(No Model.)

W. F. SINGER.

THERMOSTAT.

No. 424,363. Patented Mar. 25, 1890.

Fig. 1.

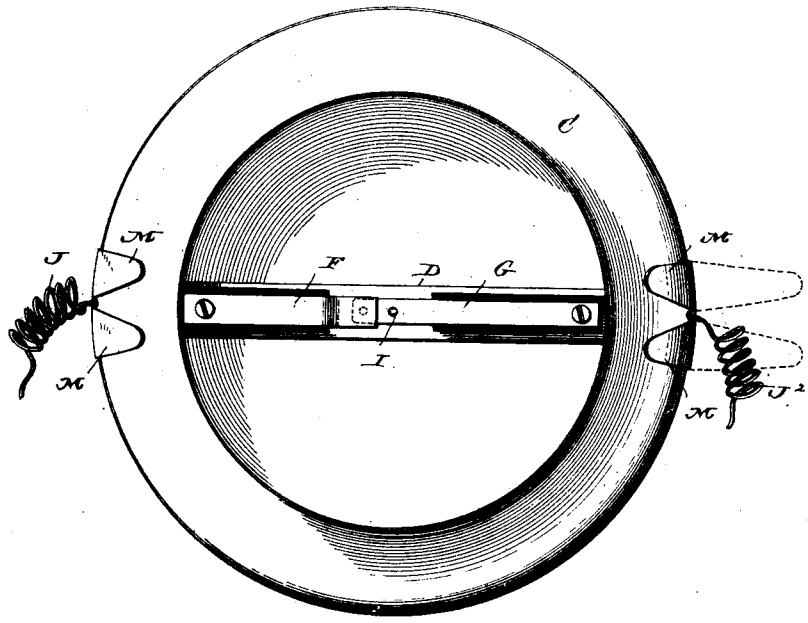


Fig. 2.

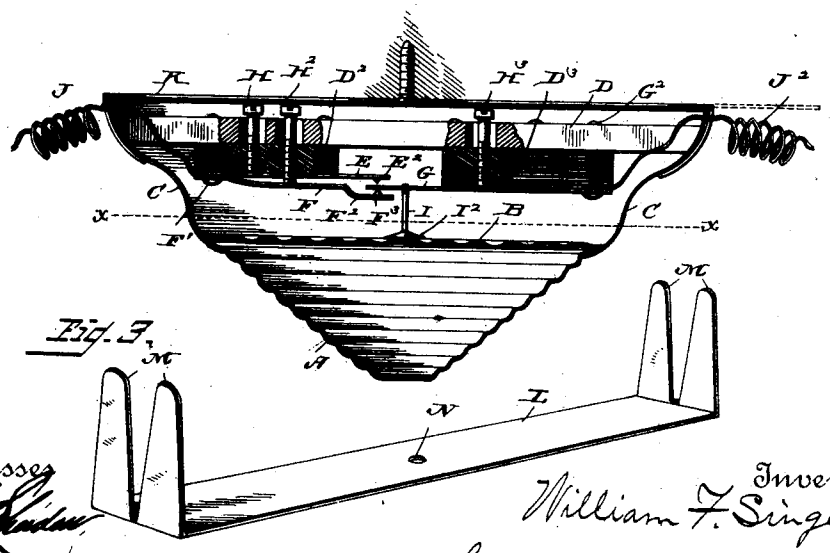


Fig. 3.

Witnesses
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UNITED STATES PATENT OFFICE.

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THERMOSTAT.

SPECIFICATION forming part of Letters Patent No. 424,363, dated March 25, 1890.

Application filed March 11, 1889. Renewed February 27, 1890. Serial No. 341,942. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM F. SINGER, a citizen of the United States, residing at Carthage, in the county of Jefferson and State of New York, 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 letters of reference marked thereon, which form a part of this specification.

This invention relates to certain new and useful improvements in thermostats, and has for its object to generally improve upon the construction, cheapen, and render more efficient in operation that class of thermostats which are used in connection with closed-circuit electric systems.

A further and more immediate object of the invention is to provide a thermostat which, while so constructed as to operate by the rise and fall of the temperature in the apartment in which it is placed, will automatically produce a change in the electric circuit and sound an alarm or signal, and is also adapted to indicate any disturbance in the building-circuit produced at a point upon the line by breaking of wires or from other causes; and the chief object of the invention is to provide a means by which the difference between an alarm or signal caused by a rise in the temperature and that caused by a broken wire or other disturbance upon the line may be distinguished.

To the above ends and to such others as the invention may pertain the same consists in the peculiar combinations and in the novel construction, arrangement, and adaptation of parts, all as more fully hereinafter described, shown in the drawings, and then particularly defined in the appended claims.

