Nov. 11, 1924. 1,515,202

H. D. HINELINE

AUTOMATIC FLATIRON CONTROLLER

Filed Sept. 16, 1921

Fig. 1.

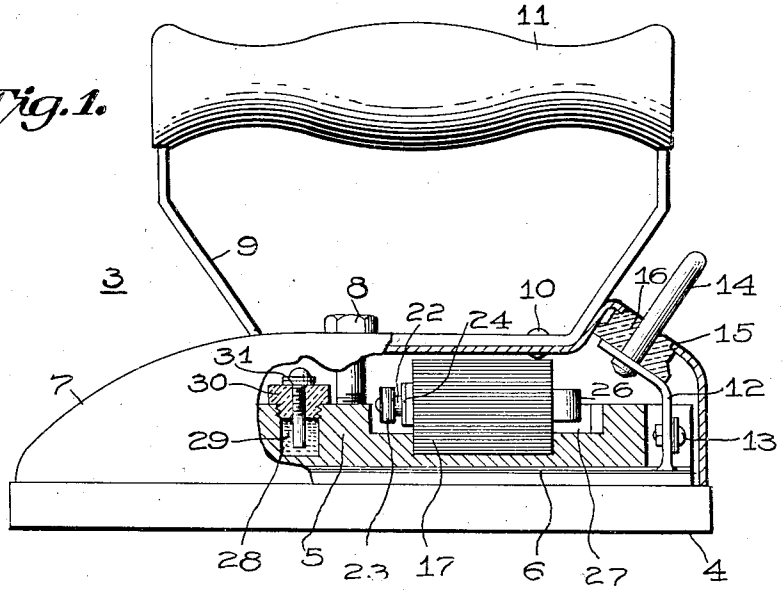
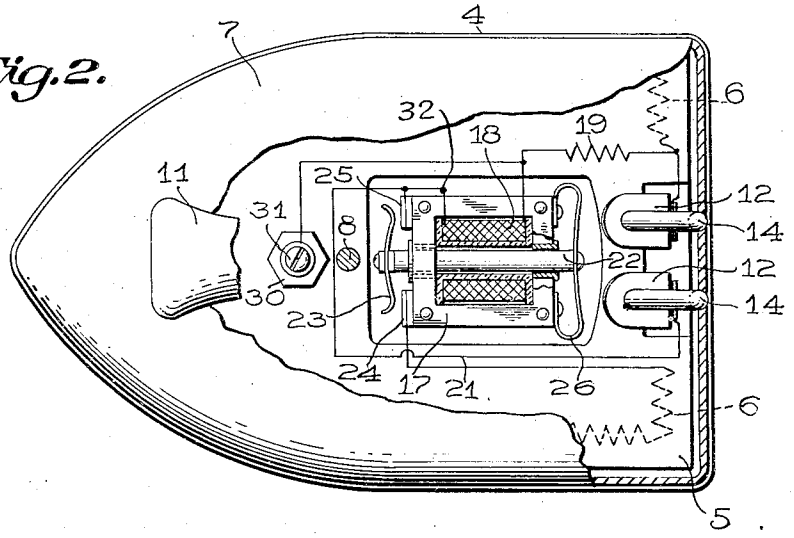


Fig. 2.



WITNESSES:

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UNITED STATES PATENT OFFICE.

HARRIS D. HINELINE, OF WILKINSBURG, PENNSYLVANIA, ASSIGNOR TO WESTINGHOUSE ELECTRIC & MANUFACTURING COMPANY, A CORPORATION OF PENNSYLVANIA.

AUTOMATIC FLATIRON CONTROLLER.

Application filed September 16, 1921. Serial No. 501,046.

To all whom it may concern:

Be it known that I, HARRIS D. HINELINE, 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 Automatic Flatiron Controllers, of which the following is a specification.

