

(No Model.)

M. MARTIN.

THERMOSTATIC ELECTRIC CONTROLLING DEVICE.

No. 329,470.

Patented Nov. 3, 1885.

Fig:1.

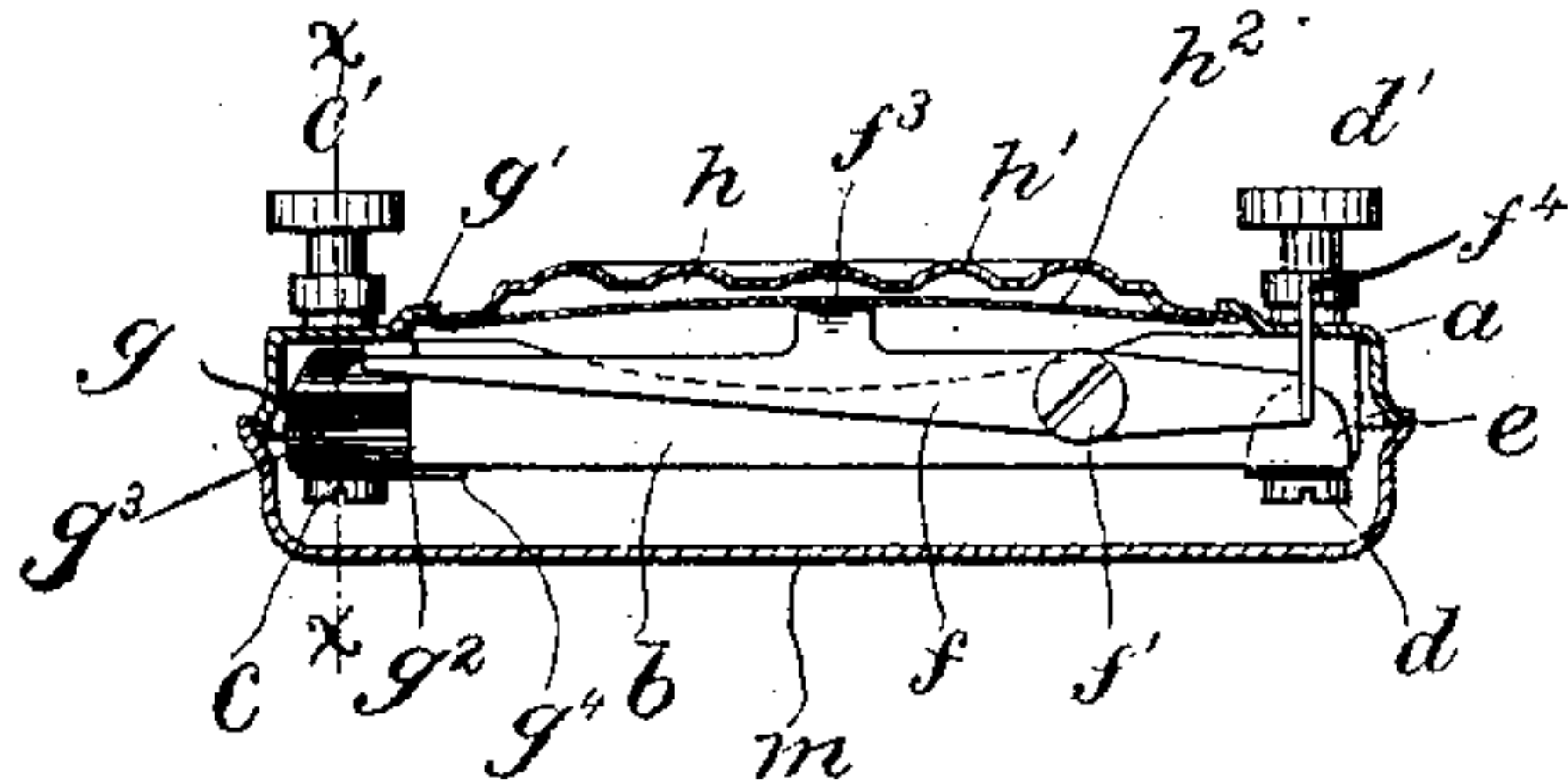


Fig:2.

