May 5, 1931. R. D. MAILEY 1,804,017

MERCURY SWITCH

Filed May 1, 1926

Fig. 1

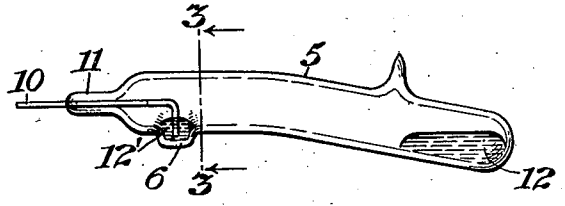


Fig. 2

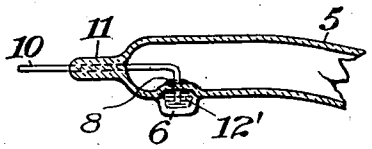


Fig. 3

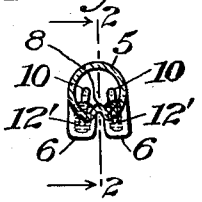


Fig. 4

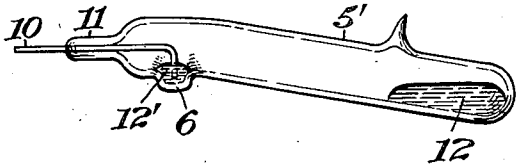
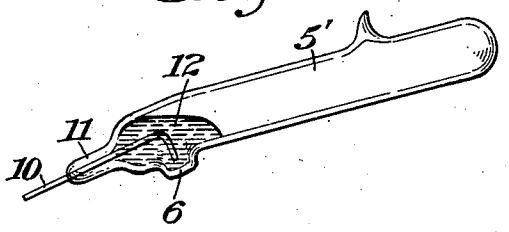


Fig. 5



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UNITED STATES PATENT OFFICE

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MERCURY SWITCH

Application filed May 1, 1926. Serial No. 105,935.

The present invention relates to electric switches of the liquid flow type and particularly to switches of this type which are adapted for rapid flow of the liquid therein and for quickly making and breaking current path therethrough upon being actuated. The invention more particularly relates to a mercury switch which is sensitive and which operates rapidly upon a tilt to a critical angle.

In accordance with the invention an envelope is provided with two or more depressions formed therein which are arranged side by side across the line of flow of the liquid therein and into which extend respective electrodes. This arrangement of the electrodes and protective liquid pools therefor makes it possible for the main body of mercury or other liquid to be separated simultaneously from said pools and to be quickly moved to a maximum distance from said pools. In a preferred form of the invention the bottom or floor of the switch envelope is inclined or bent downwardly from the portion thereof in which the cups or depressions are formed and at a point at or near said depressions. Preferably said depressions are formed near one end of the envelope.

Various objects and advantages of the invention will be obvious from the following particular description of forms of switches embodying the invention or from an inspection of the accompanying drawings; and the invention also consists in certain new and novel features of construction and combinations of parts hereinafter set forth and claimed.

In the following description and in the claims parts will be identified by specific names for convenience, but they are intended to be as generic in their application to similar parts as the art will permit.

In the accompanying drawings there is shown for purposes of illustration one form of switch with certain modifications thereof embodying the invention, in which

Fig. 1 is a longitudinal elevation view of a switch embodying the invention,

Fig. 2 is a longitudinal midsection view of the switch of Fig. 1,

Fig. 3 is a transverse section taken along the line 3—3 of Figs. 1 or 4 and looking in the direction of the arrows,

Fig. 4 is a longitudinal elevation view of an alternative embodiment of the invention, and

Fig. 5 is a similar view showing the switch in the closed circuit position.

In Figs. 1 to 3 the longitudinal tubular envelope 5 is bent to a slight degree at a point a short distance from one end at which end is formed the cups or depressions 6, 6 in the wall or floor of the envelope. Between said cups 6, 6 a ridge 8 is formed by pushing the glass inwardly while it is hot. The electrodes or leads 10, 10 sealed at a common pinch seal 11 through the envelope wall at this end extend inwardly and down, one into each of said cups or depression 6, 6. In the envelope is provided a body of mercury 12 and also preferably a filling of heat conducting gas. This switch as shown is in the open circuit position in which are left pools 12′, 12′ of mercury in said cups 6, 6 and about the ends of said electrodes 10, 10.

In Figs. 4 and 5 is shown a modification of the above described switch in which the bend in the tube 5′ is formed right at the cups 6, 6.

In the switches above described flow of mercury from the cups 6, 6 take place very rapidly upon tilting the switch through a comparatively small degree and current path between the pools of said cups is very quickly broken. This is particularly pronounced in the switch of Figs. 4 and 5 because of the nearness of the bend in the envelope to the said cups. Also in these switches the bridging or main body of mercury 12 is, upon movement through a critical angle, removed quickly to a considerable distance from said pools in the open circuit position. When the switch is moved through a critical angle from the open circuit position into the closed circuit position the mercury body 12 flows quickly into the bridging position across the pools.

While I have shown and described and have pointed out in the annexed claims certain novel features of the invention, it will be understood that various omissions, substitutions and changes in the forms and details of

the device illustrated may be made by those skilled in the art without departing from the spirit of the invention.

I claim:

1. A mercury switch comprising a longitudinal tubular envelope, a plurality of cups formed in the envelope wall and arranged transversely of the length thereof, electrodes extending into said cups, mercury in said envelope, and a septum between said cups.

2. A mercury switch comprising a longitudinal tubular envelope, a plurality of depressions formed in the envelope wall and arranged transversely of the length thereof, a septum between said depressions, electrodes extending into said cups, and mercury in said envelope, said tube being inclined downwardly in the line of mercury flow therein at a point near said cups.

3. A mercury switch comprising a sealed longitudinal tubular envelope, a plurality of depressions formed in the envelope wall near one end thereof and arranged transversely of the length thereof, a septum between said depressions, electrodes sealed into said envelope through a common seal at said end and extending into said cups, mercury and a filling of hydrogen in said envelope, the floor of said envelope being inclined downwardly in the line of mercury flow therein at said cups, whereby a quick break is secured between the mercury in the said transverse depressions.

Signed at Hoboken in the county of Hudson and State of New Jersey this 28th day of April, A. D. 1926.

ROY D. MAILEY.