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THERMOSTAT.

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1,207,957.

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Fig. 1

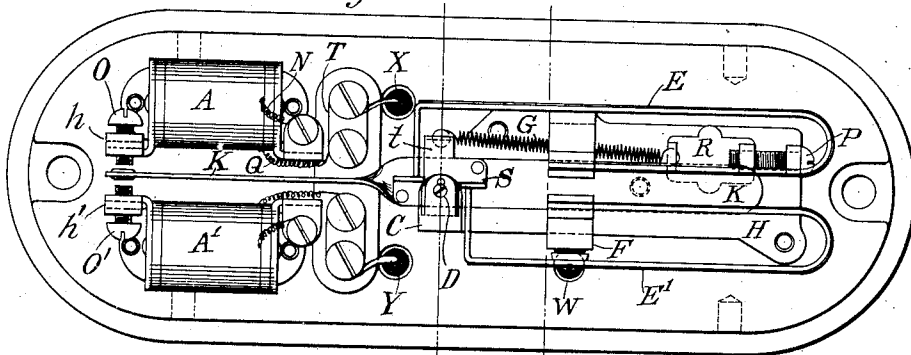


Fig. 2

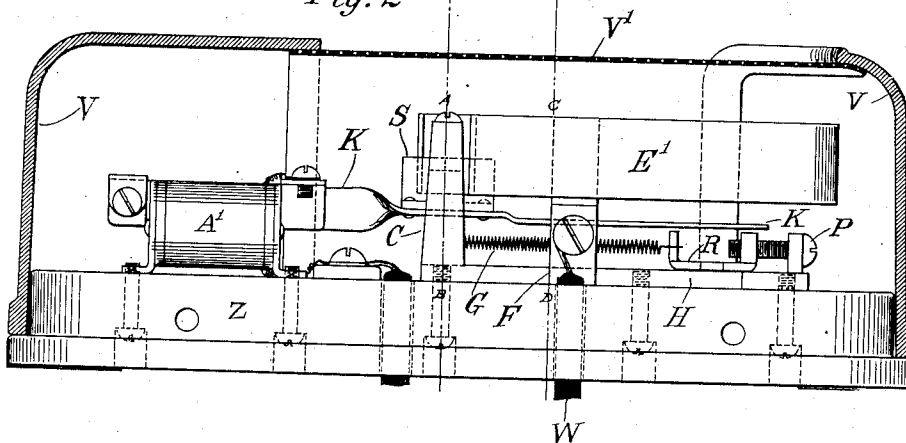


Fig. 3

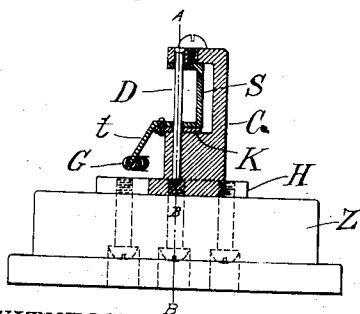
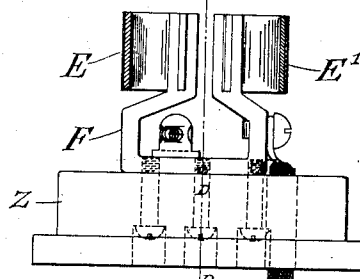


Fig. 4



WITNESSES:

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THERMOSTAT.

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To all whom it may concern:

Be it known that I, JAMES F. McELROY, a citizen of the United States, residing at Albany, county of Albany, State of New York, have invented certain new and useful Improvements in Thermostats, the following being a full, clear, and exact disclosure of the one form of my invention which I at present deem preferable.

For a detailed description of the present form of my invention, reference may be had to the following specification and to the accompanying drawing, which illustrates my invention.

Figure 1 is a plan view; Fig. 2 is a vertical longitudinal section; Fig. 3 is a detail section on line A—B, Figs. 1 and 2. Fig. 4 is a detail section on line C—D, Figs. 1 and 2.

My invention relates to a thermostat so constructed as to be immune or neutral to abnormal vibrations in either a vertical or horizontal direction, such vibration tending heretofore to seriously interfere with the proper action of thermostatically controlled mechanism on railway cars or in other situations where the thermostat is subjected to jarring or shocks.

Referring to the drawing K is the contact arm of the thermostat formed of magnetic material such as iron or steel. The forward end lies in a vertical and the rear end in a horizontal plane, the arm being given a twist near its center for this purpose. Just at the left of the twist in the arm a brass offset S is riveted thereto which has a horizontal flange on both its upper and lower edges, as appears in the section thereof in Fig. 3. Through these flanges is passed the vertical pivot rod D (see Fig. 3) giving the arm a long bearing vertically, the pivot pin being mounted in a standard C. Moreover the arm projects equally, as to its weight, on both sides of the bearing and is consequently balanced on the bearing against vertical vibrations which would tend to bind the bearing or cause incidental oscillations of the arm and also against horizontal shocks which act equally on both ends of the arm. In other words the arm is mounted approximately at its center of gravity.

