Feb. 27, 1934. F. R. MEGINNISS 1,948,728

SWITCH

Filed June 19, 1929

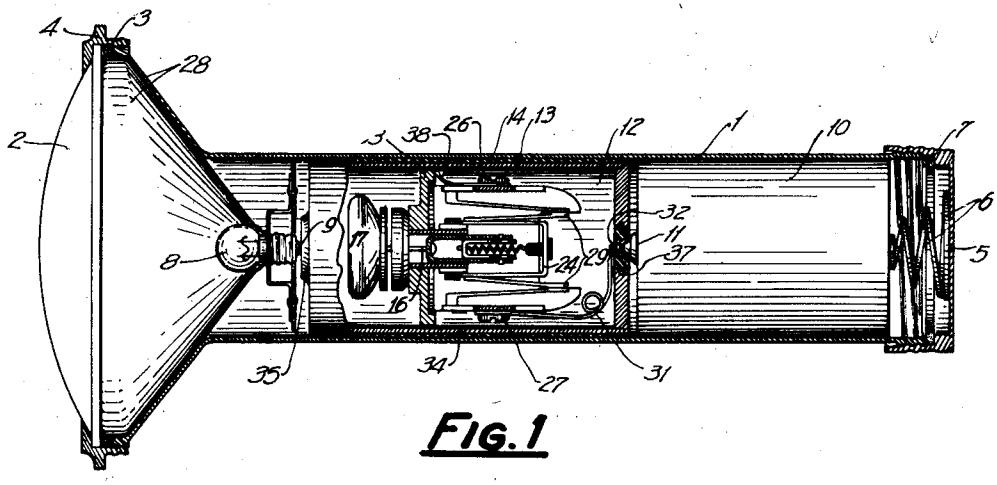


FIG. 1

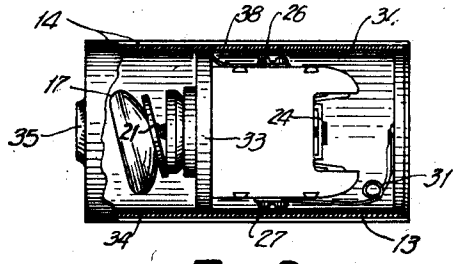


FIG. 2

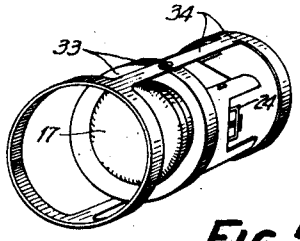


FIG. 5

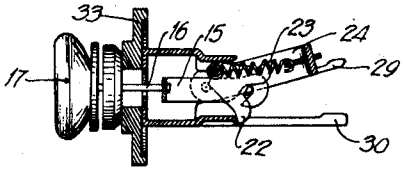


FIG. 3

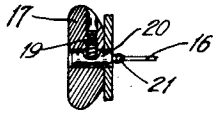


FIG. 4

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SWITCH

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16 Claims. (Cl. 200—60)

My invention relates to electrical switches and particularly to devices of this character having novel features of construction whereby it may be completely enclosed and sealed in a suitable container and yet may be operated at will. In its more specific embodiments it refers particularly to switches for use in connection with flash lights or lamps of the well known type employing a small lighting bulb and containing one or more unit cells within a hollow, tubular container. Such lamps are at present generally lighted or extinguished either by means of a push button switch or by turning one end of the container and are in no sense gas or waterproof.

The objects of my invention, therefore, are to provide an electrical switch which may, if desired, be hermetically sealed in a suitable container and yet be mechanically actuated at will to make or break an electric circuit; to provide a switch of this general character which may be actuated by subjecting the container or device to moderate shock; to provide such a switch assembled in a novel form whereby it may be substituted for one of the unit cells now employed in flash lamps; to provide a switch having a novel actuating mechanism whereby it may be mechanically operated without the necessity of actual contact with the mechanism thereof; and generally to provide a switch of extremely simple and cheap construction enclosed in a gas, weather and waterproof cell which, because of these features will be of general application throughout the arts.

Broadly speaking, my switch is actuated by creating a relative movement between the switch mechanism which has a mass or weight operatively associated therewith, and the casing in which it is contained. This relative movement may be effected in a number of different ways. For example, energy may be imparted to the weight or mass by a bodily movement of the switch container, and this energy may be caused to actuate the switch mechanism by utilizing the principles of inertia. That is, assuming the weight or mass to be endowed with kinetic energy due to the bodily movement of the container, an abrupt stopping or retarding of this movement will not immediately affect the movement of the weight which will continue, because of its inertia, and thus exert a force sufficient to effect an actuating movement of the switch mechanism. On the other hand, it is well known that a weight, mass or body at rest tends to remain at rest due to its inertia. Hence, the switch may be operated by an abrupt starting movement of the container in such a direction as to cause the weight or mass through its inertia to exert an actuating force on the switch mechanism. Again, it is obvious that my switch may be operated by a whirling movement of sufficient velocity to cause the weight or mass to exert an actuating pull on the switch through centrifugal force.

