(No Model.)

M. D. COMPTON.

ADJUSTABLE THERMOSTAT.

No. 482,420. Patented Sept. 13, 1892.

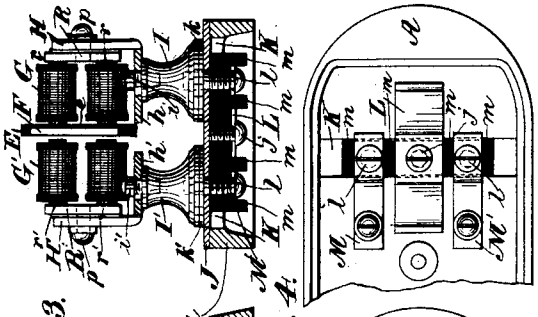

Fig. 3.

Fig. 4.

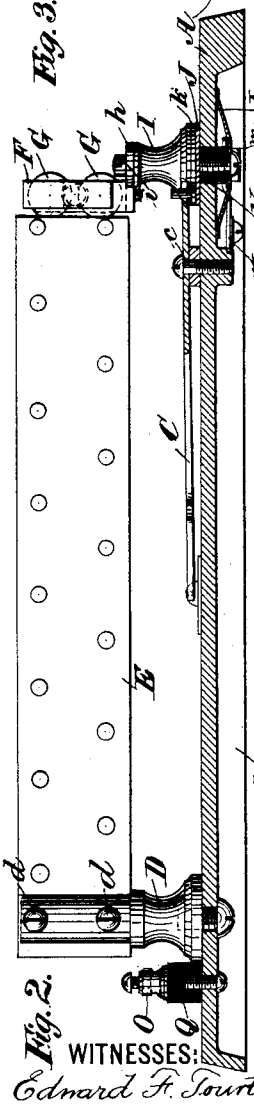

Fig. 2.

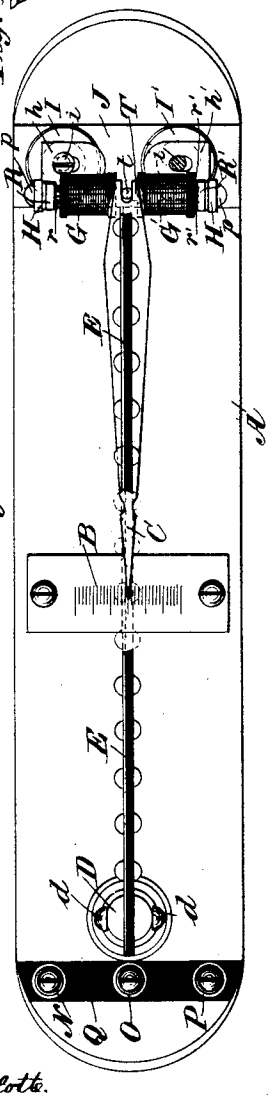

Fig. 1.

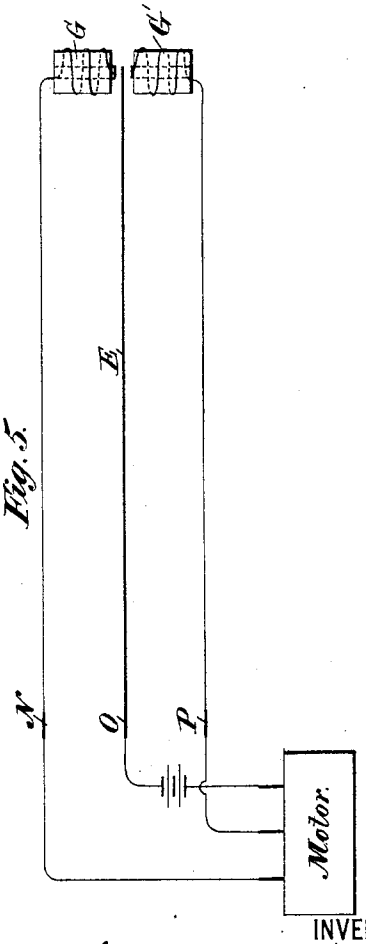

Fig. 5.

