MERCURY CONTACT SWITCH

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Fig. 1

Fig. 2

Fig. 3

Fig. 4

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This invention relates to improvements in a mercurial or mercury contact switch in which mercury containing tubes are tilted in one direction to break the contacts projecting therein by means of thermostat or pressure means.

The principal object of my invention is to provide in a switch of this character a novel method of mounting and tilting a plurality of such tubes, and a bracket structure to support the tubes in unitary fashion and so as to enable the tubes to be set at different slopes to each other, thus enabling the extent of tilt necessary to cause the contacts to be broken to be different in the various tubes; and to enable such difference to be adjusted at will.

By means of this arrangement a single thermostat or pressure control means may be used to thus control the movement of all the tubes, and the adjustment features of the different tubes enables very sensitive operation and accurate results to be easily obtained.

A further object of the invention is to produce a simple and inexpensive device and yet one which will be exceedingly effective for the purpose for which it is designed.

These objects I accomplish by means of such structure and relative arrangement of parts as will fully appear by a perusal of the following specification and claims.

In the drawings similar characters of reference indicate corresponding parts in the several views:

Fig. 1 is a side elevation of my improved switch-tube mounting structure, shown in connection with the preferred form of thermostat operating means.

Fig. 2 is an end view of the tube bracket detached.

Fig. 3 is a longitudinal section of the bracket on the line 3—3 of Fig. 2.

Fig. 4 is a top plan view of the bracket with the tubes removed.

Referring now more particularly to the characters of reference on the drawings, the numeral 1 denotes an open faced supporting casing at one end of which is mounted a compression spring 2. The lower end of this spring bears down on an arm 3 which is pivoted at one end onto the adjacent end of the casing. Below this arm and in vertical alignment with the spring is an expansible diaphragm 4, having a central head 5 projecting upwardly therefrom for engagement with the under face of the arm.

A tube 6 leading to a source of heat or pressure is connected to the bottom of the diaphragm, said diaphragm and tube containing an expansible fluid of suitable character as is customary.

Projecting upwardly from the bottom of the casing toward the end thereof opposite the spring is a support 7 which forms a journal for one end of a rod 8, the other end of which is journaled in the back wall of the casing. Supported by the rod is the tube supporting bracket, which is constructed as follows:

Mounted on the rod is a rigid plate 9 having a rearwardly extending arm 10. A link 11 projects downwardly from the outer end of this arm to a connection with a longitudinal extension 12 connected to the arm 3. The member 3 and its extension from the pivoted end to the link is much longer than the arm 10 and plate 9 from the link to the rod 8, so that a relatively slight arcuate movement of the member 3 will impart a great arcuate movement to the plate 9. The arm 10 and member 12 have a plurality of longitudinally spaced holes to receive the pivot pins 13 of the link therethrough so that this difference in arcuate movement may be altered somewhat to suit different conditions.

The plate 9 is herein shown as having a width sufficient to accommodate three mercury contact tubes 14 in transversely spaced relation, though such width may be altered to suit. For supporting each tube from the plate and adjustably holding such tube at any desired angle relative to the plate I provide the following structure:

Mounted in connection with the plate is a tube holding bracket comprising a longitudinally extending strip 15 under the plate from the ends of which strip spring clips 16 project upwardly above the plate a sufficient distance to engage the tube and hold the same in spaced relation to the plate. The plate is longitudinally slotted as at 17 to permit the clips to project upwardly therethrough. One clip is turnably mounted on the rod 8 while the other is free. Fixed on the plate 9 over the pin 8 and extending under the tube toward the other clip is a spring strip 18, pressing upwardly at its free end against the bottom of the tube.

In order to restrict the spring action and maintain the strip 15, and hence the clips...
and tube in predetermined angular relation to the plate, I mount an adjustable screw 19 in the free end of the strip 15 to bear against the under face of the plate as shown in Fig. 3. It will therefore be seen that since each tube bracket is individually mounted on the rod 8 and each may be independently adjusted relative to the plate and to each other, the tubes may be set at any desired angle to each other and to the plate. The plate 9 is so connected to the arm 3 that when the diaphragm is slack the tubes have a downward tilt toward that end in which the contacts 20 are located. The mercury 21 in the tubes will therefore normally engage the contacts. Then when the tube supporting structure is tilted by the expansion of the diaphragm and the upward movement of the arm 3, the tilt of the tubes is reversed in predetermined order so that the mercury will flow away from and break the contacts with different extents of movement of the arm 3 in a continuous direction.

From the foregoing description it will be readily seen that I have produced such a device as substantially fulfills the objects of the invention as set forth herein.

While this specification sets forth in detail the present and preferred construction of the device, still in practice such deviations from such detail may be resorted to as do not form a departure from the spirit of the invention, as defined by the appended claims.

Having thus described my invention what I claim as new and useful and desire to secure by Letters Patent is:
1. In a switch, a contact-tube supporting structure including a pivoted member, means for tilting the member, a contact-tube to extend longitudinally thereof, supporting means for the tube mounted in connection with the member, and means between said member and supporting means for enabling the angular setting of the tube relative to the member to be altered at will.

2. In a switch, a contact-tube supporting structure including a pivoted plate, means for tilting the plate, a plurality of contact-tubes to extend longitudinally thereof in transversely disposed relation to each other, individual supporting means for the tubes mounted in connection with the plate, and means for each such supporting means for enabling the tubes to be set at different slopes relative to each other and to the plate.

3. In a switch, a contact-tube supporting structure including a pivoted member, means for tilting the member, a contact-tube to extend longitudinally thereof, a pair of clips to engage the tube, means connecting the clips, means pivotally mounting one of said clips in connection with the member, and means for moving the other clip to or from the member to alter the angle of setting of the tube relative to the member.

4. In a switch, a contact-tube supporting structure including a member, a transverse pivot for the same, means for tilting the member, a contact tube arranged to extend longitudinally of and above the member, a pair of clips to engage the tube, a strip under the member connecting the clips, one of said clips being turnably supported on the pivot, a spring mounted on the member and bearing against the bottom of the tube adjacent the other clip, and an adjustable screw mounted in the strip and bearing against the under face of the member.

In testimony whereof I affix my signature.

IRA E. SMITH.