

E. C. McBRIDE.
THERMOSTATIC CONTROL FOR ELECTRIC HEATING DEVICES.
APPLICATION FILED JULY 26, 1909.

989,273.

Patented Apr. 11, 1911.

Fig. 1.

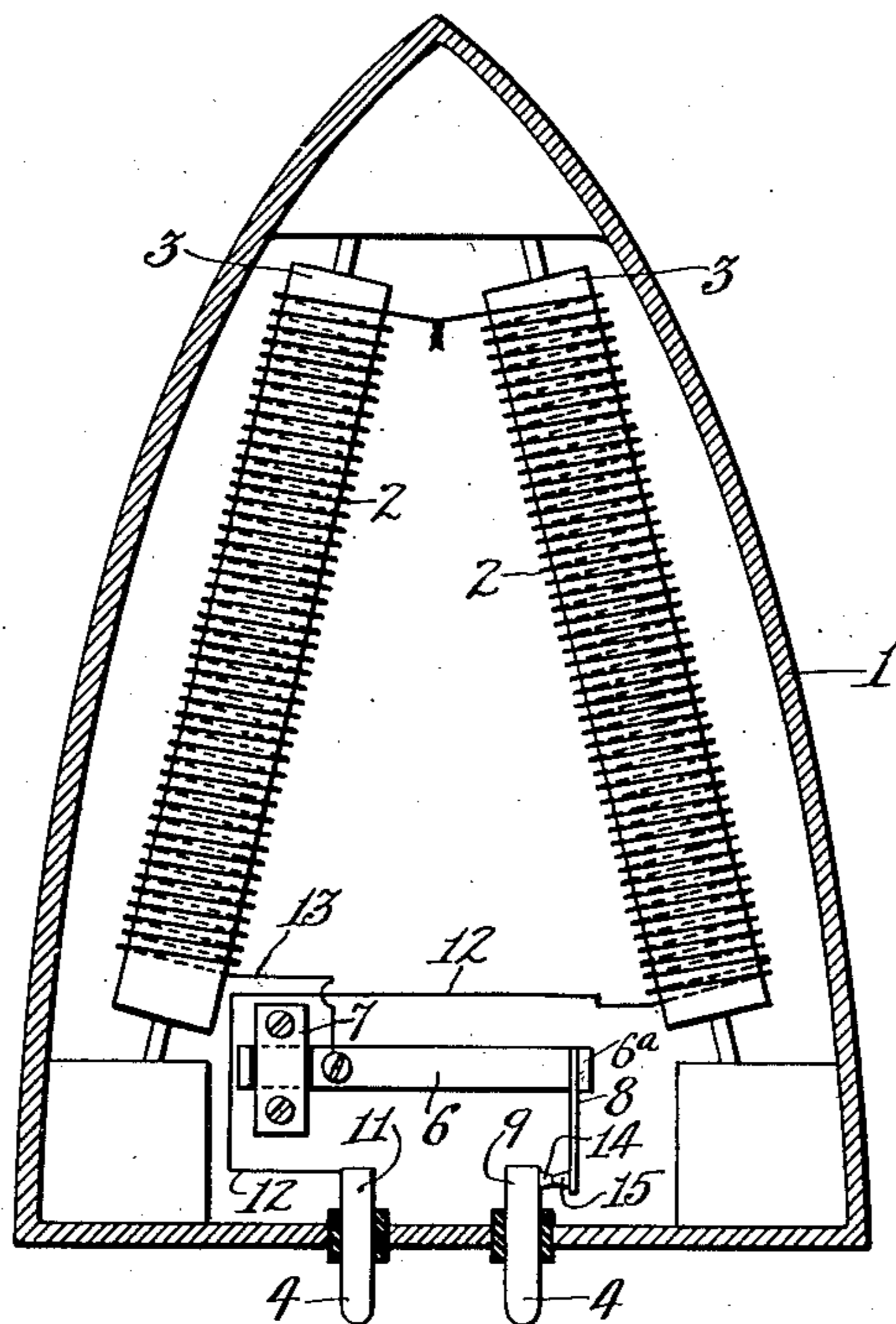
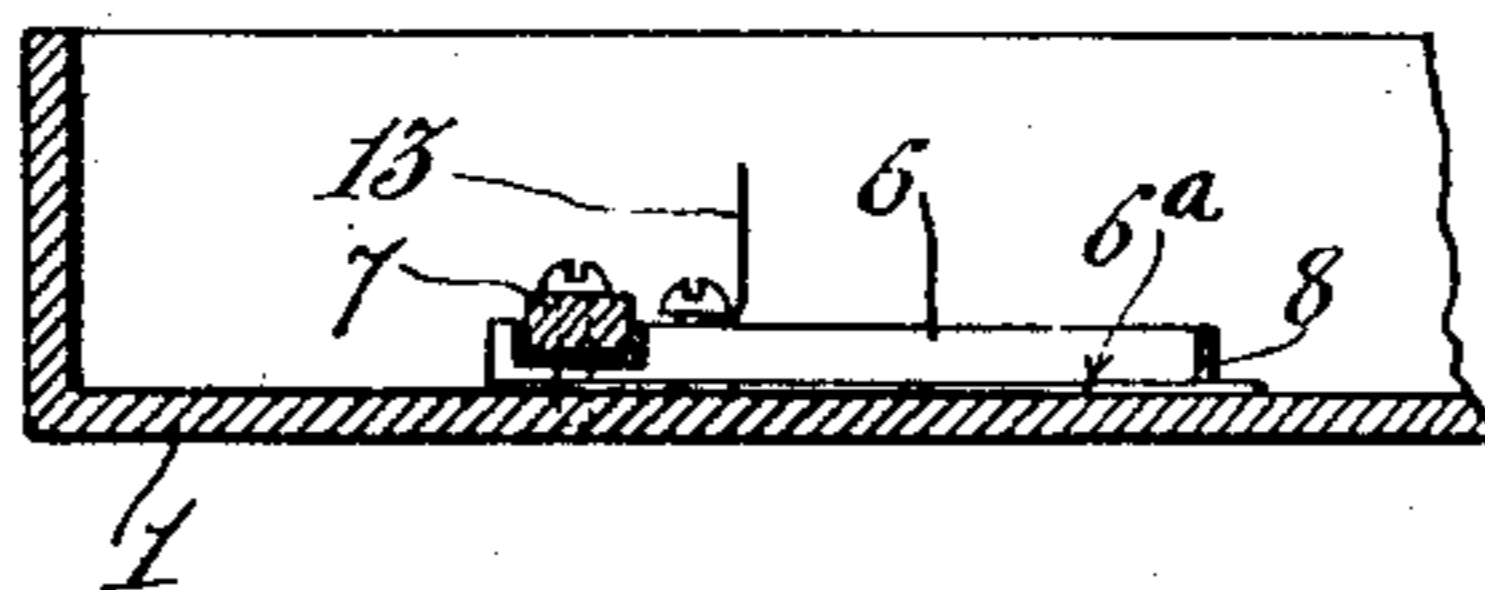


