

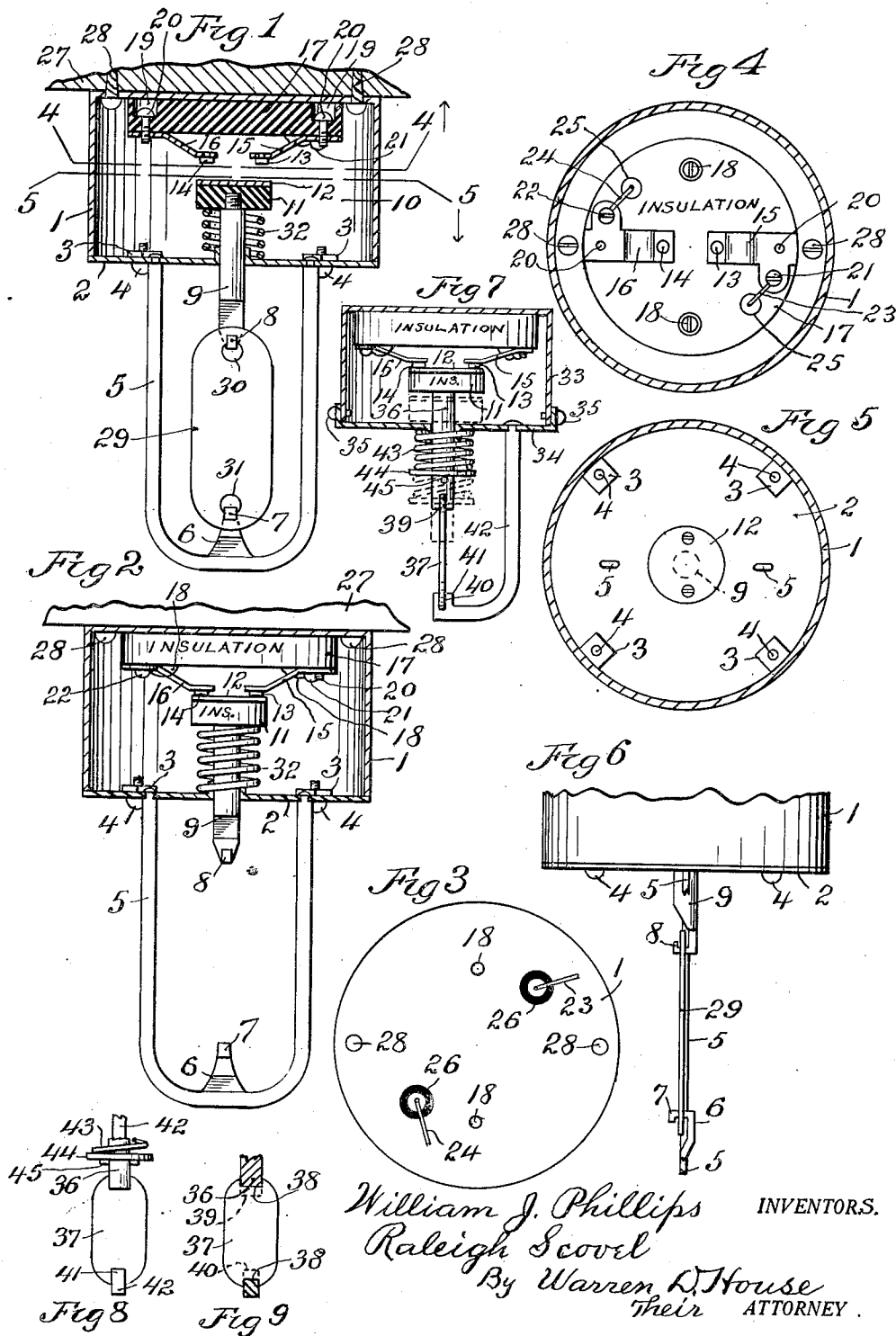
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THERMOCIRCUIT CONTROLLER

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THERMOCIRCUIT CONTROLLER

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1 Claim. (Cl. 200—142)

Our invention relates to improvements in thermo circuit controllers. It is adapted for a variety of purposes in which it is required, when the controller is subjected to a predetermined temperature, to open or close an electric circuit. It is particularly well adapted for use in connection with fire alarm systems, or with systems in which water is to be automatically discharged in case of a fire adjacent to the controller.

