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2,328,855

MECHANICAL GRAVITY ACTIVATED ELECTRICAL SWITCH

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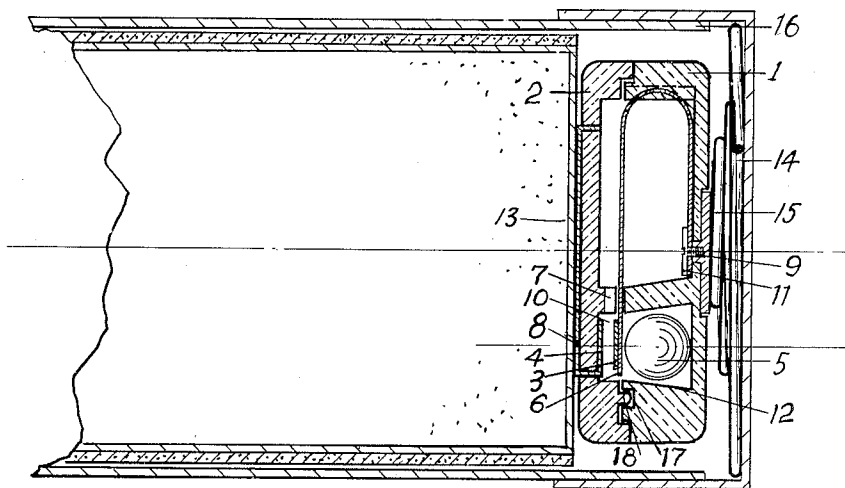


FIG. 1

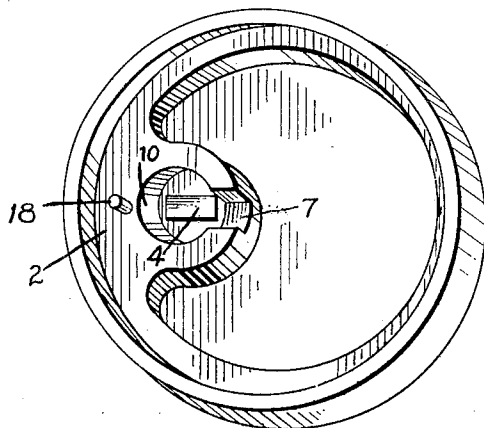


FIG. 2

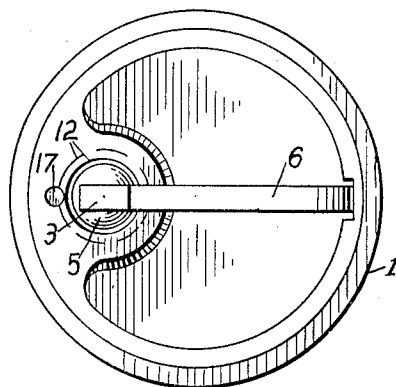


FIG. 3

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UNITED STATES PATENT OFFICE

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MECHANICAL GRAVITY ACTIVATED
ELECTRICAL SWITCH

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3 Claims. (Cl. 200—52)

My invention relates to portable electric lamps such as flash lights in general and to switches which are gravity operated or activated in particular. The primary object of the present invention is the closing of the circuit when the lamp bulb is tilted well below the horizontal plane and the opening of the circuit when the raised lamp bulb is still well below the horizontal plane.

A second object of my switch is that it may be self contained and the device placed within any lamp shell to become a secondary limiting control supplementing the lamp's manually controlled switch.

A further object of my switch is that it may be incorporated within the lamp as an integral part of the same and constituting the sole switching device of the lamp.

Another object of my switch is to provide a safe switching device, fully inclosed in a vapor and dustproof housing; to decrease the hazard of exposed contact points that might create dangerous sparking and serious explosions.

A further object of my switch is that it can be used within any flash lamp to provide the means of rapid blinking for signaling in code. When positioned as illustrated in the drawing the light would be directed below the horizontal and when positioned in the reverse fashion, the lamp signals would be sent in an upward direction.

Other objects will suggest themselves or be apparent from the following description and the accompanying drawing; the latter illustrates one embodiment of the present invention and in which the views thereof are as follows:

Figure 1 is a sectional view of my switch in a lamp barrel; Figure 2 is a view of the interior of switch cover in perspective. Figure 3 is a plan view of the switch body viewed from inside.

Referring to the drawing the lower or body part of housing 1, engages the upper or cover part of housing 2, both of which are molded of insulating material, cemented or sealed together after assembly. The movable contact 3, is fixed to the flat spring conductor 6, the latter being secured to the conductor plate 9 by the screw 11. A slot 7 cut in the straight wall of hole or pocket 10 of member 2, serves as a side guide for spring 6 to insure alignment of movable contact 3 with stationary contact 4 to better withstand any side thrust of ball 5. The positive alignment of contact 3 above contact 4 and that of spring 6 with respect to slot 7 is insured in assembly by engaging small hole 17 in member 1, with projecting pin 18 a part of member 2. A suitable conductor strip 8 attached to or a continuation of contact

4 is exposed on the outside surface of housing 2 to form the terminal which will engage the base of battery 13 to establish circuit contact. The spring interposed as shown is not essential as contact may be made directly between grounded frame cap 14 and terminal plate 9 or between a flat spring in place of the coiled spring 15 as space dictates.