Fig. 2.



Witnesses:

Paul L. Mahan
P. H. Shulton

Inventor,
Elmer C. McBride.

by Townsend Lyon & Haekley
his attys.

UNITED STATES PATENT OFFICE.

ELMER C. McBRIDE, OF SANTA ANA, CALIFORNIA.

THERMOSTATIC CONTROL FOR ELECTRIC HEATING DEVICES.

989,273.

Specification of Letters Patent.

Patented Apr. 11, 1911.

Application filed July 26, 1909. Serial No. 509,714.

To all whom it may concern:

Be it known that I, ELMER C. McBRIDE, a citizen of the United States, residing at Santa Ana, in the county of Orange and State of California, have invented a new and useful Thermostatic Control for Electric Heating Devices, of which the following is a specification.

This invention relates to means for automatically controlling the circuit through electric heating devices of various kinds by automatically cutting out or open circuiting electric heating devices when the heat developed thereby attains a certain point, and automatically closing the circuit when the temperature of the device has fallen back to said point. For example, as applied to an electric laundry iron the invention provides for cutting off the current of the iron when the iron becomes unduly heated and for re-establishing the current upon the cooling of the iron to its normal working temperature.

Another object of the invention is to provide for adjusting the circuit controlling device, so that the temperature of the laundry iron or other electric heating appliance may be automatically maintained at various temperatures as desired.

In the accompanying drawings: Figure 1 is a horizontal section of the iron showing the automatic controlling device therein and illustrating diagrammatically the circuit connections therefor. Fig. 2 is a vertical section of the clamping means for the thermostatic bar.

1 designates the body of the iron, and 2 the usual heating means which may consist of resistance wire wound on suitable insulating cores or supports 3. Two circuit terminals or contact pins 4 are supported on the body 1 of the iron and insulated therefrom and are adapted to make connection with suitable plug or circuit connecting means for a supply circuit or cord and are connected to the resistance means or heating element 2 to supply the current thereto, a circuit controlling means being included in these connections for automatically open circuiting the connection to the heating element when the iron becomes overheated, and for closing the circuit when the temperature falls to the desired working point. Said circuit controlling means consists in this embodiment of a thermostatic bar or blade 6 resting upon the bottom of the iron and being insulated therefrom by mica 6^a and is secured at one

end to the iron by a clamp bar 7 which is secured to the base of the iron and insulated therefrom by the mica 6^a. The bar 6 has a contact finger or arm 8 extending therefrom and adapted to make contact with a terminal 9 connected to one of the plug connecting pins 4. The other of said pins 4 is connected by its terminal 11 and wire 12 with one end of one of the heating elements 2, the other end of said heating element being connected with a corresponding end of the other heating element, whose other end is connected by wire 13 with the bar 6.

