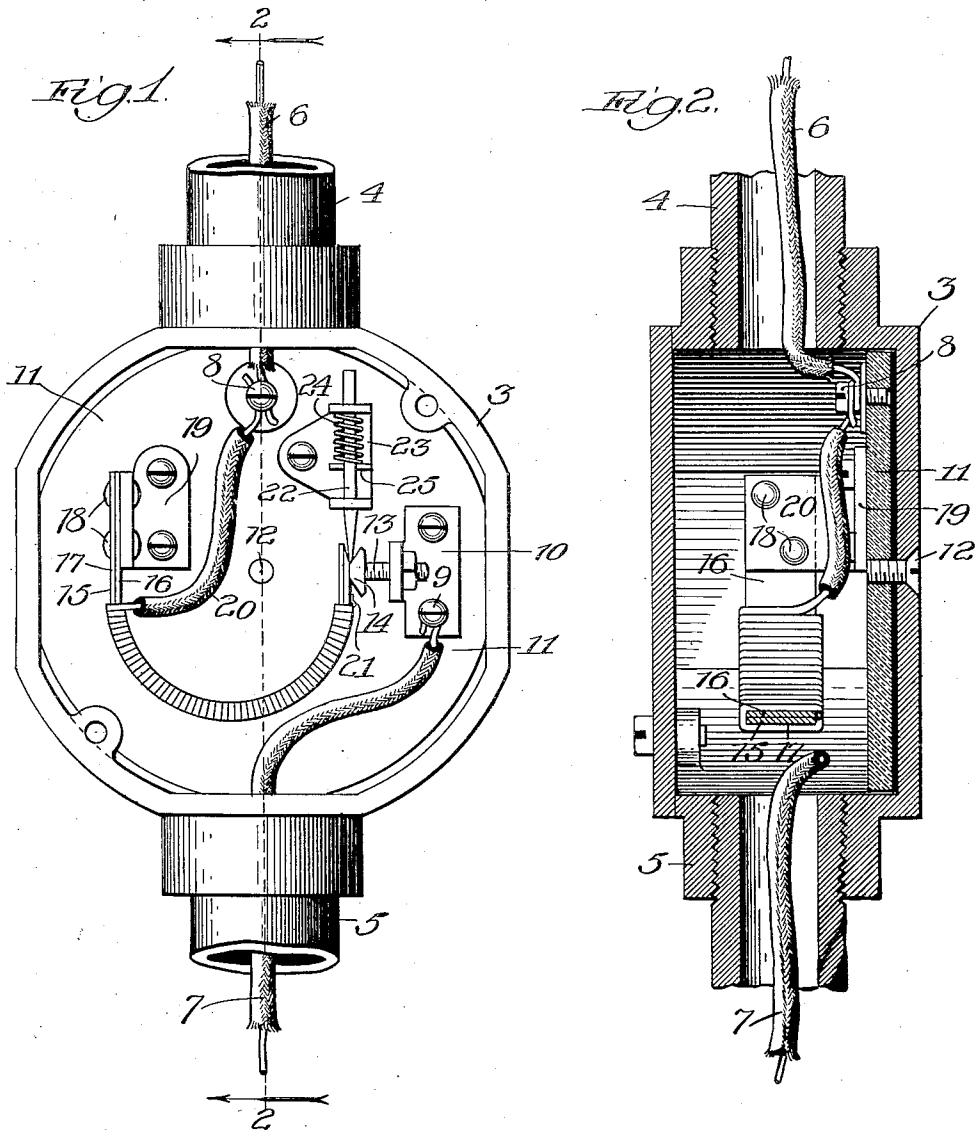


H. W. FREESE.
 AUTOMATIC ELECTRICAL CUT-OUT.
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AUTOMATIC ELECTRICAL CUT-OUT.

1,373,128.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, HERMAN W. FREESE, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Automatic Electrical Cut-Outs, of which the following is a specification.

My invention relates more particularly to a device for interposition in an electrical circuit for effecting the breaking of the circuit after the current has traversed the same a predetermined length of time, in order that the undue heating of the electrical device located in the circuit and operated by the current traversing the same, shall be avoided, my invention having been devised for use more particularly where relatively weak electric currents are employed, as, for example, in the operation of solenoid switches.

My primary object is to provide a simple, economical and positively operating construction for accomplishing the above purpose.

Referring to the accompanying drawings:—

Figure 1 is a face view of apparatus embodying my invention; and Fig. 2, a section taken at the line 2—2 on Fig. 1, and viewed in the direction of the arrows.

Generally stated, my invention involves the use of a thermostatic element which is subjected to the heat generated by the current to be controlled and through the medium of which the circuit is opened and closed.