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UNITED STATES PATENT OFFICE.

MELVIN D. COMPTON, OF NEWARK, NEW JERSEY.

ADJUSTABLE THERMOSTAT.

SPECIFICATION forming part of Letters Patent No. 482,420, dated September 13, 1892.

Application filed November 21, 1891. Serial No. 412,667. (No model.)

To all whom it may concern:

Be it known that I, MELVIN D. COMPTON, a citizen of the United States, residing at Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Adjustable 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 reference to thermostats; and it consists of several features, the most important of which is that of rendering the action of the thermostatic apparatus more certain than has been the case heretofore. The thermostats to which my invention is applied are such as are employed for operating electrical circuits. It happens that the initial contact made by a gradual increase or decrease of the temperature is excessively feeble. It is noticed in practice that the contacts in such cases are at first vibrating contacts. This circumstance interferes greatly with the perfect operation of the apparatus, in consequence of which any motor in a circuit controlled by the thermostat has been imperperfectly operated or with extreme slowness. I combine with a thermostat of this sort electro-magnets in such a manner that when the initial contact is made an electro-magnet will be energized and will hold the circuit closed until the motor has been duly operated. Moreover, my invention concerns itself with providing means for adjusting the contacts on opposite sides of the expansible portion of the thermostat, and at the same time indicating upon a dial the degree to which the thermostat has been adjusted.

My invention will be understood by reference to the accompanying drawings, in which—

Figure 1 is an elevation of a thermostat embodying my improvements. Fig. 2 is a side elevation, partly sectional. Figs. 3 and 4 are detail views, and Fig. 5 is a diagram of the circuits.

Referring to the drawings by letter, A is the base of my thermostat, on which is a scale B and a pointer C, the latter being pivoted at *c*. In the base A is mounted a post D, within which is secured by the screws *d d* a thermostatic compound bar E. On the free end of the said bar is secured an armature F, which stands between an electro-magnet G on the one side and an electro-magnet G′ on the other. These magnets are mounted on frames H and H′, respectively, the said frames being adjustable on posts I and I′, as will be presently shown. The posts last mentioned are secured upon an adjustable frame J and insulated therefrom. The tops of the said posts are flat, and they admit of the adjustment laterally thereon of the bottoms *h* and *h′* of the magnet-frames by means of slots in the said bottoms co-operating with screws *i i′*, entering the tops of the posts.

The frame or plate J slides over a slot K in the base A, and it is held firmly down upon the said base by means of a spring L under the base A, which bears at both ends upon the bottom of the said base and is secured to the said plate J by a screw *j*. The posts I and I′ are secured in place by means of screws *l l′*, which are insulated from the base and from the frame J. It will be observed that there are insulating-washers *k k′* between the bottoms of the posts and the plate J, and also that below the base A there are insulating-pieces *m m m m*. The screws which attach the posts to the frame also secure below the base some insulated binding-strips M M′, to which are attached electric-circuit wires, as will be explained hereinafter. On the upper end of the base A are mounted three binding-posts N O P, the two extreme posts being insulated by the strip Q, of hard rubber, and the central post being connected through the said insulating-piece with the base A, and also through the base with the post B and the thermostatic bar E. The binding-post N is joined below the base with the binding-strip M by suitable wire. Similarly the binding-post P is joined to the binding-strip M′. Now the said binding-strips are joined by their respective attaching-screws to the posts I and I′ and the frames H and H′. The frame H is joined to the magnet G the back piece R of the said magnet being joined to the said frame by a screw *p*, which is insulated from the said frame H, but is metallically connected to the back piece, and is consequently in electrical connection with the cores *r r* of the two bobbins form-

ing the magnet. The same connection exists from the binding post or strip M′ and its attaching-screw to the post I′, the frame H′, the magnet G′, the screw P′, the back piece R′, and the cores r' r'.