A further object of our invention is the provision of a simple thermo circuit controller, which is novel, cheap, durable strong, not likely to get out of order, which is easily and quickly installed and safely used, and which is efficient in its operation.

The novel features of our invention are hereinafter fully described and claimed.

In the accompanying drawing, which illustrates our invention.

Fig. 1 is a central vertical view of one form of our invention, partly in section and partly in side elevation, in which the controller closes an electric circuit automatically when subjected to a predetermined degree of heat, the parts being shown in the open circuit positions, the device being shown operatively mounted.

Fig. 2 is a view similar to Fig. 1, with the parts shown in the closed circuit positions.

Fig. 3 is a top view of the controller shown in Figs. 1 and 2.

Fig. 4 is a section on the line 4—4 of Fig. 1.

Fig. 5 is a section on the line 5—5 of Fig. 1.

Fig. 6 is a side elevation, partly broken away, of a portion of the controller shown in Fig. 1.

Fig. 7 is a vertical view partly in side elevation and partly in section of a form of our invention in which the controller opens the electric circuit when subjected to a predetermined degree of heat.

Fig. 8 is an elevation of a portion of what is shown in Fig. 7.

Fig. 9 is a view partly in elevation and partly in section of some of the parts shown in Fig. 8.

Similar characters of reference designate similar parts in the different figures.

Referring to the form shown in Figs. 1 to 6 inclusive, 1 designates the upper inverted cup shaped member of a housing having a horizontal disk like bottom member 2 removably fastened to inwardly extending lugs 3 at the lower edge of the member 1 by screws 4.

The housing is provided at its under side with a U shaped member 5 the upper end portions of which are extended through and riveted to the

bottom member 2. The middle transverse portion of the U shaped member 5 has an upwardly extending arm 6 provided at its upper end with a hook 7.

Spaced above and alined with the hook 7 is a hook 8 provided at the lower end of the lower end portion of a vertical rod 9 which extends through and is vertically longitudinally slidably reciprocative in a central hole through the bottom member 2. Upon the upper end of the rod 9 in the closed chamber 10, formed by the cylindrical housing comprising the members 1 and 2, is a block 11 of insulation having a threaded hole in its under side in which is tightly fastened the upper threaded end of the rod 9. The rod 9 and insulation block 11 form a vertically reciprocative member which carries an electrical contact comprising an electrically conductive disk 12, preferably of platinum, nickel, or other refractory conductive material.

The disk contact 12 is adapted, when the reciprocative member is in the uppermost position, shown in Fig. 2, to contact with two contacts 13 and 14 respectively mounted upon two resilient electrically conductive plates 15 and 16 fastened to the under side of and insulated from each other by a block of insulation 17 in the chamber 10, fastened to the under side of the top of the member 1 by screws 18, Figs. 3 and 4.

In the upper side of the block 17 are two recesses 19 in which are respectively located the heads of two screws 20 which extend downwardly through the block and are respectively fitted in threaded holes in the contact plates 15 and 16, thereby fastening said plates to the insulation block 17. The block 11 and the block 17 may be composed of any suitable insulating material, such as hard rubber, glass or "bakelite".

Respectively fastened to the contact plates 15 and 16 by screws 21 and 22 are two conductive wires 23 and 24, which form part of the electric circuit with which the controller is to be used, and which respectively extend upwardly through holes 25 in the block 17 and holes 26 registering therewith in the upper end of the member 1. The wires 23 and 24 are insulation covered excepting where attached to the plates 15 and 16.

For attaching the member 1 to the ceiling 27, two wood screws 28 extend through the top of the member 1 and enter the ceiling 27, the heads of said screws bearing against the under side of the top of the member 1.

For normally holding the reciprocative rod 9 in the lower position, shown in Fig. 1, with the contact disk 12 separated from the contacts 13

and 14, there is provided a fusible member consisting of a thin plate 29 having respectively adjacent to its upper and lower ends two transverse holes 30 and 31 through which respectively
5 ly extend the hooks 7 and 8.

Encircling the rod 9 in the chamber 10 and engaging and bearing at its upper and lower ends respectively against the block 11 and the upper side of the bottom member 2 is a coil spring
10 32, which, when the fusible member 29 fuses and releases the hook 8, forces the rod 9 and block 11 to the upper position shown in Fig. 2 in which position the contact disk 12 engages conductively
15 the contacts 13 and 14, thus closing the circuit.

