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THERMOSTATICALLY CONTROLLED SWITCH

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Fig. 1

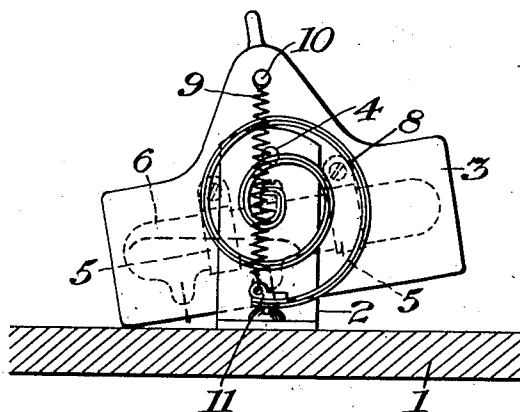
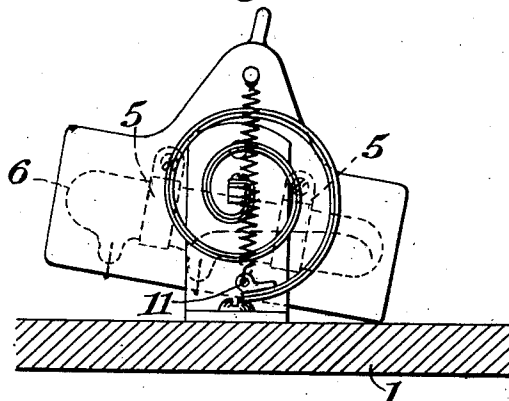


Fig. 2



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THERMOSTATICALLY-CONTROLLED SWITCH.

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My present invention relates to thermostatically controlled switches for electric circuits and more particularly to a thermostatic control device for such switches which are adapted to open and close such switches with abrupt and clear cut movement for the purpose of opening and closing said circuits with a minimum amount or no arcing at the switch. It further relates to such thermostatic switch controlling apparatus for electric heaters such as used in flat irons, ranges and the like, and for general use.

In thermostats, heretofore used for controlling electric circuits there has been such slow and continuous movement that has in many cases resulted in opening of contacts through arcing therebetween and the lack of positive action which rendered the device impractical for many uses. According to my invention, however, I provide a thermostat of such a nature and having such connection with the switch that movement changes in the thermostat due to changes in surrounding temperature will be accumulated over a period of time and range of temperature and releasable suddenly and at predetermined temperature so that accumulative forces resulting through such changes will act to positively open or close the switch with a sudden and concise movement.

In the practical embodiment of my invention I provide a bimetallic thermostat element formed into a flat spiral and connected to a switch in a manner hereinafter fully described so that at predetermined temperatures and after predetermined movements of such thermostatic element the switch will be moved by gravity or by a spring with a positive and abrupt action to the completion of the respective operations of the switch.

In the drawings forming part of this application,

Fig. 1 is an elevation view of a mercury switch pivoted on a vertical standard which standard carries a spiral bimetallic thermostat element affixed at the inner end to the standard and connected from its outer end through a tension spring to said mercury switch in such manner that lateral movement of said outer end of the spiral one way or another past given points will impart a toggle action to said mercury switch resulting

in abrupt and sudden movements of the switch for the operation thereof. In this view the switch is shown in the closed circuit position.

Fig. 2 is a view similar to that of Fig. 1 but showing the switch in the open circuit position.

In Figs. 1 and 2 of the drawing the base 1 carries the standard 2 which in turn supports the member 3 pivoted thereto at the pintle 4. On member 3 are mounted the clips 5, 5, which carry the mercury switch 6. Mounted with its inner end fixed to the standard 2 and in the plane of movement of member 3 about pintle 4 is the flat spiral bimetallic thermostatic element 8 which has its lower end terminating below pintle 4.

A tension spring 9 extending from the pin 10 mounted on member 3 at a point above pintle 4 to the eyelet 11 mounted on the outer end of thermostat element 8 tends to move said mercury switch 6 into and out of the circuit making position in a manner herein- after fully described.

In the use and operation of the device shown in Figs. 1 and 2 and starting from the closed circuit position of Fig. 1 the operation of the device shown to open the switch upon the attainment of a predetermined temperature is as follows: With an increase in temperature the thermostatic element 8 tends to straighten out and uncurl with the result that its outer end and the lower end of spring 9 are moved transversely to the right and when said lower end of spring 9 has moved to a point past the right which is diametrically opposite pin 10 from pintle 4 the tension of said spring 9 on pin 10 will cause member 3 to rotate upon pin 4 and so carry mercury switch 6 with a sudden and sharp movement into the open circuit position as shown in Fig. 2, the base 1 serving as a stop for member 3 to limit the movement thereof whereby the switch is held in the open circuit position. Upon a following lowering of the temperature said lower end of spring 9 is moved by element 8 back to the left and when it has passed a point which is diametrically opposite pin 8 with respect to pintle 4 the said tension spring 9 will be again free to move and will rotate member 3 about its pintle 4 whereby

said mercury switch 6 is carried into the closed circuit position as shown in Fig. 1. In this movement as in the circuit breaking movement, the action of spring 9 as seen as it has passed the dead center position will be quick and sharp whereby the making or breaking of the circuit path and switch by the mercury is made suddenly as is generally desired for preventing the continuation of any arcing which may occur in the switch and for preventing the drawing of unnecessary arcs.

I claim:

1. In combination with a switch of the mercury tube type mounted for pivotal movement, a flat spiral bimetallic element mounted in a plane parallel to the plane of movement of said switch, fixed at its inner end near the pivotal mounting of said switch, and having its other end terminating at a point substantially diametrically opposite the pivot of said switch and capable of movement between given limits in response to changes in temperature over a given range, and a resilient connection from said other end of the thermostat to a point on said switch diametrically opposite said other end with respect to the pivot of said switch.
2. In combination with a switch of the mercury tube type mounted for pivotal movement, a flat spiral bimetallic element mounted in a plane parallel to the plane

of movement of said switch, fixed at its inner end near the pivotal mounting of said switch, and having its other end terminating at a point substantially diametrically opposite the pivot of said switch and capable of movement between given limits in response to changes in temperature over a given range, and a tension spring from said other end of the thermostat to a point on said switch diametrically opposite said other end with respect to the pivot of said switch.

3. In combination with a switch of the mercury tube type mounted for pivotal movement, a flat spiral bimetallic element mounted in a plane parallel to the plane of movement of said switch, fixed at its inner end near the pivotal mounting of said switch, and having its other end terminating at a point substantially opposite the pivot of said switch and capable of movement between given limits in response to changes in temperature over a given range, and a tension spring from said other end of the thermostat to a point on said switch diametrically opposite said other end with respect to the pivot of said switch, said spring being substantially parallel with said thermostat element.

Signed at Hoboken in the county of Hudson and State of New Jersey this 4th day of May A. D. 1925.

ROY D. MAILEY.