With the foregoing in mind, my invention includes the novel elements and the combinations and arrangements of elements described below and illustrated in the accompanying drawing in which—

Fig. 1 is a longitudinal section of an electrical flash lamp;

Fig. 2 is a fragmentary plan of the switch with portions broken away to show the switch device;

Fig. 3 is a partial view of the switch with arm raised and circuit open;

Fig. 4 is a fragmentary cross section of the weight showing one method of attaching it to the switch actuating element; and

Fig. 5 is a perspective view of a detail.

Referring to the drawing, 1 is a cylindrical metal casing flared at one end to receive the lens, 2, which is held in place by a parabolic reflector, 28, and the ring 4, threaded on the casing, 1. Between ring, 4, and casing, 1, is placed gasket, 3, to make the casing tight. At the other end, the casing, 1, is threaded to receive the cap, 5, to which is attached the spring, 6. The cap, 5, is threaded on the casing, 1, against a gasket, 7. The purpose of spring, 6, is to cause positive contact between the elements in the tube or casing, 1. 8 is an incandescent bulb having one terminal grounded to the casing, and one terminal, 9, insulated therefrom, all as is well known in the art.

10 is an ordinary unit dry cell having contact point, 11, and of course, there may be one or more dry cells depending on the length of the casing.

The switch cell is denoted generally as 12, and has the external appearance of a unit dry cell. It consists of a casing, 13, covered with an insulating material, 14. The switch operating link, 15, is connected through actuating element, 16, to the relatively heavy weight, 17. The weight, 17, is connected to the actuating element, 16, by means of set screw, 19, and recessed plug, 20 and is swiveled at joint, 21.

The switch unit which I propose to use, I call for convenience a pull switch. By this I mean a switch of the well known type used in lighting fixtures which is actuated either to open or close an electric circuit by moving an actuating element in the same direction. One species of

such a switch is generally described in United States Letters Patent No. 1,483,162 issued to Victor R. Despard and No. 1,483,173 issued to David D. Gordon. No claim is made to the switch, per se, and any type of a push or pull switch in which the actuating element, when released, automatically returns to its initial position for the next operation will, obviously, serve the purpose.

The switch consists essentially of operating element, 16, U-shaped connection, 15, hooked member, 22, helical spring, 23, and switch arm, 24. On the end of switch arm 24, are attached two arms, 29, adapted to have sliding contact with elongated contact plates, 30, connected with screws, 26 and 27. Attached also to binding posts, 27, is an insulated wire, 31, which is connected with contact point, 32. This point, 32, is adapted to form a connection with upper contact, 11, of dry cell. Connected with screw, 26, is connection, 38, of wire, preferably, which connects slidably with skeleton framework, 34.

The switch mechanism is attached to circular base, 33, which in turn is attached or soldered to the cylindrical skeleton framework, 34. This frame is to hold the switch mechanism in place in the container and is electrically connected with contact point, 35. The contact point, 32, is insulated from the rest of the cell by insulation, 37, molded in place and making cell air and water tight. Of course, the switch mechanism could be attached to and form a part of the lamp, being soldered in place.

The path of the current is as follows: From cell, 10, to spring, 6, cover, 7, casing 1, reflector, 28, the lamp socket, to filament of lamp, 8, to contact, 9, to contact point, 35, which is grounded to the frame, 34, through the elements of the switch mechanism, when closed, through conductor, 31, to contact, 11, and back to the unit cell, 10, completing the circuit.

When the lamp is shaken, or a rapid movement thereof is abruptly stopped or retarded, the weight, 17, moving through inertia pulls on the actuating element, 16, thus moving the switch arm in or out of contact, as is well known in the art.

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

What I claim is—

1. A switch unit adapted for insertion in an electric flash lamp comprising a casing provided with contacts adapted to form electrical connections in series with unit cells at either end, a switch mechanism therein of the type provided with an actuating element adapted to effect an opening or closing of said mechanism when moved in the same direction, and a weight secured to said element and of sufficient mass to effect an actuating movement thereof by its inertia when a movement of said unit is abruptly stopped.

