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G. T. NEWELL, JR

THERMOSTAT

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Fig. 1.

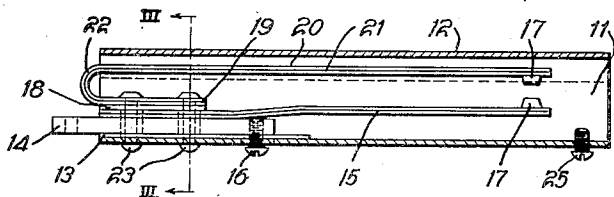


Fig. 2.

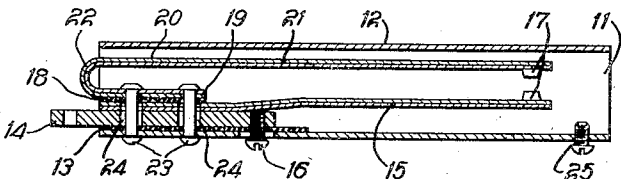
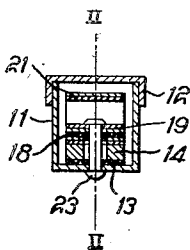


Fig. 3.



WITNESSES:

H. B. Chubb
Wm. Bichel

INVENTOR

George T. Newell, Jr.

BY

Herbert E. Carr
ATTORNEY

UNITED STATES PATENT OFFICE.

GEORGE T. NEWELL, JR., OF BEVERLY, NEW JERSEY, ASSIGNOR TO WESTINGHOUSE
ELECTRIC & MANUFACTURING COMPANY, A CORPORATION OF PENNSYLVANIA.

THERMOSTAT.

Application filed April 11, 1922. Serial No. 551,745.

To all whom it may concern:

Be it known that I, GEORGE T. NEWELL, Jr., a citizen of the United States, and a resident of Beverly, in the county of Burlington and State of New Jersey, have invented a new and useful Improvement in Thermostats, of which the following is a specification.

My invention relates to control devices and particularly to thermostats and it has for its object to provide a relatively simple, inexpensive and rugged construction that shall insure quick and positive operation of the device.

In practicing my invention, I provide a relatively thin-wall sheet-metal casing having open ends and mount therein a combined terminal and supporting-member insulated from the casing. A substantially straight bimetallic strip is mounted, at one of its ends, on the supporting member, means being provided for adjusting the free end of the strip. A second bimetallic strip is located in a substantially parallel spaced-apart location relatively to the first strip and has an integral return-bent portion by which it is operatively secured on the supporting member, an insulating strip being placed between the two bimetallic strips. Rivets hold the two bimetallic strips, the insulating strips and the supporting member in proper operative positions relatively to each other and to the casing.

In the single sheet of drawings,

Figure 1 is a view, partly in longitudinal vertical section and partly in side elevation, of a device embodying my invention;

Fig. 2 is a view, in vertical longitudinal section thereof taken on the line II—II of Fig. 3, and

Fig. 3 is a view, in vertical lateral cross section thereof, taken on the line III—III of Fig. 1.

A metallic casing 11 having relatively thin walls is provided with a substantial y co-extensive cover member 12 which is quickly removable therefrom. The casing 11 and the cover 12 may be of any suitable or desired length and of any suitable or desired form in lateral cross-section, but, for convenience in manufacturing the same, may be made substantially rectangular in cross-section. The cover 12 is made removable to permit of easy and quick assembly of the operative elements inside of the casing.

At one end and inside of the casing 11 is located a longitudinally extending strip 13 of a suitable insulating material, such as mica, upon the outer surface of which is operatively mounted a combined terminal and supporting member 14. One end of a longitudinally extending bimetallic strip 15 is located in operative engagement with the supporting member and terminal 14. The strip 15 is substantially straight throughout its length and means, comprising an adjustable screw 16, is provided at the inner end of the supporting member 14 to permit of adjusting the free end of the strip 15 which may be provided with a suitable contact member 17 secured thereagainst. A relatively short strip 18 of insulating material, such as mica, is located against the outer surface of the bimetallic strip 15 to insulate the same from an integral return-bent portion 19 of a second bimetallic strip 20 which comprises the return-bent portion 19, a substantially straight main portion 21 and an integral connecting portion 22, substantially semicircular in contour. The free end of the straight portion 21 of the second bimetallic strip may be provided with a contact member 17. A plurality of rivets 23 may be employed to hold the two bimetallic strips, the insulating strips and the terminal and supporting member in proper operative positions relatively to each other and inside of the casing. The rivets 23 extend through enlarged openings 24 in the terminal and supporting member 14 to permit of insulating them from the supporting member while securing the return-bent portion of the second strip both mechanically and electrically to the casing.

