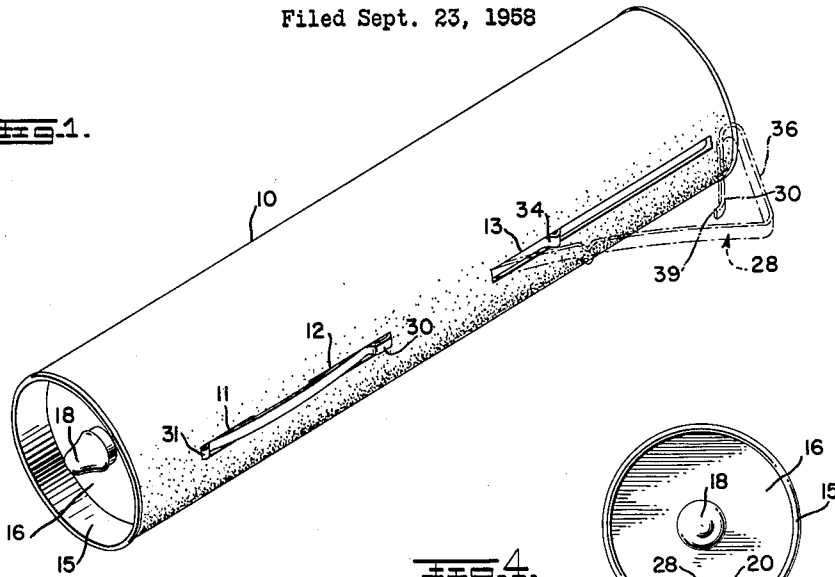


FIG. 4.

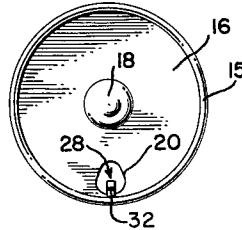


FIG. 2.

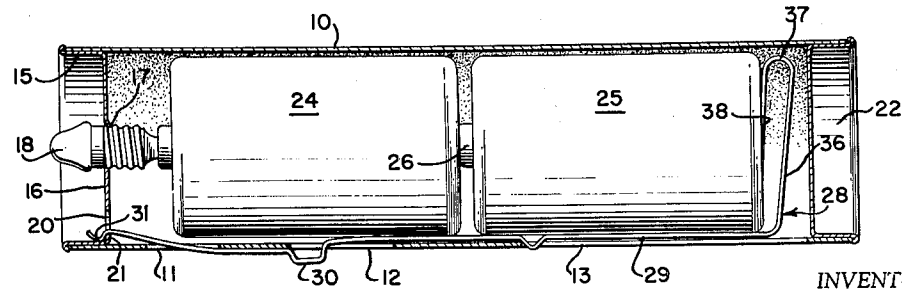
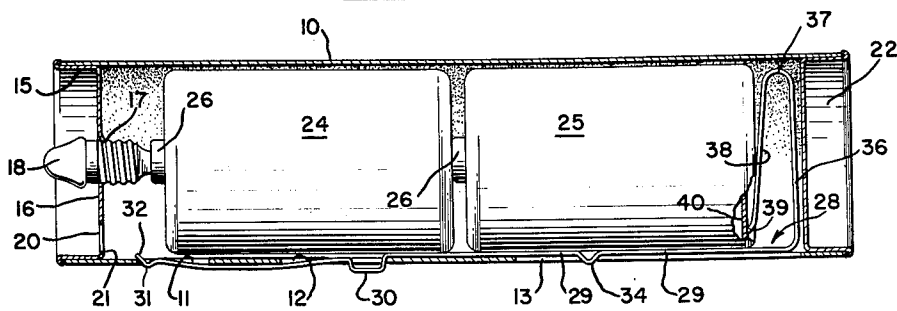


FIG. 3.

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FLASHLIGHT

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This invention relates to a flashlight, and more particularly to such a device which may be so economically produced that the casing and switch mechanism will be much lower in price than the cost of the batteries and light bulb.

