D. G. HOWARD.

THERMAL CUT-OUT.

APPLICATION FILED JAN. 5, 1917.

1,385,999. **Patented Aug. 2, 1921.**

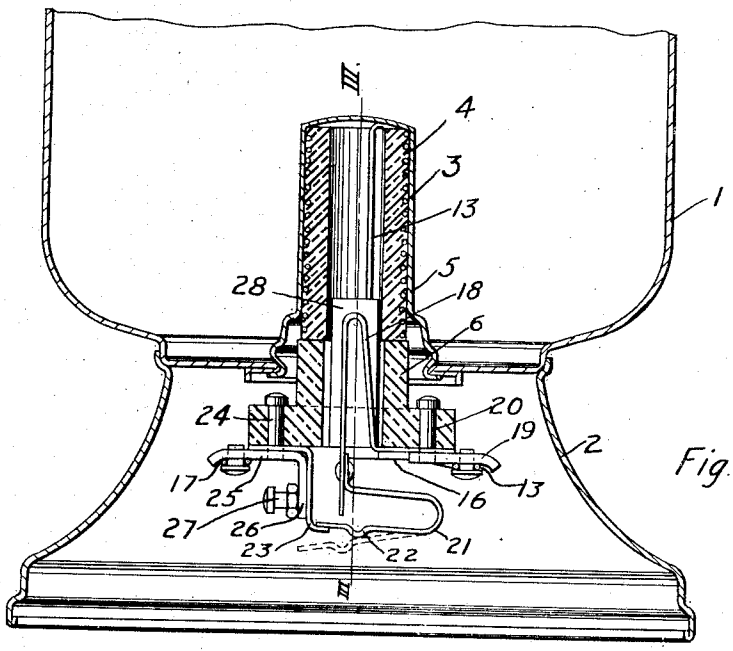


Fig. 1

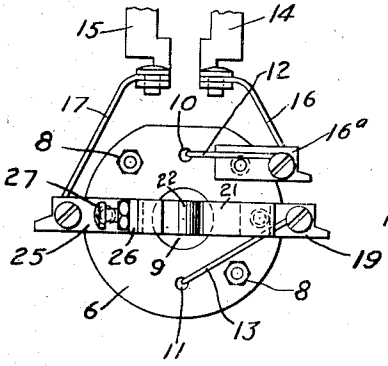


Fig. 2.

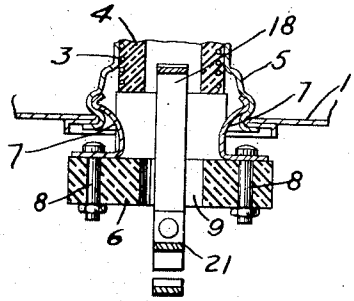


Fig. 3.

WITNESSES:

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THERMAL CUT-OUT.

1,385,999. Specification of Letters Patent. Patented Aug. 2, 1921.

Application filed January 5, 1917. Serial No. 140,736.

To all whom it may concern:

Be it known that I, DAVID G. HOWARD, a citizen of the United States, and a resident of Wilkinsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Thermal Cut-Outs, of which the following is a specification.

My invention relates to electrically heated apparatus such as percolators, water heaters, sad irons and the like, and it has for its object to provide a cutout device for interrupting the circuit through a current-consuming device of the above indicated character at a definite and predetermined temperature by means of a thermally actuated circuit-controlling member which is normally maintained under spring tension and is quickly released when its temperature rises beyond the predetermined maximum.

One manner in which may invention may be applied to an electrically heated coffee percolator is illustrated in the accompanying drawing, in which Figure 1 is a central vertical sectional view of the lower part of a percolator equipped with a thermal cutout constructed in accordance with my invention. Fig. 2 is a partial plan view of the cutout structure shown in Fig. 1, as seen from the bottom of the percolator, and Fig. 3 is a fragmentary vertical sectional view of the same structure, the section being taken substantially along the line III—III, Fig. 1.

