No. 714,810. Patented Dec. 2, 1902.

A. T. LE VESCONTE.

THERMOSTAT.

(Application filed Feb. 7, 1901.)

(No Model.)

Fig. 1.

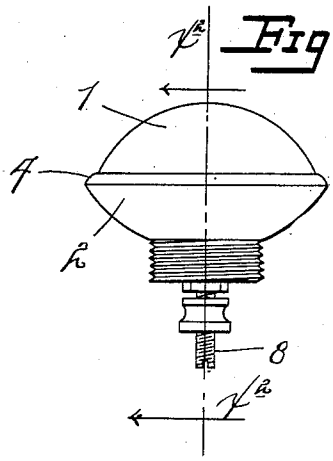


Fig. 2.

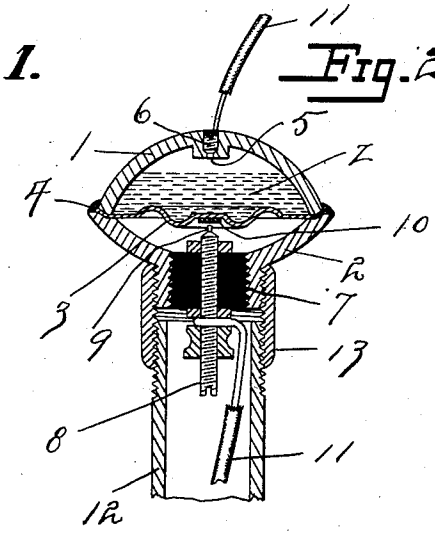


Fig. 3.

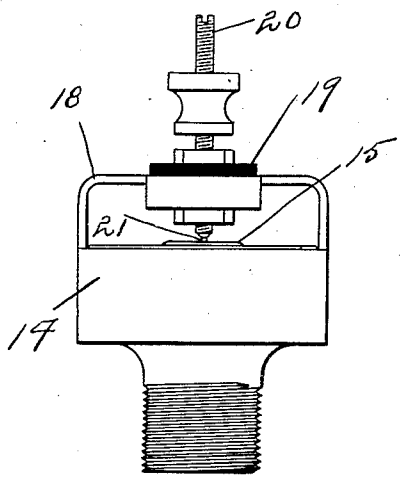
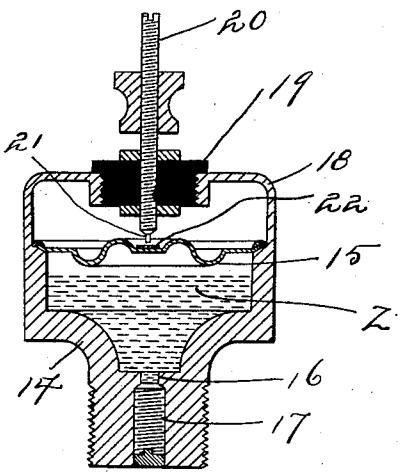


Fig. 4.



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UNITED STATES PATENT OFFICE.

ALFRED T. LE VESCONTE, OF MINNEAPOLIS, MINNESOTA.

THERMOSTAT.

SPECIFICATION forming part of Letters Patent No. 714,810, dated December 2, 1902.

Application filed February 7, 1901. Serial No. 46,311. (No model.)

To all whom it may concern:

Be it known that I, ALFRED T. LE VESCONTE, a citizen of the United States, residing at Minneapolis, in the county of Hennepin and State of Minnesota, have invented certain new and useful Improvements in Thermostats; and I do hereby 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.

My invention has for its object to provide an improvement in thermostats; and to this end it consists of the novel devices and combinations of devices hereinafter described, and defined in the claim.

More specifically stated, my invention relates to thermostats for controlling electric circuits for sounding alarms or for doing similar work; and it consists of a bulb or liquid-containing compartment having a diaphragm the movement of which makes and breaks contact between the electrodes of the electric circuit. In this bulb or compartment a liquid is placed, and the diaphragm is arranged to be actuated by the boiling of the liquid. For most purposes the electric circuit should be closed and the alarm sounded at quite low temperatures compared with the boiling-temperature of water. Hence liquids other than water must usually be employed. Chlorid of ethyl, which boils at 54° Fahrenheit, aldehyde, which boils at 69° Fahrenheit, sulfuric ether, which boils at 95° Fahrenheit, sulfid of carbon, which boils at 114° Fahrenheit, and bromin, which boils at 145° Fahrenheit, may be used within the bulb, according to the temperature at which it is desired to operate the thermostat. For other temperatures other liquids or combinations of liquids may, of course, be used.