An important object of the invention is to provide a flashlight which is so simple in construction that the case for the light and the switch mechanism will cost very little more to manufacture than a carton containing the batteries.

A further object is to provide such a flashlight wherein the case may be made of relatively cheap material similar to cardboard, with one end provided with a simple cap forming the reflector and socket for the light bulb, and to provide a simple switch mechanism which readily may be made of a single piece of thin narrow spring material.

A further object is to provide a flashlight structure of the type referred to wherein the switch mechanism comprises a switch bar and a contact spring adjacent the end of the casing opposite the bulb and of such nature that movement of the switch bar to close the circuit through the light bulb flexes the spring and assists in making a firm electrical contact between the end of the spring and the lower battery.

A further object is to provide such a device wherein the spring end of the switch bar is formed by bending the switch bar transversely of the case and bending it back upon itself to form a free battery engaging contact end, and to so construct the case that the spring end of the switch bar may be flexed radially outwardly of the casing for the removal and replacement of the batteries.

A further object is to provide a switch bar of the character referred to, which lies in a single plane and has an elongated body portion extending longitudinally of the case and batteries and which has a radially outwardly extending finger piece which may be moved longitudinally of the case to close the circuit through the light, and to associate such switch bar with a case having an elongated longitudinal slot in the radial plane of the switch bar and through which the spring end thereof may be flexed radially outwardly for removing and replacing the batteries.

A further object is to provide a combination of a battery case and switch bar wherein the latter is provided with two radially outwardly extending projections operable in aligned longitudinal slots in the case so that one of the projections is engageable by the finger to operate the device while the other projection is slidable in a longitudinal slot to maintain the switch bar in proper longitudinal alinement with the battery and case.

A further object is to provide a simple cap reflector for a device of this character, provided with a punched opening through which an end of the switch bar projects upon operation thereof to close the circuit through the bulb, and to utilize such end of the switch bar to engage the cap or reflector to maintain the circuit closed until the switch bar is manually moved to off position.

Other objects and advantages of the invention will become apparent during the course of the following description.

In the drawing I have shown one embodiment of the invention. In this showing:

FIGURE 1 is a perspective view of the device, the

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position of the spring end of the switch bar for removing and replacing batteries being shown in dotted lines;

FIGURE 2 is a longitudinal sectional view through the device, showing the parts in off positions, the batteries and bulb being shown in elevation;

FIGURE 3 is a similar view showing the parts in operative positions; and

FIGURE 4 is an end elevation of the reflector end of the flashlight.

Referring to the drawing, the numeral 10 designates a cylindrical battery case which may be made out of relatively cheap material such as relatively stiff cardboard, fiber, etc. This battery case may be cylindrical from end to end, and individual cases may be cut to length from tubular stock. One side of the case 10 is provided with preferably three longitudinally aligned slots 11, 12 and 13, longitudinally separated from each other by intervening solid portions of the case 10, the latter of which slots is relatively long and is adjacent the end of the case opposite the bulb end, as shown in FIGURE 1.

One end of the case 10 is provided with a flanged metallic cap 15 which preferably is permanently fastened in position in the case and serves to reinforce it radially thereof. The cap may be made of any suitable relatively cheap material having a reflecting surface and provided with a base portion 16 the central portion of which has an axial opening 17 shaped to provide a single thread engageable with the threaded base of a conventional bulb 18. Adjacent one side thereof, the cap base 16 is punched to provide an opening 20, the radially outer edge 21 of which projects inwardly from the flange of the cap to form a shoulder for a purpose to be described.

The flashlight is shown in the present instance as having a suitable cap 22 at the end thereof opposite the bulb, such cap being frictionally engaged in the end of the case 10 to be removed therefrom for the removal and replacement of the batteries as further described below. If desired, in the interest of economy, the cap 22 may be wholly eliminated, since it is unnecessary to the operation of the device.

