Oct. 8, 1929. P. F. SHIVERS 1,730,831

THERMOSTAT

Filed Nov. 21, 1927

Fig. 1.

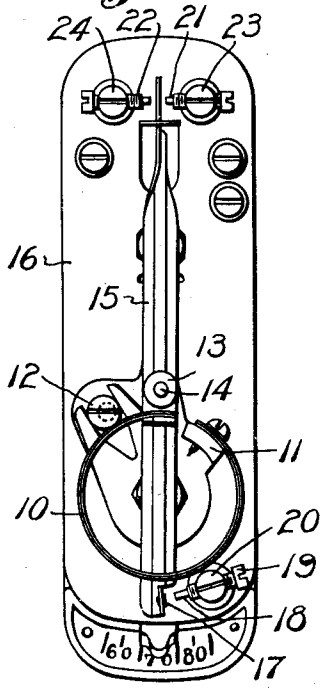


Fig. 2.

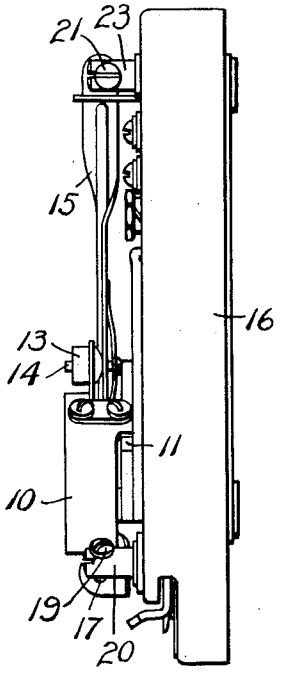


Fig. 3.

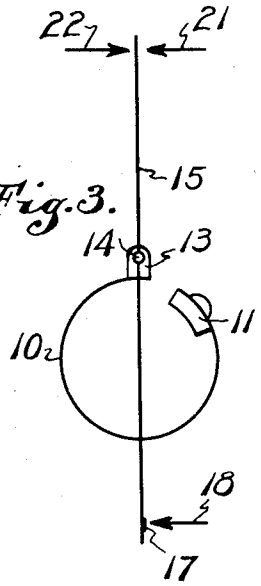
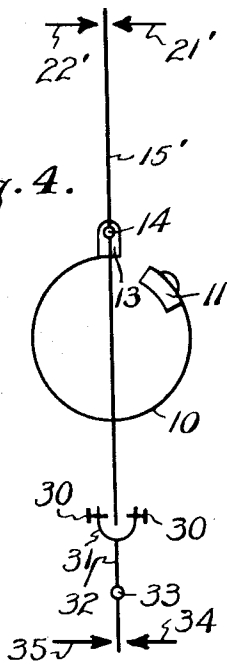


Fig. 4.



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UNITED STATES PATENT OFFICE

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THERMOSTAT

Application filed November 21, 1927. Serial No. 234,645.

The object of my invention is to produce a circuit controlling thermostat in which the circuit making and breaking operations will be only as a result of a substantial temperature change and will then be quick and positive and not likely to be subject to chattering.

The accompanying drawings illustrate my invention:

Fig. 1 is a front elevation of a thermostat embodying my invention;

Fig. 2 is a side elevation;

Fig. 3 is a skeletonized diagram of the essential elements, and

Fig. 4 is a skeletonized view of a modification.

In the drawings 10 indicates a thermostatic element, i. e., one capable of reacting under changes of temperature to cause movement of the circuit controlling element. Preferably this thermostatic element is a bi-metallic structure substantially circular and anchored at one end to an adjustable anchor plate 11 pivotally supported at about the axis of element 10 and swingably adjustable by means of an eccentric cam head 12. The free end of element 10 is provided with a head or fitting 13 adapted to receive the pivot pin 14 carried at an intermediate point in the length of the circuit controlling arm 15.

