(No Model.) 3 Sheets—Sheet 1.

H. A. CHASE.

THERMOSTAT.

No. 455,788. Patented July 14, 1891.

Fig: 1.

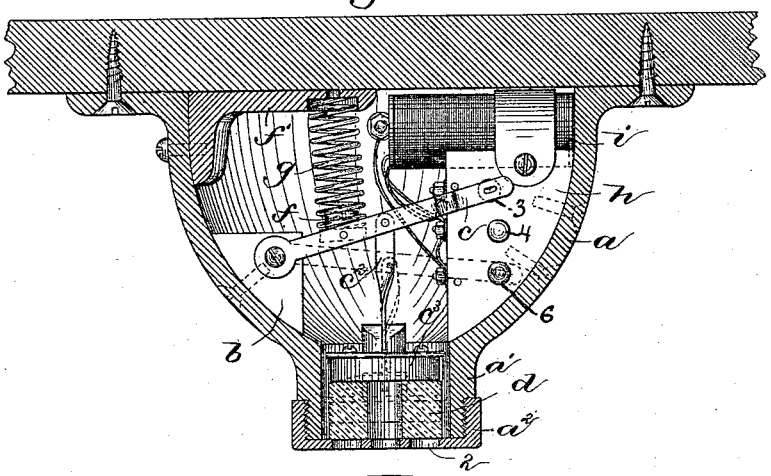


Fig: 2.

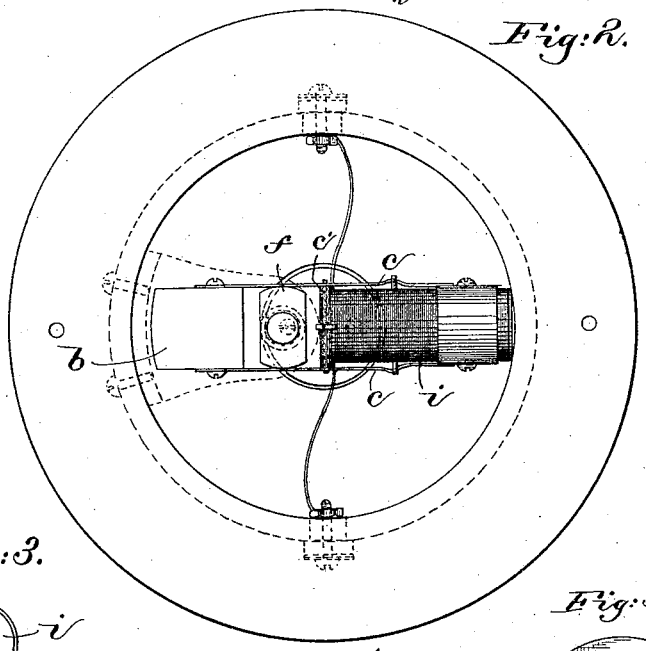


Fig: 3.

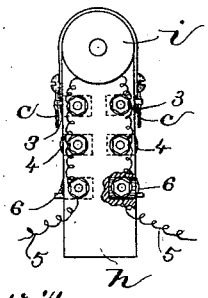


Fig: 4.

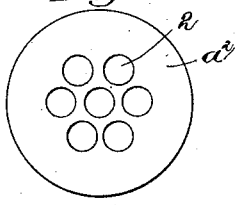
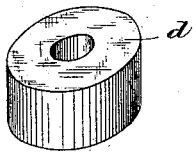


Fig: 5



Witnesses.
Howard F. Eaton.
Frederick L. Emery.

Inventor:
Henry A. Chase,
by Lemby & Gregory
Attys.

