July 8, 1941. G. C. HARRIS 2,248,531

THERMOSTAT

Filed March 3, 1939

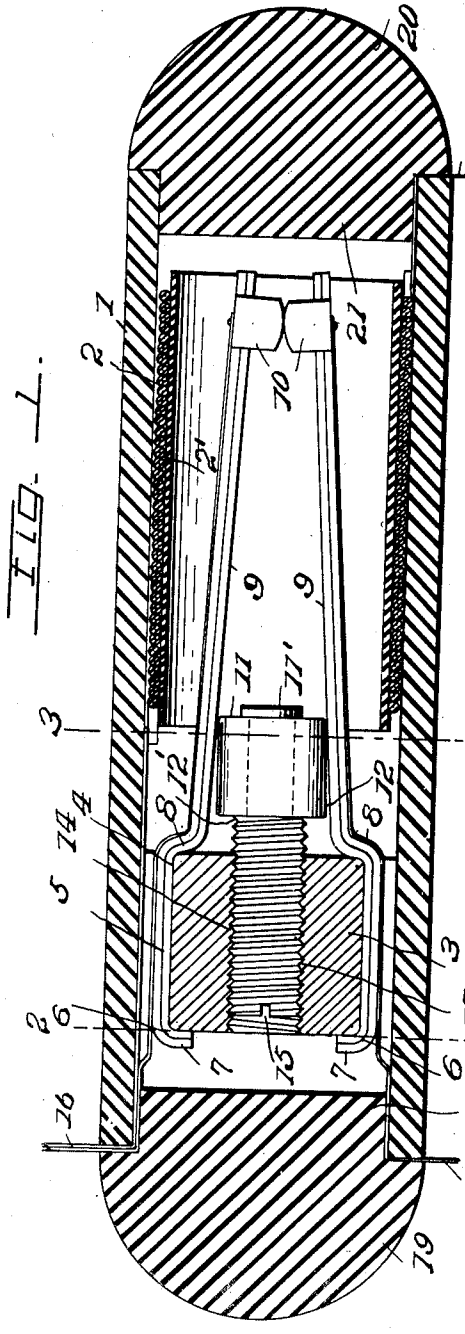

FIG. 1.

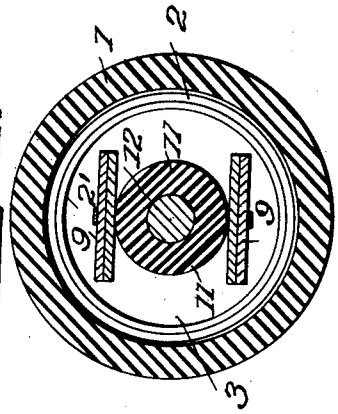

FIG. 2.

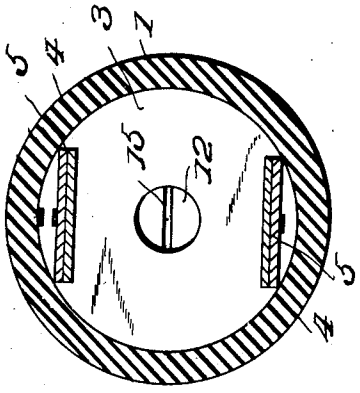

FIG. 3.

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THERMOSTAT

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Application March 3, 1939, Serial No. 259,648

1 Claim. (Cl. 200—122)

This invention relates to a balanced double blade opposed bimetallic thermostat, enclosed in a non-metallic casing and mechanically adjustable.

The primary object of the present invention is the provision of a thermostat of this character which, while capable of general use, is designed more particularly for use in connection with a heating pad.

The invention is illustrated in the accompanying drawing in which:

Figure 1 is a longitudinal section, partly in elevation, of the improved thermostat.

Figure 2 is a section on line 2—2 of Figure 1.

Figure 3 is a section on line 3—3 of Figure 1.