My invention relates to electrically-heated devices and particularly to circuit-controlling means for electrically-heated irons and it has, for its object, to provide a relatively simple, inexpensive and rugged means for controlling the energization of an electrically-heated iron,

In practising my invention, I provide a a plural-position electromagnetic switch, spring biased to one of its positions, the winding of which is connected in shunt-circuit relation to the heating element of the iron. A salt thermostat, under the thermal control of the heating element, is so connected as to control the energization of the winding, and comprises a material which is normally electrically non-conductive but becomes conductive at a predetermined temperature and permits the switch to interrupt the circuit through the heating element. When the temperature falls below a predetermined value, the material again becomes non-conductive and permits the electromagnetic switch to re-establish the circuit through the heating element.

In the single sheet of drawings,

Figure 1 is a view, in side elevation, of an electric iron comprising the device embodying my invention, certain parts being cut away; and

Fig. 2 is a top plan view of an electric iron comprising the device embodying my invention, certain portions thereof being cut away.

An electrically heated iron 3 comprises a sole plate or working member 4, a top plate 5 and an electric heating element 6 suitably clamped therebetween by means not shown. The heating element 6 may be of any suitable or desired construction known in the art. A hood or cover member 7 may be clamped against the sole plate 4 by a bolt 8. A handle strap 9, substantially of U-shape, is suitably riveted to the top of the cover 7 by rivets 10 and carries a handle 11 suitably secured thereto.

Strap terminals 12 are secured to the ends of the heating element 6 by means of bolts or screws 13 and have secured thereto, at their upper ends, terminal pins 14 which extend through an opening 15 in the cover 7, being held in spaced relation to each other and to the cover by an insulating member, 16.

A circuit-controlling device comprises a suitably laminated soft-iron core 17 within which is located an energizing winding 18 which is connected in series-circuit relation to a suitable resistor 19. The two parts 18 and 19 are connected in shunt-circuit relation to the strap terminals 12 so as to be energized when the iron is connected to a suitable source of energy (not shown). An elongated armature 22 is located within the winding 18 and the core 17 and has mounted thereon, at one end, an insulated contact-bridging member 23 which is adapted to engage two contact terminals 24 and 25 which are mounted upon, and insulated from, the iron core 17. A spring member 26 is mounted on the core 17 to engage the other end of the core 22, the member 26 being of such form as to resiliently maintain the contact-bridging member 23 out of engagement with the contact terminals 24 and 25 as long as the winding 18 is de-energized. When the winding 18 is energized, the core 22 is moved to effect engagement of the contact bridging member with the terminals 24 and 25 to permit current to traverse the heating element 6. The resistance of the resistor 19 is of such value that the voltage drop through the winding 18 does not exceed 25 volts and may be preferably as low as 6 volts. A recess 27 may be provided in the top plate within which the control mechanism is located, or the relay may be located in such other position as may be desirable, as, for instance, in the leads to the iron.

A recess 28 is provided in the top plate 5 within which may be located a mass 29 of a salt such as potassium nitrate or silver chloride, which is electrically non-conductive at all temperatures below a predetermined value but liquefies and becomes electrically conductive at temperatures above such predetermined value. An insulating screw plug 30 may be located in the top of the recess 28, and a terminal 31 projects

through the insulating cover 30 into the salt 29. One end of the winding 18 is grounded on the top plate 5 as at 32, and the other end is connected to the terminal 31.

The operation of the device is as follows:—

If a contact plug, the conductors of which are connected to a suitable supply circuit, is placed upon the terminal pins 14, a circuit is established through the resistor 19 and the winding 18, whereby the core armature 22 is moved to close the switch, thus permitting the current to traverse the heating element 6. If, for any reason, the temperature of the top plate exceeds a predetermined value, the salt 29 liquefies and becomes electrically conductive, short-circuiting the winding 18 and permitting the spring 26 to move the core 22 and the contact-bridging member 23 to substantially the position illustrated in Fig. 2, thus deenergizing the heating element 6. If the temperature of the top plate falls below the predetermined value, the salt 29 solidifies and again becomes electrically non-conductive, thus permitting the deenergization of the winding 18 and the closing of the switch.

