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H. T. OLSON

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ELECTRIC SWITCH

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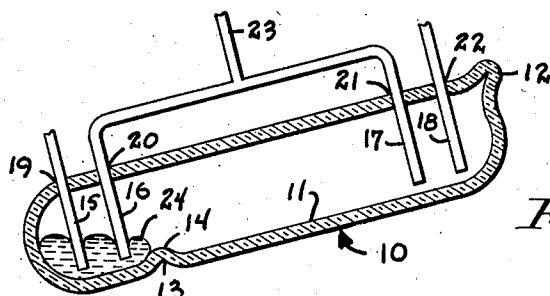


Fig. 1

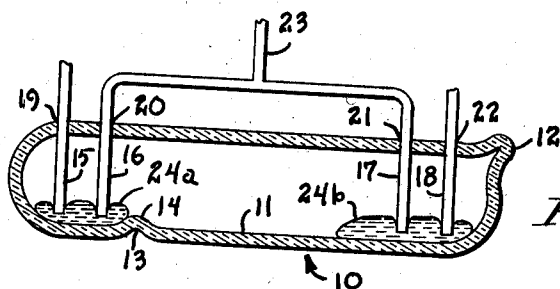


Fig. 2

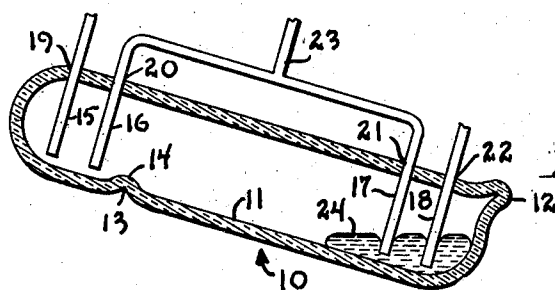


Fig. 3

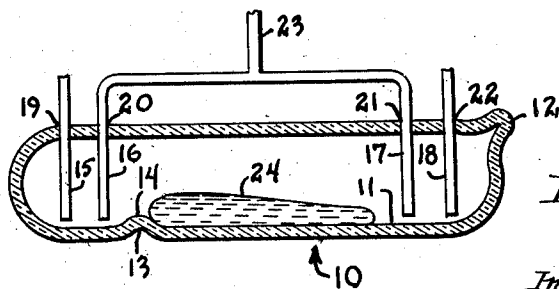


Fig. 4

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ELECTRIC SWITCH

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1 Claim. (Cl. 200—152)

This invention relates to liquid flow switches and more particularly to mercury switches.

An object of this invention is to provide a liquid flow switch which in one operative position will complete a first circuit, and when moved toward another operative position will complete a second circuit before breaking the first circuit, but when moved back toward its first position will break the second circuit before re-making the first circuit.

Other objects and advantages will become apparent to those skilled in the art upon reference to the accompanying specification, claim and drawing.

In the drawing;

Figure 1 shows a cross sectional embodiment of the illustrated form of the invention in which one of the circuits is closed;

Figure 2 is a sectional view of the switch shown in Figure 1 in a position in which both circuits are closed;

Figure 3 is a sectional view of the switch in which the second circuit is closed, and

Figure 4 shows the switch in open circuit position.

An envelope 10 of glass or other insulating material substantially tubular in shape has a generally straight lower internal surface or floor 11 and the conventional sealing-off tip 12. The lower surface 11 of the envelope 10 is indented at 13 forming a raised portion 14 somewhat nearer one end of the tube than the other. Electrodes 15 and 16 extend within the tube to a point close to the lower surface 11 and between the raised portion 14 and the end of the tube to which raised portion 14 is closest. Electrodes 17 and 18 are located in the opposite end of the envelope, and likewise extend to a point adjacent the lower internal surface 11. The electrodes are suitably sealed into the envelope 10 as at 19, 20, 21 and 22. Electrodes 16 and 17 are joined together exteriorly of the envelope as at 23. A globule of mercury 24 lies within the envelope for the purpose of making contact with the various electrodes.

The operation of the switch will be apparent from the various operative positions shown in Figures 1 through 4. In Figure 1 the mercury 24 is shown bridging electrodes 15 and 16. The amount of mercury and position of the raised portion 14 are so proportioned that in this position of the tube all the mercury will lie between the raised portion 14 and the end of the envelope.

As the envelope is tipped clockwise from the

position shown in Figure 1 to a position slightly past horizontal, the mercury 24 will divide into two parts, 24a and 24b, as shown in Figure 2. This division of the mercury is caused by the raised portion 14 which is sufficiently high to retain some of the mercury but not high enough to retain all of it. The portion of mercury 24a which is retained beside the raised portion 14 still bridges electrodes 15 and 16 while the portion 24b which has broken away runs down the bottom of the envelope and bridges electrodes 17 and 18. In this position, therefore, both external circuits are completed. Further clockwise tipping of the envelope from the position shown in Figure 2 will dislodge the portion of mercury 24a and it will run down the envelope to become reunited with the rest of the mercury as shown in Figure 3. Here only electrodes 17 and 18 are bridged.

Tipping the envelope in a counter-clockwise direction from the position shown in Figure 3 to a point slightly past horizontal will cause the mercury 24 to leave electrodes 17 and 18 and run down the envelope until the raised portion 14 is reached, as shown in Figure 4. Here neither circuit is completed. Continued counter-clockwise tipping of the envelope from the position shown in Figure 4 will return the mercury to the position shown in Figure 1 in which electrodes 15 and 16 are bridged by the mercury.

Thus it will be seen that a single-pole double-throw switch is provided in which the two circuits overlap in one switching operation but not in the reverse switching operation.

It will be understood that other arrangements of the various parts and other materials could be used to accomplish the same result, and it is desired that the scope of this patent be limited only by the appended claim and prior art.

I claim as my invention:

In an electrical switching mechanism, in combination, a straight floored container having first and second ends tiltable to a first position in which the first end is lower and to a second position in which the second end is lower, electrodes in the first end for controlling a first circuit, electrodes in the second end for controlling a second circuit, a body of mercury for bridging the electrodes in the first end when the container is in the first position and for bridging the electrodes in the second end when the container is in the second position, and an obstruction in the first end of the container of such proportions that on tilting the container from the second position to a position in which there is a slight gra-

5 dient toward the first end the mercury will assume a stable position against the obstruction to unbridge all the electrodes, said obstruction also being so proportioned in relation to the size of the container and the volume of mercury that on tilting the container from the first to the second position the mercury will separate into two portions, the first moving to the second end of

the container to bridge the electrodes in the second end and the second portion being restrained from unbridging the electrodes in the first end of the container by the obstruction until the first portion has bridged the electrodes in the second end.

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