Sept. 25, 1934. H. H. COLE 1,974,411

MERCURY SWITCH

Filed Feb. 11, 1931

FIG. 1.

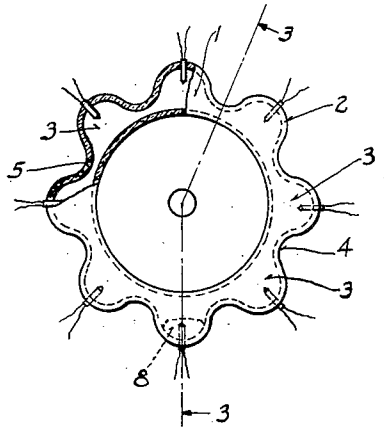


FIG. 2.

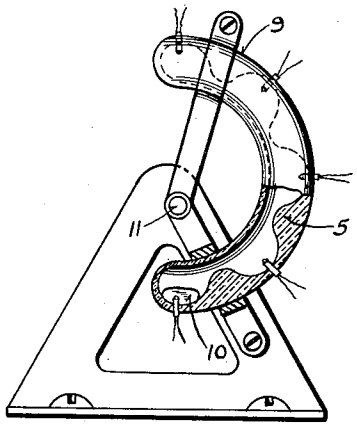
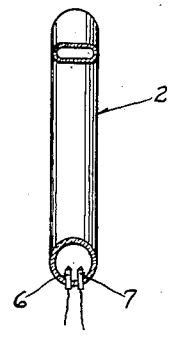


FIG. 3.



INVENTOR.

HARRY H. COLE

BY Ronald M. Adams

ATTORNEY.

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MERCURY SWITCH

Harry H. Cole, Eagle River, Wis., assignor of three-fourths to August H. Meyer, Oshkosh, Wis.

Application February 11, 1931, Serial No. 515,017

3 Claims. (Cl. 200—33)

The present invention relates to a mercury switch.

An object of the invention is to provide a mercury switch for closing a series of circuits in progression.

Another object of the invention is to provide a mercury switch for a plurality of circuits constructed to minimize arcing when making and breaking contact.

A further object of the invention is to provide a mercury switch in which the conducting medium is utilized to impart retarded motion to the switch.

Various other objects will appear from the accompanying description and claims.

In the drawing:

Figure 1 represents a front view of an embodiment of the invention showing parts in section.

Fig. 2 is a similar view of a modified form of the invention.

Fig. 3 is a transverse sectional view of the mercury switch taken on a line 3—3 of Fig. 1.

The switch 1 comprises an annular tube 2 of glass or other insulating material. The tube 2 is divided into a series of partly closed chambers 3.

The chambers may consist of a series of scallops 4 about the outer surface of the annulus forming restrictions or baffles 5 within the tube 2. Said baffles 5 may be entirely within the tube leaving a smooth outer surface as shown in Fig. 2.

Each chamber has a pair of electrical contacts 6 and 7 embedded in the wall of the tube 2 and insulated from each other. The contacts 6 and 7 project inwardly from the outer wall for a distance substantially equal to the depth of the mercury bubble 8 in order to insure good electrical contact therethrough and thus prevent heating.

The baffles 5 serve a double function. First, they prevent the mercury 8 from passing to the second set of contacts until the first has been broken. It follows that when contact is made with the second set of contacts, it is made with a rush. This rapid make and break tends to minimize arcing and protects the contacts 6 and 7. The second function of the baffles 5 is to restrict the flow of mercury 8 from one set of contacts to another to prevent too rapid rotation of the switch 1. If the switch 1 rotates too rapidly, the mercury 8 will tend to remain in a chamber which has left the lowest part of its circle of rotation and cause the motion of the switch to be checked. This is particularly true where the power for driving the switch is only sufficient to rotate the same. The weight of the mercury 8 is too great to lift, and, until it has passed into the next chamber, rotation will be checked.

In the modified form shown in Fig. 2, where the tube 9 is overbalanced, the mercury 10 tends to hold back the rotation of the tube in its arc about the axis 11, the rotation being caused by gravity. When the switch rotates too rapidly, the mercury 10 is lifted, and the tube momentarily reaches a state of equilibrium. When the mercury flows into the next chamber, the tube is again overbalanced and rotates, closing each of the circuits in succession.

The tube is suited for a number of purposes, such as motor starters, and is particularly adaptable for use in burglar alarm systems such as that disclosed in copending application to August H. Meyer, Serial No. 514,944, Feb. 11, 1931 and owned by common assignees.

It will be understood that rotation of the switch to effect the closure of a number of circuits in succession may be accomplished in a number of ways, such as by clockwork, motors, or by a weight suspended from a cord wrapped around the axle.

Various modifications may be used within the scope of the appended claims.

I claim:

1. A mercury switch comprising a segment of a hollow annulus, said segment being mounted in an over-balanced position, a plurality of pairs of electrical contacts within said segment, a mercury globule for closing said contacts, and means for restricting the flow of said mercury from one pair of contacts to the next and retarding the rotation of said switch beyond a predetermined speed.

2. In a mercury switch, in combination, a segment of a hollow annulus having closures at each end, said segment being eccentrically mounted upon a pivot and being disposed to be actuated by gravity to move about the pivot, baffles in the outer wall of the segment defining chambers within the segment, contact points within each chamber for controlling an electrical circuit, and a mercury globule disposed within the segment to close the contacts and to retard the rotation of said segment about the pivot.

3. In a mercury switch, an arcuate glass tube, said tube being divided into a plurality of chambers, baffles between said chambers, electrical contacts within each chamber, mercury within the tube for covering the contacts and for retarding the rotation of the tube, and an eccentric pivot for the tube.

H. H. COLE.