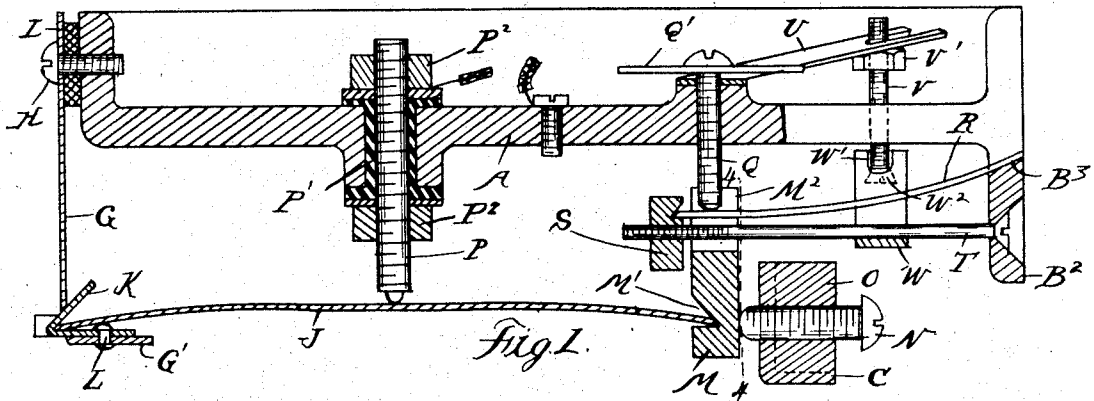
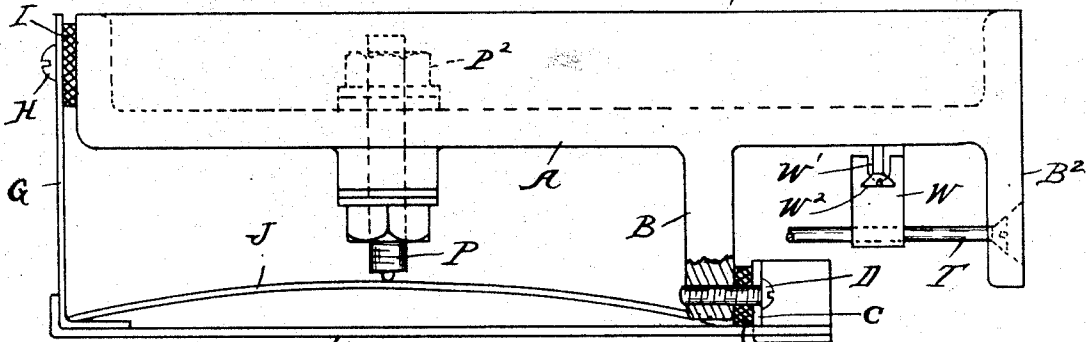
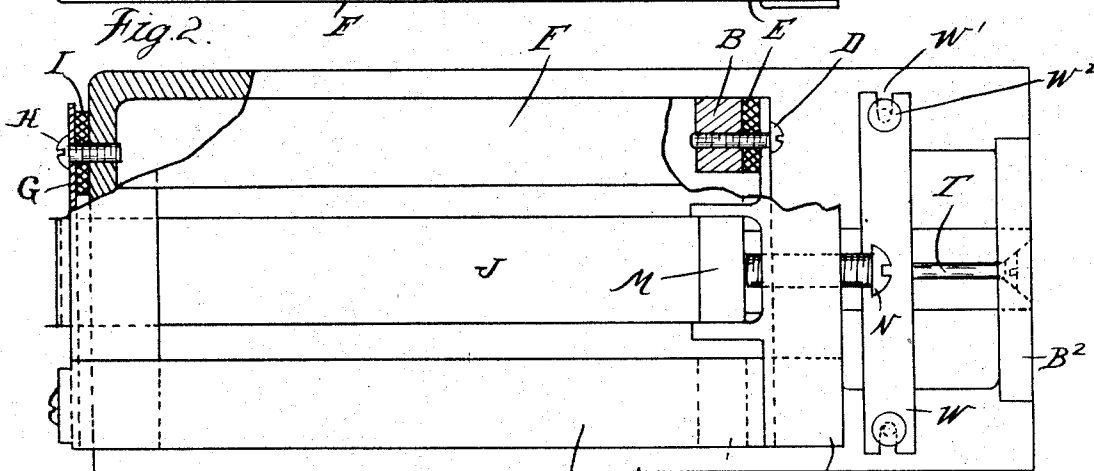
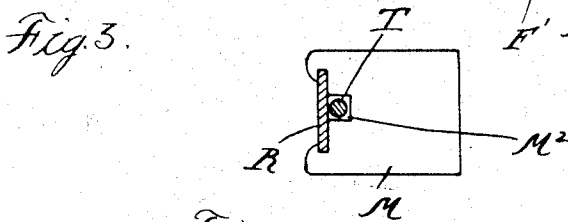


H. G. GEISSINGER.
ELECTRIC CONTACT THERMOSTAT.
APPLICATION FILED JAN. 19, 1918.

1,315,602.

