

M. J. BRIGGS.
THERMOSTAT.

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992,541.

Patented May 16, 1911

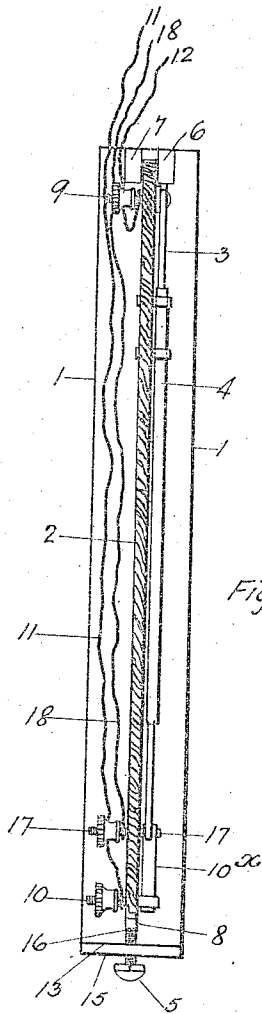


Fig 2

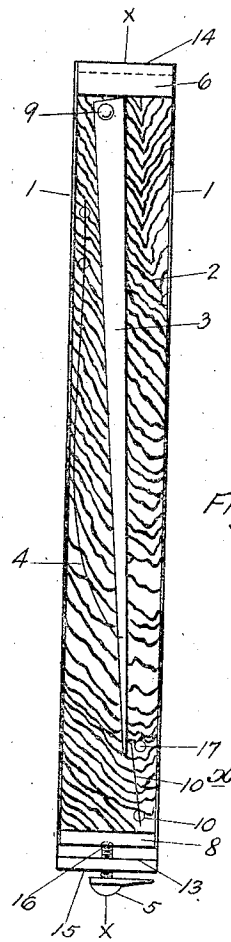


Fig 1.

Fig 3.

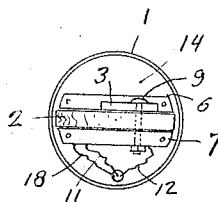
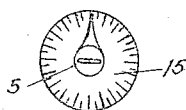


Fig 4.

Witnesses

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THERMOSTAT.

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To all whom it may concern:

Be it known that I, MELANCTHON J. BRIGGS, a citizen of the United States, residing in the city and county of Philadelphia, State of Pennsylvania, have invented a new and useful Thermostat, of which the following is a specification.

My invention is concerned with the construction of a new form of electrical thermostat, such as is employed in a fire alarm circuit to indicate a rise in temperature to or beyond certain predetermined degrees.

One object of my invention is to have the operating parts of the thermostat liable to be injuriously affected by gases or moisture in the surrounding atmosphere, protected therefrom by being inclosed in an air and water tight compartment.

Another object of the invention is to so increase the distance between the contacts as to greatly reduce the liability to false or accidental alarms.

A further object is to secure two successive and distant alarms at different degrees of temperature.

Still another object is to readily adjust and to change the adjustment of the thermostat to any degree of temperature that may be desired.

In carrying out my invention, I employ an elongated tube or case, closed at both ends, so as to be impervious to both air and water, as the expansible member of the thermostat inclosing therein all the other operative parts of the thermostat, except the adjusting screw and the dial plate. This expansible member may be composed of any substance which expands with heat and contracts with cold, but preferably of zinc or brass, and inclosed therein is an adjustable base, preferably of wood, to which is pivotally attached a lever conductor, the short arm of which engages the end of the expansible member and its long arm acted upon by a spring closes electrical circuits when the case of the thermostat is expanded by heat.

My invention further consists of an adjusting screw with an indicating arm thereon, set in a scaled dial affixed to one end of said tube or case, which screw acts upon the

inclosed base by which the thermostat may be adjusted to close an electrical circuit at any predetermined degree of temperature.

It still further consists of a plurality of electrical contacts so arranged as to close a second electrical circuit and thereby give a second or further signal when the temperature increases a predetermined number of degrees above that at which the first circuit is closed.

It still further consists of a lever conductor pivotally secured to an adjustable base and so engaging the expansible member with its short arm that the force exerted by the spring acting on its long arm always acts in one direction both when the thermostat is expanding and contracting thus avoiding any lost motion when changing, whereby the efficiency of the usual indicating mechanism is seriously impaired.

It further consists of other novel details of construction which will be hereinafter fully set forth.

My invention is illustrated in the accompanying drawings in which—

Figure 1, represents the front elevation of the interior mechanism of a thermostat embodying my invention. Fig. 2 represents a section on line *x-x* of Fig. 1. Fig. 3 is a detail showing the dial with scale thereon and the adjusting screw with indicating finger thereon, upon one end of the thermostat. Fig. 4 is a cross sectional view.

