

May 5, 1925.

R. L. KNUTSSON

MERCURY SWITCH

Filed Jan. 7, 1924

1,536,439

Fig. 1.

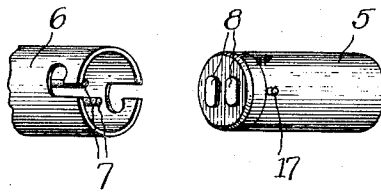


Fig. 2.

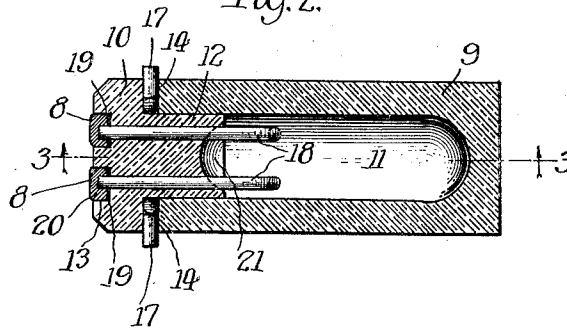


Fig. 3.

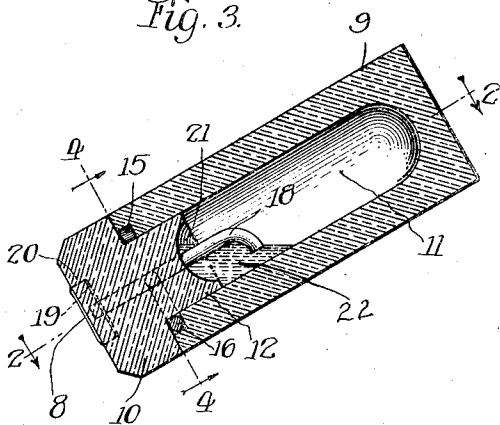
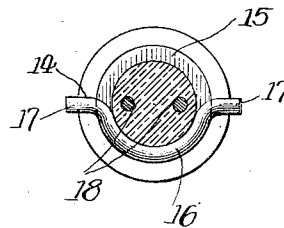


Fig. 4.



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UNITED STATES PATENT OFFICE.

ROGER L. KNUTSSON, OF ROCKFORD, ILLINOIS, ASSIGNOR OF ONE-HALF TO EDGAR C. ALLEN, OF ROCKFORD, ILLINOIS.

MERCURY SWITCH.

Application filed January 7, 1924. Serial No. 684,690.

To all whom it may concern:

Be it known that I, ROGER L. KNUTSSON, a citizen of the United States, residing at Rockford, in the county of Winnebago and State of Illinois, have invented a certain new and useful Mercury Switch, of which the following is a specification.

This invention relates generally to mercury switches and more particularly to one which is constructed to withstand rough usage. Ordinarily mercury switches are made of glass and are therefore subject to breakage in certain applications, a fact which has limited the use of such switches to a relatively narrow field.

It is one object of this invention to provide a substantially unbreakable switch of material which is much less fragile than glass.

It is a particular object to construct such a switch of a molded synthetic resin.

It is another object to provide a switch which has a mounting providing, simultaneously, security for the switch in its mounted position and a reliable electrical connection thereto.

Other and ancillary objects and advantages arising from the particular structure employed will appear from the following description of one embodiment of the invention as shown in the accompanying drawings, and more generally characterized in the appended claim.

In Figure 1 are shown the switch and a socket mounting therefor.

Fig. 2 represents a longitudinal cross section along the line 2—2 of Fig. 3.

Fig. 3 shows a longitudinal cross section on the line 3—3 of Fig. 2.

Fig. 4 shows a cross section along the line 4—4 of Fig. 3.

The invention is shown embodied in a self-contained quick-detachable switch 5 adapted to fit an ordinary bayonet socket 6 having the usual spring contacts 7 therein which are pressed against contact surfaces 8 at one end of the switch. The switch is preferably of cylindrical form embodying an elongated hollow body portion 9 closed at one end by a plug cap portion 10 containing the contacts 8. The material of the switch is preferably a molded synthetic resin, such as bakelite, redmanol or the like. The body 9 is molded with a chamber 11 therein, while the cap is molded with a plug

end 12 to fit into the chamber 11 and also with depressions 13 for the contacts 8. The cap is secured to the body by any suitable means, as, for example, shellac or other cementing material. In the body 9 are suitable radial slots 14 and a circular rabbet 15 serving to hold a bent wire 16 the ends of which provide pins 17 projecting from diametrically opposite points near one end of the body to engage the bayonet slots of the socket 6.

Holes are formed through the cap to receive iron wires 18 which constitute the terminals of the switch. Within the chamber 11 the wires are bent in parallel relation toward the walls of the chamber, as shown in Fig. 3. The other ends of the wires extend into the depressions 13 and through brass or copper plates 19 to which they are secured by solder 20. By reason of the form of the wire that constitutes the pins 17, there is no possibility of error in assembling which would cause grounding or short-circuiting of the terminals 18. The exposed surface of the solder 20 forms the contacts 8 substantially flush with the cap. The chamber 11 contains a globule of mercury 22.

Any suitable designation may be made upon the casing of the switch to indicate its proper use, as, for instance, the word "Up" in Fig. 1 indicating its proper insertion into the socket 8.

The switch is specially suitable for use in the automotive field where jarring may affect the smooth operation of the mercury type of switch. In one use of the switch I contemplate having the casing 5 rigidly mounted in a tilting part of an automobile, the socket 6 being in that case removably mounted on the switch.

When a mercury switch is quickly tilted there is apt to be a rebound of the mercury from the end of its containing chamber, and such rebound is apt to be more or less continuous when the switch as a whole is mounted in a body subject to continuous jarring motions, as in an automobile. To prevent such rebound I provide in the end of the chamber a concave recess 21 in preference to a plane abutment at the end of the plug 12. In the approach of the mercury to the concave abutment its momentum is gradually absorbed and its course directed along the curvature to prevent the rebound. Having once been thus stopped the hooked ends of

the wires 18 serve to retain it therein by acting mechanically as an obstruction thereto. Furthermore the lesser vibrations of the mounted switch may keep the mercury in a rolling state in its resting place rather than a vibrating and bounding condition. The hooked wires, entering below the surface of the mercury maintain a good contact therewith, free from the possibility of a poor contact from particles floating on the mercury.

It will be noted that the switch 5 has no binding posts for the attachment of electric wires, but that, on the contrary, it is provided with exposed contacts 8 which are adapted to coact with the contacts of a standard type of socket or receptacle. No special clips or other supports need be provided to hold the switch, as it is adapted to fit into the sockets commonly employed in automotive and other industries.

Inasmuch as the casing or body of the switch is composed of relatively strong material, the switch may be applied to numerous uses where a switch having a glass casing could not be employed.

Owing to the character of the material and the method of assembling the parts, the

switch may be constructed at much less cost than mercury switches of the prior art.

This application is a continuation in part of application Serial No. 664,367, filed September 24, 1923.

I claim as my invention:—

A self-contained quick-detachable mercury switch adapted to be removably mounted in a bayonet socket, having, in combination, an elongated chambered body of insulating material, two pins to enter the slots of a bayonet socket, said pins being secured within said body and projecting from diametrically opposite points near one end of the body, two electrodes in the last-mentioned end of the body, the inner ends of said electrodes projecting into the chamber of the body, enlarged contacts secured to the outer ends of said electrodes and providing contact surfaces exposed upon the last-mentioned end of the body, and a globule of mercury in said chamber to bridge the gap between said electrodes.

In testimony whereof, I have hereunto affixed my signature.

ROGER L. KNUTSSON.