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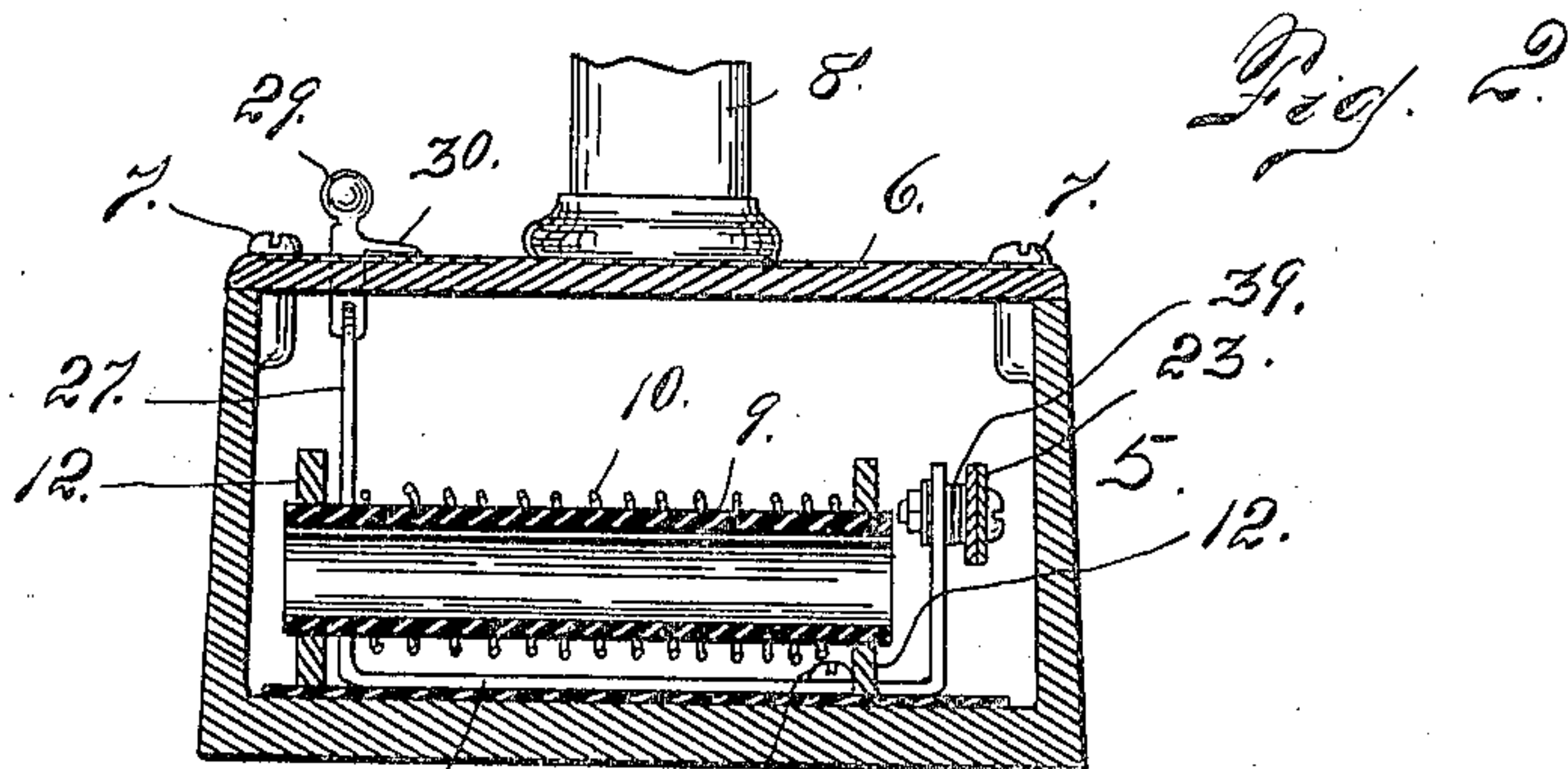
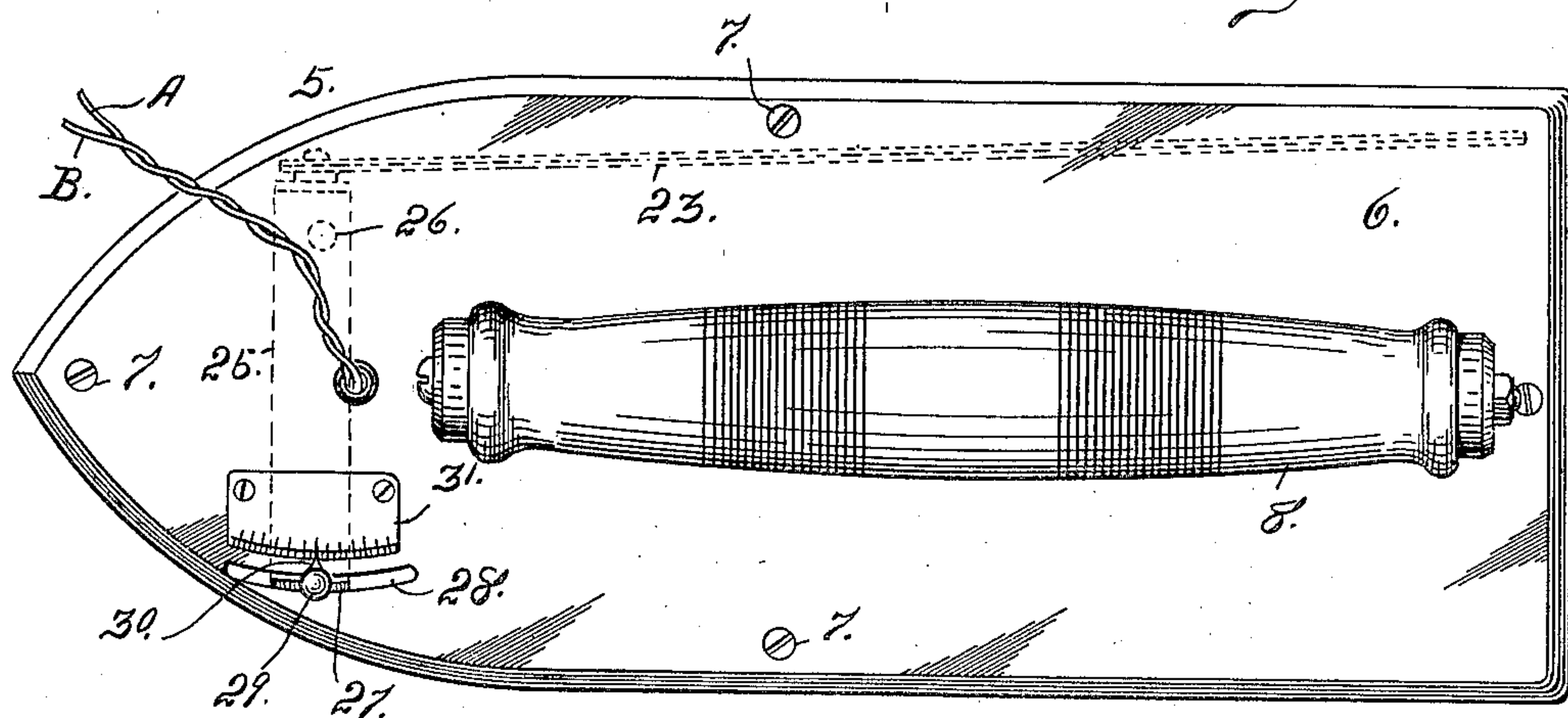
