C. S. JOHNSON.

THERMOSTATIC INSTRUMENT.

APPLICATION FILED DEC. 17, 1907.

912,573.

Patented Feb. 16, 1909.

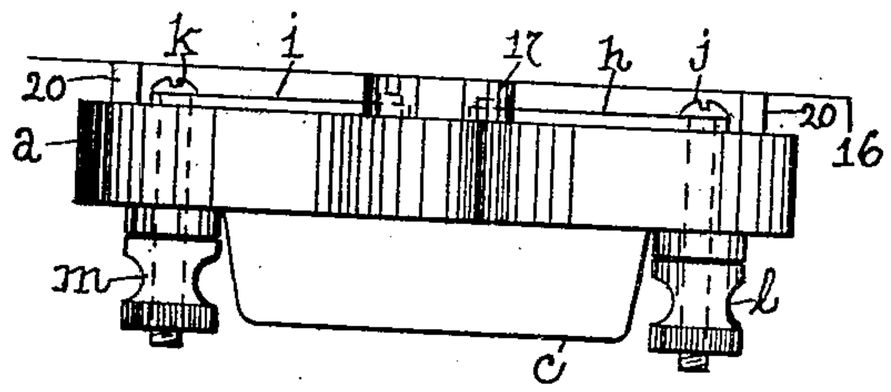

Fig. 1.

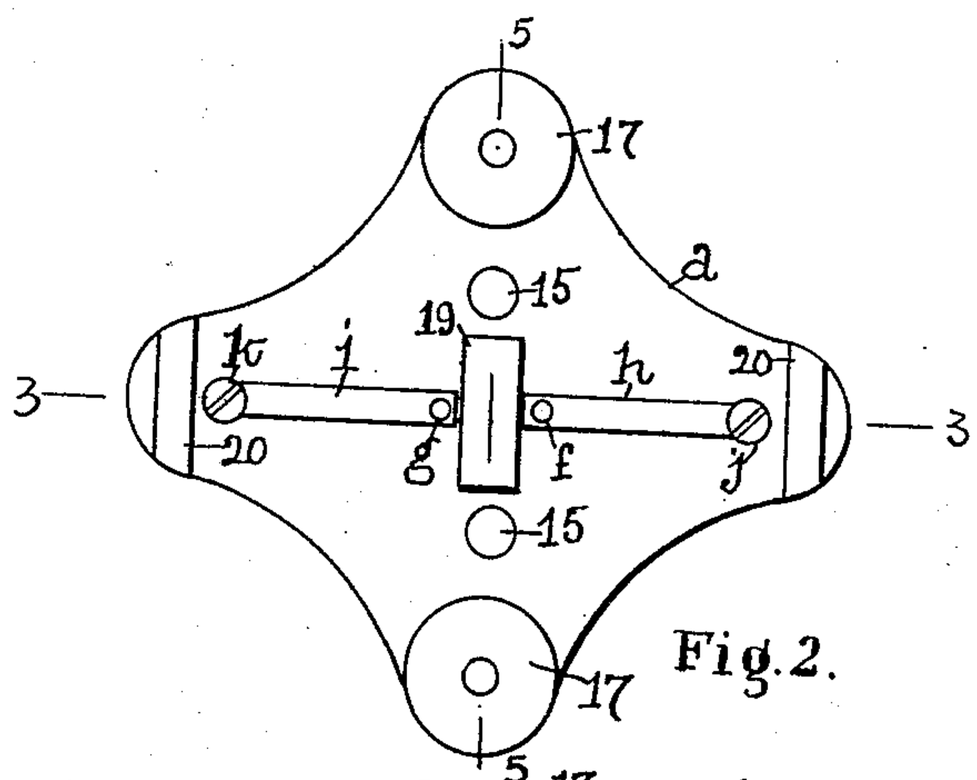

Fig. 2.

