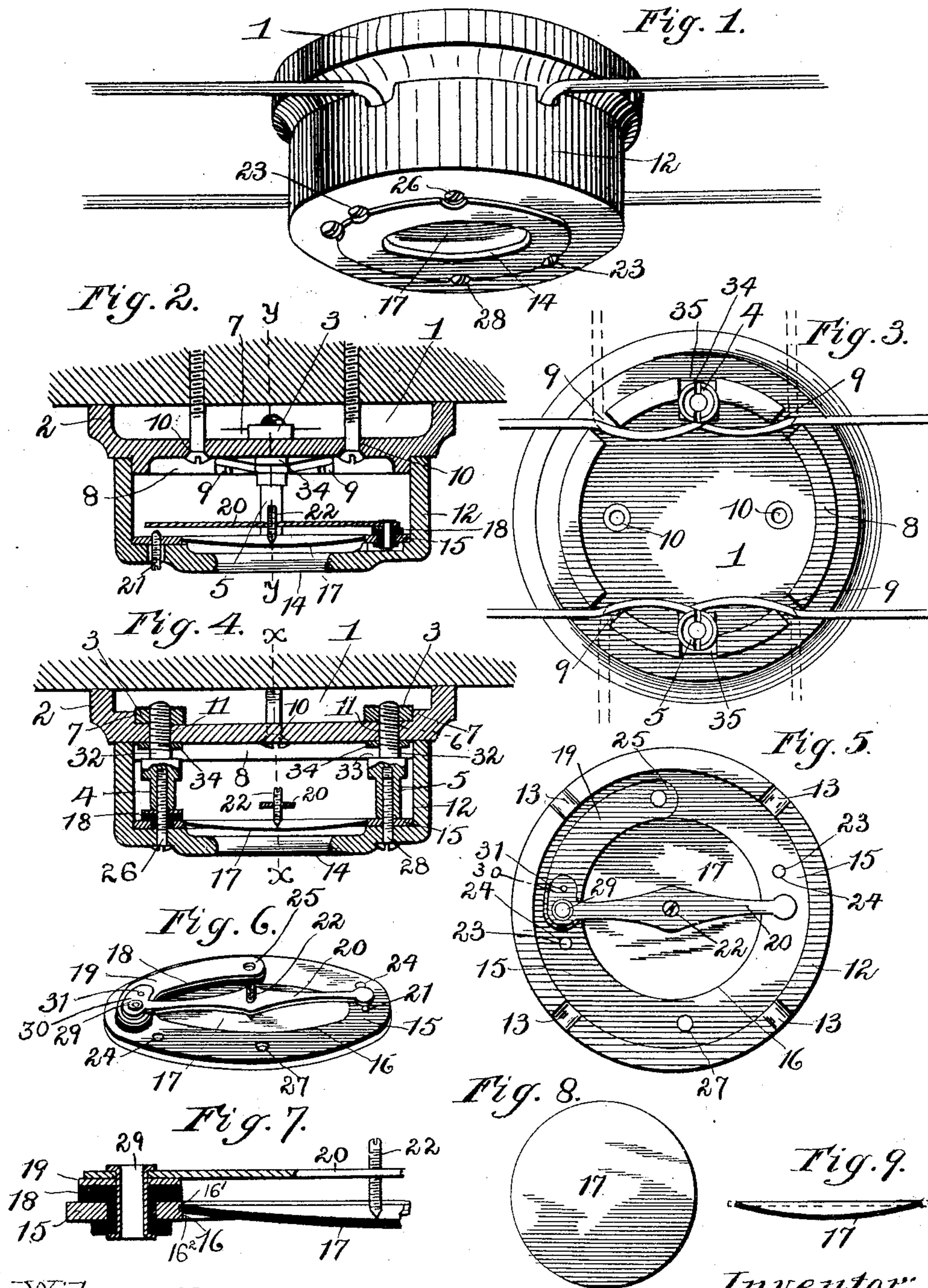


H. CORTLAND.
THERMOSTAT.

(Application filed Jan. 13, 1900.)

(No Model.)



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UNITED STATES PATENT OFFICE.

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THERMOSTAT.

SPECIFICATION forming part of Letters Patent No. 663,419, dated December 11, 1900.

Application filed January 13, 1900. Serial No. 1,288. (No model.)

