H. DIXON.

ELECTRIC THERMOSTATIC FIRE ALARM CONTACTS

APPLICATION FILED DEC. 26, 1912.

1,117,347. Patented Nov. 17, 1914.

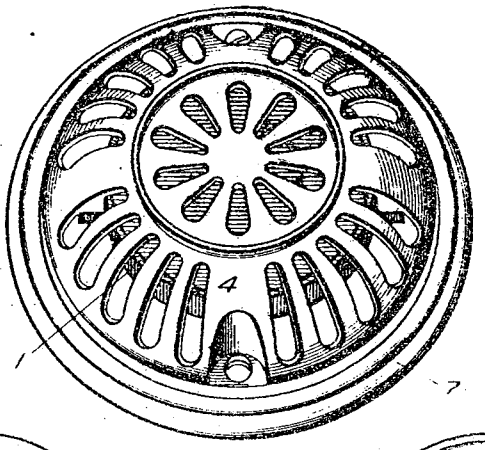


FIG. 1.

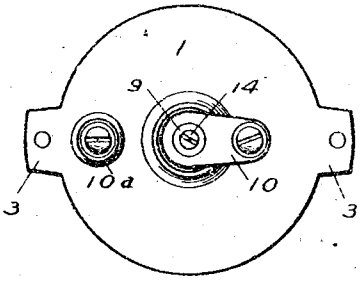


FIG. 2.

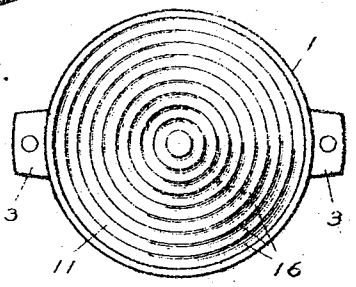


FIG. 3.

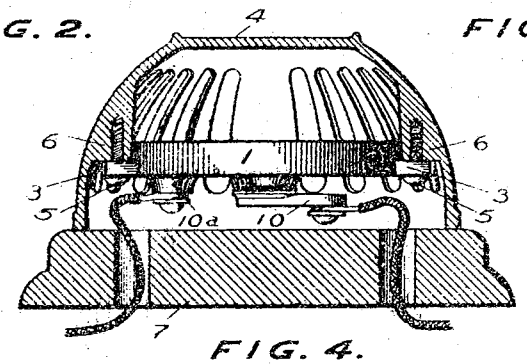


FIG. 4.

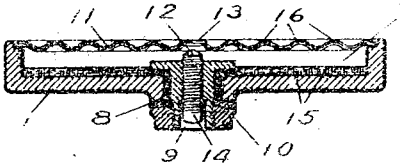


FIG. 5.

Witnesses

Stanley J. Palmer

J. M. Kent

Inventor

Henry Dixon

UNITED STATES PATENT OFFICE.

HENRY DIXON, OF TORONTO, ONTARIO, CANADA, ASSIGNOR TO FRANKLIN DWIGHT CURTIS, OF HAMILTON, ONTARIO, CANADA.

ELECTRIC THERMOSTATIC FIRE-ALARM CONTACTS.

1,117,347. Specification of Letters Patent. Patented Nov. 17, 1914.

Application filed December 26, 1912. Serial No. 738,738.

To all whom it may concern:

Be it known that I, HENRY DIXON, of the city of Toronto, in the county of York and Province of Ontario, Canada, have invented certain new and useful Improvements in Electric Thermostatic Fire-Alarm Contacts; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, which form part of this specification.

The present invention relates to improvements in a device for the detection and location of fire, and particularly to that class in which a thermally-actuated contact automatically closes or opens an electric circuit and sets in action the alarm device; and the object of the invention is to overcome the difficulties that are encountered owing to the uncertainty of contact occasioned by the presence of minute particles of dust or oxidation between the contact-points, and the detriment due to the tendency of the contacts to vibrate, serious defects in the use of previous devices of this class; and furthermore, to provide a positively reliable and highly sensitive thermally-actuated contact device, applicable alike, for high or low predetermined temperatures and under varying climatic conditions.

Characteristic of the present invention is the inclosing of the electric contacts within a hermetically sealed chamber, in part formed by a thermally-actuated resilient diaphragm, consisting of elements having different coefficients of expansion and contraction, of such construction and form as to set up therein a differential stress relatively proportionate to the change in temperature from that of normal conditions.

The invention consists in part of the incorporation of a non-conducting or heat obstructing medium within the inclosed space contiguous to the resilient diaphragm, whereby the slightest change in temperature beyond that predetermined for setting in operation the alarm device is not prematurely lost through dissipation within the walls of the heavier material forming the case or body of the thermostat, but operative in deflecting the highly sensitive resilient diaphragm irrespective of the attained temperature of the inactive parts of the device, and certain details of construction, as hereinafter set forth and illustrated in the accompanying drawings, in which similar figures of reference refer to like parts throughout.

Figure 1 is a view in perspective showing more particularly the outer casing or protector of the thermostat. Figs. 2 and 3 are views in plan of the back and front, respectively, of the thermostat. Fig. 4 is a view of the device, partly in vertical transverse section with the thermostat shown therein in elevation; and, Fig. 5 is a vertical transverse sectional view showing the interior arrangement of the several parts of the thermostat.