Referring now to the diagram Fig. 5, it will be seen that every time the thermostat moves so as to bring the armature at its end into contact with the magnet-cores on one side or the other the circuit of the magnet in question will be closed and the motor in the said section will be operated; but since the magnet-circuit is closed, the armature will be held fast against the poles and all vibration will be avoided.

It is true that the motor which is usually employed in heat-regulating circuits is usually such a motor as itself causes repeated interruption of the circuit according to the principle of a vibrating bell; but in such cases the armature at the motor responds, when the circuit is broken, to the action of a spring of considerable force, whereas the tendency to break the circuit at the thermostat itself is at the most very feeble. Consequently I find that the residual magnetism in the magnet-cores of the magnets G and G′ is sufficient to hold the armature *e* without any sensible vibration, notwithstanding the interruptions of the circuit at the motor.

On the top of the plate J is a pin *t*, which is inclosed in a yoke T on the lower end of the pointer. By moving the pointer on its pivot, the whole frame, together with the magnets supported thereon, can be moved from side to side in an obvious manner. Now my thermostat is designed for use in systems of heat-regulation where it is desired to maintain the temperature in a room where the thermostat is located stationary within certain fixed limits. The limit may be made wide or narrow by adjusting the distance between the magnets G and G′, as has already been described. Ordinarily the temperature at which a room is to be maintained is 70°, with a limit of 1° on each side. In that case the magnet will be so adjusted that the armatures will stand just half-way between their poles when the temperature is 70°, and will make contact with one of them when the temperature increases to 71°, and with the other when the temperature decreases to 69°. It may, however, become desirable to use the thermostat in another room, whose temperature is to be kept at a lower or a higher degree, with the same range on either side. In that case the pointer is moved upon the scale to the right or left until it indicates the degree desired, and in moving it causes the magnets to move correspondingly, as will be readily understood. Thus when a thermostat has been once adjusted it can be used to keep the temperature stationary at any desired degree by simply turning the pointer C so as to bring it into line with the degree determined upon. It has been explained already that the magnets themselves can be adjusted to vary the limits between which the temperature is to range.

What I claim is—

1. In an electrical system, a thermostatic expansible piece forming a terminal of an electric circuit, contact-pieces forming corresponding terminals on either side thereof, the said contact-pieces forming the cores or poles of electro-magnets and being located each in a separate branch circuit, and the said electro-magnet being located, respectively, in the same branch circuits, the said expansible piece having or carrying an armature common to the two magnets, as and for the purpose set forth.

2. The combination, with an electro-magnetic motor and a pair of branch circuits connected therewith, of a thermostat adapted to close one branch or the other on an increase or decrease of the temperature, the said thermostat consisting of an expansible piece forming the terminal of the main circuit and carrying an armature which is located between the poles or cores of a pair of electro-magnets, one on each side of the said armature, the said magnets, with their cores or poles, being located in different branches, as set forth.

3. In a thermostat, a pair of adjustable electro-magnets located on opposite sides of the expansible portion, in combination with an armature attached to or forming a part of the said expansible portion, as set forth.

4. In a thermostat, an adjustable frame or plate carrying insulated posts, a pair of electro-magnets, one on each post, the said electro-magnets being adjustable with reference to the posts, all in combination with a thermostatic piece having or carrying an armature between the said electro-magnets, as set forth.

5. In a thermostat, a frame or plate carrying a pair of insulated posts, an electro-magnet adjustably supported on each post, a thermostatic piece having or carrying an armature between the said magnets, in combination with a scale and a pointer co-operating therewith, the said pointer engaging with the said plate or frame in such a manner as to move it when turned, as and for the purpose set forth.

In testimony whereof I have signed my name, in the presence of two witnesses, this 31st day of October, A. D. 1891.

MELVIN D. COMPTON.

Witnesses:
GEORGE O. SWASEY,
G. H. STOCKBRIDGE.