E and E' are two composite bars or strips which respond, by bending, to changes in temperature and together constitute a ther-

mostatic element. They are U-shaped and secured at their respective inner ends to the uprights of a yoke-shaped standard F (see Figs. 1 and 4) while their outer ends are turned inward and rest against, loosely without being attached to, the aforesaid offset S of the arm K on opposite sides respectively of the pivotal bearing. They are also symmetrically placed with respect to the upper and lower bearing points on the pivot-rod D and act differentially on arm K and thereby cooperate to turn it on its pivot. The offset S has a short projection *t* (see Figs. 1 and 3) which extends downwardly and outwardly and has attached thereto one end of a spring G, the other end of which is anchored to one end of an adjustment-yoke R resting on the base of the instrument and controlled by an adjusting screw P. This arrangement of the strips E and E' with respect to the arm K serves to free the latter from the effect of horizontal jar and vibration of the strips, since they both, cooperating by pressure on the arm K in opposite directions, tend to exert a turning movement on the arm against the opposite turning movement of the spring G. Hence any shock tending to force strip E, for instance, against the offset, and cause it to increase its pressure against spring G, is counterbalanced by the effect of the same shock in causing the other strip E' to move in the same direction and thereby decrease its pressure against spring G. The practical result is that both the arm K and strips E E' are neutralized against abnormal vibrations by jarring and shock and my compensated thermostat can therefore be used effectively in railway cars and other situations where the ordinary uncompensated thermostat would be constantly causing false contacts, and consequent untimely action of the apparatus which the thermostat controls, such false contacts being due to shocks and vibrations of a non-thermal character and not to changes in temperature.

On each side of the arm K is a magnet, the two magnets being shown at A and A'. Each magnet has its two poles adjacent to the arm, so that, when energized, it may attract and hold the arm in the position to which the arm has moved to cause the energizing of the magnet. The left hand pole of each magnet is formed by a loop of mag-

netic material (see h and h') both sides of the loop being traversed by a contact screw (see O and O') and serving to lock the screw in any position at which it may be set. The electric current enters by the wire W , which is attached to the yoke F , and passes thence, by the base-plate H and standard C , to the arm K . When the arm K comes in contact with screw O , for instance, the current then flows by the core of the magnet and wire N to the winding of the magnet, thence by magnet wire Q to the connection-plate T and the outgoing wire X . When, on the other hand, the arm K comes in contact with screw O' , there will be a similar current-route established through magnet A' to outgoing wire Y . The outgoing wires X and Y lead to the apparatus to be controlled by the thermostat where different effects are to be produced according to the temperature changes affecting the thermostat.

The apparatus above described is mounted on a base Z and inclosed in a casing V , composed partly of glass V' .

What I claim as new and desire to secure by Letters Patent is:

1. The combination with stationary contacts and a movable contact piece, of a thermostatic element engaging the movable contact piece to move the same conformable to temperature changes, and non-thermostatic means independent of the stationary contacts cooperating with the thermostatic element to prevent non-thermal vibrations of said movable contact piece.

2. The combination with stationary contacts and a neutrally mounted contact piece, of a thermostatic element engaging the movable contact piece to move the same conformable to temperature changes, and adjustable non-thermostatic means independent of the stationary contacts cooperating with the thermostatic element to prevent non-thermal vibration of said movable contact piece.

3. In a thermostat, the combination with a movable contact-piece neutrally mounted with respect to non-thermal vibrations, of a thermostatic element acting thereon neutrally with respect to non-thermal vibrations, and adjustable means acting on the contact piece in opposition to the thermostatic element.

4. In a thermostat, the combination with a movable contact-piece pivotally mounted at its center of gravity, of a thermostatic element acting thereon in response to temperature variations, and adjustable means engaging and acting on the contact piece in opposition to the thermostatic element.

5. In a thermostat, the combination with a movable contact-piece pivotally mounted

at its center of gravity, of a thermostatic element acting thereon oppositely on opposite sides of its pivotal point and a spring resisting the action of said element.

6. In a thermostat, the combination with a movable contact-piece pivotally mounted at its center of gravity, of a spring having a turning effect thereon and a thermostatic element applied loosely to the said contact-piece on opposite sides of its pivotal point.

7. In a thermostat, the combination with a movable contact-piece extending horizontally and pivotally mounted at its center of gravity of a horizontal thermostatic element acting differentially thereon on opposite sides of its pivotal point and a spring acting in opposition to said element.

8. In a thermostat, a movable arm mounted at its center of gravity, a thermostatic element having its opposite ends applied differentially to the said arm on opposite sides of its pivotal point, and a spring acting in opposition to the said element.

9. In a thermostat, a pivoted arm mounted neutrally with respect to non-thermal vibrations, a thermostatic element having its opposite ends bearing loosely against said arm on opposite sides of its pivotal point respectively and a spring acting in opposition to said element.

10. In a thermostat, a movable arm, an offset thereon, a pivot-pin applied to said offset and on which said movable arm is mounted neutrally with respect to non-thermal vibrations, a thermostatic element bearing against said offset on opposite sides of the pivotal point, and a spring acting in opposition to said element.

11. A thermostat comprising a contact bar pivotally supported at its center of gravity, thermostatic elements disposed on opposite sides of the contact bar and bearing against the contact bar on opposite sides of its pivotal point, a spring for neutralizing the contact bar and thermostatic elements against non-thermal vibration, and means for adjusting the tension of the spring.

12. A thermostat comprising a contact bar, an offset in which the bar is pivotally mounted at its center of gravity, thermostatic bars disposed on opposite sides of the contact bar and engaging the offset on opposite sides of the pivotal point of the bar, a spring connected to the offset, and an adjustable anchorage for the spring.

In witness whereof I have hereunto set my hand, before two subscribing witnesses, this 16th day of October, 1911.

JAMES F. McELROY.

Witnesses:

J. A. McELVENY,
E. H. VIBBARD.