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R. H. BADGLEY

2,278,964

GAS TUBE

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FIG. 1

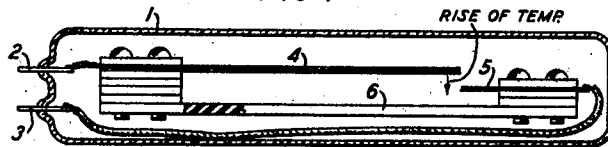


FIG. 2

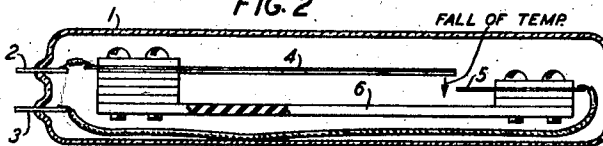
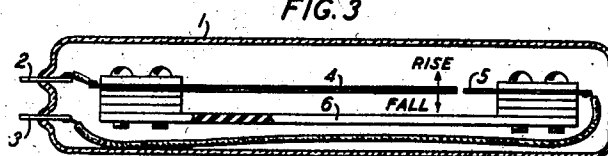


FIG. 3



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1 Claim. (Cl. 250—27.5)

This invention relates to circuit makers and breakers and particularly to that type known as trigger tubes wherein an inert gas surrounding a pair of electrodes is caused to ionize and thereby become a conducting path between said electrodes.

The object of the invention is to provide for selective response to some external critical stimulus. Accordingly the tube of the present invention is provided with a pair of electrodes one of which is comparatively long and has a free end so spaced in relation to the other of said electrodes that the breakdown potential of the tube is not reached until the free end moves closer to the other electrode.

A feature of the invention is a movable electrode by means of which the gap is changed so that by mechanical movement the tube is fired.

A feature of the invention is the use of a bimetallic strip responsive to changes in temperature whereby the tube may become ionized at a particular temperature. In accordance with one feature of the invention a bimetallic strip is constructed and arranged to decrease the separation between the electrodes upon increasing temperatures.

In accordance with another feature of the invention a bimetallic strip is constructed and arranged to decrease the separation between the electrodes upon decreasing temperatures so that the tube may be fired upon the reaching of any particular low temperature.

In accordance with another feature of the invention a bimetallic strip may be constructed and arranged to approach the other electrode at a minimum separation at a given temperature. Any deviation from this given temperature will cause the separation between the electrodes to become greater.

The drawing consists of a single sheet having three figures, each of which shows a cross-sectional view of a gas tube. In Fig. 1 a movable element constructed of a bimetallic strip is formed in such a way that with rise of temperature the gap between the movable element and a stationary contact is shortened. In Fig. 2 the bimetallic strip is so disposed that the gap between such movable element and a stationary electrode is shortened upon fall of temperature. In Fig. 3 the bimetallic element is so disposed that the gap is at a minimum dimension at a particular temperature so that upon either a rise or fall of temperature from this predetermined point the gap will be lengthened.

In each of the figures the envelope is designated by the numeral 1. In each of these figures an electrode assembly is sealed within this envelope 1 and immersed in an inert gas. In each

of these figures a pair of external electrodes 2 and 3 are furnished. The terminal 2 is connected electrically with a movable bimetallic element 4 and the terminal 3 is connected to a stationary electrode 5. The movable electrode 4 and the stationary electrode 5 are mounted on an insulating piece 6 in any convenient manner.

As hereinbefore mentioned, the bimetallic element 4 in Fig. 1 is normally spaced so that its free end is a given distance away from the stationary electrode 5. If the assembly is placed in a position where the temperature will rise above normal, the movement of the bimetallic element 4 will shorten the gap to the stationary electrode 5 so that the tube will break down and current will flow from the terminal 2 to the terminal 3 in any convenient circuit where a proper potential is applied to the terminals 2 and 3.

Likewise, the arrangement of Fig. 2 will indicate a fall of temperature from normal when the assembly is placed in such a position that it will be affected by a fall of temperature.

The arrangement of Fig. 3 may be used in a circuit where a potential is applied at intervals to the terminals 2 and 3. At any such interval if the temperature is normal and the gap between the element 4 and the stationary electrode 5 is at a minimum, the tube will break down. If at such an interval the temperature has either risen or fallen to the point where the gap between the movable element 4 and the stationary electrode 5 has increased sufficiently, the tube will not break down and by this means an indication of deviation from normal may be had.

What is claimed is:

An electron circuit closing tube responsive to the temperature of the ambient atmosphere comprising a sealed tubular envelope encasing a pair of electrodes immersed in an inert gas and mounted substantially along the axis of said tubular envelope, a first of said pair of electrodes comprising a bimetallic strip responsive to changes in the temperature of the external ambient atmosphere having one end secured and the other end free to move to approach but not to make contact with the other of said electrodes, and a second of said pair of electrodes comprising a comparatively short and stiff conducting element immovably secured and forming a gap between the free end of said first electrode and said second electrode, said first electrode being secured in a position whereby movement of the free end thereof will change the dimensions of said gap, and electrical conductors connected to said electrodes being sealed through said envelope for external circuit connections.

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