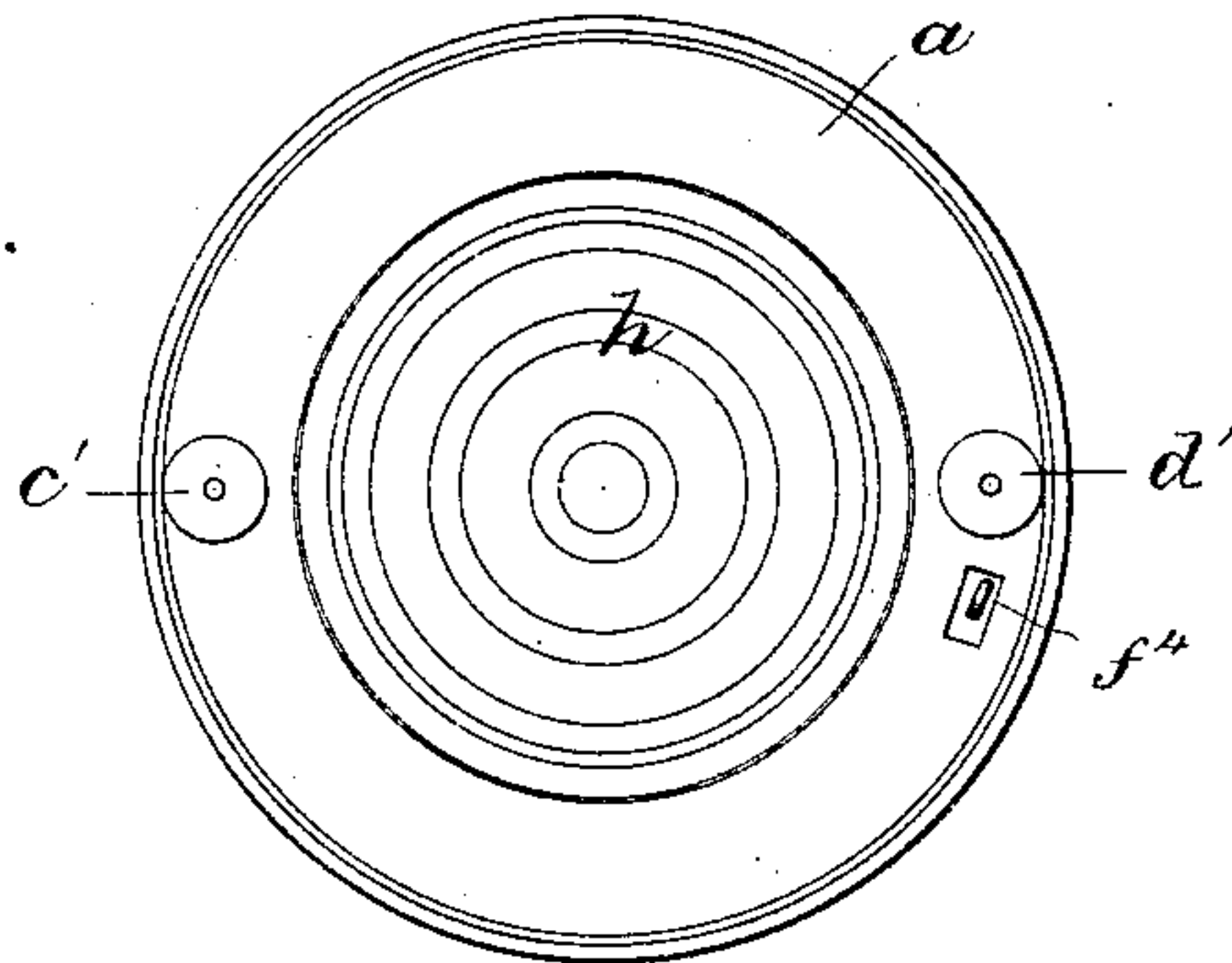


Fig:3.