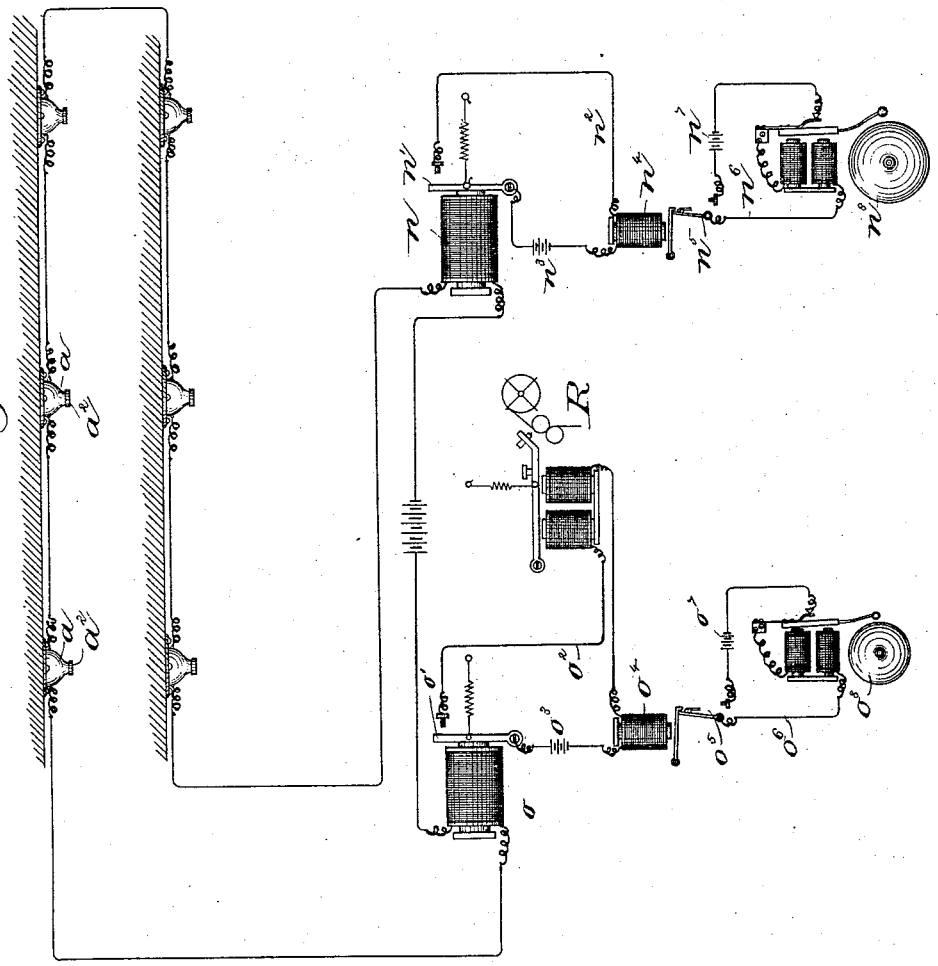
(No Model.) 3 Sheets—Sheet 2.

H. A. CHASE.

THERMOSTAT.

No. 455,788. Patented July 14, 1891.

Fig. 6.



Witnesses.
Howard F. Eaton.
Frederick L. Emery.

Inventor.
Henry A. Chase,
by Lemby & Gregory
Attys.

(No Model.) 3 Sheets—Sheet 3.

H. A. CHASE.

THERMOSTAT.

No. 455,788. Patented July 14, 1891.

Fig: 7.

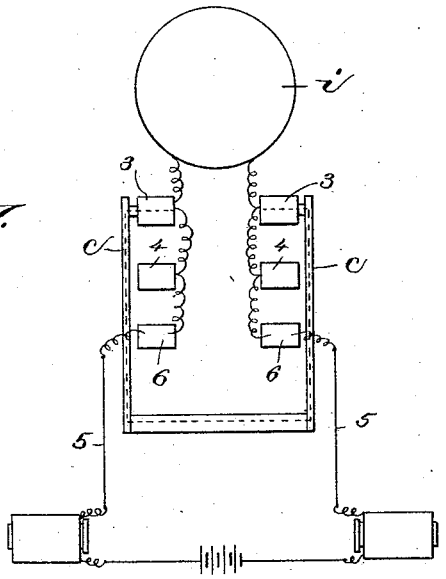
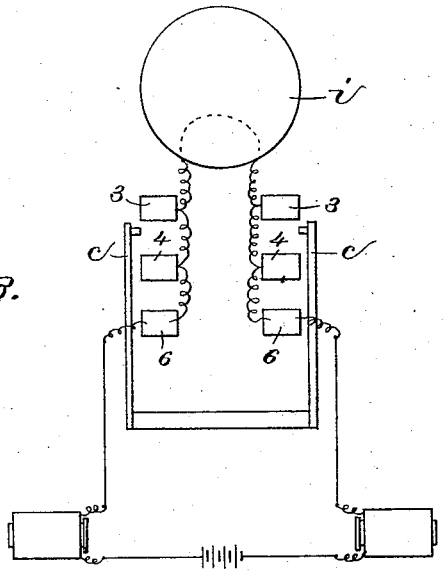


Fig: 8.



Witnesses.
Howard F. Eaton.
John C. Edwards.

Inventor:
Henry A. Chase
by Crosby & Gregory
Attys

UNITED STATES PATENT OFFICE.

HENRY A. CHASE, OF BOSTON, MASSACHUSETTS.

THERMOSTAT.

SPECIFICATION forming part of Letters Patent No. 455,788, dated July 14, 1891.

Application filed October 29, 1888. Serial No. 289,415. (No model.)

To all whom it may concern:

Be it known that I, HENRY A. CHASE, of Boston, county of Suffolk, State of Massachusetts, have invented an Improvement in Thermostats, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

This invention has for its object to improve the construction of thermostatic fire-alarm systems, and has particular reference to the thermostats which are sensible to excessive rises in the temperature and operate to change the condition of a circuit to call into operation an alarm mechanism.

In accordance with this invention the circuit-changing lever of the thermostat is normally pressed by a spring against a block of paraffine or other suitable material, which melts or changes its condition at a certain temperature to permit the spring to descend and move the circuit-changing lever. The circuit-changing lever normally bears upon suitable contacts maintaining the continuity of the circuit, and when moved passes over an insulated portion and again rests upon other contacts, so as to effect a change in the condition of the circuit and thereafter restore it. A resistance-coil is provided, which is short-circuited by the circuit-changing lever when the latter is bearing upon the contacts, but which is introduced when bearing upon the insulated portion to weaken the current.