It may be noted that the device embodying my invention provides a relatively simple, inexpensive and rugged device for controlling the energization of an electrically-heated iron by means comprising a fusible-salt thermostat which is effective to interrupt the current through the heating element when the temperature exceeds a predetermined value and to again permit the current to traverse the heating element as soon as the temperature drops below the predetermined value.

Various modifications may be made in the device embodying my invention without departing from the spirit and scope thereof, and I desire that only such limitations shall be placed thereupon as are imposed by the prior art or are specifically set forth in the appended claims.

I claim as my invention:—

1. A circuit-controlling device for an electrically-heated appliance, mounted therein and comprising an electromagnetic switch and means comprising a closed electric circuit, normally electrically non-conductive, for permitting the selective energization of said switch.

2. A circuit-controlling device for an electrically-heated appliance, mounted therein and comprising an electromagnetic switch and stationary means comprising a closed electric circuit, electrically conductive at a predetermined temperature only for causing said switch to interrupt the circuit.

3. A circuit-controlling device for an electrically-heated appliance comprising a normally open switch, electromagnetic means for maintaining said switch in its closed position and means electrically conductive at a predetermined temperature only for de-energizing said electromagnet means.

4. In an electrically heated appliance, in combination, a heating element, a normally open switch member for controlling the energization of said heating element, electromagnetic means connected in shunt-circuit relation to said heating element for maintaining said switch in its closed position, and means electrically conductive at a predetermined temperature only for de-energizing said electromagnetic means.

5. A circuit-controlling device for an electrically-heated appliance comprising an electromagnetic switch and means comprising a closed electric circuit and a variable-resistance element normally electrically non-conductive for permitting the closing thereof only at temperatures below a predetermined value.

6. A circuit-controlling device for an electrically-heated appliance comprising an electromagnetic switch and means normally electrically non-conductive and connected in shunt-circuit relation to said switch for permitting the energization thereof only at temperatures below a predetermined value.

7. In an electrically-heated iron, in combination, a heating element, a switch spring biased to its open position, electromagnetic means for causing said switch to close upon the energization of said heating element, and means under the thermal control of said heating element and electrically conductive at a predetermined temperature only for de-energizing said electromagnetic means upon the occurrence of said temperature.

8. A circuit-controlling device for an electrically-heated appliance comprising an electromagnetic switch and means connected in shunt-circuit relation to said switch for selectively actuating the same, said actuating means comprising a closed electric circuit electrically non-conductive at all temperatures below a predetermined value and conductive at temperatures above said value.

9. A circuit-controlling means for an electrically-heated appliance having a heating element, said means comprising a two-position switch biased to one of its positions, an electromagnet for holding said switch, a variable resistance closed circuit under the thermal control of said heating element and electrically conductive at a predetermined temperature only for causing said electromagnet to move said switch to its open position upon the occurrence of said predetermined temperature.

10. A circuit-controlling means for an electrically-heated appliance having a heating element, said means comprising an electromagnetic switch for controlling the circuit through said heating element, and sta-

tionary variable resistance means electrically conductive only at a predetermined temperature for controlling said switch to interrupt the circuit upon the occurrence of said predetermined temperature and to reestablish the circuit when the temperature falls below said predetermined value.

11. A circuit-controlling means for an electrically-heated appliance having a heating element, said means comprising a two-position switch biased to one of its positions, an electromagnet for holding said switch in the other of its positions, and a variable resistance closed circuit means under the thermal control of said heating element and electrically conductive at a predetermined temperature only for causing said electromagnet to move said switch to its open position upon the occurrence of said predetermined temperature and for permitting said switch to return to its biased position when the temperature falls below said predetermined value.

In testimony whereof, I have hereunto subscribed my name this 31st day of August, 1921.

HARRIS D. HINELINE.