The same figures designate the same parts throughout the drawings.

For the purpose of illustrating my invention, I have shown in said drawings one form thereof which is at present preferred by me, since the same has been found in practice to give satisfactory and reliable results, although it is to be understood that the various instrumentalities of which my invention consists, can be variously arranged and organized, and it is not limited to the precise arrangement and organization of these instrumentalities as herein shown and described.

1 designates the expansible member composed of any suitable metal or substance, which will expand and contract under very slight changes of temperature, in the pres-

ent instance composed of zinc. This member may be an elongated cylindrical tube or any form of a case so constructed as to inclose the other operative parts of the thermostat in an air and water tight compartment, so that said parts so inclosed in said expansible member may not be impaired or affected by gases or moisture in the atmosphere surrounding the thermostat.

2 designates an adjustable base supporting the several parts of the thermostat other than the expansible member, and is preferably made up of a thin piece of wood or some other non-conducting material but little affected by changes of temperature, having a metal tip 8 upon one end thereof, in which is a socket 16 fitting the end of the adjusting screw 5. This base 2 fits closely upon the inside of the expansible member 1, yet so loosely as to permit its free movement longitudinally therein. It is supported in position by the adjusting screw 5 in the socket 16 and by the other extremity thereof passing between the blocks 6 and 7 firmly affixed to the end 14 of the expansible member 1, but so loosely that it may move or slide longitudinally between said blocks.

5 designates the adjusting screw with indicating arm thereon. This screw passes through a threaded hole in the center of the dial plate 15 and the end 13 of the expansible member 1 and enters the socket 16 in the center of the metal tip 8 on the base 2, thus supporting in position that end of the base 2, and by its action adjusting the thermostat by moving said base 2 longitudinally therein. By turning the adjusting screw to the right the base 2 is forced upward between the blocks 6 and 7 the short arm of the lever 3 in contact with the block 6 is forced downward, and the long arm thereof is forced against the tension of the spring 4, to the left and away from the contact 10. A scale is laid off upon the dial plate 15, so spaced upon each side of the thermostat, that the movement of the indicating arm upon the adjusting screw 5, of one space of said scale, makes a change of one degree in the temperature required to close the first circuit.

9 designates the conducting lever, made of some conducting material, preferably brass, which is pivotally connected to the base 2, by means of the metal screw or pin 9, so that its short arm engages the face of the block 6, at or near the center thereof, and its long arm extends nearly to the other extremity of the base 2, so as to engage the contact 10. By my novel form of connection of the lever 3, with the expansible member 1, it will be seen that the pressure upon the pivot 9, always acts in one direction, both when the expansible member is contracting and when it is expanding.

4 designates a spring, one end of which is rigidly affixed to the base 2, and the other engages the long arm of the lever 3, with a tension sufficient to force the same against the contact 10 and to carry it in turn against the contact 17, when and as the short arm of said lever 3, shall be sufficiently relieved from the pressure of the block 6, by the expansion of the expansible member 1. 10 designates a flexible spring contact preferably made of German silver, placed on the said base 2, in the path of the long arm of the lever conductor 3, so constructed and placed that it will yield to the pressure of the said lever 3, and spring back to its normal position when such pressure is removed. Its normal position can be adjusted in reference to the contact 17, so that when the temperature shall have increased a predetermined number of degrees, the lever 3 will cause it to engage the said rigid contact 17.

17 designates a second contact attached to the base 2, which, when engaged by the flexible spring contact 10, when it is in electrical contact with the lever 3, will close a second electrical circuit.

12 designates an insulated wire electrically connected with the pivot 9, and passing through a hermetically sealed hole in the end 14 of the expansible member 1, and connected to one pole of an electric battery.

11 and 18 respectively designate insulated wires respectively connected to the contacts 10, and 17, and passing through hermetically sealed holes in the end, 14, of the expansible member 1, and each thence passing through their respective armatures connected with bells, annunciators and the like, to the opposite pole of said electric battery.

The operation of my device, will it is believed, be perfectly clear from the foregoing.

In practice, the thermostat may be set to close the first circuit by means of the adjustable screw 5, at any predetermined degree of temperature. Should the thermostat be subjected to that degree of heat, the expansible member 1, will expand so as to relieve the pressure of the block 6 upon the short arm of the lever 3, the spring 4 will instantly take this up and move the long arm of the lever to the right and against the contact 10, thus closing the first circuit. Should the temperature continue to increase the flexible spring contact 10, will be forced by the pressure of said lever 3 until it engages the second contact 17, thereby closing the second circuit. When a falling temperature causes the contraction of the expansible member 1, the block 6, will press upon the short arm of the lever 3, overcoming the tension of the spring 4, and force the long arm of the said lever 3 to the left and away from the contact 10, which will then spring back

to its normal position away from the contact 17, thus opening the circuits.