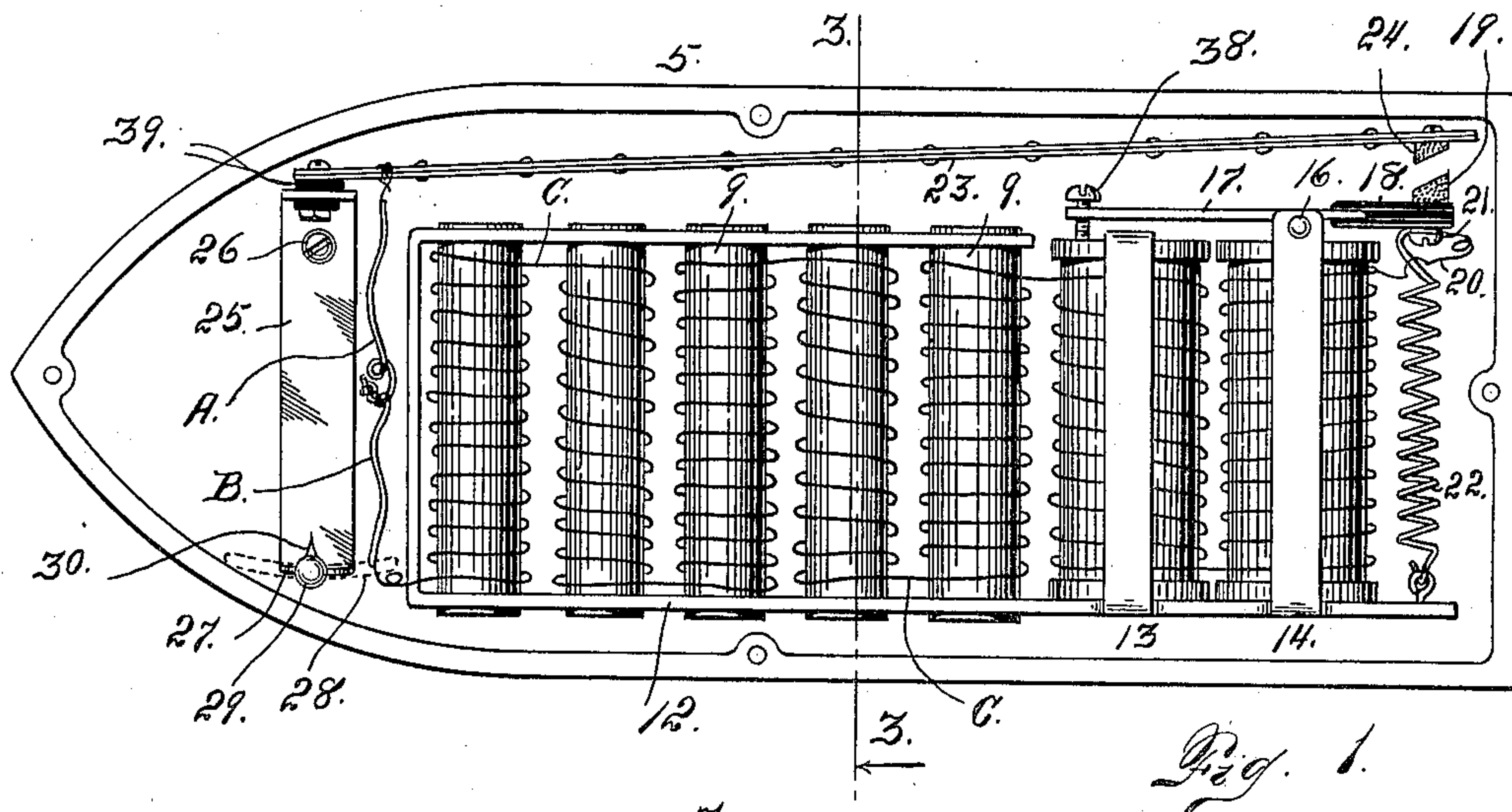
PATENTED JUNE 23, 1908.

