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ELECTRICAL THERMOSTAT.  
APPLICATION FILED MAY 2, 1910.

989,347.

Patented Apr. 11, 1911.

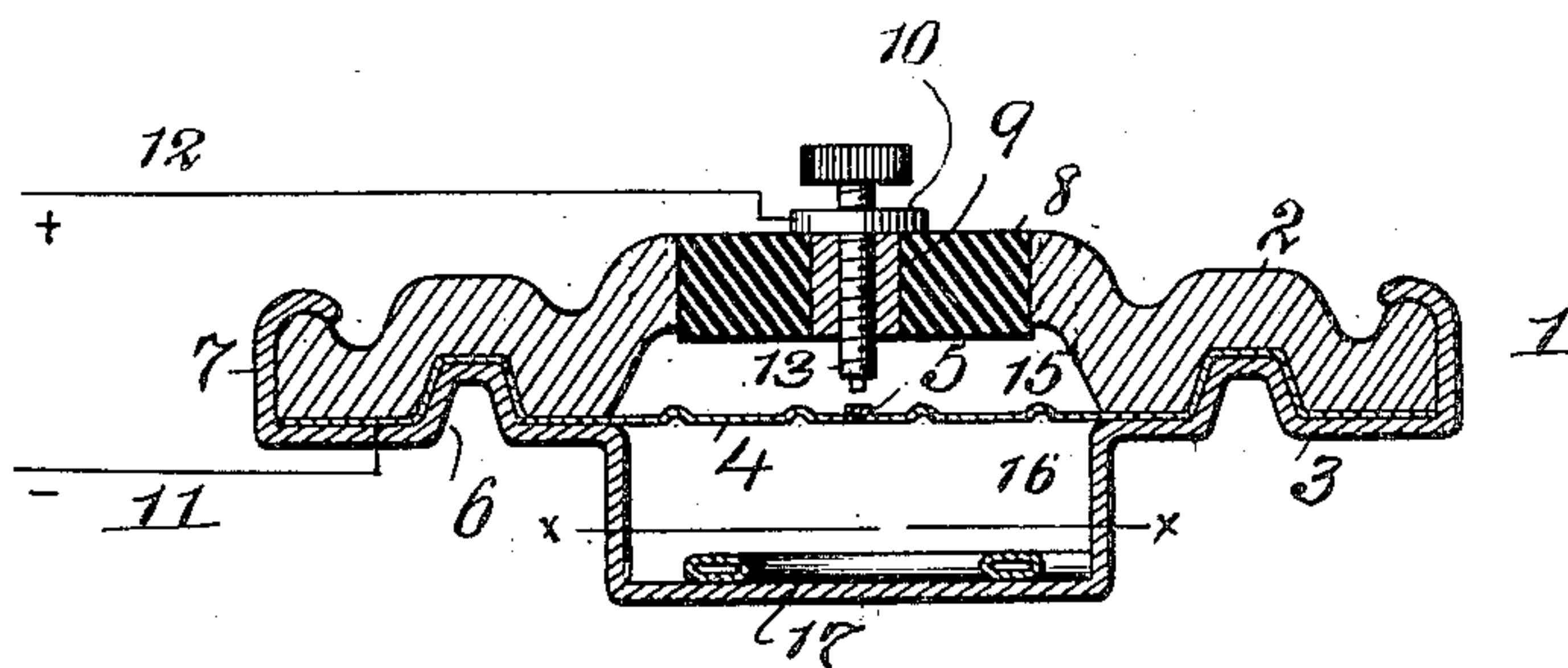


Fig. 1.