The flashlight has been shown in the present instance as having two batteries 24 and 25 of conventional type having center contacts 26. The contact 26 of the battery 25 engages the metallic base of the battery 24 while the latter has its central contact 26 engaging the base of the bulb 18. It will become apparent that the present invention is not limited to the use of any particular number of dry cells as the source of current for lighting the bulb.

A metallic switch bar indicated as a whole by the numeral 28 is formed of thin relatively narrow spring material, the width of which relatively may be as indicated in FIGURE 4. The switch bar comprises a longitudinally extending shank portion 29 extending throughout the greater portion of the length of the case 10. Such shank portion is provided intermediate its ends with an outwardly projecting finger piece 30 the end of which project substantially radially outwardly to be readily engaged by the finger to move the bar longitudinally in either direction, as will become apparent.

The end of the switch bar adjacent the bulb is provided with a projection 31 the extremity 32 of which slopes upwardly and inwardly as viewed in FIGURES 2 and 3 for a purpose to be described. This finger is movable through the opening 20 to close the circuit through the bulb 18. Between the projections 30 and 31, the shank 29 projects outwardly through the opening 12, over the portion of the case 10 between the slots 11 and 12 and then inwardly through the slot 11, as shown in the drawing. This arrangement serves to maintain the switch bar

in proper position relative to the case when the batteries are removed for replacement.

Within the slot 13 and slidable therein is a projection 34 formed integral with the switch bar portion 29. In the "off" position of the switch bar, the projection 34 is spaced from the left-hand end of the slot 13 as viewed in FIGURE 2 to provide for free movement of the switch bar to the left to the operative position shown in FIGURE 3, as further described below.

At its end opposite the projection 31, the switch bar has a spring integral therewith formed by bending the switch bar diametrically across the inside of the case 10 as at 36 and bending it back upon itself as at 37 to form a free spring end 38 the extremity of which turns inwardly as at 39 against the metallic base 40 of the battery 25 to form electrical contact therewith. It will be noted that the spring portions 36 and 38 normally diverge from each other downwardly as viewed in FIGURE 2 from the loop 37 when the parts are in the normal "off" positions shown in FIGURE 2.

Operation

As stated above, the parts normally occupy the positions shown in FIGURE 2, with the projection 34 spaced a substantial distance from the left-hand end of the slot 13. The spring portions 36 and 38 will diverge downwardly from each other as viewed in FIGURE 2. As previously stated, the portion of the shank 29 between the slots 11 and 12 lies outwardly of the casing to maintain the switch bar in proper position when the case 10 is empty incident to changing batteries. The resiliency of the switch bar causes the portion thereof between the slots 11 and 12 to snugly fit against the external surface of the case 10.

The device is operated by pushing forwardly or to the left against the finger piece 30 to shift the switch bar portion 29 to the left. The finger 32 of the projection 31, being inclined as shown in FIGURE 2, will cause the projection 31 to be cammed upwardly and inwardly as forward movement of the switch bar takes place. A similar action occurs when the finger 32 comes into engagement with the shoulder 21, and when the fully "on" position of the switch bar is reached, the projection 31 will snap over the shoulder 21 as viewed in FIGURE 3. The finger piece 30 may be released and the switch bar will remain in operative position.

It will be noted that the batteries are not shifted when the switch bar is operated, the center contact 26 of battery 24 being always in contact with the base contact of the bulb 18. When the switch is operated in the manner referred to, the lower end of the spring portion 36 will be flexed from the position shown in FIGURE 2 to that shown in FIGURE 3, and the flexing of the loop 37 will cause the spring end 39 to engage more firmly against the bottom casing portion of the battery 25, thus increasing the efficiency of the electrical contact between these elements. A circuit thus will be completed from contact 26 of battery 24 through the base of the light bulb 18, through the cap or reflector 15, switch bar 28, base 40 of the battery 25, thence through this battery and its center pole 26 to the battery 24. The bulb will remain illuminated indefinitely and may be turned off by reversing the force against the finger piece 30 to slide the switch bar from the position shown in FIGURE 3 back to the normal position shown in FIGURE 2.