The percolator shown in the drawing is of a well-known type comprising a liquid container 1, a hollow support 2, and a heating coil 3 wrapped around a spool 4 of lava or other suitable insulating material and inclosed by a casing 5. The insulating spool 4 rests upon a flanged bushing 6 which is suspended from the casing 5 by means of spring clips 7 attached to the bushing by means of small bolts 8. The bushing 6 is provided with a circular central opening 9 and with two smaller openings 10 and 11 through which are led the terminals 12 and 13 of the heating coil 3. The percolator is provided with the usual terminal pins 14 and 15, the pin 14 being connected to the terminal 12 of the heating element by means of a conductor 16 and a clamp 16ª, while the terminal pin 15 is connected to the terminal 13 of the heating element through a conductor 17 and the thermal cutout device which embodies my invention and is best shown in Fig. 1.

The cutout device comprises a thermally controlled actuating member consisting of a strip 18 composed of two metals of unequal expansion fastened together. The strip 18 is bent in the hairpin form shown in Fig. 1 and extends upwardly through the opening 9 of the bushing 6 to a point within the spool 4. One end of the member 18 is connected to the bushing 6 and to a terminal clamp 19 by means of a screw 20, while its other end is soldered or riveted to a bent spring member 21 which is stiffened by means of a transverse rib 22 and normally rests upon a bent metal finger 23 depending from the bushing 6 and attached thereto by means of a screw 24. A terminal clamp 25 for the conductor 17 is secured in contact with the finger 23 by means of a screw 24 and comprises a downwardly bent portion 26 through which extends an adjusting screw 27 for varying the amount by which the members 21 and 23 overlap. The upwardly extending loop of the member 18 is protected from contact with the terminals of the heating coil 3 by means of an L-shaped shield 28 of mica or other suitable insulating material.

In the normal operation of the percolator which I have shown and described, the spring member 21 is held in the position shown by means of the finger 23, and the heating circuit is, therefore, completed from the terminal pin 14 through the conductor 16, clamp 16ª, terminal 12, heating coil 3, terminal 13, clamp 19, thermostat member 18, spring 21, finger 23, clamp 25, and conductor 17, to the terminal pin 15. The finger 23 should be so adjusted, by means of the screw 27, that this arrangement of the parts is not disturbed during the normal operation of the percolator, but that, if the percolator should be allowed to boil dry and thereby become overheated, the end of the spring member 21 would be released from the finger 23 by the distortion of the member 18, and take the position shown in dotted lines in Fig. 1, thereby interrupting the circuit through the apparatus. The spring may easily be reset and the percolator placed in service immediately, without replacement or repair of any of its parts.

The principle of obtaining a quick break in a thermal cutout by the action of spring tension may be applied to many forms of electric heating apparatus other than that

which I have specifically illustrated and it is therefore to be understood that the structural details herein shown and described may be variously modified and adapted within the scope of my invention as set forth in the appended claims.

I claim as my invention:

1. A thermal cut-out for electric-circuit control comprising a resilient member forming a part of the electric circuit and maintained under tension when the circuit is closed, and heat-responsive means connected to said member and forming a part of the electric circuit for releasing the same and thereby interrupting the circuit.

2. A thermal cut-out for electric-circuit control comprising a resilient current-carrying member, means for holding the said member under tension when the circuit is closed and a heat-responsive element forming a part of the electric circuit for releasing the said member when the heat responsive element becomes heated to a predetermined temperature.

3. A thermal cut-out for electric-circuit control comprising a heat-responsive member forming a part of the electric circuit, a resilient contact member secured thereto and means for releasably maintaining the said contact member under tension and in engagement with a stationary coöperating contact member.

4. A thermal cut-out for electric-circuit control comprising a heat-responsive member and a resilient contact member coöperating with the said heat-responsive member to complete the circuit through the cut-out and heat-responsive member and adapted to quickly interrupt the circuit when the said heat-responsive member is heated to a predetermined temperature.

5. A thermal cut-out for electric-circuit control comprising a resilient current-carrying contact member, a heat responsive element, forming a part of the electric circuit, a stationary coöperating contact member comprising a latch for normally maintaining the said resilient contact member under tension and for releasing the said contact member when the heat responsive element becomes heated to a predetermined temperature and means for varying the position of the said latch to change the temperature at which the said resilient contact member is released.

6. A cut-out for electrically heated devices comprising a heat-responsive member forming a part of an electric circuit, a latch associated with said heat-responsive member, and a contact member coöperating with said latch and adapted to interrupt said circuit through the heating element of said device at a predetermined temperature in response to the movement of said heat-responsive member.

In testimony whereof, I have hereunto subscribed my name this 23rd day of Dec., 1916.

DAVID G. HOWARD.