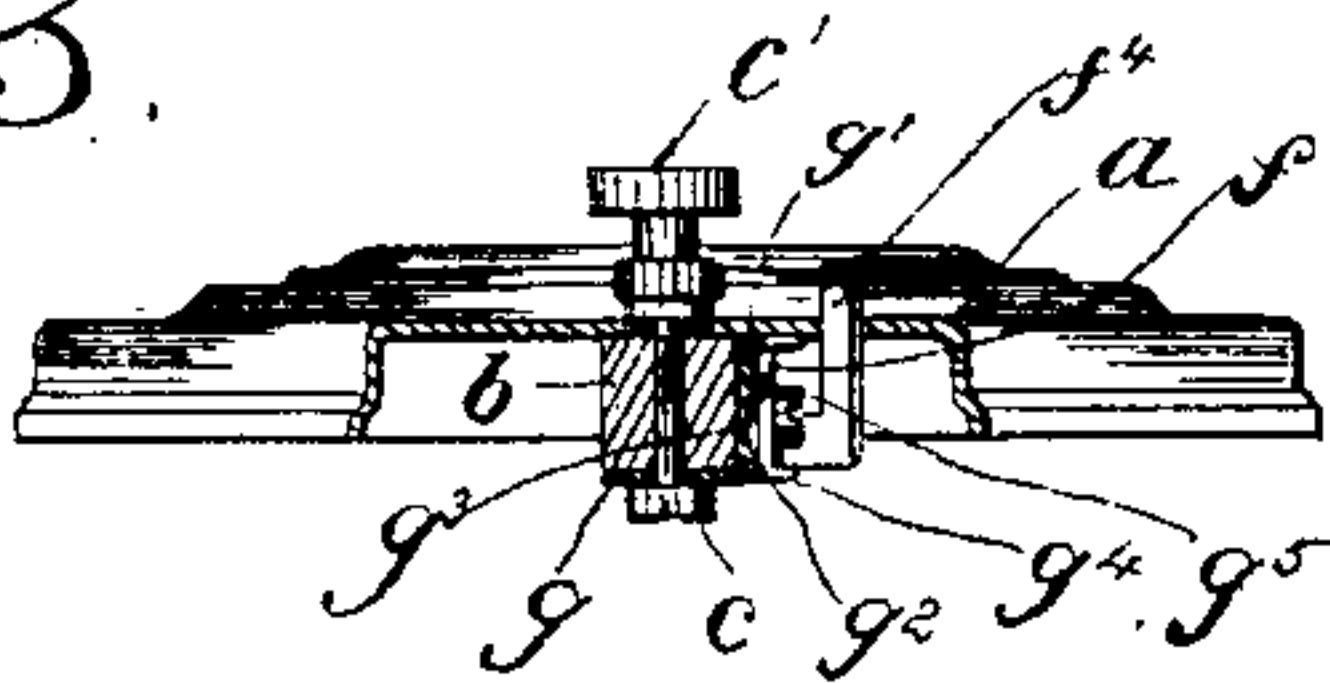
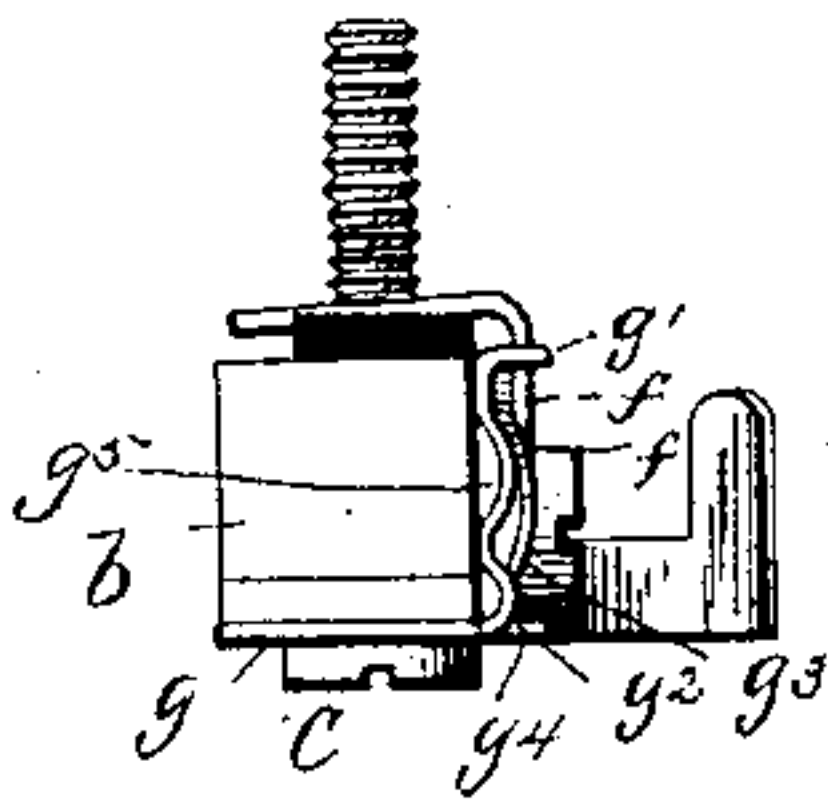


Fig:4.



Witnesses.
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UNITED STATES PATENT OFFICE.

MORRIS MARTIN, OF MALDEN, MASSACHUSETTS.

THERMOSTATIC ELECTRIC CONTROLLING DEVICE.

SPECIFICATION forming part of Letters Patent No. 329,470, dated November 3, 1885.

Application filed February 24, 1885. Serial No. 157,043. (No model.)