To all whom it may concern:

Be it known that I, HARVEY CORTLAND, a citizen of the United States, residing at Pittsburgh, in the county of Allegheny and State of Pennsylvania, 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 figures of reference marked thereon, which form a part of this specification.

My invention relates to a thermostat of a character to be employed in coaction with an automatic fire-alarm indicator; and one object of the invention is to provide a single-acting thermostat upon an open circuit.

A further object is to provide a thermostat in which the base and inclosing parts shall be non-corrosive, not liable to rust, and at the same time dust-proof.

A further object is to provide a thermostat in which the base is attachable to a fixed object—as, for instance, a ceiling—with binding-posts connected with the base, arranged for convenience of wiring thereto, whereby a building may be wired upon the binding-posts of the base, and afterward the top case, having secured therein a ring in which are secured the expansible diaphragm and finger for closing the circuit upon flexure of the diaphragm under thermal conditions, is secured, the said ring being provided with contacts with the binding-posts, thereby greatly reducing the labor of wiring a building.

A further object is to provide a base and porcelain shell having openings at different radial points through which the wires may be passed either in parallelism or at an angle to each other, thereby dispensing with the ordinary cleat at this point.

A further object is to simplify the means of attachment of the contact-finger with the ring, and, in fact, to simplify and cheapen the production of the thermostat generally.

The invention consists in the parts and combination of parts hereinafter described, and pointed out in the claims.

In the drawings, Figure 1 is a perspective view of the thermostat, showing the wires

turned at right angles. Fig. 2 is a central vertical section taken at a point indicated by line $x x$, Fig. 4. Fig. 3 is a top plan view with the case removed, the wires being shown in full lines in parallelism and in dotted lines at right angles. Fig. 4 is a central vertical section taken at a point indicated by line $y y$, Fig. 2. Fig. 5 is a top plan view of the case, showing the ring secured therein, this view showing the case as ready for attachment to the base after the wires have been secured upon the binding-posts of the base. Fig. 6 is a perspective view showing the ring and its attachments. Fig. 7 is a detail view, on an enlarged scale, showing the means of securing the finger and insulator to the ring. Fig. 8 is a plan view of the concave expansible disk; and Fig. 9 is a sectional elevation of the disk, showing by dotted lines the disk when flat and in full lines the contraction in diameter when it is flexed into the ring.

1 designates the base, preferably formed with an annular flange 2 upon the bottom side to accommodate the square nuts 3 of the binding-posts 4 and 5, and for convenience of assembling the parts I form the binding-posts with screw-threaded ends 6, which screw into the nuts and bisect the circle of the flange by squared shoulders 7, against which the nuts abut upon one side to prevent them from turning. Upon the face of the base there is formed a ring 8, having openings 9, through which the wires may pass and over which the case fits closely to exclude dust. The base is provided with holes 10, through which screws pass to secure the base to a fixed object, there being holes 11 through which the binding-posts pass. 12 designates the case, of an interior diameter to closely fit ring 8 and having openings 13, which register with openings 9 and which closely fit the wires, the top of the case having a central opening 14, through which heat may communicate to the expansible disk of the thermostat.

I have found that in this branch of the art there must be provision for an absolute prevention of rust or corrosion and have discovered that a base and case formed of porcelain or analogous material attains this object perfectly, a further advantage in the use of this or an analogous material being that when in a plastic state it can be molded to the ex-

act shape, with all the necessary indentations and projections to perfectly assemble the contained parts, it being my object to securely house the thermostat proper, so as to be not only dust-proof, but to so insulate the thermostat as to prevent contact with extraneous conductors, and have provided for an assemblage of the base and case with the inclosed thermostat by simply telescoping the case upon the ring of the base without danger of injuring the wires or their insulating-covering.