In the particular illustrated embodiment of my invention, I provide a box 3 connected at opposite ends with pipe sections 4 and 5 into which the electric current conducting wires 6 and 7 at one side of a circuit to be controlled, extend into the box, the wire 6 connecting with a binding post 8 and the wire 7 with a binding post 9. The bracket 10 carrying the binding post 9 is mounted on a block of insulating material 11 secured to the casing 3 as by a screw 12, this bracket carrying a contact member 13 the end face of which is of frusto-conical shape as represented at 14. The contact 13 coöperates with the thermostatic member represented at 15, this member being shown as formed of a pair of flatwise opposed bars 16 and 17 welded together and secured at one end, as indicated at 18, to a block 19 secured to the

insulating plate 11. The opposite, free, end of the thermostat 15, the latter being curved as represented, presses against the contact 13 in the normal condition of the structure to close the circuit at this point by reason of the connection with the device 15, of a wire forming a part of the circuit as herein-after explained. The bars 16 and 17 may be made of any desirable material provided they present different co-efficients of expansion in order that the free end of the thermostatic element will be drawn toward its fastened end and in a direction to disengage it from the contact 13; when the thermostat 15 is heated to a predetermined degree. By way of example the bar 16 may be constructed of copper and the bar 17 of zinc. The thermostatic element 15 is wound with current-conducting wire for subjecting it to the heat of the current, this wire being represented at 20. It is preferred that this wire 20 be what is known as magnet wire, either silk or cotton covered, and that one end thereof be connected with the binding post 8 and its opposite end, represented at 21, electrically connected with the bar 17.

It will be readily understood from the foregoing that in the passage of the current through the wire 20, this wire forming a part of the circuit to be controlled by the cut-out, the thermostatic element 15 will become heated and will move out of contact with the electrical contact 13 and thus break the circuit. Furthermore, it will be understood that the length of time which elapses before the circuit is broken, as stated above, will depend upon the strength of current traversing the wire 20 and the gage of this wire and thus the device may be constructed to hold the circuit closed for any desired predetermined length of time within certain limits.

In the use of the cut-out in certain connections it is desirable that upon the breaking of the circuit between the element 15 and the contact 13, these parts be held out of electrical contact and in opposition to the tendency of the thermostatic member to return to contacting position, and as a desirable means, operating automatically for this purpose, I provide the pin 22 of insulating material slidably mounted in a bracket 23 secured to the plate 11 and normally urged by a coil spring 24 surrounding the pin 22 and bearing at opposite ends against an end

of the bracket 23 and a pin 25 on the pin 22, into the space between the contact 13 and the free end of the thermostatic element 15 when the latter is moved out of engagement with the contact 13, the spring 24 holding the pin 22 in such position as to maintain the circuit broken, after the element 15 has cooled.

The pin 22 may be withdrawn from a position in which it holds the thermostatic element 15 away from the contact 13, by shifting the pin 22 in opposition to the spring 24, these parts being so constructed and arranged that the spring 24 does not, in the normal condition of the structure, operate to force the element 15 out of engagement with the contact 13.

While I have illustrated and described a particular construction embodying my invention, I do not wish to be understood as intending to limit it thereto as the same may be variously modified and altered without departing from the spirit of my invention, it being my intention to claim my invention as fully and completely as the prior state of the art will permit.

What I claim as new and desire to secure by Letters Patent, is:—

1. In combination with an electrical circuit, separable contacts interposed therein, thermostatic means for separating said contacts when the heat to which the thermostatic means is subjected reaches a predetermined degree, means for subjecting said thermostatic means to heat generated by the current in traversing said circuit, and mechanical means separate from the parts which serve to close the circuit movable automatically to a position for maintaining said contacts out of engagement with each other upon the separating of said contacts by the action of said thermostatic means.

2. In a device of the character set forth, the combination of separable contacts, a thermostatic device operating to separate said contacts when said device is heated, an electric-current-conducting element for interposition in an electrical circuit and adapted to be heated by the current traversing the circuit to be controlled by said thermostatic device and operating to heat said thermostatic device, and mechanical means sep-

arate from the parts which serve to close the circuit movable automatically to a position for maintaining said contacts out of engagement with each other upon the separating of said contacts by the action of said thermostatic device.

3. In combination with an electrical circuit, separable contacts interposed therein, thermostatic means for separating said contacts when the heat to which the thermostatic means is subjected reaches a predetermined degree, means for subjecting said thermostatic means to heat generated by the current in traversing said circuit, and spring-impelled means separate from the parts which serve to close the circuit, movable automatically to a position for maintaining said contacts out of engagement with each other upon the separating of said contacts by the action of said thermostatic means.

4. In combination with an electrical circuit, separable contacts interposed therein, thermostatic means for separating said contacts when the heat to which the thermostatic means is subjected reaches a predetermined degree, means for subjecting said thermostatic means to heat generated by the current in traversing said circuit, a reciprocally supported member movable into a position for maintaining said contacts out of engagement with each other upon the separating of said contacts by the action of said thermostatic means, and a spring for moving the said member into said position.

5. In combination with an electrical circuit, separable contacts interposed therein, thermostatic means for separating said contacts when the heat to which the thermostatic means is subjected reaches a predetermined degree, means for subjecting said thermostatic means to heat generated by the current in traversing said circuit, and means positioned adjacent the abutting surfaces of said contacts and adapted, upon the separating of said contacts by the action of said thermostatic means, to be automatically moved into a position between said contacts, the surfaces of said contacts opposing said last-named means converging away from said means.

HERMAN W. FREESE.