The invention is clearly illustrated in the accompanying drawings, in which—

Figure 1 is a transverse section, through a thermostat constructed in accordance with my invention, upon line *x x* of Fig. 2. Fig. 2 is a central vertical section of the same, and Fig. 3 is a perspective view of the clamp used to secure the thermostat to the ceiling.

The chamber is filled with air at a normal temperature of sixty degrees and is hermetically sealed. The upper face of the capsule is made of flexible material capable of expansion or distortion by the expansion of the air within the chamber, and, in order to permit the use of exceedingly thin metal in the construction of this diaphragm and capsule, are preferably corrugated.

Reference being had to the details of the drawings by letter, A represents the air-chamber, made, preferably, in substantially the form of an inverted cone, having its sides corrugated, as shown.

B is the diaphragm secured to and forming a hermetically-sealed cover for the chamber.

C is an annular casing open at its end, one end of said casing being of less diameter than the other end, and adapted to receive the upper end of the air-chamber A, which is soldered or otherwise secured thereto.

D is a transverse bar of brass secured within the upper portion of the casing C, the end of said bar being secured to opposite sides of the casing, and D^2 D^3 are blocks of hard rubber or other suitable insulating material.

Secured to the lower face of the block D^2, with its end extended a short distance beyond the inner end of the same, is the metal strip E, carrying upon its under surface at a point adjacent to its free end the contact-point E^2.

F is a strip of metal secured at its outer end by the bolt or screw F′, which serves to retain both the strips E and F in place. The strip F is extended directly beneath the strip E, but is so bent downward slightly as to provide a space between the strips, as shown, while upon the upper face of the strip F, at a point within the offset portion F^2 and directly beneath the contact-point E^2, is a similar contact-point F^3.

G is a strip of metal secured at one of its ends by means of the bolt or screw G^2 to the under face of the insulated block D^3 and extended transversely beneath the same, its inner end being extended beyond the inner end of said block and terminating at a point between the strips E and F or at a point slightly beyond the points E^2 and F^3.

H, H^2, and H^3 are adjusting-screws which are passed vertically downward through open-

ings in the bar D and insulated blocks D^2 and D^3, the apertures in the bar D being of greater diameter than the diameter of the bolts. These bolts bear, respectively, upon the upper faces of the strips E, F, and G, and by adjusting the bolts the relative position of the said strips and their contact-points may be regulated as desired.

I is a copper rivet, the upper end of which is passed through the strip G at a point adjacent to its free end, and the lower end of this rivet is provided with an enlargement or head I^2, which bears upon the upper face of the diaphragm B.

J J^2 are wires secured at their inner ends to the lower ends of the bolts F^2 and G^2, and strips E^2, E^3, and G, and connecting the said points with the opposite poles of a battery. (Not shown.)

K is a cover which is fitted over the upper end of the case C, and L is a strip of metal, the ends of which are bifurcated, as shown at M M. This strip L is used to secure the thermostat to the ceiling of the room, the said strip being secured to the ceiling by a single screw passed through the central opening N, and after it has been thus secured in place the thermostat is pressed against its lower face and the bifurcated ends M are bent down around the edges of the casing C, as shown in Fig. 1, thus serving to securely retain the same in position. The course of the current enters upon the wire J, which is in contact with the spring F, and the current passes over said spring and makes contact with the spring G, and thence through the wire J^2.

After having been adjusted for use by the adjusting-screws H, H^2, and H^3, heat being applied to the surface of the air-chamber A causes the contained air to expand in volume, thus forcing the diaphragm upward, carrying with it the rivet I and moving the spring-metal strip G and lifting the same from its contact with the contact-point F^3, thus opening the circuit. The heat being continued, the diaphragm continues to rise until the spring-strip G contacts with the spring-strip E through the contact-point E^2, which again restores the current to its normal position through said strip E, which is in contact with F at F^3, thus enabling the operator at the central office to distinguish between a broken wire J or J^2 and the opening of the circuit by heat. In case of the circuit being opened and again closed by the effect of heat, the automatic signal-box, with which the thermostat is in metallic connection, gives a short signal at the central office in contradistinction to a long signal, which would be created by a break of either wire J or J^2, as will be readily understood.

What I claim as new is—

1. In a thermostat, the combination, with the chamber, the casing, and the insulating-blocks, of the transverse bar D, the strips E F, carrying the contact-points, the strip G, the diaphragm B, the pin I, and the adjusting-screws passed loosely through the bar upon said blocks, through the blocks, and bearing on said strips, substantially as and for the purpose specified.

2. In a thermostat, the combination, with the casing and its contained parts, of a metallic strip L, provided centrally with the hole N and with bifurcated ends M M, bent around the edge of said casing, and the securing-screw passed through said hole, with its head retained between the said strip and the cover. K of the chamber, substantially as and for the purpose specified.

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

WILLIAM F. SINGER.

Witnesses:

FRANKLIN H. HOUGH,

VICTOR L. MASON.