If it is desired merely to light the bulb without permitting the switch bar to remain in the operative position shown in FIGURE 3, the finger piece merely may be moved to the left a sufficient distance to engage the finger 32 with the shoulder 21 without snapping thereover. Inasmuch as the spring portion of the switch bar is loaded in the normal position of the parts, the resilient action of the spring portion will cause the switch bar to return to normal position upon the releasing of the finger piece 30. When such position is reached, the projection 31

will snap outwardly through the slot 11 and will tend to assist the spring in maintaining the parts in normal position against accidental displacement.

When it is desired to renew the batteries, the cap 22 will be removed since such cap will be held in position merely by simple frictional engagement with the case 10. As previously stated, there is no necessity for using the cap 22 and this element may be completely eliminated if desired, particularly in view of the fact that the present device provides a fully operative flashlight capable of being manufactured at minimum cost. Assuming that no cap 22 is used or that it has been removed, the operator will exert a force transversely of the casing against the looped portion of the spring to flex the adjacent end of the bar portion 29 and the spring portion radially outwardly through the slot 13 as suggested in dotted lines in FIGURE 1. The loop 37 may rest against the portion of the case between the adjacent extremity of the slot 13 and the adjacent extremity of the case 10, as suggested in FIGURE 1. The batteries are then free to slide from the case through the open end thereof, whereupon new batteries may be inserted. If the loop 37 is engaged against the casing in the manner described, it then merely will be necessary to push longitudinally inwardly on the spring portion of the switch bar adjacent the loop 37, whereupon the spring portion of the switch bar will spring inwardly into the case to the position shown in FIGURE 2.

Thus it will be apparent that the removal and insertion of the batteries of the device is a simple operation which may be performed in a minimum period of time. Particular attention is invited to the fact that the present device is intended to be sold at the lowest possible price, and its features are such as to permit it to be manufactured at minimum cost. The case 10 is plain tubular stock which may be cut to length, and the simple cap 15, serving also as a reflector, may have the extremities of its flanges crimped over the case, while the flanges may be glued or cemented into the case. The formation of the single thread in the opening 17 is a simple stamping operation. The case 10 may be formed of relatively cheap material and the slots 11, 12 and 13 may be easily cut through the case 10, as will be apparent. The switch bar is integral and may be produced from very light spring stock at minimum cost.

It is to be understood that the form of the invention shown and described is to be taken as a preferred example of the same and that various changes in the shape, size, and arrangement of the parts may be made as do not depart from the spirit of the invention or the scope of the appended claims.

I claim:

1. A flashlight comprising an insulating case, a metallic cap carried by one end of said case and comprising a reflector having means supporting a light bulb with its base contact engaging the center pole of a battery in said case, an integral resilient metallic switch element having a shank portion extending longitudinally of and mounted through most of its length in said case and having an end adjacent said cap out of engagement with said cap and movable into electrical contact therewith, said case having a longitudinal slot intermediate its ends, said shank portion having a finger piece projecting therefrom through said slot for longitudinally moving said switch element, said switch element having a spring integral therewith in the other end of said case electrically engaging the base of the adjacent battery and exerting a constant axial force thereagainst to maintain the center pole of the battery in electrical contact with the base contact of the light bulb, said case having an elongated slot between said longitudinal slot and said other end of said case in longitudinal alinement with said longitudinal slot, said slots being separated by a solid intervening portion of said case inwardly of which lies a portion of said shank, said shank portion having a projection movable in said elongated slot to

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assist said finger piece in maintaining the longitudinal position of said shank portion relative to said case.

