

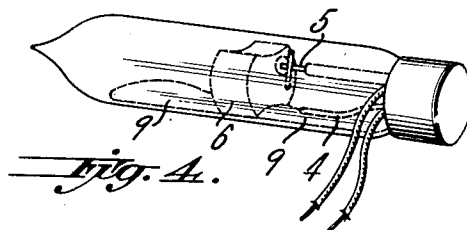
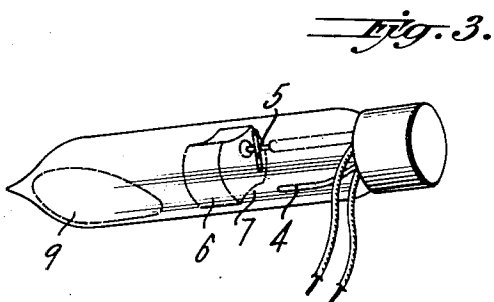
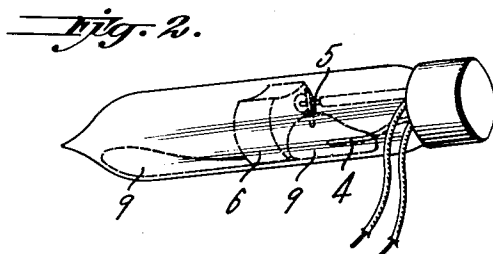
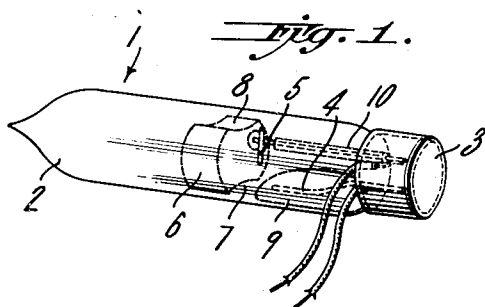
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LIQUID SWITCH

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LIQUID SWITCH

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1 Claim. (Cl. 200—33)

My invention relates to liquid switches, and more particularly to a delayed action mercury switch. For many purposes it is desired to use a liquid switch for making and breaking electrical circuits carrying small currents. Such switches are mainly used for making and breaking electrical circuits controlling the actuation of other circuits.

Such switches usually comprise a casing of electrical insulating material such as glass either with or without a base of insulating material such as a phenolic condensation product, hard rubber, or the like, for inserting electrodes. A liquid, usually mercury, is disposed within the container so as to make and break contact between the electrodes in response to movement of the container. The switch is pivotally mounted so that it may be readily tilted in response to physical movements or electrical impulses so as to initiate or break circuits for actuating other apparatus.

I provide a switch of this general class in which a circuit is completed for a period of time when the switch is moved from one position to another. When the switch is returned to its original position, it is re-set without completing a circuit.

I accomplish the foregoing result by providing a barrier of insulating material intermediate the casing, which barrier is provided in a lower portion with a passageway for the movement of the conducting liquid. One electrode is disposed near the bottom of the switch so as to readily engage a pool of the liquid. Another electrode is disposed on the same side of the carrier but well above the first mentioned electrode so that when a pool of the liquid is formed immediately behind the barrier both electrodes are immersed to complete a circuit. The circuit persists for a period of time depending upon the time required for the liquid to escape through the passageway in the barrier. When the switch is restored to its initial position the liquid returns through the passageway but does not complete a circuit between the electrodes.

The accompanying drawing illustrates a present preferred embodiment of my invention, in which

Fig. 1 is a side elevational view of the switch in its "set" position;

Fig. 2 is a similar view showing the switch in its circuit completing position;

Fig. 3 is a similar view of the switch after the circuit is interrupted; and

Fig. 4 is a similar view of the switch during the resetting operation.

Referring to the drawing, a liquid switch 1

comprises a container 2 of insulating material. If desired the container 2 may be of glass so that the operation of the switch is visible. A base 3 of moldable insulating material such as hard rubber, or the like, is placed over one end of the container and supports electrodes 4 and 5 which extend through the wall of the container in a manner well known to the art. It is to be understood that in practice the switch 1 is mounted in suitable mechanism, not shown, for giving it a rocking movement. Such mechanism is well known in the art and may be operated directly by physical movement of other apparatus or electro-magnetically by electrical impulses from other sources.

Intermediate the length of the container 2, and preferably substantially centrally thereof, there is disposed a barrier 6 of insulating material, soapstone being suitable for the purpose. In the lower portion of the barrier a passageway 7 is formed. In the drawing the passageway 7 is at the lower surface of the barrier. A passageway 8 is also provided at the upper surface for the movement of gases in case the container is filled with an inert gas.

The electrode 4 extends through the base toward the barrier and is shaped normally to lie in a pool of the conducting liquid 9, usually mercury. The electrode 5 also projects toward the barrier but is spaced well above the electrode 4 so that when the switch is in its "set" position, illustrated in Fig. 1, an electrical contact is not made between the electrodes 4 and 5. The electrode 5 may be connected to the barrier 6 for support. The base of the electrode 5 is preferably covered with insulation 10 to prevent the completion of a circuit when the switch is in the "set" position if a considerable quantity of liquid 9 is used. Upon tilting the switch to the position shown in Fig. 2, the conducting liquid 9 forms a pool directly behind the barrier 6 to complete the circuit. The circuit so completed persists for a period of time depending upon the movement of the liquid 9 through the passageway 7. It is to be understood that the size of the passageway and the amount of liquid present may be varied to give the desired time delay action in maintaining the circuit.

After the liquid has flowed through the passageway 7 the circuit is interrupted as shown in Fig. 3. Thereafter the switch may be reset by tilting it to the position shown in Fig. 4, at which time the conducting liquid returns through the passageway 7 but without completing a circuit between the electrodes 4 and 5.

While I have shown and described a present preferred embodiment of my invention, it is to be understood that it may be otherwise embodied within the spirit of the invention and the scope
5 of the appended claim.

Having thus described my invention, what I claim and desire to protect by Letters Patent is:

10 In a liquid switch, a container of insulating material, a barrier disposed substantially centrally of the container, said barrier having a passageway in a lower portion thereof to permit the movement of a conducting liquid, an electrode disposed near the bottom of the container, and

a second electrode disposed on the same side of the barrier as the first-named electrode but thereabove and mechanically connected to the barrier to serve as an anchor therefor whereby when the switch is tilted to impound the liquid
5 behind the barrier a circuit is completed between the electrodes for a period of time determined by the movement of the liquid through the passageway, and when the switch is tilted in a reverse direction the liquid returns through the passage-
10 way without completing a circuit.

ALEXIS W. KEEN.