The thermostat proper includes the ring 15, having a central opening 16, which is of two diameters, an upper larger diameter forming a seat 16', into which is flexed a concave disk 17, sensitive to heat, and a lower smaller diameter forming a flange 16², which forms a limiting-stop for the disk when it is pressed into the ring and upon which the lower edge rests, and upon the inner face of the ring is placed an insulator 18, in the form of a segment of a circle, and upon the insulator is placed a similarly-shaped metal conductor 19, upon the top of which is secured a conducting-finger 20 of a length to span the opening 16 and when depressed make contact with a contact-point 21, adjustably secured in the ring, the finger being secured at a diametrically-opposite point in contact with conductor 19, but insulated from the ring. The finger is perforated centrally of its length, the perforation being screw-threaded, there being a screw 22 run into the screw-threaded perforation and normally resting upon the expansible disk 17, so that when the disk 17 is flexed from its normal concavity the screw responding to the movement allows the free end of the finger to make contact with the point 21 to short-circuit the current, as will be presently described. Binding-posts 4 and 5 are centrally perforated upon their free ends, the perforations being screw-threaded, and in assembling the parts the thermostat is first secured within the case by means of screws 23, which screw into screw-threaded holes 24 in the ring. Binding-post 4 is in coincidence with the end 25 of conductor 19 and is secured to the thermostat by means of a screw 26, while binding-post 5 coincides with perforation 27 in the ring and is secured to the ring in electrical connection by screw 28. With this construction and arrangement the series wire is connected with binding-post 4 and the annunciator-wire with binding-post 5, so that in the event of the flexure of disk 17 the finger contacts with point 21 and short-circuits the current to the ring, and consequently to the annunciator-wire.

In order to produce an expansible and contractible disk that will respond accurately under thermal conditions, such as are met in a fire-alarm system, I form the disk of vulcanized fiber vulcanized at a temperature of approximately 350°, and after repeated experiments have found this character of disk to be superior to any heretofore employed to

my knowledge, as I find that vulcanized fiber treated at this temperature produces a disk which in the manufacture can be produced of uniform thickness and sensitiveness at a small cost and in its operation can be subjected to flexure by heat a greater number of times without destroying its uniformity of flexibility. I have simplified the construction and means of attachment of the finger by the employment of an eyelet 29, which passes through the ring, insulator, and conductor 19, thereby securing these parts closely together, and by forming an enlargement 30 upon the end of the finger allow of indenting the same into the conductor 19, as shown at 31, thereby holding the finger in its transverse arrangement with the ring. I consider the construction of the binding-posts of especial importance. The screw-threaded portions 6 are of a length to pass through the base and screw into the nuts, and above the screw-threaded portion is a smooth unthreaded portion 32, around which the wire is coiled and abuts against a shoulder 33, there being a squared washer 34 interposed between the base and the wire, the washer seating in opening 35 in the ring of the base.

It will be seen from the foregoing that I have provided a thermostat inexpensive of construction, with a non-corrosive practically dust-proof case and with provision for convenience of wiring by means of my improved binding-post, the wires being safely housed from contact with or abrasion from an extraneous object, and that I have reduced the cost of assembling the parts to a minimum.

What I claim is—

1. An expansible and contractible disk for thermostats of fiber vulcanized at substantially 350° Fahrenheit.

2. In a thermostat, a base having binding-posts secured thereto, the outer ends of said binding-posts being tubular, and internally screw-threaded, a case having an annular flange of a diameter and length to abut against the base, and house the binding-posts, a thermostat housed in the case, and screws passing through orifices in the case and thermostats and screwing into the threaded bores of the binding-posts.

3. In a thermostat, a base having upper and lower annular flanges, binding-posts, each comprising a body and a shank of less diameter than the body, forming a shoulder, orifices in the base through which the shank passes, a washer secured upon the shank between which and the shoulder is secured the wiring, a case, a thermostat housed therein, and screws passing through orifices in the case, and screw-threaded orifices in the binding-posts.

4. A thermostat, comprising the following elements, a metal ring having an expansible and contractible disk secured therein, a metal conductor in the form of a segment, a strip of insulating material between the conductor and the ring, and a finger bearing at one end

upon the conductor, and means for securing these elements together, which consists of an orifice in each of the elements, an eyelet passed through the several orifices the ends
5 being expanded, the orifice in the metal ring being larger than the orifice in the other elements, and insulating material interposed between the wall of the orifice and the eyelet, and also between the face of the ring surrounding the orifice, and the flange of the
10 eyelet.

5. In a thermostat, a finger having an orifice in one end, an enlargement at one side of the

finger opposite the orifice, a metal ring, a segmental plate upon which the finger rests, an
15 eyelet for securing the parts together, and a projection formed by an indentation in the enlargement, which projects into the segmental plate, by which means the finger is held from radial movement upon the eyelet. 20

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

HARVEY CORTLAND.

Witnesses:

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