Aug. 17, 1948. L. C. ZEHNPFENNIG 2,447,453
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L. C. ZEE
ELECTRICAL SWITCH
Filed March 5, 1946

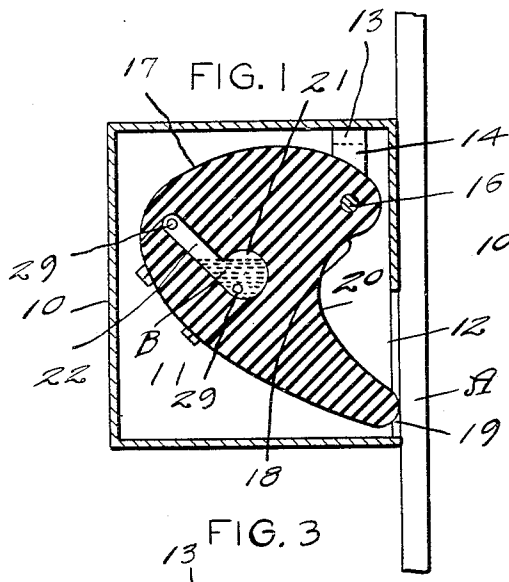


FIG. 1

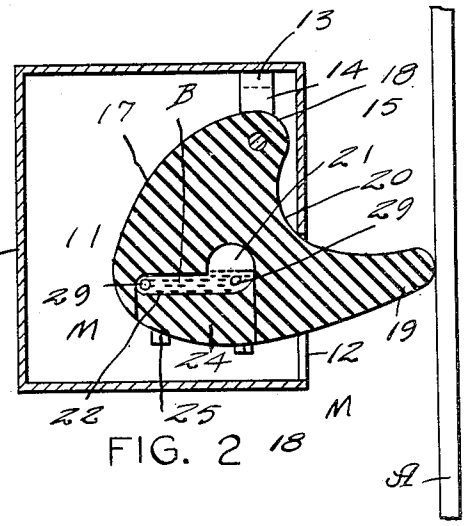


FIG. 2

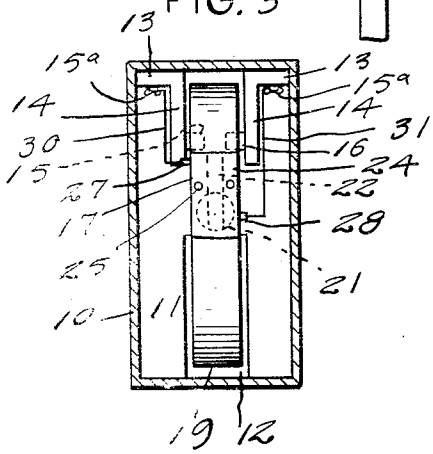


FIG. 3

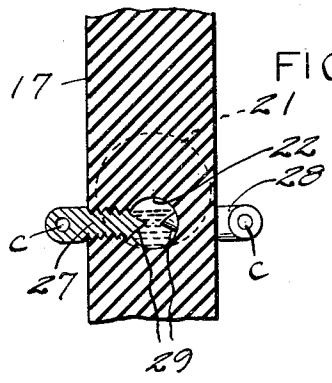


FIG. 4

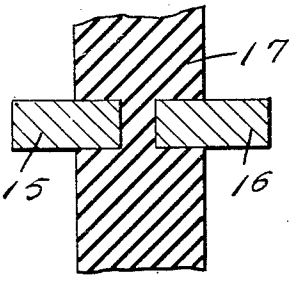


FIG. 5

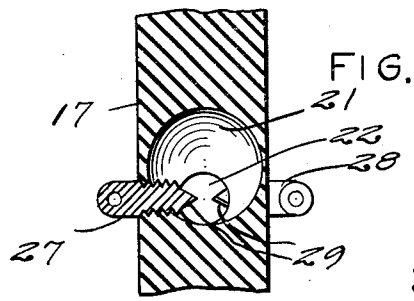


FIG. 6

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ELECTRICAL SWITCH

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1 Claim. (Cl. 200—152)

1

This invention relates to improvements in circuit maker and breakers and more particularly to a gravity operating switch.

One of the objects thereof is to provide a simple, efficient and inexpensive switch construction for special use in closets of households so that upon opening the door of the closet an electrical lighting circuit may be closed to illuminate the closet temporarily, and upon, closing the door the circuit may be automatically disrupted so as to turn out the light.

Another object thereof is to provide such a form of switch that it may consist of only one part proper so far as movable mounting in a suitable case is concerned, and be effective, at all times, to positively close and open the circuit in which it is included.

A further object thereof is to provide a mercury switch wherein the movable parts may function without appreciable friction, noise and susceptibility of derangement, and wherein a proper balance and counterbalance of the mobile fluid may be had in the switch.

A still further object thereof is to provide a switch member in such a shape that due regard will be had to locating the main mass and bulk thereof where it will remain at rest in suspended relation in a switch case and cause a part thereof to movably project forwardly of the case to be contacted by the door as it is being closed. The retraction of the switch member thus occasioned by the door impact is effective to tilt the lever inside of the case and to redistribute automatically the mercury therein in such a manner that an electrical lighting circuit is disrupted suddenly which will darken the closet or room in which the switch is located, as is desired.

A further object thereof is to provide a heart-shaped switch member with oppositely arranged contact points between which mercury in this member makes a shiftable traverse as well as a diminution of length for the purpose of either bridging electrically said contact points or else unbridging them.

With the above and other objects in view my invention consists in the combination, arrangement and details of construction disclosed in the drawings and specification, and then more particularly pointed out in the appended claim.