To all whom it may concern:

Be it known that I, MORRIS MARTIN, of Malden, county of Middlesex, State of Massachusetts, have invented an Improvement in
5 Thermostatic Electric Controlling Devices, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

10 My invention is embodied in a device for producing a change in an electric circuit dependent upon a change of temperature in the neighborhood of the said device, which may thus be employed for automatically producing
15 an alarm or giving a signal when a fire breaks out or when the temperature in a building becomes dangerously high. The operation of the device is produced by the expansion or vaporization of a volatile liquid, which may
20 be chosen to operate at any desired temperature, the apparatus consisting, essentially, of a metallic reservoir or chamber having a flexible side or face, which is caused to bulge outward when the liquid contained in the
25 reservoir vaporizes, the said reservoir being supported in a frame, which also supports the circuit-changing device operated by the movement of the flexible face of the reservoir. The
30 said circuit-controlling device consists in this instance of a pivoted arm moving with sufficient friction on its pivot to remain in whatever position it is last placed until positively moved therefrom, the said arm being engaged and moved by the flexible side of the reservoir, and preferably co-operating with two
35 contact-points, by which it first opens and then closes the circuit controlled by it in its movement produced by the expansion of the reservoir, it being intended to co-operate with
40 signaling apparatus, such as described in application No. 129,529, filed by me April 28, 1884, in which the signaling device is made operative by a momentary change in a circuit, such as would be produced by the herein-described instrument, but is not made effective
45 to produce fire-alarm signals by a permanent change in the circuit, such as might be produced by an accident to the wires or apparatus. The reservoir for the volatile liquid
50 preferably consists of two disks united at their edges, one of the said disks being thick

and comparatively rigid, so that the expansive force of the inclosed fluid produces its effect almost entirely on the other side, and when placed in the buildings the thicker or
55 rigid face will preferably be placed outward or exposed, and the circuit-controlling device or switch will be at the rear of the reservoir and concealed from view by the same. The said circuit-controlling device is preferably
60 provided with a projection or finger extending through the frame-work to the front or exposed side of the instrument, so that its condition may be observed, and so that it may also be
65 restored to the proper position if it has been accidentally moved therefrom, without deranging the instrument.

Figure 1 is a transverse section of a thermostatic circuit-controlling instrument embodying this invention, the movable circuit-
70 controlling arm or switch being shown in side elevation. Fig. 2 is a front elevation or face view of the thermostatic instrument; Fig. 3, a sectional detail on line *xx* of Fig. 1, and Fig. 4 an end view of the bar and pivoted circuit-
75 controlling devices.

The frame-work of the instrument consists of a ring, *a*, (shown in this instance as of sheet metal,) struck up in dies to the proper shape, and having connected with it and extending
80 diametrically across it a bar, *b*, of insulating material. The said bar *b* is fastened to the ring *a* by binding-screws *c*, insulated from the said ring, and adapted to be connected with the terminals of the circuit or branch
85 circuit to be controlled by the instrument. The binding-screw *d* is electrically connected with a contact-piece consisting of an ear, *e*, extending up at one side of the insulated bar *b*, and being continually in contact with one
90 arm of a pivoted circuit-controlling device, consisting, in this instance, of a metal switch-lever, *f*, pivoted at *f'* on the said bar. The other arm of the lever *f* co-operates with a metal contact-piece, *g*, connected with the
95 other binding-screw, *c*, and having two portions, *g'* *g''*, which are touched by the lever *f* when in its extreme different positions, the said portions *g'* *g''* having a depressed portion or recess, *g'''*, between them at the end of the
100 lever, so that the latter in its movement from one to the other of the said portions *g'* *g''* will