Cast or malleable iron is preferable for the material of which the case 1 of the thermostat is made, the expansion or contraction due to the changes of temperatures being so small comparatively as to be negligible. The case 1 forms the bottom and side walls of the chamber 2, which are of sufficient thickness to withstand any undue strain brought about through careless manipulation when in the act of attaching or regulating the device, and to eliminate practically all deflection or vibration. The case 1 is circular in shape and provided with lateral lugs 3, by means of which it is suspended within the outer casing 4 and attached thereto by screws 5, which enter corresponding lugs 6 integral with the outer casing. The outer casing or protector 4 is of substantially openwork construction, preferably ornamental in design and adapted to be mounted upon a base. The circular wooden base 7, shown in this instance, may be replaced by a suitable condulet or metal base, and provided provision is made for the connecting wires the base can be dispensed with entirely, if found desirable. The openwork construction of the outer casing insures the slightest variation in temperature being readily communicated to the thermostat contained therein by the free circulation of the surrounding air.

The bottom of the chamber 2 is provided with a central opening adapted to receive the insulating bushing 8 surrounding the internally-threaded sleeve 9. One end of the sleeve 9 is provided with a laterally-extending flange, in which respect the insulating bushing 8 is similarly constructed, while the opposite end of the sleeve 9 passes through an insulating washer and into the collar forming portion of the offset binding-post 10, preferably in screw-threaded engagement

with the latter, whereby all parts are clamped firmly to the case 1. In the case 1 provision is made in the upper edge of the circular wall of the chamber 2 for the reception of the circularly-corrugated diaphragm 11, the perimeter of which is adapted to be soldered thereto or otherwise integrally united therewith and thereby hermetically seal the chamber 2. Within the chamber 2 are the contacts 12 and 13, which normally remain out of engagement on an open circuit and the reverse when operating on a closed circuit. The contacts 12 and 13 are in electrical conductivity with the respective binding-posts 10 and 10^a. Adjustment for temperatures at which the thermostat will effect the electric circuit is brought about by varying the distance between the contacts. One end of the adjustable member 14, the shank of which is in screw-threaded engagement with the sleeve 9, comprises the contact 12, while the opposite or accessible end is provided with a screw slot for turning the same. The contact 13 is preferably a platinous point or surface of limited extent, centrally located and integral with the diaphragm.

Between the diaphragm 11 and the opposing wall of the chamber 2, and in juxtaposition with the latter, is the non-conducting or heat obstructing medium 15. This is a very valuable and novel feature as it lessens radiation and tends to conserve the changes of temperatures effecting the diaphragm, and reduces to a minimum the lag or time required for the thermally-actuated member, the diaphragm of the thermostat to conform to the changing conditions of the temperature of the surrounding air.

The diaphragm 11, the thermally-actuated member of the thermostat, consists of elements having different co-efficients of expansion. The major and minor expansive elements of the diaphragm are preferably disks of thin sheet-metal, two or more adapted to be integrally united and provided with concentric creases or corrugations. The effect of providing the corrugations 16, does not only stiffen and control the direction of the deflection of the diaphragm 11, but is advantageous in producing magnified differences in the deflection of the central portion of the same, when subjected to the influence of varying changes of temperatures.

Having described my invention, what I claim as new and desire to secure by Letters-Patent, is:—

1. In a thermostat, a protective outer casing of openwork construction, an inner casing supported thereby and provided with a chamber having an insulated adjustable contact screw, a circular diaphragm comprising an integral succession of alternately inclined concentric surfaces consisting of elements having different co-efficients of expansion, whereby a magnified deflection of the central portion of said diaphragm is brought about by a change in temperature, an electrical contact surface centrally located of said diaphragm, and binding-posts insulated from one another and in electrical conductivity with said contacts.

2. In a thermostat, a casing provided with a chamber having an insulated adjustable contact screw, a circularly-corrugated diaphragm an integral succession of alternately inclined concentric surfaces consisting of elements having different co-efficients of expansion, a non-conducting or heat obstructing medium thermally interacting with said diaphragm, said diaphragm adapted to be integrally united with said casing and provided with a central electrical contact surface, and binding-posts insulated from one another and in electrical conductivity with said contacts.

3. In electrical thermostatic fire-alarm contacts, an outer casing of openwork construction, a thermostat supported therein and having a circularly-corrugated diaphragm made up of elements having different co-efficients of expansion and adapted to be integrally united therewith, a non-conducting or heat obstructing medium interposed between the opposing surfaces of the said diaphragm and the chamber formed in said casing, an insulated adjustable contact screw adapted to interact with an electrical contact surface, and binding-posts insulated from one another and in electrical conductivity with said contacts.

In testimony whereof, I have hereunto signed my name to this specification in the presence of two subscribing witnesses, at the city of Toronto, this twenty-first day of December, 1912.

HENRY DIXON.

Witnesses:
GEO. B. JENKINSON,
H. M. EAST.