The fusible member 29 is composed of such an alloy as provides the desired fusing temperature. Thus with the employment of an alloy composed of one part each by volume of cadmium, lead, tin and bismuth a fusing temperature of
20 approximately 155½ degrees Fahrenheit is obtained. Any of the fusible alloys that are in common use and which have the desired fusing temperature may be employed.

By having the contacts 12, 13, and 14, and coil spring 32 located in the closed chamber 10, and the contacts properly insulated, there is no liability of these parts becoming damaged by outside heat until after they have effected their
25 proper functions.

By locating the fusible member 29 outside the chamber 10, the fusible member is exposed at once to any dangerous rise in temperature of the air adjacent to the controller.

After the controller has effected its function of closing the circuit, the rod 9 may be drawn
30 downwardly and another fusible member 29 substituted for the one which fused and fell.

In Figs. 7, 8, and 9 is illustrated a form of our invention in which when the fusible member employed fuses, the circuit is opened. In this form
40 the construction is quite similar to that shown in Figs. 1 and 2, with some difference which will now be explained.

The housing comprises a cylindrical inverted cup shaped member 33 and a bottom member 34 having an annular peripheral flange embracing the lower end of the member 33 to which it is
45 releasably held by screws 35.

To the under side of the top of the member 33 is fastened a block of insulation 17, corresponding
50 to the one shown in Fig. 1 and similarly fastened to the member 33.

The insulation block 11 carrying the contact disk 12 is mounted upon the upper end of a rod 36, corresponding in function to the rod 9, and which is reciprocative vertically through the bottom member 34.

The disk contact 12 is normally held in contact with the electrical contacts 13 and 14 carried by the resilient contact plates 15 and 16, fastened to the insulation block 17 in the same manner as in the form shown in Fig. 1. The electrical connections to the plates 15 and 16 are the same as described with reference to the form shown in
65 Fig. 1.

For normally holding the contact plate or disk 12 against the contacts 13 and 14, there is pro-

vided a fusible member 37 comprising a thin plate having notches 38 in its upper and lower ends respectively. The notched upper end of the member 37 is fitted in a notch 39 in the lower end of the rod 36, and the lower notched end of the
5 member 37 is fitted in a notch 40 in the upper end of a projection 41 extending upwardly from the lower end of an arm 42, the upper end of which extends through and is riveted to the bottom member 34, Fig. 7.

For opening the circuit by lowering the contact plate 12 out of contact with the contacts 13 and 14, when the fusible member 37 has fused, there is provided a coil spring 43 which encircles the rod 36 and has its upper end bearing against the under side of the member 34, and its lower end bearing against the upper side of a collar
10 44 which rests on a transverse pin 45 extending through the rod 36.

When the fusible member 37 fuses, the spring 43 will force the rod 36 downwardly thus lowering the block 11 and contact disk 12 to the position shown in dotted lines in Fig. 7, in which position, the contact disk 12 will be separated from the contacts 13 and 14, and the circuit in which
15 the contacts are located will be broken between the contacts 13 and 14.

Another fusible member 37 may be substituted for the fused fusible member by lifting the rod 36 against the pressure of the spring 43. The notches 38 of the fusible member entering the notches 39 and 40 prevent the member from accidental displacement.

Other modifications of our invention, within the scope of the appended claim, may be made
25 without departing from its spirit.

What we claim is:

In a thermo circuit controller, a closed housing comprising an inverted cup shaped member, a bottom member normally closing the lower open
40 end of said cup shaped member and provided with a perforation, and means releasably fastening together said two members, whereby said bottom member may be removed for access to the interior of said cup shaped member, an arm
45 attached to said bottom member and extending downwardly therefrom and provided with a hook aligned with said perforation, a rod extending through and reciprocative in said perforation and having at its lower end a hook, a plate of
50 fusible material engaging said rod and said arm and having two holes through which said hooks respectively extend, insulation fastened to the inner side of the top of said housing, an insulation block on the upper end of said rod in said
55 housing, a contact carried on the top of said block, a coil spring encircling said rod and bearing at its ends respectively against the said bottom member and said block, for forcing said rod upwardly, when said fusible plate fuses, and two contacts
60 fastened to the first named insulation and normally separated from each other and the first named contact but engaging the latter when said plate fuses and said spring forces said rod upwardly.

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