be wholly disconnected from the contact-piece g for a moment, and at the end of its movement will be again connected therewith. A projection, g^4 , integral with the contact-piece g , arrests the lever f in its movement when it is in contact with the portion g^2 of said contact-piece g , and a slight rib or projection, g^5 , resists the movement of the lever and prevents it from jarring or being accidentally removed from the portion g^2 until positively removed therefrom. Thus when the lever or arm f is in either of its extreme positions it closes the circuit between the contact-screws c d , and in its movement from one to the other of the said positions it momentarily opens and immediately thereafter closes the said circuit. The lever or arm f is moved from its position in contact with the portion g^1 to its position in contact with the portion g^2 by an increase in the temperature in the neighborhood of the instrument, affecting a volatile liquid in a reservoir, h , composed of two sheet-metal disks, h^1 h^2 , the former of which is considerably thicker and more rigid than the latter, which is very flexible. The rigid disk h^1 is preferably corrugated, as shown in Fig. 1, to give it greater stiffness, as well as to improve its appearance, and the said disk is of proper size to be received within the ring or annular frame a , and retained in position by the said ring which overlaps its outer edge, and the bar b , which extends across its inner or flexible side, the said bar being sufficiently recessed at its middle portion, as shown by the dotted line, Fig. 1, to permit the expansion or bulging of the flexible face h^2 of the reservoir when the inclosed liquid is vaporized. The lever or arm f has a projection, f^3 , which receives the pressure of the flexible face of the reservoir in expanding, causing the said arm to turn on its pivot. By slightly unscrewing the nuts c' d' of the binding-screws the reservoir h may be slipped out from the case and another inserted, thus enabling a reservoir containing a liquid which vaporizes at any desired temperature to be applied without any other change in the instrument, thus giving the said instrument any desired degree of sensitiveness. The arm f has a projection or finger, f^4 , extending through an opening in the ring a , so as to be seen from the face of the said ring, and thus indicate the position of the switch lever or arm f from the face of the instrument seen in Fig. 2, also enabling the said arm to be moved from the face of the instrument, if desired. The ring a may be provided with a back cap or cover, m , (see Fig. 1,) which incloses the operative parts, and the exposed face of the instrument shown in Fig. 2 is of ornamental appearance, producing no disfigurement to the wall or ceiling of the building in which it may be used.

The instrument is herein shown as arranged to break a normally-closed circuit in order to produce an alarm, and the circuit-controlling device f makes its electrical connections with a rubbing contact, making the instrument far

more reliable than others of this class in which the electrical connection is made by one part pressing against another, which latter instruments are likely to fail on account of an accumulation of dust or other non-conducting material on the contact-points, which are likely to remain for a long period of time without being operated.

The entire circuit-controlling devices are connected with and supported in the framework of the instrument independent of the reservoir which actuates the said devices, and which may be removed from the frame-work without disturbing them.

I claim—

1. In a thermostatic electric-circuit-controlling instrument, an annular metallic frame, circuit-controlling devices connected therewith and insulated therefrom, and an independent metallic reservoir supported by and detachable from said frame, it containing a volatile liquid and having a flexible side which is distorted or bulged by volatilization of the inclosed liquid, and actuates the circuit-controlling device to produce a change in the circuit controlled thereby, substantially as described.

2. In a thermostatic circuit-controlling instrument, the combination, with an actuating device sensitive to a rise in temperature, of an independent pivoted circuit-controlling device frictionally held from turning on its pivot until positively moved, substantially as described.

3. In a thermostatic circuit-controlling instrument, the combination of an actuating device sensitive to a rise in temperature with two contact-pieces connected with the terminals of the circuit controlled by the instrument and a pivoted lever always in contact with one of the said contact-pieces, and having one end movable with relation to the other contact-piece, which is provided with a projection resisting the free movement of the said lever, substantially as described.

4. In a thermostatic circuit-controlling instrument, the combination of an actuating device sensitive to a rise in temperature with two contact-pieces connected with the terminals of the circuit controlled by the instrument and a pivoted lever always in contact with one of the said contact-pieces, and having one end movable with relation to the other contact-piece, which has two contact portions separated by an intervening recess, the movable lever being in contact with the said contact-piece when in its extreme positions, and breaking the electrical connection while moving from one to the other position, substantially as described.

5. In a thermostatic circuit-controlling instrument, the combination of an actuating device sensitive to a rise in temperature with two contact-pieces connected with the terminals of the circuit controlled by the instrument and a pivoted lever always in contact with one of the said contact-pieces, and having one

end movable with relation to the other contact-piece, the said lever having a bearing portion to be engaged by the said sensitive actuating device, substantially as described.

5 6. In a thermostatic circuit-controlling instrument, the combination of an actuating device sensitive to a rise in temperature with two contact-pieces connected with the terminals of the circuit controlled by the instrument
10 and a pivoted lever always in contact with one of the said contact-pieces, and having one end movable with relation to the other contact-piece, the said lever having an indicating projection visible from the outside of the instrument, substantially as and for the purpose
15 specified.

7. A thermostatic circuit-controlling instrument consisting of a struck-up metallic frame, and circuit - controlling devices connected
20 therewith, and a metallic reservoir detachable

from said frame, containing a volatile liquid, and having a flexible face for actuating the circuit-controlling devices, substantially as described.

8. A thermostatic circuit-controlling instrument 25 consisting of a frame, and circuit-controlling device connected therewith, and an actuating device sensitive to change in temperature, supported by and detachable from said frame, and a cap or cover to inclose the
30 actuating mechanism, substantially as described.

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

MORRIS MARTIN.

Witnesses:

G. W. GREGORY,
W. H. SIGSTON.