Most conveniently arm 15 is a part of the grounded side of a circuit to be controlled, said grounding being through the medium of the element 10 and the base structure 16 and said arm 15 is therefore provided at one end with a contact portion 17 adapted to contact with the circuit terminal pin 18 which is preferably formed at the end of the screw 19 threaded in the support 20 so as to be adjustable toward and from contact 17.

The opposite end of arm 15 is projected between two abutments 21 and 22 which are preferably threaded through supports 23 and 24 respectively, so that the distance between said abutments, and their relation to the interposed end of arm 15 at any particular temperature, may be accurately and readily adjusted.

The operation is as follows:

Assuming a drop in temperature, the parts will first move substantially around the axis of element 10. This will bring the interposed end of arm 15 into contact with abutment 21, at the same time moving contact 17 further away from terminal pin 18. Further reduction of temperature will continue movement of arm 15 substantially around the axis of element 10, but arm 15 will pivot about abutment 21 and, the arm 15 being thus effectively substantially lengthened, relative to any effect produced by contraction of the thermostatic element 10. Movement of contact 17 toward terminal pin 18 will then be quick and positive and a comparatively small movement of the free end of element 10 will cause a much larger movement of contact 17.

With the parts in the position just described, a rise in temperature will cause a reverse movement of element 10 and the first action will be to press contact 17 more firmly against terminal pin 18 and to swing arm 15 about the end of pin 18 as a pivot until the interposed end of arm 15 engages abutment 22, whereupon continued movement of the thermostatic element under increasing temperature will cause arm 15 to pivot about abutment 22 and contact 17 to be moved quickly and positively away from terminal pin 18, thereby decreasing the sparking resulting from the break of circuit.

It will of course be readily understood that the essential characteristics of my invention may be embodied in a structure in which the arm, corresponding to arm 15, is not itself a part of the circuit which is to be controlled. I have shown such a construction diagramatically in Fig. 4. Here the arm 15′ forms no part of an electrical circuit. It is medially pivoted, as before, at 14 upon head 13 of element 10. One end of arm 15′ is projected between the abutments 21′ and 22′. The other end of arm 15′ is projected between adjustable screws 30 carried by a yoke 31 formed at one end of a contact lever 32 pivoted at 33 and having one end projected between the terminal pins 34 and 35, either or both of which may be part of an electrical circuit intended to be completed and broken through the medium of arm 32.

It will, of course, be understood that the form of the thermostatic element may be

substantially varied without departing from my invention, it being merely necessary that it shall comprise a portion which is movable, relative to a fixed point, under changes in temperature.

I claim as my invention:

1. A circuit controlling thermostat comprising an anchored thermostatic element having a free end, a circuit controlling arm movably supported at an intermediate point in its length upon the free end of said thermostatic element, a pair of abutments flanking one end of said arm on opposite sides thereof, and a circuit controlling element associated with the opposite end of said arm.

2. A circuit controlling thermostat comprising an anchored thermostatic element having a free end, a circuit controlling arm movably supported at an intermediate point in its length upon the free end of said thermostatic element, a pair of abutments flanking one end of said arm on opposite sides thereof, and a circuit terminal arranged to form an abutment for the opposite end of said arm, the said arm embodying a circuit element adapted to coact with said terminal.

3. A circuit controlling thermostat comprising a thermostatic element having a portion movable under temperature changes, a circuit-controlling arm pivoted intermediate its length to said portion, a pair of abutments flanking one end of said arm on opposite sides thereof, and another abutment flanking one side of the opposite end of said arm and adapted to form part of an electric circuit.

4. A thermostat comprising a thermostatic element having a portion movable under temperature changes, an arm pivoted intermediate its length to said portion, a pair of abutments flanking one end of said arm on opposite sides thereof, and another abutment flanking one side of the opposite end of said arm.

In witness whereof, I PAUL F. SHIVERS, have hereunto set my hand at Wabash, Indiana, this 26th day of October, A. D. one thousand nine hundred and twenty-seven.

PAUL F. SHIVERS.