No. 807,718. PATENTED DEC. 19, 1905.

P. A. BROWN.

THERMOSTAT.

APPLICATION FILED MAR. 20, 1905.

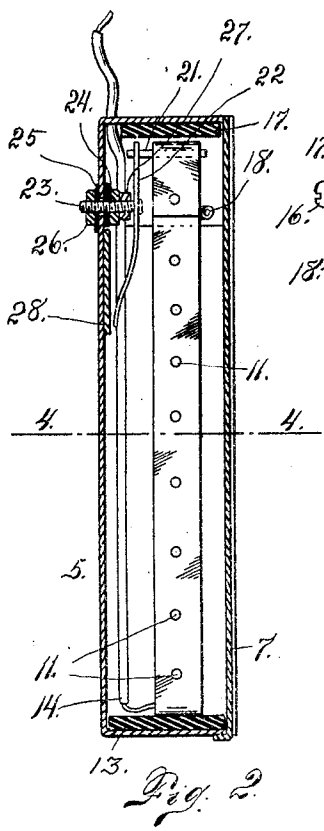


Fig. 2.

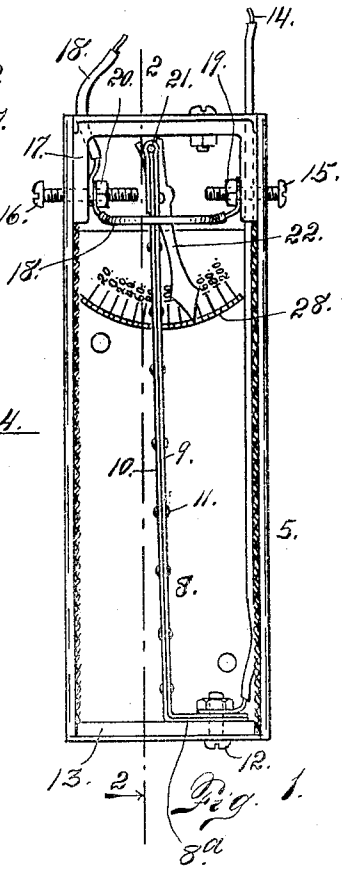


Fig. 1.

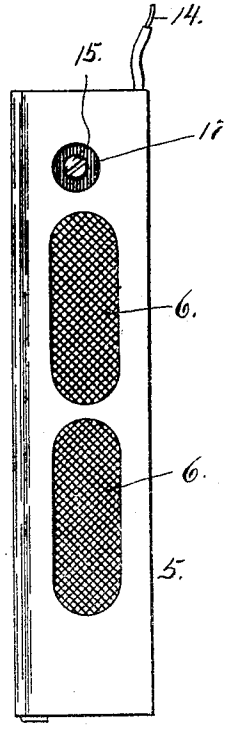


Fig. 3.

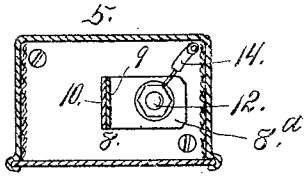


Fig. 4.

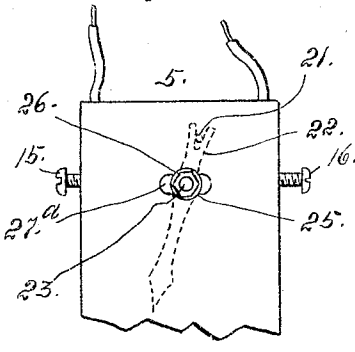


Fig. 5.

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THERMOSTAT.

No. 807,718. Specification of Letters Patent. Patented Dec. 19, 1905.

Application filed March 20, 1905. Serial No. 251,014.

