A further object of the invention is generally to improve the design, construction and efficiency of switch devices utilized in connection with flashlight and similar devices.

The means by which the foregoing and other objects of the present invention are accomplished and the manner of their accomplishment will be readily understood from the following specification upon reference to the accompanying drawings, in which:

FIG. 1 represents a substantially conventional flashlight with the switching arrangement of the present invention mounted thereon, and with parts broken away for purposes of illustration.

FIG. 2 is a fragmentary view on an enlarged scale illustrating the switch moved into actuating position, and with additional features schematically shown.

FIG. 3 is a fragmentary cross sectional view taken as on the line III-III of FIG. 1.

Refering now to the drawings in which the various parts are indicated by numerals, the present invention is specifically illustrated in conjunction with a flashlight 11 having a casing 13, a bulb 15 mounted in an electrically conductive reflector 16, and a suitable source of power such as the batteries 17. Batteries 17 are mounted within casing 13 and, as is usual, the negative pole of batteries 17 is in electrical contact with ground to the casing as through a spring 19, and the positive pole of batteries 17 is disposed for contact by bulb 15.

The present invention particularly relates to the switching mechanism for actuating the bulb by completing circuit through the batteries of the present setup. This switching arrangement comprises a housing 21 which is mounted upon casing 13, with housing 21 including a flexible and compressible plastic capsule 23 within which is contained a supply of mercury 25.

Mercury 25 is normally positioned as a globule intermediate the length of capsule 23 and, in order to assist in the assembly of mercury globule 25, capsule 23 is provided with an underlying groove 27, and in some instances a central depression for the mercury globule may be provided.

Slidably mounted in the upper part of switch housing 21 is an activating slide 29 which overlies capsule 23. Slide 29 is adapted for fore and aft advancement and retraction relative to housing 21 for the purpose of activating the switch. Slide 29 at its rearward end includes a downwardly extending enlargement 31 which in retracted position of the slide as shown in FIG. 1, is adjacent to the position of mercury globule 25 in capsule 23 with the capsule uncomprssed, and in advanced condition as shown in FIG. 2, engages with the capsule so as to effect spreading of the mercury from end to end of the capsule.

At its rear end capsule 23 is provided with a lead 33 which is suitably connected to casing 13 so as to effect grounding thereof. At its forward end capsule 23 is provided with a lead 35 which is connected to bulb 15, preferably through connection to reflector 16. Each of leads 33, 35 extends through the capsule into the interior of the capsule for engagement with mercury 25 upon compression of the capsule by advancement of slide 29.

In the embodiment of the switching device as presently shown, slide 29 is provided with a pair of laterally projecting flanges 37 which slidably engage with elongated grooves 39 formed in housing 21, and thus provide for guiding and control of the movement of the slide. It will
be observed that the grooves 39 terminate short of the ends of the housing so as to restrain the movement of slide 29 against overtravel beyond the housing.

In the assembly of the device housing 21 together with its contained capsule 23 and slide 29 is mounted upon the exterior of casing 13. Leads 33, 35 are respectively inserted through casing 13 and extended rearwardly and forwardly respectively, with the lead 33 being connected to the casing in order to ground the switching, and the lead 35 being connected to the bulb as by connection to the reflector mounting for the bulb or directly to the bulb itself.

In operation of the device, after batteries 17 have been inserted in the casing, bulb 15 mounted suitably therein and the switching arrangement mounted upon the casing, forward movement of slide 29 from the position of FIG. 1 to the position of FIG. 2 effects a compression upon the compressible capsule 23 and expresses the globule of mercury 25 from end to end of the collapsed compressed capsule.

The mercury thus expressed from end to end of the capsule effects contact between leads 33, 35, and thus completes the circuit activating and energizing bulb 15 for lighting purposes.

When use is discontinued, slide 29 is retracted to the position of FIG. 1, relieving the compressive force on the capsule and its mercury contents, thus permitting the mercury to reassemble as a globule, breaking the circuit making contacts with leads 33, 35. When so retracted, enlargement 31 restrains any accidental flow of mercury 25 toward lead 33 and thus insures against accidental energizing of the device.