The hereinbefore described construction provides a path for an electric current beginning with, for example, the terminal member 14, to the fixed end of the first bimetallic strip and therethrough to the contact member 17, from there to the contact member 17 on the second bimetallic strip, to the return-bent portion, rivets, casing, and from there out to the supply conductor (not shown) which may be operatively connected to the casing by means of a connecting screw 25 suitably located on the casing. The bimetallic strips may be built up in any suitable or desired manner and it is to be noted that the metal having the larger coefficient of expansion is placed on either

the outside or the inside of the two strips, as illustrated in the drawings, so that the free ends thereof may move either toward or away from each other under the influence of a change in the temperature of the parts and of the surrounding air.

By employing relatively thin sheet metal for the casing 11 and the cover 12 and by leaving the ends of the casing open a quick movement of the two thermostatic strips relatively to any change of temperature is obtained and hence the time lag of a thermostat constructed in accordance with my invention is relatively small. By employing substantially coextensive bimetallic strips, one of which embodies an integral arcuate portion at a relatively large distance from the movable end of the strip, I obtain a relatively large motion of the free end of the strip, as referred to a co-operating contact member. I am aware, of course, that the entire length of the straight portion of the bimetallic strip embodying a return-bent portion assumes a somewhat curved form but I have found that the movement of the free end is apparently greater than would be given by a coextensive substantially straight bimetallic strip. I believe that the expansion or contraction of the metals constituting the bimetallic strip relatively to the other is magnified in accordance with the length of the straight portion thereof, thus resulting in a relatively large movement of the free end and, consequently, a quick and positive make or break of the circuit controlled by the thermostat. By employing one substantially straight strip and a second strip extending substantially co-extensive with the first strip and having a return-bent portion, I may mount both of these on a single supporting member and by permitting the substantially straight strip to electrically engage the supporting member, this member may also serve as a terminal for the device, thus providing a relatively simple thermostat comprising a relatively small number of parts.

Various modifications may be made in the device embodying my invention without departing from the spirit and scope thereof and I desire that only such limitations shall be placed thereon as are imposed by the prior art or are specifically set forth in the appended claims.

I claim as my invention:

1. A thermostat comprising an open-end casing of relatively thin material, a supporting member located at one end thereof and insulated therefrom, a substantially straight bimetallic strip adjustably mounted on said supporting member, a second bimetallic strip having a main portion extending substantially parallel to, coextensive with and spaced from, said first strip and having a return-bent portion, the metals in

the main portion of the second strip being oppositely placed to those in the first strip, insulation between said straight bimetallic strip and said return-bent portion, and means for securing said return-bent portion, insulation, straight bimetallic strip, and supporting member in said casing.

2. A thermostat comprising an open-end casing of relatively thin material, a terminal and supporting member located in said casing at one end thereof, insulation between said casing and said terminal and supporting member, a straight bimetallic strip engaging said supporting member and extending longitudinally of said casing, means carried by said supporting member for adjusting the position of the free end of said bimetallic strip, and a second bimetallic strip insulatedly mounted on said first strip by a return-bent portion thereof and having a main portion extending substantially parallel to said first strip and co-operating therewith to control a circuit therethrough.

3. In a thermostat, in combination, a combined casing and terminal member, a combined supporting and terminal member insulatedly mounted in said casing at one end thereof, a substantially straight bimetallic strip adjustably mounted on said supporting member, a second bimetallic strip having a main portion extending substantially parallel to said first strip and being operatively supported in said casing by an integral return-bent portion, insulating means between said first bimetallic strip and the return-bent portion of said second strip, and means for operatively securing the return-bent portion, one end of the first bimetallic strip, the supporting member and the insulating means against the casing.

4. In a thermostat, in combination, a casing, a pair of oppositely moving, co-operating, substantially parallel and coextensive, spaced-apart, bimetallic strips in said casing each having one end operatively secured thereto, one of said bimetallic strips having integral means for causing a greater movement of the free end thereof with a predetermined variation of temperature, than said second strip.

5. In a thermostat, in combination, a casing, a combined terminal and supporting member, a pair of co-operating, oppositely moving, substantially parallel and coextensive, spaced-apart, bimetallic strips in said casing, each having one end operatively engaging said supporting member, one of said strips having integral means for causing a greater movement of its free end with a predetermined variation of temperature than occurs in said second strip, insulation between said casing and supporting block and between the adjacent ends of said strips and means for securing all of said parts in proper operative positions in said casing.

6. In a thermostat, in combination, a casing, a combined terminal and supporting member, a pair of co-operating, oppositely moving, substantially parallel and coextensive, spaced-apart, bimetallic strips in said casing each having one end operatively engaging said supporting member, one of said strips having integral means for causing a greater movement of its free end with a predetermined variation of temperature than occurs in said second strip, means carried by

said supporting member for adjusting the position of the free end of said second strip, insulation between said casing and supporting block and between the adjacent ends of said strips and means for securing all of said parts in proper operative position in said casing.

In testimony whereof, I have hereunto subscribed my name this first day of April 1922.

GEORGE T. NEWELL, JR.