Referring to Figure 1, a feature of my switch is the inclined wall of the annular recess 12 which forms the enclosure or raceway for ball 5. If for example the major axis of the lamp barrel 16 is tilted below horizontal position approximately 20 degrees ball 5 rolls forward pressing its weight and force against spring 6 closing contact 3 on contact 4; assuming either there is a conventional switch in the circuit and already in closed position, or else none, the lamp will light. When the lamp barrel 16 is again raised and while its major axis is yet approximately 20 degrees below true horizontal, that portion of the raceway surface 12 which is engaged with ball 5 will have reached a horizontal position; if the barrel 16 is raised any higher the raceway surface engaging the ball will be slanting below horizontal and the ball 5 immediately in rolling away allows spring 6 to withdraw contact 3 from contact 4 breaking the circuit.

It should be noted particularly that the pocket 10 for the ball 5 is disposed in the housing off-centrally and near the peripheral wall thereof, while the spring 6 is anchored so as to extend diametrically clear across the housing. In view of the small dimensions required for accommodation of the entire switch in a conventional flashlight, this feature is of considerable importance, since it provides a long leverage for the ball to operate the spring. This makes the device more sensitive and more reliably responsive to gravity operation.

From the foregoing description in conjunction with the drawing it will be apparent that my switch can be advantageously used within portable lamps serving a very useful purpose during blackouts; similar wartime precautionary restrictions of light will suggest themselves. For example, by the simple expedient of turning the housing of my switch around, so that the stationary contact, now engages the end cap, or the interposed spring, of the lamp barrel it can readily be seen that the switch now will function so as to limit light in an upward direction only and in an arc of 180 degrees or less.

While I have described but one embodiment of my switch and but one application of its use,

it is to be understood that my drawing is to aid my description, and likewise words that I have used in description of my switch, are merely descriptive in scope, rather than of limitation.

I found it desirable to illustrate my switch greatly enlarged in order to better show details of it in its present form; the model which I made being substantially as illustrated having a case $\frac{3}{8}$ " by 1" overall, outside, measurements.

What I claim is:

1. A portable switch for a flashlight, or the like, comprising a flat annular housing having a side wall and end members, the end members having outer contact faces adapted for insertion into a circuit, means for insulating the contact faces from one another, one of the end members having an internal contact face in electrical communication with its outer contact face, a relatively small pocket member projecting from the second end member near the side wall and toward said internal contact face, a cantilever spring contact extending diametrically across the housing intermediate the two end members and having one end anchored with respect to the second contact face and having a free end projecting over the pocket member so as to be normally spaced from but movable toward the internal contact face of the first end member, and a weight movable in the pocket member for urging the free end of the cantilever spring contact upon the internal contact face for closing the circuit when the housing is tilted in one direction and to release the spring contact for opening the circuit when the tilting movement is reversed.

2. A switch for a flashlight or the like, comprising a flat annular housing having a side wall and end members, the end members having outer contact faces adapted for insertion into a circuit, means for insulating the contact faces from one another, one of the end members having an internal contact face in electrical communication with its outer contact face, a relatively small pocket member projecting from the second end member near the side wall and toward said internal contact face, a cantilever spring contact

extending diametrically across the housing intermediate the two end members and having one end anchored with respect to the second contact face and having a free end projecting over the pocket member so as to be normally spaced from but movable toward the internal contact face of the first end member, and a weight movable in the pocket member for urging the free end of the cantilever spring contact upon the internal contact face for closing the circuit when the housing is tilted in one direction and to release the spring contact for opening the circuit when the tilting movement is reversed, the wall of the pocket member being tapered to delay movement of the weight until a desired tilting angle has been reached.

3. A portable switch for a flashlight or the like, comprising a flat annular housing having a side wall and end members, the end members having outer contact faces adapted for insertion into a circuit, means for insulating the contact faces from one another, one of the end members having an internal contact face in electrical communication with its outer contact face, a relatively small pocket member projecting from the second end member near the side wall and toward said internal contact face, a cantilever spring contact extending diametrically across the housing intermediate the two end members, and having one end anchored with respect to the second contact face and having a free end projecting over the pocket member so as to be normally spaced from but movable toward the internal contact face of the first end member, and a weight movable in the pocket member for urging the end of the cantilever spring contact upon the internal contact face for closing the circuit when the housing is tilted in one direction and to release the spring contact for opening the circuit when the tilting movement is reversed, the pocket member having a slot in the wall thereof for receiving and guiding the free end of the cantilever spring.

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