The invention is illustrated in the accompanying drawings, wherein like characters indicate like parts throughout the several views.

Figure 1 is a view in side elevation, showing one of my improved thermostats. Fig. 2 is a section on the line x^2 x^2 of Fig. 1, showing the thermostat secured to the end of a tube. Fig. 3 is a side elevation showing another of my improved thermostats, which varies somewhat in construction from that shown in Figs. 1 and 2; and Fig. 4 is a section taken centrally through the thermostat shown in Fig. 3.

In the construction illustrated in Fig. 1 two outwardly-bulged concavo-convex sections 1 2 are soldered together and to the margin of a diaphragm 3, as indicated at 4 in Fig. 2. The said diaphragm 3 and section 1 constitute a liquid-containing chamber or bulb, into which the liquid (indicated at *z*) is placed, the same being passed through a perforation 5 in said section 1. The perforation 5 is normally tightly closed by a screw-threaded plug 6 or other device. An insulating-bushing 7 extends through the hub of the section 2, and through this bushing a screw 8, which serves as an electrode, is passed, the inner end of the same preferably having a patinum point 9, which is normally out of contact with a platinum contact-piece 10 on said diaphragm. One of the lead-wires 11 connects to the screw or electrode 8, while the other connects to the bulb-section 1. The said section 1 is a metal and has contact with the metal diaphragm 3. In Fig. 2 the hub of the section 2 is shown as connected to a supporting pipe or tube 12 by means of a coupling-sleeve 13.

The construction illustrated in Figs. 3 and 4 is very much the same as that above described. The bulb or liquid-containing compartment in this case is formed by a hollow head 14, having soldered to its upper and otherwise open face a diaphragm 15. The head 14 is provided with a passage 16, normally closed by plug 17, but affording when open a passage through which the liquid may be introduced into the bulb. A yoke 18, extending diametrically across the upper face of the head 14, affords a support for an insulating-bushing 19. A screw 20, which serves as an electrode, extends through the bushing 19, the same as in the above-described construction. Also, as shown, the electrode 20 is provided with a platinum contact-point 21, and the diaphragm 15 has a platinum contact-piece 22.

The operation of both devices is substantially the same, and in the following description of the operation attention is directed to Figs. 1 and 2. It is evident by inspection of Fig. 2 that the circuit through the wires 11 is normally broken between the needle-point

9 of the electrode 8 and the contact-piece 10 of the diaphragm 3. The bulb is preferably only partially filled with the liquid z, which liquid we will assume to be sulfuric ether. It is of course evident that when 95° Fahrenheit is exceeded in the temperature of the atmosphere or medium in contact with the liquid-containing bulb the said liquid will be boiled and upon being converted into vapor will expand and by its pressure force the contact-piece 10 on the diaphragm into contact with the platinum point 9 of the electrode 8, thereby closing the circuit and sounding the alarm or performing whatever work is to be performed by the closing of the circuit.

Of course the construction might be reversed and the arrangement be such that the circuit will be held normally closed and be broken or opened by the movement of the diaphragm or other movable part under the expanding pressure of the created vapor.

As one of the lead or circuit wires 11 is passed through the supporting tube or pipe 12, it is kept out of contact with the surrounding grain or material, so that the said connection 11 cannot be short-circuited even though the surrounding grain be damp or wet.

What I claim, and desire to secure by Letters Patent of the United States, is as follows:

The combination with a thermostat, comprising a liquid-containing chamber having a diaphragm which is moved by pressure generated within said chamber, a pipe or tube supporting said diaphragm a pair of electrodes movable in and out of contact by said diaphragm, and leads to said electrodes, one of which is passed axially through the said supporting pipe or tube, whereby short-circuiting by a surrounding material is prevented, substantially as described.

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

ALFRED T. LE VESCONTE.

Witnesses:
ANNE S. READ,
F. D. MERCHANT.