To all whom it may concern:

Be it known that I, PEABODY A. BROWN, a citizen of the United States, residing in the city and county of Denver and State of Colorado, have invented certain new and useful Improvements in Thermostats; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

My invention relates to improvements in thermostats of the class in which a member is mounted to vibrate between two electrical contacts, whereby one or more circuits may be automatically closed by the movement of the vibrating member incident to the change of temperature in the vicinity of the instrument. This vibrating member is composed of two substances having capacity for unequal expansion and contraction as the temperature varies under the influence of heat. The result is that when the temperature in the vicinity is raised one of the substances by virtue of its greater expansion will increase in length faster than the other substance, thus causing the member to bend, the member having the greatest capacity for expansion being on the outside of the curve. This tendency to assume a curved shape causes the vibrating member to move sufficiently to engage one of the electrical contacts, thus closing the circuit. The circuit thereby closed may be utilized to perform any desired work, as operating an alarm-signal.

Having briefly outlined my thermostat construction in a very general way, I will proceed to describe the same in detail, reference being made to the accompanying drawings, in which is illustrated an embodiment thereof.

In the drawings, Figure 1 is a front view of the instrument with the sliding door removed. Fig. 2 is a section taken on the line 2 2, Fig. 1. Fig. 3 is a side elevation of the device. Fig. 4 is a cross-section taken on the line 4 4, Fig. 2. Fig. 5 is a fragmentary rear elevation illustrating the upper portion of the instrument.

The same reference characters indicate the same parts in all the views.

Let the numeral 5 designate a suitable casing having screen-covered openings 6 to allow the air in the vicinity of the instrument to enter the casing. The front of this casing is normally closed by a sliding door 7, which fits suitable ways or grooves formed in the opposite sides of the casing. The door is intended to fit quite closely in the casing, whereby it will remain in any desired position of adjustment.

The vibrating member 8, as shown in the drawings, is composed of two flat pieces of metal, (designated 9 and 10, respectively,) the said pieces or parts 9 and 10 being rigidly connected by rivets 11. The parts 9 and 10 possess unequal capacity for expansion and contraction. It may be assumed that the part 9 is composed of zinc and the part 10 of iron. The lower extremity of this member 8, as shown in the drawings, is bent, as shown at 8^a, and secured within the casing by means of a screw 12. The part 8^a engages a piece 13 of insulating material, whereby the member 8 is insulated from the casing. An electrical conductor 14 is also connected with the lower extremity of the member 8 by the screw 12. This conductor is insulated from the casing and is supposed to be connected with one pole of a battery or other electrical source. The upper extremity of the member 8 occupies a position between two contact-screws 15 and 16, which are insulated from the casing by insulating material 17, in which the screws are threaded. This insulating material is sufficiently hard to permit the adjustment of the contact-screws. The material of the casing is cut out around the screws 15 and 16, (see Fig. 3,) whereby the screws are prevented from coming in contact with the metal of the casing.

An electrical conductor 18 is connected with both contact-screws 15 and 16, the conductor being held in place by nuts 19 and 20. By adjusting these set-screws it is evident that the distance which it is necessary for the member 8 to move in order to close the circuit may be regulated at will.

The upper extremity of the member 8 is provided with a pin 21, which enters an elongated opening formed in the upper extremity of a pointer 22, pivotally mounted on a pin 23, which is passed through an opening in the back of the casing and insulated therefrom by washers 24 and 25, composed of suitable insulating material and engaging the back of the casing both interiorly and exteriorly. Beyond these washers both interiorly and exteriorly the pin is provided with nuts 26 and 27, whereby the washers are held se-

curely in place. The outer nut 26 also serves to lock the pin in any desired position of lateral adjustment. This pin 23 passes through an elongated opening 27ª, formed in the back of the casing, and by loosening the nut 26 the pin, together with the pointer mounted thereon, may be moved bodily for the purpose of regulating the position of the expansible member between the two contacts. The farther the expansible member is from the contacts the greater will be the degree of heat or cold necessary in order to cause the said member to engage the desired contact.

The back of the casing is provided with a graduated segment 28, over which the lower extremity of the pointer moves as the member 8 is actuated. This pointer indicates on the graduated segment the temperature to which the expansible member is subjected in order to move the pointer to any position upon the segment.