It will be seen that the present device provides a minimum of moving parts in connection with the switching of the flashlight, and provides an efficient switching mechanism with a minimum of wear and thus preserves the longevity of use of the device. It will also be seen that in the event of an unforeseen disruption in any of the moving parts of the switching arrangement the switch may readily be removed from casing 13 and a new unit replaced thereon, merely requiring the detachment of housing 21 from the casing and the removal of leads 33, 35 from the capsule, with the replacement of the device being simple in the ability to merely replace the housing, at the time of replacement reinserting the leads into the new capsule 23.

Claims:

1. A switching mechanism for use with a flashlight which includes a casing, a bulb associated with said casing, and a power source mounted in said casing, said switching mechanism comprising a housing mounted on and externally of said casing, a compressible flexible plastic capsule in said housing adjacent said casing, an actuating slide above said capsule, said slide having longitudinally extending laterally protruding flanges, said housing including longitudinally extending grooves, said flanges slidably engaged in said grooves, whereby said slide is slidably shiftable fore and aft relative to said housing and said capsule, said slide including at its rear a downwardly projecting enlargement contacting said capsule and adapted to compress said capsule under forward slide shift to spread capsule contents, a supply of mercury contained in said capsule and comprising the contents of said capsule, electrical leads connected into the interior of said capsule and respectively connected to said bulb and said power source, said mercury in fore shifted position of said slide being spread into circuit making contact with said leads, said enlargement compressingly engaging said capsule to spread said mercury into said contact, retraction of said slide releasing said compression to allow reassembly of said mercury out of circuit making contact, said capsule having an internal grooved recess for collection of said mercury blocking mercury flow toward one of said leads.

2. A switching mechanism for use with a flashlight which includes a casing, a bulb associated with said casing, and a power source mounted in said casing, said switching mechanism comprising a housing mounted on and externally of said casing, a compressible capsule in said housing adjacent said casing, an actuating slide slidably mounted in said housing above said capsule, whereby said slide is slidably shiftable fore and aft relative to said housing and said capsule, said slide including at its rear a downwardly projecting enlargement contacting said capsule and adapted to compress said capsule under forward slide shift to spread capsule contents, a supply of mercury contained in said capsule and comprising the contents of said capsule, electrical leads connected into the interior of said capsule and respectively connected to said bulb and said power source, said mercury in fore shifted position of said slide being spread into circuit making contact with said leads, said enlargement compressingly engaging said capsule to spread said mercury into said contact, retraction of said slide releasing said compression to allow reassembly of said mercury out of circuit making contact, said enlargement disposed in said retracted slide position adjacent and rearward of said collected mercury blocking mercury flow toward one of said leads.

3. A switching mechanism for use with a flashlight which includes a casing, a bulb associated with said casing, and a power source mounted in said casing, said switching mechanism comprising a housing mounted on and externally of said casing, a compressible capsule in said housing adjacent said casing, an actuating slide being spread into circuit making contact with said leads, said capsule having an internal grooved recess for collection of said mercury blocking mercury flow toward one of said leads.
which includes a casing, a bulb associated with said casing, and a power source mounted in said casing, said switching mechanism comprising a housing mounted on and externally of said casing, a compressible capsule in said housing adjacent said casing, an actuating slide slidably mounted in said housing above said capsule, whereby said slide is slidably shiftable fore and aft relative to said housing and said capsule, said slide compressingly contacting said capsule under forward slide shift to spread capsule contents, a supply of mercury contained in said capsule and comprising the contents of said capsule, electrical leads connected into the interior of said capsule and respectively connected to said bulb and said power source, said mercury in fore shifted position of said slide being spread into circuit making contact with said leads, said slide compressingly engaging said capsule to spread said mercury into said contact, retraction of said slide relieving said compression to allow reassembly of said mercury out of circuit making contact, means in said capsule for collecting said mercury in retracted slide position, and means blocking mercury flow toward one of said leads in such retracted position.

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