

Sept. 4, 1928.

1,682,915

G. R. LAWRENCE

HYGROSTAT

Filed Feb. 19, 1927

2 Sheets-Sheet 1

Fig. 1.

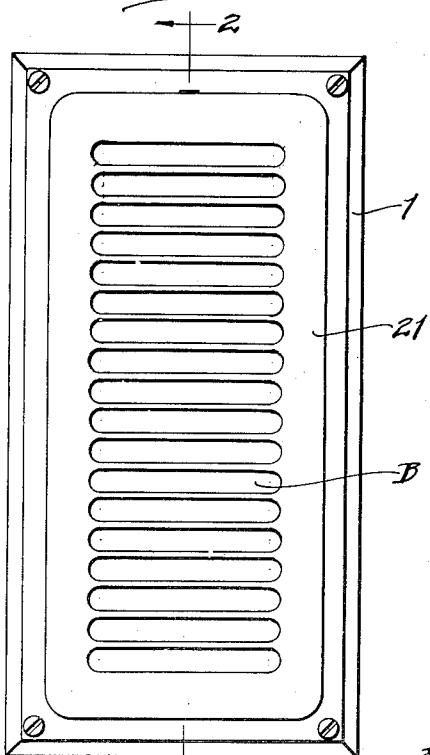


Fig. 2.

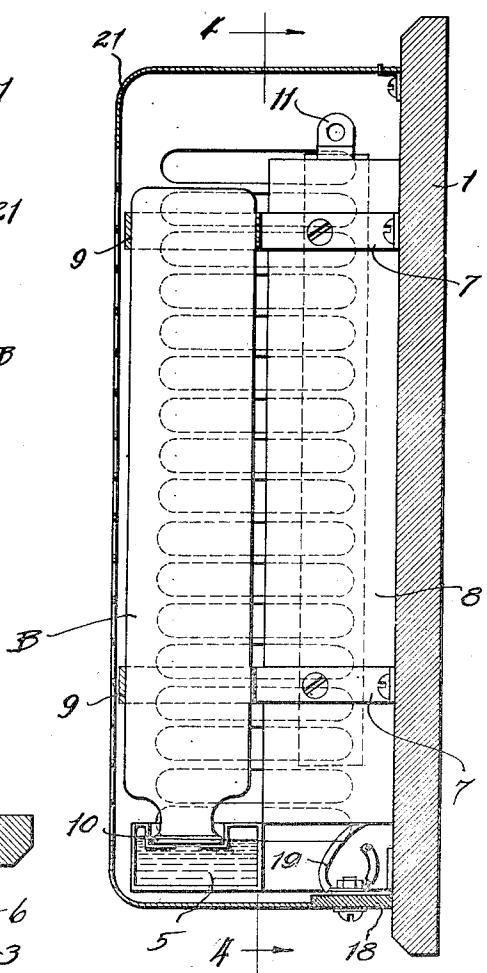
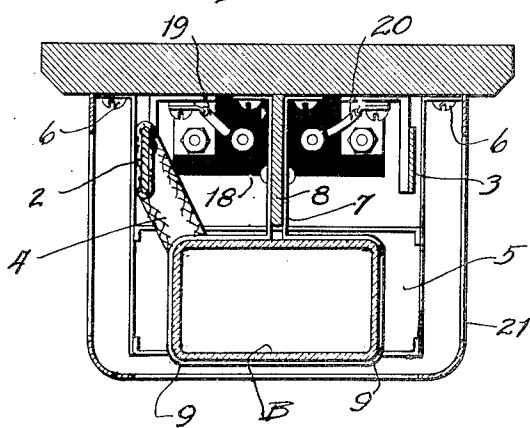


Fig. 3.



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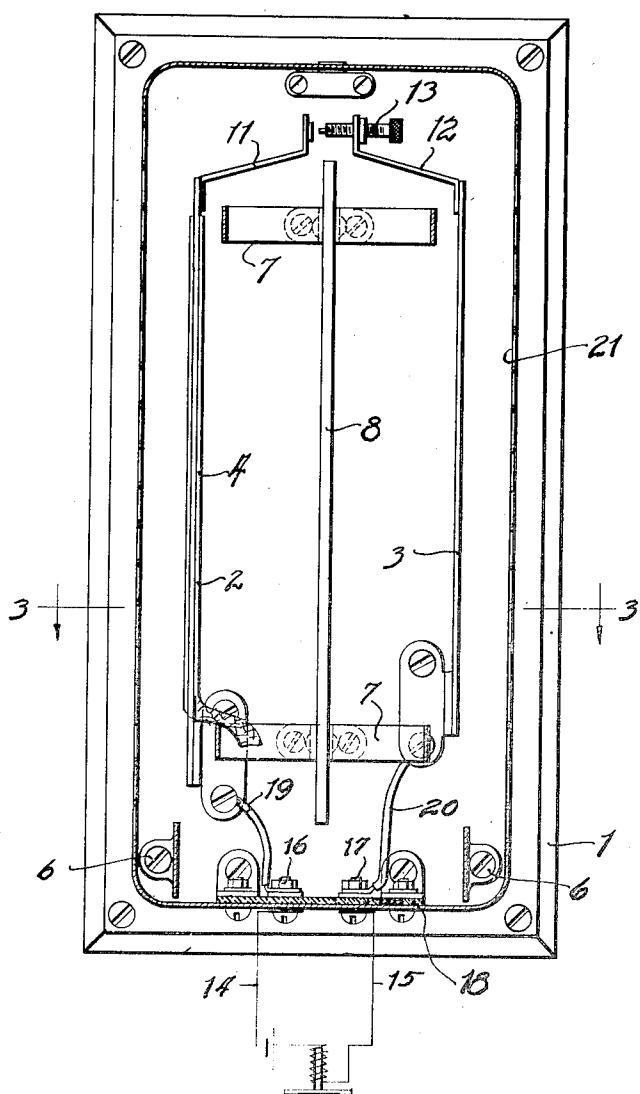
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Fig. 4.