From the foregoing description the use and operation of my improved device will be readily understood. In describing the operation of the instrument I will assume that the electrical conductors 18 and 14 are connected with the respective poles of an electrical source. From the description it will be understood that the conductor 18 is connected with both contact-screws 15 and 16, so that when the member 8 is in engagement with either contact-screw the circuit will be closed, since the member 8 is also connected with the other pole of the source by the conductor 14. Now assuming that the normal position of the member 8 is indicated in Fig. 1, if the temperature in the vicinity of the instrument is raised the zinc plate 9 will expand to a greater extent than the iron plate 10 and cause the member 8 to bend or assume a curved position, with the part 9 on the outside of the curve, since the said part becomes longer than the part 10 under the conditions stated. In order to close the circuit, this curve must be of sufficient magnitude to cause the upper extremity of the member 8 to engage the contact-screw 16. If, on the other hand, the temperature is lowered in the vicinity of the instrument, the part 9 of the member 8 will contract more rapidly than the part 10, and a member 8 will be caused to curve in the opposite direction or in such a manner that the part 10 will be on the outside of the curve. In this event the upper extremity of the member 8 will be moved in the opposite direction or toward the contact-screw 15, and when it reaches said screw the circuit will also be closed. It is evident that two distinct circuits may be closed by the member 8, one circuit being closed by the movement of its upper extremity in one direction and the other circuit by the movement of its upper extremity in the opposite direction.

In the original arrangement of the device it is preferable to adjust the member 8 so that it shall be straight and occupy a vertical position when the room is at the temperature that is considered normal. The pointer 22 should then occupy a position in line with the member 8. Then as the temperature is raised or lowered the free extremity of the member moves in the one direction or the other, according to circumstances.

In determining the figures to be placed upon the segment 28 to indicate degrees the member 8 and the pointer 22 are placed in the normal position, so that the pointer shall indicate whatever is to be the normal temperature as indicated by a thermometer at the same location. Then as the temperature is artificially raised and lowered the degrees as indicated by the thermometer are marked on the segment or dial 28.

This application is intended to cover certain improvements over the construction set forth in my previous application, Serial No. 228,437, filed October 14, 1904.

Having thus described my invention, what I claim is—

1. In a thermostat, the combination with a suitable casing, of a vibrating member composed of two substances possessing the property of expansion and contraction in unequal degrees, one extremity of the said member being fixed and the other extremity movable, two contacts adjustably mounted on opposite sides of the movable extremity of the member, suitable electrical connections with the contacts and with the vibrating member, a pin adjustably mounted in the casing, a pointer pivotally mounted on the pin intermediate its extremities, the movable extremity of the expansible member being connected with the pointer on one side of its pivot, the casing being provided with a graduated segment located on the opposite side of the pivot, over which the pointer moves as the expansible member is actuated.

2. In a thermostat, the combination of a member composed of a number of substances possessing the property of expansion and contraction in unequal degree, a suitable casing in which the said member is mounted, one extremity of the said member being made fast while the other extremity is movable, adjustable contacts mounted on opposite sides of the movable extremity of the member, a pointer pivotally mounted on the casing, the latter being provided with a graduated dial or segment marked to indicate degrees, the movable extremity of the said member entering a slotted opening formed in the pointer on the side of its pivot opposite the graduated segment, and suitable electrical connections whereby as the said member engages either contact a circuit is closed.

3. In a thermostat, the combination of a suitable casing, adjustable contacts mounted on opposite sides thereof, a pointer pivotally

mounted on the casing, the latter being provided with a graduated segment over which one extremity of the pointer travels when actuated, the opposite extremity of the pointer having a slotted opening, a member having one extremity secured to the casing while the other extremity projects between the adjustable contacts, the last-named extremity being provided with a pin which enters the slotted extremity of the pointer, the said member being composed of substances possessing the property of expansion and contraction in unequal degrees, and suitable electrical connections with the contacts and the said member, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

PEABODY A. BROWN.

Witnesses:
A. J. O'BRIEN,
DENA NELSON.