In the drawings, wherein similar reference characters designate similar parts throughout the respective views—

Figure 1 is a sectional elevation of my invention,

2

Figure 2 is a view similar to Figure 1 but showing some parts in a qualified position,

Figure 3 is a cross sectional elevation of the switch case, showing the switch lever therein,

Figure 4 is a front sectional elevation of the switch member disclosing a mercury reservoir therein,

Figure 5 is a fragmental detail view of the switch member showing means for journaling the same, and

Figure 6 another fragmental elevation of the switch member, showing the relative positions of the contact points connected therein.

In the drawings, which are merely illustrative of my invention, I show at 10 a switch case hollow inside as at 11, and formed upon its narrow front wall with a slot 12. A pair of stout brackets each have a horizontal arm 13 attached by fasteners 15 to the upper end of the case and a vertical arm 14 depending therefrom and oppositely arranged with respect to the medial line of the case. A pair of oppositely arranged pintles 15 and 16 respectively have their inner ends secured at the lower ends of the brackets so that they project towards each other towards the center of the case, as shown in Figure 1.

I provide a substantially heart-shaped switch lever or member made of insulating material, and so shaped as to have a short lobe 22 and a relatively longer lobe 19, the main trunk of the lever being rounded in one direction at 17 and in an opposite direction at 28. It will be seen that by pivotally mounting the short lobe 22 of the lever oscillatingly upon pins 15 and 16, which project into opposite sides thereof, the main mass or bulk of this lever will extend downwardly from the upper to the lower end of the case 10, the center of gravity disposing this lever in such a position, as it hangs upon said pivot pins 15 and 16 that the longer lobe thereof 19, will project out of the slot 12 of the case, as shown in Figure 2.

The switch lever thus mounted is at rest normally, when the door is open, which is intended to operate it for circuit opening purposes. The door is designated A. Formed within the heart-shaped lever eccentrically of the point of suspension of the lever is a cylindrical mercury reservoir 21 having a tangentially disposed chamber extension 22 extending as a straight prolongation from said reservoir 21 towards the outer end of the lever. The location of reservoir 21 virtually enlarges one end of the chamber 22. A removable closure member 24 forms a section of the lever, being so shaped that when attached to the lever by fasteners 25 it forms the bottom of

the reservoir and its chamber is formed in the mold; suitable washers M are interposed, where necessary to render the closure member leak-proof.

A column of mercury B is placed in the chamber 22, which chamber is disposed in longitudinal alignment with the projecting lobe 19 of the lever, so with the lever in normal position, in Figure 2, the chamber and mercury therein are in a horizontal plane, the mercury having found its level horizontally. I employ a pair of similarly constructed electrical contact pins 27 and 28 respectively; contact pin 27 is screwed into one side of the lever so its point 29 extends into the outer end of chamber 22; while contact pin 28 is screwed into the other side of the lever so that its point 29 is disposed at the opposite or reservoir end of this mercury chamber 21. Electrical wires 30 and 31 are connected at their inner ends by the fasteners 15 to the case insulatedly, being made long enough so as to pay out flexibly when the lever moves in its prescribed arc from either circuit making or circuit opening position. This is necessary because the free ends of these wires 30 and 31 are respectively connected electrically to the holes C of the outer ends of contact points 27, and 28 respectively. It will be seen that the contact points 29 of the contact pins 27 and 28 will either both be immersed in the mercury column B or else that but one of them will be so immersed, depending upon the position of the switch lever.

In operation the switch case 10 will be located on the hinge side of the door jamb, flush, or at the top of the door, working equally well in any event. When the switch lever 20 is at rest, as shown in Figure 2, the door is in open position so as not to exert pressure upon the projecting lobe or toe 19 thereof. In this position of the switch lever the mercury B has found its horizontal level and is on an even keel, and therefore it immerses the contact points 29 of both contact pins 27 and 28 at the opposite ends of the electric lighting circuit to a lamp in the room closed by the door A. When, however, the door is closed, as shown in Figure 1, then gravity shifted lever 20 is oscillated or tilted upon pivot pins 15 and 16, rocks, and as soon as the door impacts the projecting nose 19 of this lever, and this movement is undergone by the lever, the lever assumes a biased position within case 10,

shown in Figure 1, so now the mercury chamber 21 is also disposed at a bias or upward inclination whereby the mercury B therein runs down at the incline of the chamber and collects in the reservoir 22 of the lever at the reservoir end of the chamber. In doing this the length of the column of mercury is shortened appreciably, and its depth increased in the reservoir enlargement of the chamber 21, and no part of the mercury touches the contact point 29 of contact pin 27, hence disrupting and opening the electric lighting circuit so the room becomes dark. When the door is opened again, gravity shifts the position of the switch lever again and this time the main bulk of the lever, having previously been raised, now drops down projecting again the lobe or nose 19 of the lever out of slot 12 of case 10, ready for another operation when the door engages it again in the manner thus explained.

What I claim is:

An electric switch comprising a case having an opening in one wall thereof, a lever rockably mounted in said case, a pin in said case pivotally connecting one arm of said lever in said case, said arm having a relatively large mass below said pin, a substantially horizontal arm extending from the free end of said former arm and extending through said opening, a substantially horizontal chamber in said first arm, a reservoir in said first arm communicating with said chamber, mercury in said chamber, contacts in the opposite ends of said chamber, said mass and said mercury biasing said horizontal arm to extended position, the mercury being engageable with said contacts in the extended position of said lever and flowing into said reservoir in the retracted position of said lever, and moving out of engagement with one of said contacts.

LEO C. ZEHNPFENNIG.

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