The bar 6 is preferably of aluminum or other metal of high thermal coefficient of expansion and the contact arm 8 thereof is preferably a steel arm having preferably a platinum point 15, a contact point 14 preferably of platinum being provided on the terminal 9 for contact with the contact point 8.

When the heat generated is excessive, it expands the aluminum blade 6 which moves the platinum point 15 out of contact with platinum point 14, thus breaking the circuit, whereupon the iron cools down until it reaches the proper working temperature at which the blade 6 has been set to operate and then the aluminum blade 6 contracts and moves the platinum point 15 back into connection with platinum point 14, thus re-establishing the circuit. In this manner the temperature of the iron is maintained at substantially the degree required. I have found in practice that when the device is adjusted to maintain a good working temperature, that the circuit will be closed only during about a third of the aggregate time, thus making a great saving in the amount of current used.

Clamp 7 enables the blade 6 to be adjusted longitudinally so as to secure the requisite amount of pressure of the point 15 against the point 14, which pressure may be varied to regulate the point at which the thermostatic action will make and break the circuit. The steel arm 8 has a slight elasticity which will be sufficient to insure a good contact between the points 15 and 14, except when the blade 6 is expanded.

If the arm 8 were a member of considerable elasticity in the nature of a weak spring it would not have sufficient strength to separate the terminals when the bar 6 becomes heated and elongates, as in practice the terminals 14 and 15, when in contact,

stick together and do not separate until the bar 6 has expanded and slightly flexed the arm 8; which then exerts a sufficient force to separate the terminals. If the arm 8 was
 5 absolutely rigid and incapable of any flexure whatever, the terminals 14 and 15 would have to make contact at the left and limit the stroke of the said bar at the time the bar 6 was contracted and upon the slightest ex-
 10 pansion of the bar 6, the bar would move the terminal 15 away from the terminal 14, whereupon the iron would immediately cool, the bar 6 would contract and the terminal 15 would immediately contact with terminal
 15 14, thus producing a constant rapid connection and disconnection of the circuit, which would not allow the terminals to become widely separated and would result in almost continuous arcing. If the arm 8 were
 20 a weak spring, it would not have the strength to separate the terminals 14 and 15 when the bar 6 is elongated and thus the automatic connection and disconnection would not take place. But with the described construction
 25 the bar 6 expands an appreciable amount before the arm 8, of slight elasticity, exerts a pull strong enough to separate the terminal 15 from the terminal 14, and when the separation takes place the terminal 15
 30 is snapped away from terminal 14 by the stiff reaction of the arm 8, thereby producing a quick break and moving the terminal an appreciable distance away from terminal 14, which minimizes arcing to such a degree
 35 that an arc is hardly perceptible. Upon the breaking of the circuit, the iron cools and the bar 6 contracts appreciably before contact 15 has been moved far enough to again close the circuit. With this construc-
 40 tion, when the heat reaches the working point there is not a rapid and constant making and breaking of the circuit, but there is a considerable time interval after the iron is heated before the circuit is
 45 broken, and a similar interval after the circuit has been broken before it is reestablished, and, therefore, the temperature of the iron is maintained within sufficiently close limits without an unnecessary number of

connections and disconnections of the circuit which would destroy the terminals. While the adjustment of the bar 6 may vary the time between disconnection and connection, and vice versa, it may be stated that I have observed a period of about five and
 55 one-half minutes between disconnection and connection and about an equal period immediately thereafter between connection and disconnection when the bar 6 was adjusted for average work in a laundry. 60

What I claim is:

1. A thermostatic controlling means for electric heating devices comprising a fixed terminal means provided with a contact point, a thermostatic bar supported at one
 65 end and having at its other end an arm provided with a contact point for coöperation with said fixed contact point, means for connecting the said bar and terminal in the electric heating circuit, said bar being rela- 70
 tively rigid and said arm thereon having a slight elasticity in order to prolong the intervals of contact and of disruption of the circuit substantially as set forth.

2. A thermostatic controlling means for 75
 electric heating devices comprising a fixed terminal means provided with a contact point, a thermostatic bar supported at one end and having at its other end an arm provided with a contact point for coöperation 80
 with said fixed contact point, means for connecting the said bar and terminal in the electric heating circuit, said bar being relatively rigid and said arm thereon having a slight elasticity in order to prolong the intervals 85
 of contact and of disruption of the circuit substantially as set forth, and means for adjustably supporting said thermostatic bar to adjust the relative position of the afore- 90
 said contact points.

In testimony whereof, I have hereunto set my hand at Los Angeles, California, this 20th day of July 1909.

ELMER C. McBRIDE.

In presence of—

G. T. HACKLEY,
 FRANK L. A. GRAHAM.