Patented Sept. 9, 1919.

2 SHEETS—SHEET 1.



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2 SHEETS—SHEET 2.

Fig. 5.

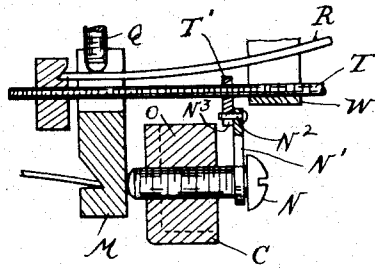
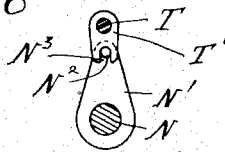


Fig. 6



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ELECTRIC-CONTACT THERMOSTAT.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, HARRY G. GEISSINGER, a citizen of the United States of America, residing at New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Electric-Contact Thermostats, of which the following is a specification, reference being had therein to the accompanying drawings.

The invention relates to electric contact thermostats of the type in which the circuit is opened and closed by the lateral movement of an arch element in coöperation with one or more chord elements having a differential coefficient of expansion. It is the object of the invention to obtain a simple construction in which the arch element may be adjusted toward or from the co-operating electrical contact bearing without disturbing the relative adjustment between the arch element and the chord element which determines the curvature of the arch. The invention also has reference to various specific features of construction as herein after set forth.

In the drawings:

Figure 1 is a horizontal section through the thermostat;

Fig. 2 is a plan view thereof;

Fig. 3 is a side elevation;

Fig. 4 is a cross-section on line 4-4 Fig. 1;

Fig. 5 is a longitudinal section similar to a portion of Fig. 1 showing a modified construction; and

Fig. 6 is a cross-section thereof.

A is the frame or base of the instrument having the lugs B B' B² projecting therefrom. C is a cross-bar preferably of angle section, secured to the lugs B B' by suitable means such as the screws D and with the interposition of suitable heat insulation E. F F' are the chord elements, one end of each being attached to the cross-bar C while the opposite ends of said elements are secured to a flexible support G, itself attached to the base A by screws H with the interposition of heat insulating material I. Thus the chord elements are held in a fixed plane in relation to the base A, but heat conduction between the elements and the frame is limited by the insulating material.

The arch element J is arranged in substantially the same plane but intermediate

the chord elements F F', and one end of this arch element is engaged with a self-aligning bearing K. This bearing is preferably formed of a V-shaped member which is secured to a laterally-extending flange G' of the flexible supporting member G and projects through a central aperture in said member G, as shown in Fig. 1. The member K is initially secured to the flange G by a rivet or other pivotal connection L, but after the bearing has become aligned with the end of the arch it may be permanently secured by a drop of solder or other fastening means. The opposite end of the arch element engages a floating lug M, which is adjustable both parallelly and transversely of the plane of the elements for the proper setting of the instrument. The block is provided with a notch M' for engaging the end of the arch, and to permit of self-alignment the opposite face of the block rests against a point bearing formed by a screw N engaging a threaded aperture in a lug or boss O on the cross-bar C. This point bearing is preferably in substantial alinement with and centrally of the notched bearing M', so that an adjustment of the screw to change the curvature or deflection of the arch may be effected without disturbing the alinement of the bearing.

