May 22, 1934. F. R. MEGINNISS 1,959,835

SWITCH

Filed Nov. 22, 1930

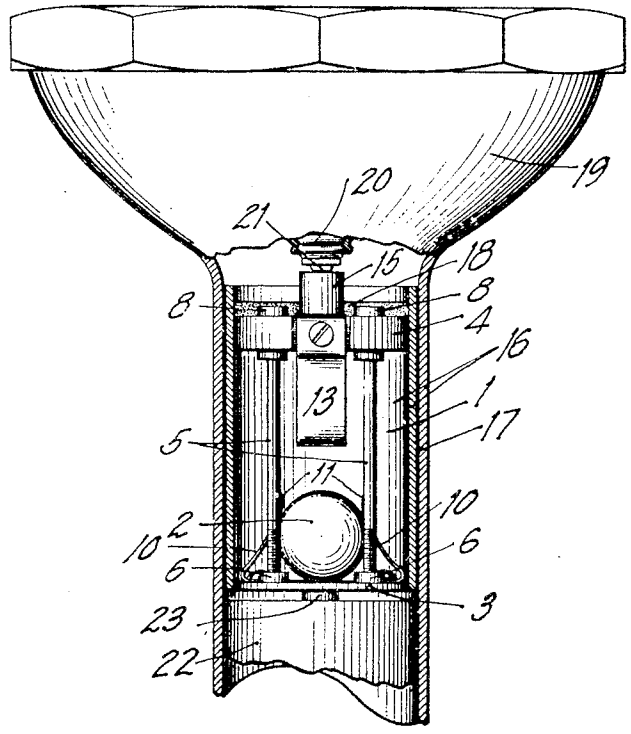


FIG. 3

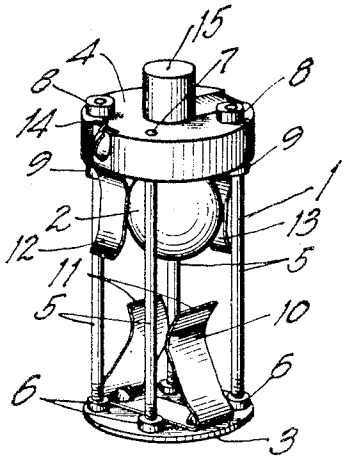


FIG. 1

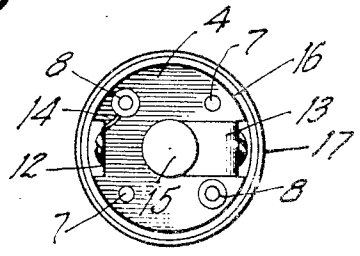


FIG. 2

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SWITCH

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4 Claims. (Cl. 200—52)

My invention relates to electrical switches and particularly to devices of this character which are operable by inertia, centrifugal force, shaking, or, in general, by a bodily movement or a stoppage of a bodily movement of the switch itself rather than by the manual manipulation of any actuating element. The switch is of the general character described in my applications, Serial Nos. 371,983 and 371,984, filed June 19, 1929.

One of the objects of my invention is to provide a switch of the character described which is extremely simple in its construction and operation and in which there are no delicate actuating or moving parts to wear or get out of order. Another object is to provide a switch which may be manufactured very cheaply and which, if desired, may be hermetically sealed in a suitable container and yet be operable to make or break an electrical circuit. Another object is to provide an electric switch of such size and form that it may be substituted for one of the ordinary unit dry cells now employed in electric flash lights.

With these objects in view my invention includes the novel elements and the combinations and arrangements thereof described below and illustrated in the accompanying drawing in which Fig. 1 is a perspective view of my switch; Fig. 2 is a top view of Fig. 1 and Fig. 3 is a fragmentary elevation view, partly in section, of an electric flash light showing the application thereto of my switch.

Generally speaking, my switch merely comprises a movable weight and a suitable container therefor with means for yieldingly holding the weight in such a position as to effect an actuation of the switch to close an electrical circuit, and means for yieldingly holding the weight in such a position as to prevent the closing of the electrical circuit through the switch, all at the will of the operator.

Referring more particularly to the drawing, which is understood to be merely illustrative, my switch may comprise a tubular or cage-like structure represented generally by the numeral 1 in which a ball or sliding weight 2 is substantially freely movable. This tubular or cage-like structure preferaby comprises a metal base 3, a top 4 of fibre or other insulating material and elements 5 extending between the base and the top to form an enclosure for the weight 2. In the particular embodiment shown these connecting elements are four rods threaded into the base 3 and secured thereto by lock nuts 6. Two of these rods, which are diametrically disposed, merely extend into the top, as shown at 7, and the other two diametrically disposed rods are secured to the top by means of nuts 8 and 9 on either side thereof. Riveted, soldered or otherwise secured to the base 3 is the spring clip 10 having its upper extremities 11 diverging as shown, and adapted to permit the weight 2 to enter therebetween and be yieldingly held in the position shown in Fig. 3. This clip has nothing to do with the contact making or breaking function of the switch and merely serves to yieldingly hold the weight 2 in the position shown in Fig. 3 to maintain an open circuit. Secured by screws or otherwise to diametrically opposite portions of the top 4 are the spring clips or contacts 12 and 13. The lower extremities of these clips diverge in a manner similar to the extremities 11 of the lower clip and they are designed to yieldingly retain the weight 2 in the position shown in Fig. 1, that is, in contact making position to maintain a closed circuit through the switch. The clip or contact 12 is grounded or electrically connected to the elements 5, and base 3, by any suitable means such, for example, as a wire 14. The other clip 13 is insulated from the elements 5 and base 3 but is electrically connected to a metallic contact element 15 secured in the upper central portion of the top.