2. A switch unit comprising a hermetically sealed container, a switch mechanism therein of the type provided with an actuating element adapted to effect an opening or closing of said switch when moved in the same direction, a weight secured to said actuating element and of sufficient mass to effect an operation of said switch by inertia when a movement of the unit is abruptly stopped, and contacts on said container forming terminals for the electrical circuit through said switch.

3. The combination with a switch mechanism having an element movable in one direction for making or breaking an electric circuit, of a weight associated with said mechanism and of sufficient mass to effect an actuating movement thereof to either open or close the circuit by kinetic energy imparted to said weight by a bodily movement of the switch in the same direction.

4. In a switch, a member movable back and forth for actuating the same, resilient means connected to said member, a weight attached to said member and of sufficient mass to effect an actuating movement thereof by its own kinetic energy against the action of said resilient means, said resilient means exerting sufficient force on said member to return it after operation by said weight, and associated means for alternately opening and closing the circuit on each operation of the switch.

5. In a switch, the combination with means for making or breaking an electric circuit, of a weight associated with said means and of sufficient mass to effect an actuating movement thereof by kinetic energy imparted to said mass by a bodily movement of said switch, and means for effecting a return of said weight to its original position after actuating the switch.

6. In a switch, the combination with means for making or breaking an electric circuit, of a weight associated with said means and of sufficient mass to effect an actuating movement thereof by kinetic energy imparted to said mass by a bodily movement of said switch, and means for positively effecting a return of said weight to its original position after actuating the switch.

7. In a switch, the combination with means for making or breaking an electric circuit, of a weight associated with said means and of sufficient mass to effect an actuating movement thereof by kinetic energy imparted to said mass by a bodily movement of said switch, and resilient means for positively effecting a return of said weight to its original position after actuating the switch.

8. The combination with an electric switch, of an actuating element therefor, means responsive to movements of said element in the same direction for both opening and closing said switch, means associated with said element and operable by inertia for effecting a switch actuating movement thereof, and means for effecting a return of said inertia operable means to its original position after actuating the switch.

9. In a device of the character described, the combination with a switch mechanism, of an actuating element therefor, means responsive to movement of said element in the same direction for effecting both the opening and closing of said switch, a weight associated with said element and of sufficient mass for actuating the same by its own inertia, and means for automatically returning said weight to its initial position after actuating said element.

10. In a device of the character described, the combination with a switch mechanism, of an actuating element therefor, a weight associated with said element and movable in a multiplicity of directions for operating said element by its inertia, and means for positively and automatically returning said weight to its initial position after actuating said switch.

11. A unitary switch adapted to make or break

an electric circuit in an atmosphere of explosive gases without danger of ignition and comprising means for making or breaking an electric circuit, an actuating element therefor, means responsive to the movement of said element in the same direction for opening or closing said switch, a weight associated with said element and of sufficient mass to effect a switch actuating movement by its own inertia, means for automatically returning said element to switch actuating position after each movement thereof in a switch actuating direction, and a fluid tight container for said switch.

12. In a switch of the pull type in which the operation thereof alternately opens and closes the circuit, a switch actuating element, a weight connected to said element and of sufficient mass to operate the switch by inertia when a bodily movement of the switch and weight is abruptly retarded, and resilient means coacting with said weight and switch for restoring the weight and the switch to their relative positions prior to the actuation of said switch and there yieldingly retaining them.

13. In a device of the character described, the combination with a switch mechanism for making and breaking an electric circuit, of a movable actuating element therefor, a weight associated with said element and of sufficient mass to effect a switch actuating movement thereof by its inertia, and resilient means for returning said weight to its original position after a switch actuating movement and yieldingly retaining said weight in position for the next actuating movement.

14. In an electric flash lamp of the type having two or more unit dry cells therein, a device adapted to light or extinguish said lamp in an atmosphere of explosive gases without danger of ignition by sparks, a switch actuating element, means responsive to movements of said element in the same direction for opening and closing said switch, a weight operatively associated with said first mentioned means and of sufficient mass to effect a switch actuating movement thereof by its inertia when a bodily movement of the flash lamp is abruptly retarded, and a fluid proof container approximating in size one of said unit cells in which said switch is enclosed and having electrical contacts whereby it may be substituted for one of said cells in the flash light.

15. In an electric flash light, a switch comprising a movable actuating element, means responsive to the movement of said element in the same direction for effecting both a closing and opening operation of said switch, and inertia operated means for effecting a switch actuating movement of said element.

16. In an electric flash light, a switch comprising a movable actuating element, means responsive to the movement of said element in the same direction for effecting both a closing and opening operation of said switch, inertia operated means for effecting a switch actuating movement of said element, and means for effecting a return of said element to its initial position after each switch actuating movement.

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