The improved thermostat comprises an open ended cylindrical insulating casing 1 within which is arranged a heating coil 2. The coil is preferably supported by winding on a thin phenol fiber tube 2' and may be arranged as closely placed relative to the bimetallic arms, to be later described, as possible to make the wattage in the coil as effective in the temperature as possible. The coil is of materially less length than that of the casing and is arranged in contact with the inner surface of the casing.

An insulating block 3 is secured within the casing adjacent one end, the block being longitudinally cut away on its peripheral edge in diametrically opposed positions, as at 4. Arranged on each cut away portion is a metallic plate 5, one end 6 of each of which is bent laterally at 7 on the block to hold the plate in position. The opposite end of each plate 5 is bent inwardly, as at 8, to overlie the end of the block 3, thus securing the plate against endwise movement relative to the block. Each plate 5 is projected longitudinally of the casing and within the coil 2 as a bimetallic, heat-responsive arm 9 and the terminals of the arm remote from the block are provided with contacts 10. Obviously, the plate 5 for the entire length may be bimetallic for convenience.

Obviously, if appropriately constructed, the arms 9 respond to the heat condition induced by the coil 2, correspondingly affecting the contacts 10. In the particular use in a heating pad wherein the thermostat is designed to accurately control heat conditions with minimum degrees of fluctuation, provision is made for adjusting the contact holding tension of the bimetallic arms 9, in order that such arms may automatically respond to heat degrees of the coil in slight variations.

To provide for this adjustment, a block 11 of insulating material is arranged between the bimetallic arms 9, which latter converge from the block 3 to the contacts 10. The block 11 is connected to a freely rotatable rod-like element 12 having threaded connection at 13 with the wall of an axial passage 14 in the block 3 passing loosely through the block 11 and headed at 11' beyond the inner end of the block. The rod 12 is of reduced diameter in passing through the block 11, providing a shoulder 12' to bear against the block for operating the block in one direction. The end of the element 12 has a conventional kerf 15 by which the rod may be turned and the block adjusted to correspondingly influence the bimetallic arms and render the same less or more sensitive to the heat influence of the coil in positioning the contacts 10.

In the more particular use of the thermostat in connection with a heating pad, a service conductor 16 is led into the casing 1 in strip form and terminally connected to one of the plates 5 and to the coil. The remaining plate 5 is connected to a strip conductor 17 while the opposite end of the coil is connected to a strip conductor 18. These conductors lead through the respective ends of the casing and are securely clamped in position by end caps 19 and 20 each having an end projection 21 to fit snugly in the end of the casing and clamp the wires in position. Beyond the casing the caps are rounded to avoid abrasive effect on the material of the pad. These caps have the additional effect of sealing the casing against rapid ingress and egress of air, which results in the contacts making and breaking the circuit in devitalized air at atmospheric pressure.

It is, of course, apparent that the block 11, here illustrated as of cylindrical form, may obviously be of wedge or conical form if desired, such additional formation being conventional for the purpose designed and not requiring specific illustration.

What is claimed to be new is:

An adjustable thermostat including a cylindrical hollow casing open at the respective ends, an insulating block conforming to and accurately fitting the interior surface of the casing, said block being formed with diametrically opposing flattened recess portions extending throughout the full axial length of the block, a plate fitted in each recess, the plate being bent over the opposing ends of the block inwardly of the bottom of the recess to hold the plate against movement longitudinally of the block and form the sole securing means of the plate relative to the block, said plates being extended beyond the block to-

ward the opposite end of the casing in the form of converging bimetallic arms, the free ends of the arms remote from the block having contact points, a coil surrounding the arms and in contact with the interior surface of the casing, the block being formed with a central axial opening extending entirely through the block and being interiorly threaded, a rod cooperating with the threaded opening, a terminal on the rod beyond the block contacting with the plates and serving to adjust the contacts on the plates relative to each other in accordance with the adjustment of the rod in the block, a conductor leading into the casing at one end and connected with one plate and the coil, a second conductor leading into the same end of the casing and connected to the other plate, and a conductor leading into the opposite end of the casing and to the coil, and caps removably closing the ends of the casing and frictionally holding the conductors in place, the removal of the cap adjacent the block permitting access to the rod in the block for adjustment of the contacts.

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