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

1. In a device of the character described, an expansible member consisting of a closed tube, an adjustable base inclosed therein and extending longitudinally thereof, means at one end of said tube for supporting and moving said base longitudinally of said tube, the other end of said base being free to move longitudinally, a lever conductor pivoted on said base near its free end, and having arms of unequal length the short arm of which is in contact with the adjacent end of said tube, a spring, one end of which is affixed to said base and the other engages the long arm of said lever conductor, and contacts in the path of said lever conductor.

2. In a device of the character described, an expansible member consisting of a closed tube or case, an adjustable base inclosed therein, an adjusting screw threaded through one end of said tube or case and attached to and supporting one end of said base, blocks affixed to the opposite end of said tube or case and supporting the other end of said base, between which said blocks, said base can be moved longitudinally, a lever conductor pivoted on said base and having arms of unequal length the short arm thereof engaging one of said blocks, a spring one end of which is affixed to said base, the other end engaging the long arm of said lever conductor, electrical contacts in the path of the long arm of said lever conductor so arranged that the lever will close two distinct circuits successively.

3. In a device of the character described, an expansible member consisting of a hermetically closed tube or case, an adjustable base therein, an adjusting screw threaded through one end of said tube or case and holding said base in position, blocks rigidly affixed to the other end of said tube or case between which blocks said base can move or slide longitudinally, a lever conductor pivoted on said base and having arms of unequal length the short arm thereof engaging one of said blocks, a spring one end of which is affixed to said base, the other end engaging the long arm of said lever conductor, a flexible spring contact in the path of the long arm of said lever conductor, which will yield to the pressure thereof caused by the tension of the said spring, and return to its normal position when such pressure is removed and a second electrical contact which will be engaged by said spring contact when it has been sufficiently deflected from its normal position by the continued pressure of said lever.

4. In a device of the character described, an expansible member consisting of an elongated tube or case hermetically closed, an adjustable base inclosed in said tube or case, a lever conductor pivoted on said base and having arms of unequal length its short arm engaging one end of said tube or case, an electrical contact in the path of the long arm of said lever conductor, a spring engaging and actuating said lever conductor, a dial laid off with a scale upon the exterior of one end of said tube or case, an adjusting screw threaded through the end of said tube or case and engaging the end of said base, and an indicating arm or pointer upon the exterior end of said adjusting screw engaging the scale upon said dial.

5. In a device of the character described, an expansible member consisting of an elongated tube or case hermetically closed, a base inclosed in said tube or case, a lever conductor pivoted on said base and having arms of unequal length its short arm engaging said tube or case, an electrical contact in the path of the long arm of said lever conductor, a spring engaging and actuating the said lever conductor and means for adjusting the thermostat.

6. In an apparatus of the character described an expansible member consisting of an elongated tube or case hermetically closed, an adjustable base inclosed in said tube or case, a lever conductor pivoted thereon, and having arms of unequal length its short arm engaging one end of said tube or case, a spring affixed to said base and engaging the long arm of said lever conductor, an electrical contact in the path of said long arm, and a screw threaded through the end of said tube or case and engaging the end of said base by which it may be adjusted,

7. In an apparatus of the character described an expansible member consisting of a hermetically closed tube or case, an adjustable base, inclosed within said tube or case, a lever conductor having arms of unequal length and pivoted on said base, its short arm engaging one end of said tube or case, a spring one end affixed to said base and its free end engaging the long arm of said lever conductor, an electrical contact in the path of said long arm and external means for adjusting the thermostat by moving the said inclosed base longitudinally.

8. In a device of the character described, an expansible member consisting of an elongated tube or case hermetically closed, a base inclosed in said tube or case, means for adjusting said base, a lever conductor pivoted on said base and having arms of unequal length its short arm engaging said tube or case, a spring engaging and actuating said lever conductor, two electrical

contacts in the path of the long arm of said lever conductor by which two distinct circuits may be closed successively.

9. In a device of the character described
 5 an expansible member consisting of a hermetically closed case, a base inclosed in said case, a lever conductor pivoted on said base and having arms of unequal length, the short arm of said lever conductor engaging said
 10 case, a spring engaging and actuating said lever conductor, an electrical contact in the

path of the long arm of said lever conductor, whereby an electrical circuit may be closed.

In testimony whereof, I have signed my name in the presence of two witnesses, this 6th day of June 1908.

MELANCTHON J. BRIGGS.

Witnesses:

HORACE M. MARQUET,
 FRANK GLADING.