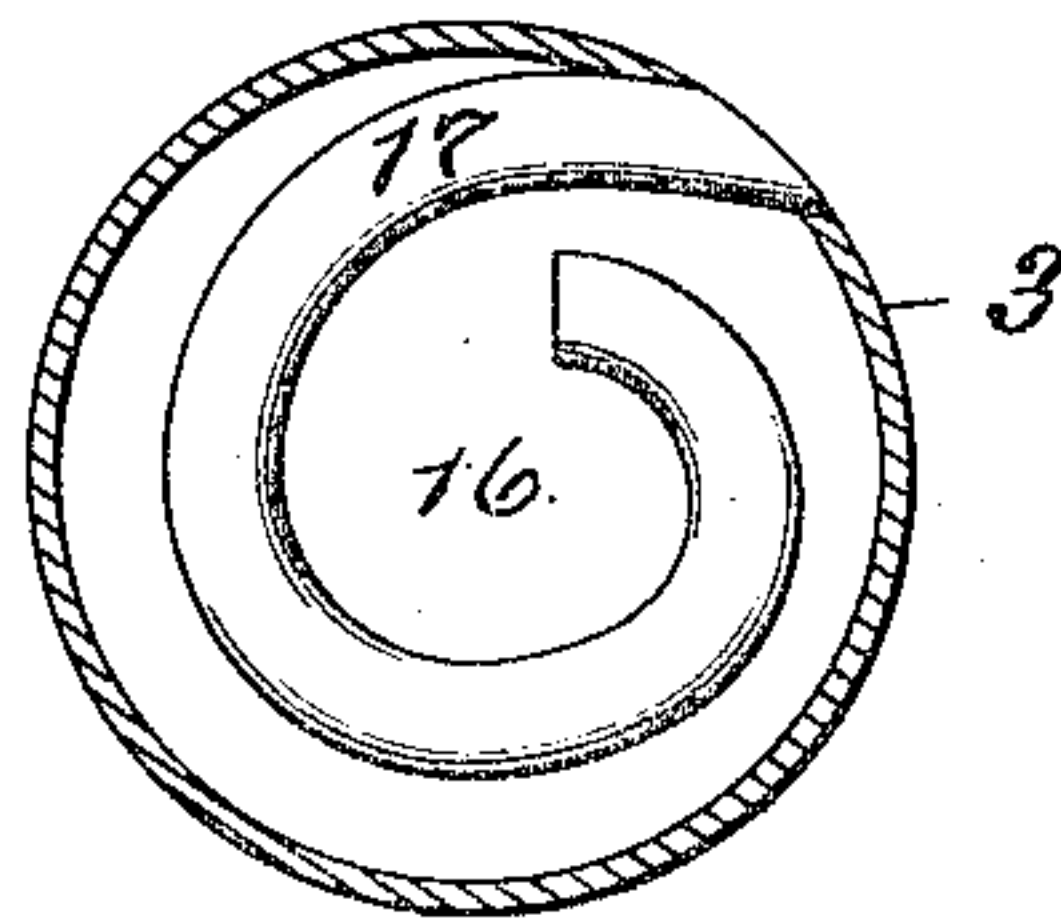


Fig. 2.

Witnesses:

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# UNITED STATES PATENT OFFICE.

ALBERT GOLDSTEIN, OF NEW YORK, N. Y., ASSIGNOR TO INTERNATIONAL ELECTRIC PROTECTION COMPANY, A CORPORATION OF NEW YORK.

## ELECTRICAL THERMOSTAT.

989,347.

Specification of Letters Patent. Patented Apr. 11, 1911.

Application filed May 2, 1910. Serial No. 558,817.

*To all whom it may concern:*

Be it known that I, ALBERT GOLDSTEIN, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented a certain new and useful Improvement in Electrical Thermostats, of which the following is a specification.

The invention relates to electrical thermostats of the type in which air expansion in a closed chamber actuates a diaphragm to close a circuit, which may include any desired translating apparatus.

The invention consists in the construction whereby the instrument is made highly sensitive to slight changes in surrounding temperature, as more particularly pointed out in the claims.

In the accompanying drawing—Figure 1 is a cross section of my thermostat, and Fig. 2 is a section on the line *x, x*, of Fig. 1.

Similar numbers of reference indicate like parts.

The circular case 1 of the apparatus comprises a base portion 2 and a cup portion 3, between which the diaphragm 4 is received and held. Said diaphragm is to be made of thin sheet metal—preferably the thinnest sheet copper procurable—and may be corrugated and provided with a central contact boss 5. The base 2 is to be made, preferably of steel, much heavier than the cup 3, so as to form the chief support of the device. The cup 3 is preferably of a metal that is highly conductive of heat, such as copper, and of as small thickness as will afford the necessary rigidity. The flange of cup 3 has a corrugation 6 which enters a similar corrugation in the flange of base portion 2. The flange of diaphragm 4 is clamped between the base and cup portions, so that when said parts are assembled, a close air-tight joint between them results. The cup portion 3 may be secured by bending its circumferential edge 7 over the edge of base portion 2.

Centrally disposed in base portion 2 is a block 8 of insulating material which receives an internally threaded metal bushing 9, the flange 10 of which rests on block 8. Through said bushing, to which one circuit terminal 12 may be attached, passes the adjustable contact screw 13. The other circuit terminal 11 is connected to the diaphragm

4. The chamber 15 into which the contact screw 13 enters, is completely dust-proof, this result being secured by the close joint, already described, between diaphragm and case. In the chamber 16 on the other side of the diaphragm is a flat spiral tube 17 open at both ends and at its outer end communicating with an opening in the wall of said chamber.

The operation of the apparatus is as follows: The contact screw 13 is preferably adjusted so that its tip comes as close to the contact boss 5 on the diaphragm as is possible without touching; but it may be adjusted at any predetermined distance from said boss, dependent upon the conditions under which it is desired the apparatus shall work. The temperature of the air within the chamber 16 and that of the surrounding atmosphere is normally equalized through the tube 17, so that there is no danger of the apparatus being set in operation and a false alarm consequently given by reason of any gradual changes of temperature in the surroundings. Should, however, a quick rise take place—as in the case of fire—the heat is rapidly conducted through the thin walls of chamber 16 and expands the air therein. This air cannot quickly escape from said chamber, because it is retarded by the long spiral tube 17 which is purposely made flat so as to present a large interior surface and corresponding skin friction. Hence the air impulse is communicated to the diaphragm and moves it instantly into contact with screw 13, so closing the circuit. If the screw is set at some greater distance from the diaphragm, then there will be a proportionate delay in the circuit closing movement.

Any suitable device, such as an alarm which it is desired shall operate when circuit is established, may be connected to the terminals 11 and 12.

I claim:

1. An electrical thermostat comprising a case, a diaphragm therein, a contact piece in proximity to said diaphragm, and a tube open at one end to the atmosphere and communicating at the other end with the interior of said case: the said tube being of a length proportioned to cause a predetermined frictional impedance to escape of air from said case.

2. An electrical thermostat comprising a



case having an air vent, a diaphragm in  
said case dividing the space therein into  
two chambers, a tube open at both ends dis-  
posed in one of said chambers and commu-  
5 nicating at one end with said vent, and a  
contact piece in the other chamber in proxim-  
ity to said diaphragm.

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

ALBERT GOLDSTEIN.

Witnesses:

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