The coöperating electric contact P is mounted in an insulator P' on the base A, being adjustable thereon by means of nuts P² on opposite sides of the insulator and engaging threaded portions of the contact. The arch element is also adjustable in relation to the contact member P, this being effected by a lateral adjustment of the floating block M through the medium of an adjusting screw Q. It is, however, necessary that during this lateral adjustment the face of the block which bears against the point contact N should be perpendicular to the plane of the elements, as otherwise there would be a variation in length between the bearings for the opposite ends of the arch which would change the curvature thereof. To obtain the result just described the block M has secured thereto a spring R, the free end of which is laterally deflected and bears against a shoulder B³ on the lug B². The opposite end of the spring projects slightly beyond the block and engages a notch in a nut S engaging an adjusting screw T, which latter passes through a slot M² in the block M and

has its head swiveled in the lug B². The arrangement is such that the rotation of the screw T will adjust the nut S thereon, said nut being held from rotation by its engagement with the spring R, while the tension of the spring R will be exerted to maintain the block M in contact with the adjusting screws N and Q. Thus after the screw N is adjusted to impart a given curvature or deflection to the arch the screw T may be adjusted until the face of the block M which bears against the screw N is exactly perpendicular to the plane of the elements. When thus adjusted the screw Q may be adjusted to move the end of the arch so as to vary the distance of its center portion from the electric contact P without disturbing the adjustment of the arch curvature. The screw Q passes through a threaded bearing in the frame A and has attached thereto the dial Q' which indicates the temperature adjustment. Accidental rotation of the screw and dial is prevented by a brake formed by the spring clip U engaging the screw Q' and frictionally bearing against the peripheral portion of the dial. The spring U is tensioned by engaging a screw-threaded stud V on which a nut V' is adjustable and forms a bearing for the spring. W is a bowed spring which is sprung over the adjusting screw T and bears thereagainst to assist in maintaining the block M in contact with its adjusting screws. The bowed spring W has its opposite ends slotted at W' to slidably engage headed screws W² secured to the base.

It is one of the objects of the construction to avoid any lag in operation due to the mass of material in the frame or mounting for the temperature elements. At the same time it is an object to avoid any inaccuracy which might be introduced by the interposition of heat insulating material between the elements or their connections. I have accomplished the desired result by placing the heat insulation only between the elements and their mounting upon the frame, but between the arch and chord elements there are only metallic connections. Consequently the elements when once adjusted will not vary their relation to each other excepting as influenced by temperature, while the insulation placed between the mass of metal in the frame and the cross-bar C and flexible support G will reduce heat conduction to a negligible amount.

In use, the screw N is first adjusted to vary the curvature of the arch, after which the screw T is adjusted to correct the angularity of the block M so that the face thereof bearing against the screw N is perpendicular to the plane of the elements. The dial Q' may then be adjusted and will move the end of the arch element so as to vary the distance between the central portion thereof and the contact P, thereby setting or closing

the cooperating contacts at a predetermined temperature.

It will be noted that the block M floats in contact with the point bearings N and Q, so that it is free to rock or otherwise adjust itself into alinement with the end of the arch element bearing thereon. The tension of the spring R tends to rotate the block counter-clock-wise, which in conjunction with the other forces operating upon the block will maintain the same against the point bearings preventing any vibration or change in adjustment.

To avoid the necessity of a separate adjustment of the screws T and N I may employ the construction shown in Figs. 5 and 6, in which said screws have projecting therefrom the laterally extending arms N' and T'. These arms are interconnected by suitable means, such as a pin N² on the one engaging a notch N³ upon the other, so that whenever one of the screws is adjusted it will cause an adjustment of the other. The relative length of the arms N' and T' may be proportioned to the relative pitches of the threads on the screws N and T so that the longitudinal movement of one screw corresponds exactly to that of the other. As this movement is always very slight it may be generally effected by the rotative adjustment of the screw through a limited angle.

What I claim as my invention is:

1. In an electric contact thermostat, a frame, a bar mounted on said frame, heat insulation interposed between said bar and its mounting, cooperating arch and chord elements, the latter being rigidly secured to said bar, a bearing for said arch element adjustable in relation to said bar to vary the curvature of the arch, a connection between the opposite ends of said arch and chord elements, anchoring means between said connection and the frame for maintaining the plane of the elements while permitting movement in said plane, and heat insulation between said anchoring means and the frame.

2. In an electric contact thermostat, the combination with a frame, of cooperating arch and chord elements, the chord elements being fixed in position relative to said frame, a contact member mounted on said frame extending in proximity to said arch element, an adjustable bearing for said arch element comprising a block, a point bearing for said block adjustable substantially in the plane of said elements, and means for maintaining said block in contact with said point bearings in each position of adjustment.

3. In an electric contact thermostat, the combination with a frame, of cooperating arch and chord elements arranged in substantially the same plane, a mounting for said elements adapted to hold the chord elements constantly in the same plane, a con-

tact member mounted on said frame extending in proximity to said arch element, a block forming a bearing for one end of said arch element, a screw adjustable on said frame in a direction perpendicular to the plane of said elements and having a point contact on said block, a screw adjustable in a plane parallel to the plane of said elements and having a point contact on said block, and cooperating means for resiliently and yieldably pressing said block against said contact bearings in each position of adjustment thereof.