The entire structure is preferably secured in a metallic case 16 provided with an insulated covering 17 (see Fig. 3) of paper or the like. The base 3 may be soldered to the cylindrical casing 16 and the upper portion of the casing 16 may be filled with wax or other insulating material 18 as shown in Fig. 3 so that the device is hermetically sealed within the casing. In such a case one contact is the metal base 3 and the other contact is the element 15. That is, the contacts are substantially identical with the contacts on a unit dry cell and the cylindrical casing 16 is preferably of the same size as the zinc casing on a unit dry cell so that the switch element may be substituted in an ordinary flash light for such a cell.

Referring to Fig. 3, 19 represents the upper portion of an ordinary electric flash light and 20 represents a portion of the base of the electric light bulb therein, it being understood that this terminal of the light is grounded to the casing of the flash light. The other terminal 21 of the bulb rests in contact with the element 15 of the switch, and below the switch may be any number of unit dry cells 22 assembled in the usual way, the center terminal 23 of the uppermost dry cell being in electrical contact with the base 3 of my switch and it being understood that the base of the lower dry cell (not shown) is electrically connected to the casing in the usual manner.

With the weight 2 in the position shown in Fig. 3, it will be apparent that there is no electrical circuit through the switch or through the lamp and hence the lamp is not lighted. When the weight is in this position it is grasped by the spring element 10 and yieldingly held in the position shown so that the flash light may be turned upside down or otherwise moved without dislodging the weight 2. When it is desired to light the light the enlarged end of the flash light may be held downwardly and struck rather sharply by the palm of the hand. This will break the yielding engagement of the clip 10 with the weight 2 and permit it to roll or slip into the position shown in Fig. 1 where it will be yieldingly held by the clips 12 and 13 to effect a closing of the circuit through the switch. That is, the metal weight 2 forms an electrical connection between the spring elements 12 and 13 to effect a closing of the switch. When the weight is in this position the spring elements 12 and 13 are so designed as to yieldingly hold the weight so that the flash light may be turned right side up or upside down or otherwise moved without breaking the circuit. The weight or mass, therefore, is held either in the open circuit or closed circuit position with pressure sufficient to require a force greater than that due to its own gravity to dislodge the same. To break the circuit the flash light may be held in the position shown in Fig. 3 and slapped with the palm of the hand on the bottom, this will dislodge the weight from engagement with the elements 12 and 13 and cause it to move downward into engagement with the clip 10. It will be apparent, of course, that it is not necessary to strike the flash light with the hand as above described but that the weight 2 may be moved from the position shown in Fig. 3 to contact making position either by centrifugal force developed by whirling the flash light or moving it bodily through a certain arc, or by inertia brought into operation by abruptly starting or stopping a bodily movement of the flash light.

From the foregoing it will be apparent that a flash light equipped with my switch has no moving parts on the exterior of and passing through the casing, and that the circuit making and breaking means, although hermetically sealed, is operable at will. The applications of such a switch are many, and while it is of particular advantage in providing a water and gas proof flash light, it will be useful for any purpose where it is necessary or desirable to eliminate all danger of igniting combustible or explosive fluids or other substances by sparks at the switch when the circuit is made or broken.

While I have described only one embodiment of my switch and one application therefor, it is to be understood that the drawing is purely illustrative and that the words which I have used in describing my invention are words of description rather than of limitation. Hence, changes within the purview of the appended claims may be made without departing from the true scope and spirit of my invention in its broader aspects.

What I claim is:

1. In combination, a portable device including an electric circuit, spaced pairs of spring clips mounted thereon, one of said pairs forming terminals for said circuit, a metallic member mounted in said device and movable into engagement with either pair of clips, the circuit closing clips engaging said member with pressure sufficient to require a force greater than that due to its own gravity to dislodge the same.

2. In combination, a portable device including an electric circuit, spaced pairs of spring clips mounted thereon, one of said pairs forming terminals for said circuit, a metallic member mounted in said device and movable into engagement with either pair of clips, either pair of said clips engaging said member with pressure sufficient to require a force greater than that due to its own gravity to dislodge the same.

3. In combination, a portable device including an electric circuit, gripping means comprising at least two spaced spring clips one of which forms a terminal for said electric circuit, a metallic member mounted in said device and movable into engagement with either of said clips, the clip which forms a terminal for said electric circuit engaging said movable member with pressure sufficient to require a force greater than that due to its own gravity to dislodge the same.

4. In combination, a portable device including an electric circuit, gripping means comprising at least two spaced spring clips one of which forms a terminal for said electric circuit, a metallic member mounted in said device and movable into engagement with either of said clips, each of said clips engaging said movable member with pressure sufficient to require a force greater than that due to its own gravity to dislodge the same.

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