F. KUHN.

THERMAL CIRCUIT CONTROLLER.

APPLICATION FILED MAR. 8, 1913.

1,210,331. Patented Dec. 26, 1916.

Fig. 1.

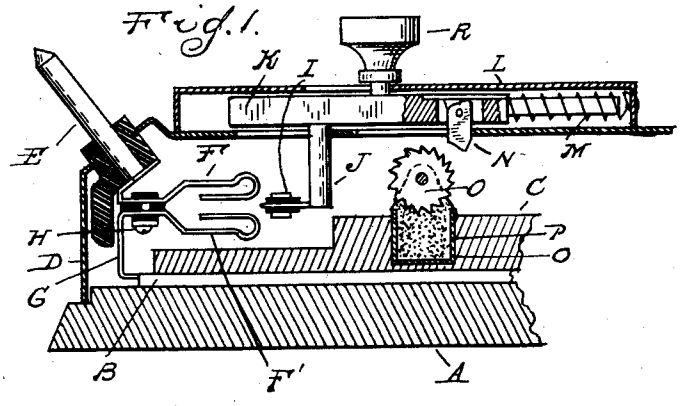


Fig. 3.

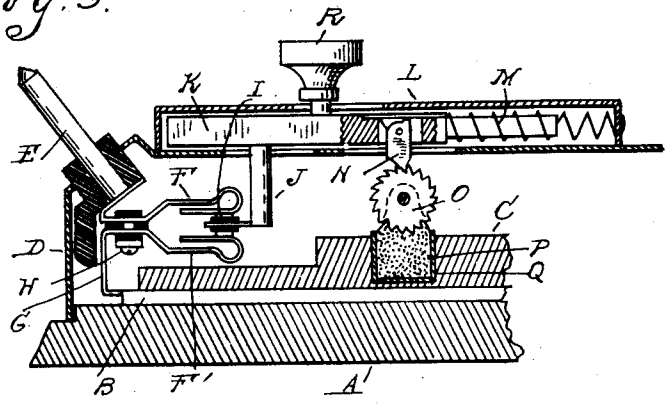
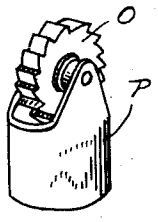


Fig. 2.



Witnesses
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UNITED STATES PATENT OFFICE.

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THERMAL CIRCUIT-CONTROLLER.

1,210,331. Specification of Letters Patent. Patented Dec. 26, 1916.

Application filed March 8, 1913. Serial No. 752,876.

To all whom it may concern:

Be it known that I, FRANK KUHN, a citizen of the United States of America, residing at Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Thermal Circuit-Controllers, of which the following is a specification, reference being had therein to the accompanying drawings.

The invention relates to automatic cut-outs for electric circuits and is particularly designed for use in connection with electric heaters.

It is the object of the invention to provide; first, means for automatically breaking the circuit whenever the temperature exceeds a predetermined point; and second, a construction which, when the temperature falls, is again operative without reconstruction and may be repeatedly used in the same manner.

In the drawings: Figure 1 is a longitudinal section through a portion of an electrically heated sad iron to which my improvement is applied and showing the circuit cut out. Fig. 2 is a perspective view showing the cup for the fusible metal and the detent wheel locked thereby. Fig. 3 is a view similar to Fig. 1 with the parts in circuit closing position.

A is the base of a sad iron which, as shown, is heated by a flat heating unit B between said base and a heat-absorbing and distributing plate C.

D is the hood or cover for the body, and E is a terminal contact passing outward through said hood and which is connected with the electrical terminals of the unit.

My improved automatic cut-out comprises a cut-out switch which is preferably interposed between one of the external contact elements and the heating unit, and, as shown, is housed within the hood D above the distributing plate C. In detail, it comprises two spaced and parallel resilient contact members F and F′ which are respectively connected to the external terminal contact E and the terminal member G, which connects directly with the unit B. The contact members F and F′ may be formed of sheet metal which is bent to extend laterally within the hood, the two members being mechanically connected to each other by a bolt or rivet H which is electrically insulated to prevent short circuiting.

The contact members F and F′ in the normal or closed position of the circuit are electrically connected to each other by a bridge contact member I which is mounted upon but insulated from a carrying-arm J projecting downward from a slide K which is mounted in a suitable housing L on top of the hood D. The slide K is further provided with a spring M for yieldably drawing the same in a direction to separate the bridge contact I from the contact members F and F′. There is also a latch dog N upon the slide adapted to engage with a ratchet wheel O which is normally immovable and forms a detent for holding the slide and bridge contact I in a position to close the circuit. The ratchet wheel O is locked from rotation by fusible metal which is placed in a cup member P upon which said ratchet wheel is mounted and this cup member is placed in a recess Q in the member C or in some other suitable location where it will be subjected to the heat developed by the unit.

With the construction as described when the parts are assembled, as shown in Fig. 1, the slide K is in a position which separates the bridge contact I from the spaced contact members F and F′ and therefore the heater circuit is open. To close the circuit the operator moves the slide by means of a knob R so as to engage the latch dog N with one of the teeth of the ratchet wheel O, which latter being immovable serves to hold the slide from return movement. This will close the electric circuit by bridging between the contact members F and F′ and the parts will remain in this position during normal operation, as the heat developed will be insufficient to melt the fusible metal. If, on the other hand, the instrument becomes overheated—as for instance by leaving on the current when not in use—the heat will accumulate, raising the temperature of the heat-distributing body C until it exceeds the melting point of the fusible metal held in the cup P. As the latch dog N is constantly pressed against the ratchet wheel by the tension of the spring M, it is obvious that as soon as said wheel is released by the melting of the fusible metal, it will be turned upon its pivot S, freeing the dog N and permitting the slide K to assume a position where the bridge contact I is withdrawn from the contacts F and F′ and the circuit is broken.

In all positions of adjustment of the wheel

O, there will be one or more of its teeth in a position for engagement with the latch dog N. Thus when the fusible metal again solidifies the parts are in position for re-engagement.

What I claim as my invention is:

1. A thermal cut-out comprising an automatically opening switch and means controlling said switch including a cup containing a fusible element, a toothed wheel mounted upon said cup and having its teeth engaging said fusible element and said switch, said means being operative to release said switch upon the fusing of said element.

2. A thermal circuit controller comprising a receptacle, a fusible element therein and a tooth member controlling an electric switch adjacent said receptacle and having a portion of the teeth engaging said fusible element, said fusible element holding said tooth member from movement when solidified and releasing the same when fused.

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

FRANK KUHN.

Witnesses:
JAMES P. BARRY,
HENRI E. BOWMAN.