4. In an electric contact thermostat, the combination with cooperating arch and chord elements arranged in substantially the same plane, of a frame, means for mounting said elements upon said frame to maintain the chord elements thereof in a fixed plane, a connection between the chord elements at one end thereof for maintaining the same in alinement, an electric contact for cooperating with said arch element fixed to said frame, and means for adjusting the opposite end of said arch element comprising a floating block forming a self alining bearing for the end of said element, point bearings for said block in planes respectively parallel and perpendicular to the plane of said elements and adjustable in their respective plane and means for maintaining said block in contact with said point bearings in all positions of adjustment thereof.

5. In an electric contact thermostat, the combination with cooperating arch and chord elements arranged in substantially the same plane, of a mounting for maintaining the plane of the chord elements permitting adjustment of one end of the arch element, and adjustment means for said end of the arch element comprising a floating block having a self alining bearing for the end of said arch element, a point bearing for said block adjustable parallel to the plane of the elements to vary the curvature of the arch, a point bearing for said block adjustable perpendicular to the plane of the elements to vary the position of the arch in relation to a cooperating contact and means for maintaining said block in contact with said points in all positions of adjustment thereof.

6. In an electric contact thermostat, the combination with cooperating arch and chord elements arranged in substantially the same plane, of a mounting for maintaining the plane of the chord elements permitting adjustment of one end of the arch element, a floating block forming a self alining bearing for the adjustable end of said arch element one face of said block being perpendicular to the plane of said element, a point bearing in contact with said face and adjustable perpendicularly thereof, means for correcting the angularity of said face with each adjustment of said point bearing to main-

tain said face perpendicular to the plane of the element, a point bearing for said block adjustable perpendicular to the plane of said elements and means for maintaining said block in contact with said point bearings.

7. In an electric contact thermostat, the combination with cooperating arch and chord elements, of a mounting for said elements maintaining the chord elements thereof in a fixed plane while permitting adjustment of one end of said arch element, and adjustment means for said end of the arch element comprising a floating block notched to form a self-alining bearing for the end of the arch element having one face perpendicular to the plane of the element, a point bearing in contact with said face and adjustable perpendicularly thereof to vary the curvature of the arch, a spring connected to said block tensioned to maintain the same in contact with said point bearing and a point bearing adjustable perpendicularly to the plane of said elements and bearing upon said block against the tension of said spring.

8. In an electric contact thermostat, the combination with cooperating arch and chord elements arranged in substantially the same plane, of a mounting for said elements comprising a frame and connections for maintaining the chord elements in a fixed plane in relation thereto while permitting adjustment of one end of the arch element, and adjustment means for said end of the arch element comprising a floating block having a self-alining bearing for the end of the arch element, one face of said block being perpendicular to the plane of said elements, a screw adjustable on said frame perpendicular to said face and forming a point contact therefor, a screw adjustable on said frame perpendicular to the plane of said elements, a spring exerting a tension on said block to maintain the same in contact with said point bearings in all positions of adjustment thereof, and means for correcting the angularity of said face of the block when adjusted by the screw in contact therewith.

9. In an electric contact thermostat, the combination with cooperating arch and chord elements arranged in the same plane, of a mounting for said elements comprising a frame and connections for maintaining the chord elements in a fixed plane while permitting adjustment of one end of the arch element, and adjusting means for said end of the arch element comprising a floating block for forming a self-alining bearing for said end of the arch element, one face of said block being perpendicular to the plane of said elements, adjusting screws on said frame respectively perpendicular to said face and to the plane of said elements, said screw forming point contacts for said block,

a screw parallel to the screw in contact with said face, and a spring for exerting a tension on said block to maintain the same in contact with said point bearings.

5 10. In an electric contact thermostat, the combination with a frame, of cooperating arch and chord elements arranged in the same plane and mounted on said frame with freedom for adjustment of one end of the
10 arch element, and adjusting means therefor comprising a floating block forming a self-aligning bearing for the end of said arch element, one face of said block being perpendicular to the plane of said elements, a
15 screw on said frame forming a point bearing for said face of the block and adjustable perpendicularly thereof, a screw adjustable in a plane perpendicular to the plane of said elements forming a point bearing
20 on said block, a spring secured to said block and having a bearing on said frame, being tensioned to press the block into contact with said point bearings, a screw parallel to the plane of said elements passing
25 through a slot in said block, and a nut engaging said screw notched to engage and bear upon the end of said spring, for the purpose described.