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UNITED STATES PATENT OFFICE

GEORGE R. LAWRENCE, OF CHICAGO, ILLINOIS.

HYGROSTAT.

Application filed February 19, 1927. Serial No. 169,635.

This invention relates to improvements in hygrostats and the like, and to certain improvements and modifications in the hygrostat shown in my application, Serial Number 143,663, filed October 23, 1926.

The main objects of this invention are to provide a hygrostat especially adaptable for relay control, where the currents controlled by the hygrostat switch may be very weak, and the sparking is not objectionable; to provide a simple form of hygrostat having very few parts, and no hinged joints in the mechanism; to provide such a device in which the circuit is controlled at a predetermined relative humidity, irrespective of the varying temperatures; and to provide means for compensating for the variations which are shown by the differences in the increments of the readings of the wet and dry bulb thermometers and different ranges of temperatures.

An illustrative embodiment of this invention is shown in the accompanying drawings, in which:

Fig. 1 is a front elevation of the hygrostat.

Fig. 2 is a section taken on the line 2—2 of Fig. 1.

Fig. 3 is a section taken on the line 3—3 of Fig. 4.

Fig. 4 is a section taken on line 4—4 of Fig. 2.

In this invention, two bi-metallic plates or strips, of unequal length, are anchored, at one end, in spaced relation, to a suitable base. The longer plate is covered with a suitable moistened wick which maintains the plate at the wet bulb temperature, while the other plate is at the dry bulb or air temperature. As is well known, the bi-metallic plates are bent in proportion to the degree of temperature. If the surrounding air were completely saturated, both plates would be deflected similarly for any changes in temperature, except for the difference in the lengths of the plates, but, at ordinary values of relative humidity, the shorter plate is at a higher temperature, and is therefore deflected a greater amount. A differential movement is caused by the two plates. This differential movement, as will be understood, is a function of the relative humidity.

Cooperating contact members are secured to the free ends of the two plates, and the control circuit is connected through the plates, from one to the other. The contacts

are adjusted to touch when the upper ends of the plates are at a certain distance apart, so that the contact is made at a predetermined relative humidity; then, as the temperature changes without a change in the humidity, the plates will move together, without changing the relation between the upper ends, or breaking the contact, but, if a change in the humidity occurs regardless of the change in temperature, the relation at the contact will be changed accordingly.

Referring to the drawings, the instrument is provided with an insulating base 1, to which is anchored the lower ends of the bi-metallic plates 2 and 3. This plate 2 is made the longer, for the purpose which will be more fully explained hereinafter. The hollow wick 4 is slipped over the plate 2, and dips into an open reservoir 5. The side portions of the reservoir are extended to provide feet which are secured to the base by means of the screws 6. For supporting the water bottle B, a frame comprising spaced brackets 7 secured to a vertically positioned bar 8 for stiffening, is secured to the base 1. The water bottle B is held, in an inverted position, between the clips 9 in the frame members 7 with the lower open end of the bottle supported by suitable brackets 10 in the reservoir 5. The lower end of the wick 4 dips into the reservoir, so that the wick is continually saturated. Suitable arms 11 and 12 are attached to the upper free ends of the plates 2 and 3, respectively. The inner ends of the arms 11 and 12 are bent upwardly and an adjustable contact screw 13 is provided in the end of the arm 12.

The wires 14 and 15, of a suitable controlling circuit, are attached to the binding posts 16 and 17, respectively, and are mounted in an insulating block 18 which is mounted on the base 1. The binding post 16 is connected to the plate 2 by means of a wire 19, and the binding post 17 is connected to the opposite plate by means of a wire 20.

For enclosing the instrument, a suitable perforated cover 21 is provided, which may be secured in any suitable manner to the base 1. As explained in the application referred to above, the differences in the readings of the wet bulb thermometer increase slightly for the higher temperatures. If the plates 2 and 3 were made of equal lengths, the contact would be made at a lower relative humidity for the higher temperatures than it would be for the lower temperatures.

Therefore, by making the wet plate longer, compensation is made for this variation and the contact is made at the same relative humidity throughout the ordinary ranges of 5 temperatures.

While but one illustrative embodiment of this invention has been shown and described, many alterations and omissions may be had without departing from the spirit of the invention, as defined in the following claim:

Claim:

A hygrometer comprising a base of insulating material, two bi-metallic plates anchored

at one end to the base in spaced parallel relation, and means for wetting the surface 15 of the one plate, the free end of said plates arranged to contact when the plates are in a predetermined relative position and control an electric circuit, the wetted plate being slightly longer than the other plate to compensate for the differences in the movements of the two plates at different ranges of temperatures.

In testimony whereof I affix my signature.

GEORGE R. LAWRENCE.