As herein shown, the device is designed to change the condition of the circuit twice in succession upon the occurrence of a fire. At the central office two receiving-relays are provided, one of which is responsive to a weak current, and the other of which is responsive to a total interruption of the current—such, for instance, as may be caused by a broken wire.

Figure 1 shows in vertical section a thermostat embodying this invention; Fig. 2, a plan view of the thermostat; Figs. 3, 4, and 5, details to be referred to; Fig. 6, a diagram of a circuit provided with several thermostats embodying this invention and with independently-operating receiving-instruments; and Figs. 7 and 8, enlarged diagrams of the circuit, to be referred to.

The outer or inclosing case a is of any suitable shape to be secured to a ceiling or other desirable place. A block b is secured within the case a or formed integral with it, to each side of which is loosely connected a lever c, the said lever c being joined at a point intermediate therewith by a pin or cross-bar c'. An arm or link c^2 is loosely connected with the cross-bar c', which has connected with it at its lower end a disk or plate c^3, preferably circular in shape. The lower end of the case a has a suitable screw-threaded nipple a', upon which is screwed a cap a^2, (see Figs. 1 and 4,) provided with several perforations 2. A block of paraffine d or other suitable fusible material is placed within the nipple a' and held in position beneath the plate or disk c^3 by the cap a^2. Another cross-bar is interposed between the levers c, which supports a block f, which block serves as a support for the lower end of a spiral spring g, the upper end of said spring bearing against a bracket or frame f'. The tendency of the spring g is to depress the levers c as the material d melts. The levers c serve as the circuit-changing lever and normally bear upon contacts 3, attached to a block h, secured to or formed integral with the case a. As the material d melts the spring presses the circuit-changing lever c downward free from contacts 3 over the insulated portion of the block h and onto the contacts 4, it being understood that the block h is composed of insulating material. As the levers c pass from the contacts 3 to the contacts 4 the condition of the circuit will be changed. A resistance-coil i is placed within the case a and connected in circuit, as shown in Figs. 3, 7, and 8, so that the circuit-changing lever c, when resting on the contacts 3, short-circuits the said resistance-coil, the current passing over the wires 5 to contacts 3 and through the levers c, and when the said levers c have been moved down free from the contacts 3 the current passes over the wires 5 and through the resistance-coil i, thereby weakening the current. As soon as the levers rest on the contacts 4 the condition of the current is again restored.

I have herein shown a third pair of contacts 6, located below the contacts 4, so that the circuit-changing lever c may be depressed sufficiently to produce two changes in succession in the condition of the current—namely,

by successively introducing the resistance-coil *i*.

At the central station I have provided a relay *o*, which is responsive to a weakening or variation in the strength of the current, and as its armature *o'* recedes it falls against a contact and closes a local circuit o^2, including a local battery o^3, and the operating-coil o^4 of an annunciator-drop o^5, which is designed not only to indicate the operation of the relay *o*, but also to close a local circuit o^6, including a local battery o^7 and the operating-coils of a bell o^8. A register R will also be included in the local circuit o^2. I have also included in the circuit a relay *n*, the armature *n'* of which will recede or respond upon a total interruption of the current, and will close a local circuit n^2, including a local battery n^3 and the operating-coil n^4 of an annunciator n^5, which is designed to also close a local circuit n^6, including a local battery n^7 and the operating-coils of a bell n^8. These relays *o* and *n* are adjusted to operate, as described, by adjusting the retractile springs.

It will be seen that by the employment of the thermostat herein described a momentary rise in the temperature will hardly be sufficient to effect the operation of the alarm; but by a continuous rise in the temperature the material *d* will melt and will be pressed through the perforations in the cap a^2 by the employment of the spring *g*, and, as herein shown, two changes in the condition of the current will be made.

I do not desire to limit my invention to a series of contacts, whereby the condition of the circuit may be changed more than once, although this forms an important feature.

I claim—

1. In a thermostatic fire-alarm system, the combination, substantially as described, of a thermostat comprising a spring-actuated circuit-changing lever, material *d* for sustaining the lever in position against the tension of its actuating-spring, electric contacts for the circuit changing lever, and a resistance-coil normally short-circuited or shunted out by the said circuit-changing lever, an electric circuit in which said thermostat is placed, and a receiving-relay responsive to a weakening in the circuit caused by the introduction of the resistance-coil, substantially as described.

2. In a fire-alarm system, several thermostats, each having circuit-changing levers and electric contacts, and a resistance-coil normally short-circuited or shunted out by the said circuit-changing levers, combined with a receiving-instrument responsive to a weakening of the current produced by the interposition of the said resistance coil or coils, and another relay responsive only to a total interruption in the current, substantially as described.

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

HENRY A. CHASE.

Witnesses:
BERNICE J. NOYES,
F. L. EMERY.