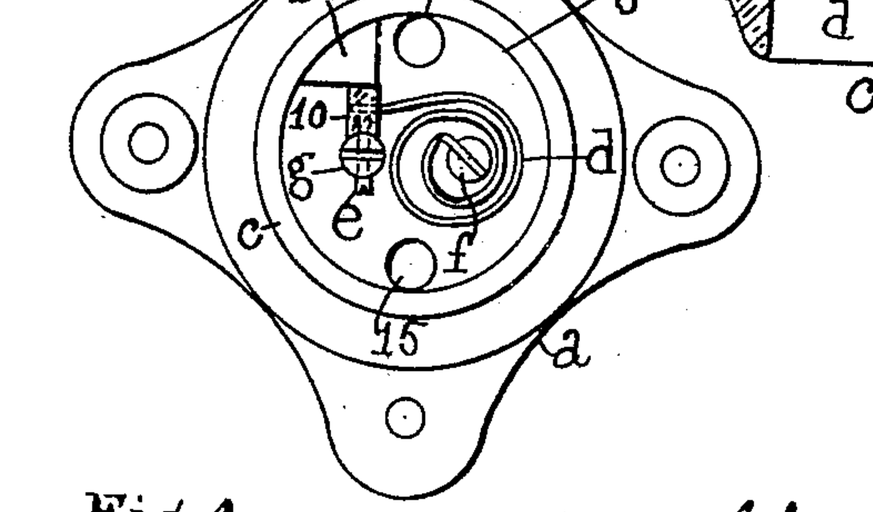

Fig. 3.

Fig. 5.

Fig. 4.

Witnesses.
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UNITED STATES PATENT OFFICE.

CHARLES S. JOHNSON, OF BOSTON, MASSACHUSETTS.

THERMOSTATIC INSTRUMENT.

No. 912,573. Specification of Letters Patent. Patented Feb. 16, 1909.

Application filed December 17, 1907. Serial No. 406,837.

To all whom it may concern:

Be it known that I, CHARLES S. JOHNSON, a citizen of the United States, residing in Boston, in the county of Suffolk and State of Massachusetts, have invented an Improvement in Thermostatic Instruments, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

This invention relates to a thermostatic instrument of that class having a movable strip or member which elongates under heat. Thermostats of the class referred to are usually provided with a fixed member with which the movable member coöperates.

The present invention has for its object to provide a thermostat of the class described, in which the contact points of the two members are protected from external influences, such as dust, moisture, etc., without interfering with the sensitiveness of the instrument.

Another feature of the invention consists in providing means for preventing the movable member from contracting abnormally for a purpose as will be described.

The invention further has for its object to provide for the circulation of air through the instrument, so as to avoid dead air pockets and thereby render the instrument more sensitive.

These and other features of this invention will be pointed out in the claims at the end of this specification.

Figure 1 is an elevation of a thermostat embodying this invention. Fig. 2, a plan view of the thermostat shown in Fig. 1. Fig. 3, a section on the line 3—3, Fig. 2. Fig. 4, an underside view of the thermostat shown in Fig. 1, and Fig. 5, a section on the line 5—5, Fig. 2.

Referring to the drawings *a* represents a base of porcelain or other insulating material, provided on its front side with a chamber or pocket *b*, from which projects an annular flange *c*. Within the chamber *b* are located the movable member *d* and the stationary member *e* of the thermostat.

The movable member *d* may be of any suitable or usual construction such as a coiled metal strip having one end fastened to a metal post *f*, and the stationary member *e* is shown as a screw extended through a metal post *g*. The posts *f*, *g*, are extended through the base *a* and screwed or otherwise secured to the end of conducting strips *h*, *i* located at the back of the base *a* and secured thereto by the terminal screws *j*, *k*, which are extended through the base to the front side thereof and provided with binding nuts *l*, *m*, for the circuit wires (not shown).

The free end of the movable member or thermostatic strip *d* coöperates with the stationary member or screw *e*, and in the present instance, said strip is normally out of contact with the said screw, and the instrument is designed for use on an open circuit, which is adapted to be closed by a rise in temperature to a given or predetermined point, as by a fire.