11. In an electric contact thermostat, the
30 combination with cooperating arch and chord elements arranged in substantially the same plane, of a mounting for said elements comprising a frame and connections for maintaining the chord elements in a fixed
35 plane in relation thereto while permitting adjustment of one end of the arch element, adjusting means for one end of the arch element comprising a floating block having a self-aligning bearing for the end of the arch
40 element, one face of the block being perpendicular to the plane of said elements, a screw adjustable on said frame perpendicular to said face and forming a point of contact therefor, a screw adjustable on said
45 frame perpendicular to the plane of the elements, a spring exerting a tension on said block to maintain the same in contact with said point bearing in all positions of adjustment thereof, a screw parallel to the screw
50 in contact with said face, a bearing for said block adjustable with said screw, and means connecting said parallel screws for compelling a corresponding adjustment thereof to maintain the angularity of said block during adjustment.

12. In an electric contact thermostat, a frame, cooperating arch and chord elements, the latter being rigidly secured to said frame at one end thereof, a bearing for said
60 arch element adjacent the rigidly mounted end of the chord element, said bearing being adjustable in relation to the frame to vary the curvature of the arch, a connection between the other ends of said arch and chord
65 elements, anchoring means between said

connection and the frame for maintaining the plane of the elements while permitting movement in said plane, heat insulation between said anchoring means and the frame, and insulation between the rigidly mounted
70 end of the chord element and the frame and between the adjacent end of the arch element and frame.

13. In an electric contact thermostat, the combination with a frame, of cooperating
75 arch and chord elements mounted upon said frame, a contact member mounted on said frame extending in proximity to said arch element, a block forming a bearing for one end of said arch element, a screw adjustable
80 on said frame in a direction perpendicular to the plane of said element and having a point contact on said block, a screw adjustable in a plane parallel to the plane of said elements and having a point contact on said
85 block, and cooperating means for resiliently and yieldably pressing said block against said contact bearings in each position of adjustment thereof.

14. In an electric contact thermostat, the
90 combination with cooperating arch and chord elements, of a frame supporting the same, an electric contact for cooperating with said arch element fixed to said frame, and means for adjusting one end of said
95 arch element comprising a floating block forming a self-aligning bearing for the end of said element, point bearings for said block in planes respectively parallel and perpendicular to said elements and adjustable
100 in their respective plane, and means for maintaining said block in contact with said point bearings in all positions of adjustment thereof.

15. In an electric contact thermostat, the
105 combination with cooperating arch and chord elements, of a mounting therefor permitting adjustment of one end of the arch element, a floating block forming a self-aligning bearing for said end of the arch ele-
110 ment, one face of said block being perpendicular to the plane of said element, a point bearing in contact with said face and adjustable perpendicularly thereof, means for correcting the angularity of said face with each
115 adjustment of said point bearing to maintain said face perpendicular to the plane of the element, a point bearing for said block adjustable perpendicular to the plane of said element, and means for maintaining
120 said block in contact with said point bearings.

16. In an electric contact thermostat, the combination with cooperating arch and chord elements, of a mounting for said ele-
125 ments permitting adjustment of one end of said arch element and adjustment means for said end of the arch element comprising a floating block notched to form a self-aligning bearing for said end of the arch ele-
130

ment having one face perpendicular to the plane of the element, a point bearing in contact with said face and adjustable perpendicularly thereof to vary the curvature of the arch, a spring connected to said block tensioned to maintain the same in contact with said point bearing, and a point bearing adjustable perpendicularly to the plane of said elements and bearing upon said block against the tension of said spring.

17. In an electric contact thermostat, the combination with coöperating arch and chord elements, of a mounting for said elements comprising a frame and connection to said elements permitting adjustment of one end of the arch element and adjustment means for said end of the arch element com-

prising a floating block having a self-alining bearing for said end of the arch element, one face of said block being perpendicular to the plane of said element, a screw adjustable on said frame perpendicular to said face and forming a point contact therefor, a screw adjustable on said frame perpendicular to the plane of said element, a spring exerting a tension on said block to maintain the same in contact with said point bearings in all positions of adjustment thereof, and means for correcting the angularity of said face of the block when adjusted by the screw in contact therewith.

In testimony whereof I affix my signature.

HARRY G. GEISSINGER.