2. A flashlight according to claim 1 wherein said switch element is of uniform width throughout, including said spring, whereby said shank portion may be flexed adjacent the end of said elongated slot remote from said other end of said case for the radial springing outwardly through said elongated slot of said spring and the adjacent end of said shank portion whereby batteries may be inserted and removed through said other end of said case.

3. A flashlight comprising an insulating case, a metallic cap carried by one end of said case and comprising a reflector having a base provided with means supporting a light bulb with its base contact engaging the center pole of a battery in said case, said base of said cap at one side thereof adjacent said case having an opening there-through, the radially outer extremity of which forms a shoulder, and an integral metallic switch element having a shank portion extending longitudinally of and mounted through most of its length in said case and having an end portion adjacent said cap projecting radially outwardly relative to said case and terminating in an extremity which converges toward the axis of said case adjacent said one end thereof and forms a contact finger movable over said shoulder and through said opening upon longitudinal movement of said switch element, said case having a longitudinal slot intermediate its ends, said shank portion having a finger piece projecting radially outwardly through said slot and slidable longitudinally to move said contact finger toward and away from said cap, said switch element being formed of resilient material and having a portion in the other end of said case comprising a spring terminating in an extremity electrically engaging the base of the adjacent battery, said case having a slot in the end thereof adjacent said cap alined with said longitudinal slot and through which the radially outwardly projecting end portion of said shank portion projects to maintain said switch element in normal position.

4. A flashlight comprising an insulating case, a metallic cap carried by one end of said case and comprising a reflector having means supporting a light bulb with its base contact engaging the center pole of a battery in said case, an integral resilient metallic switch element having a shank portion extending longitudinally of and mounted through at least part of its length in said case and having an end adjacent said cap out of engagement with said cap and movable into electrical contact therewith, said case having a longitudinal slot intermediate its ends, said shank portion having a finger piece projecting therefrom through said slot for longitudinally moving said switch element, said switch element being formed of resilient material and

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having the portion thereof adjacent the other end of said case constituting a spring portion projecting diametrically across said case and then being bent back upon itself to terminate in a free end longitudinally inwardly of said other end of said case and electrically engaging the base of the adjacent battery, said case being provided with an elongated slot between said longitudinal slot and said other end of said battery, said shank portion being provided within the longitudinal limits of said elongated slot with a projection slidable in such slot to maintain the longitudinal position of said shank portion relative to said case, said elongated slot providing for the radially outward flexing of said shank portion for the removal from said case of said spring portion for the insertion and removal of batteries through said other end of said case.

5. A flashlight comprising an insulating case, a metallic cap carried by one end of said case and comprising a reflector having a base provided with means supporting a light bulb with its base contact engaging the center pole of a battery in said case, said case having spaced longitudinally alined slots one of which is adjacent said one end of said case and the other of which is spaced therefrom, and an integral metallic switch element having a shank portion projecting outwardly through said other slot and then inwardly through said one slot and terminating in a contact end engageable with the base of said reflector, the outwardly projecting portion of said shank portion having a radially outwardly extending finger piece for moving said switch element longitudinally, said switch element at the end opposite said cap having a spring portion engageable with the base of the adjacent battery, said shank portion between said other slot and the other end of said case lying within said case, said case having an elongated slot adjacent said other end thereof, said shank portion within the limits of said elongated slot having an outwardly extending radial projection slidable in said elongated slot.

References Cited in the file of this patent

UNITED STATES PATENTS

1,382,440	Recker	June 21, 1921
1,404,077	Vince	Jan. 17, 1922
1,421,399	Burgess	July 4, 1922
1,472,088	Puckett	Oct. 30, 1923
1,498,332	Staples	June 17, 1924
1,697,405	Reichenbach	Jan. 1, 1929
1,986,242	Zook	Jan. 1, 1935
2,655,593	Fredrickson	Oct. 13, 1953
2,731,545	Bolinger	Jan. 17, 1956
2,806,100	Schildbach	Sept. 10, 1957