The present invention has for one of its objects, to protect the contacting points or surfaces of the movable and stationary members of the instrument, against dust, moisture, etc., without impairing the sensitiveness and efficiency of the instrument. This is accomplished by enveloping or covering the contacting surfaces or points of the instrument with a piece or body 10 of non-conducting material, which is fusible or plastic under heat, such for instance as wax and which in the present instance is interposed between the post *g* and a back stop 12 which is shown as a projection on the wall of the chamber or pocket *b*. The wax 10 preferably completely covers the contacting end of the screw *e* and also the free end of the thermostatic strip *d*, thereby fully protecting these parts from external influences, such as dust, moisture, etc., and maintaining them for an indefinite time in good working condition. The wax may be of such a character as will soften at the temperature it is desired the instrument should operate, so that when the heat in the vicinity of the thermostat reaches a predetermined or given piont, the wax will soften sufficiently to permit unrestrained or free movement of the thermostatic strip, which is elongated by the heat and makes contact with the screw or stationary member of the instrument, thereby closing the circuit and giving the alarm. If the heat in the vicinity of the thermostat should subside before the wax was melted, the latter would again solidify and remain effective as a protecting medium. The back stop 12 serves to prevent an abnormal movement of the thermostatic strip *d* away from the member *e*, which might take place when the instrument is exposed to a low temperature, as for instance, in the winter, which low tem-

perature might otherwise contract the thermostatic strip to such extent as to draw the wax away from the stationary member and thereby expose the contact surface of said member to external influences.

From an inspection of Fig. 4, it will be seen that the thermostatic strip *d* can only have a predetermined or limited movement away from its coöperating member, which movement can be regulated by positioning the back stop with relation to the thermostatic strip and the post *g*. It will also be observed that the wax 10 interposed between the back stop 12 and the thermostatic strip *d* assists in preventing abnormal contractive movement of said strip. Provision is also made for preventing the formation of a dead air space in the chamber *b*, which is accomplished by providing the back of the said chamber with one or more outlets or openings, which are extended to the outside of the instrument. In the present instance, this result is obtained by providing the base with openings 15 (see Figs. 2, 4 and 5), which are extended through the bottom wall of the chamber *b* and connect the same with the atmosphere at the back of the base, a space being formed between the base and the ceiling, wall or other structure represented by the line 16 (see Fig. 1) by lugs 17 on the back of the base. The formation of arcs between the conducting strips *h*, *i*, may be avoided by erecting on the back of the base a wall 19, which may be integral therewith. The base *a* may also be provided with additional lugs 20 arranged at the opposite ends of the conducting strips in line with the wall 19 to form abutments for layers of wax, not shown, with which the conducting strips may be covered, if desired.

The members of the instrument may be protected from injury by a wire grating 21 inserted into the flange *c* and resting on a shoulder 22. It will be observed from inspection of Fig. 3, that the chamber *b* is practically open, thereby affording access of the heat directly to the thermostatic members.

I have herein shown one construction of instrument embodying this invention, but I do not desire to limit the invention in this respect.

Claims.

1. In a thermostatic instrument, in combination, a base of insulating material provided on its front side with a chamber or pocket, posts within said chamber and extended through the back of said base, conducting strips secured to said posts on the back of said base, terminal screws engaging said conducting strips and extended through said base, a stationary member secured to one of said posts within said chamber, a movable member secured to the other of said posts and coöperating with said stationary member, and a fusible non-metallic material covering the contacting surfaces of said members, substantially as described.

2. In a thermostatic instrument, in combination, a base, coöperating members supported by said base and one of which is movable with relation to the other, a fusible non-metallic material covering the contacting surfaces of said members, and a back stop coöperating with said movable member to limit its contractive movement away from its coöperative member, substantially as described.

3. In a thermostatic instrument, a base, coöperating members supported by said base and one of which is movable with relation to the other, a fusible non-metallic material covering the contacting surfaces of said members, and a back-stop on said base substantially in line with the said coöperating members and coöperating with the movable member, for the purpose specified.

4. In a thermostatic instrument, a base provided with a chamber, coöperating members supported by said base within said chamber and one of which is movable with relation to the other, a lug or projection integral with the base and located within the chamber in line with said members to form a back stop for the movable member, substantially as described.

In testimony whereof, I have signed my name to this specification in the presence of two subscribing witnesses.

CHARLES S. JOHNSON.

Witnesses:

JAS. H. CHURCHILL,

J. MURPHY.