P. A. BROWN.

ELECTRIC HEATER AND MEANS FOR CONTROLLING THE SAME.

APPLICATION FILED AUG. 20, 1908.

2 SHEETS—SHEET 1.



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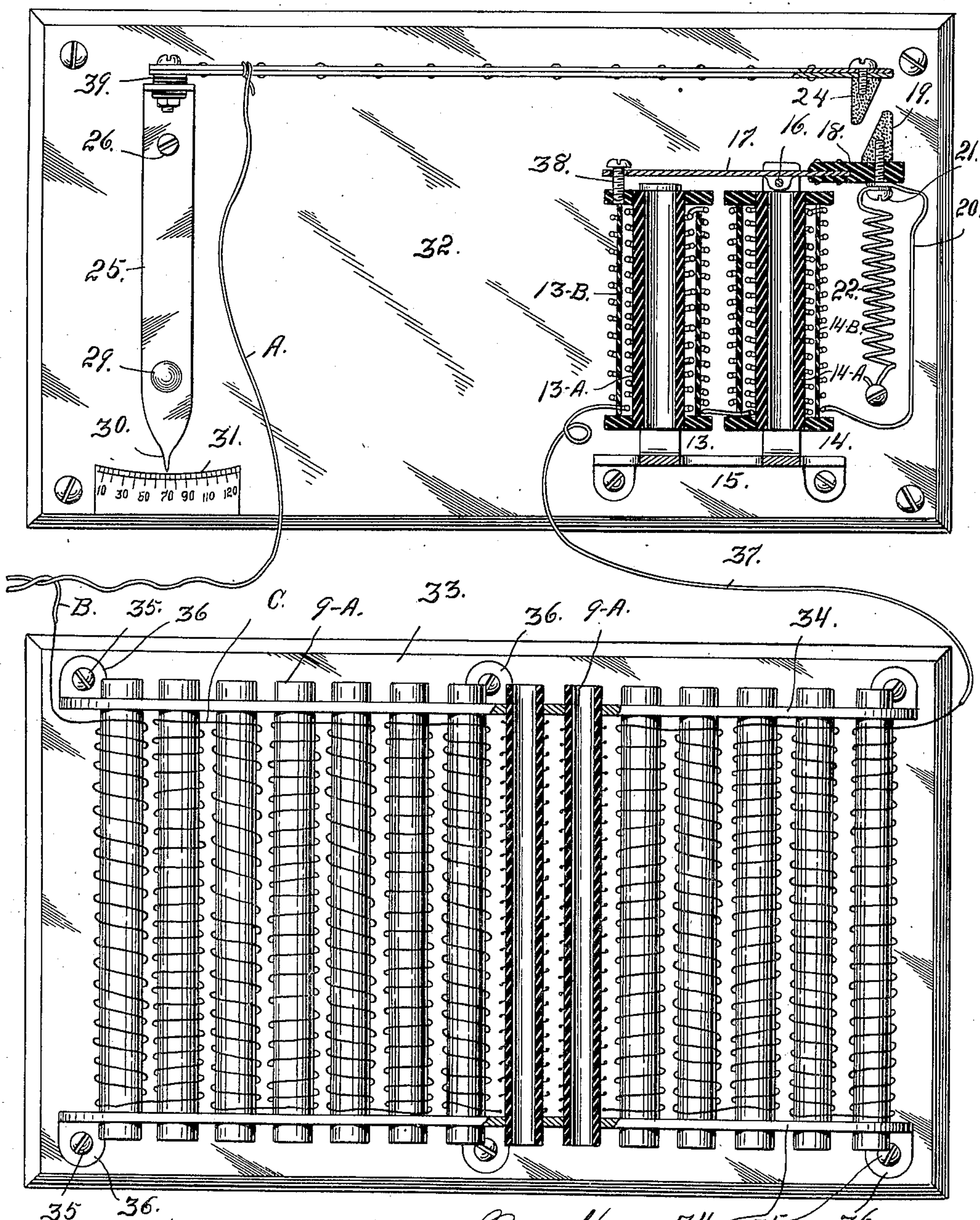
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Fig. 4. 34. 35. 36.
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UNITED STATES PATENT OFFICE.

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ELECTRIC HEATER AND MEANS FOR CONTROLLING THE SAME.

No. 891,400.

Specification of Letters Patent.

Patented June 23, 1908.

Application filed August 20, 1906. Serial No. 331,287.

To all whom it may concern:

Be it known that I, PEABODY A. BROWN, citizen of the United States, residing at 1431 Sixteenth street, in the city and county of Denver and State of Colorado, have invented certain new and useful Improvements in Electric Heaters and Means for Controlling the Same; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

My invention relates to improvements in electric heaters and controlling means therefor.

In my improved heater I employ hollow bodies wound with resistance wire, the said bodies being open at both ends to permit radiation from the interior as well as the exterior surface thereof. In the same circuit with the resistance coils, I locate an electro-magnet preferably also composed of hollow bodies wound with resistance wire whereby the magnet portion of the device performs the double function of an electro-magnet and a heating device. The electric circuit is controlled by a thermostat capable of adjustment to make and break the circuit at predetermined temperatures. In the breaking of the circuit I also utilize the armature of the electro-magnet, whereby as soon as the temperature reaches a sufficiently high limit to break the circuit by the movement of the bar of the thermostat, thus deenergizing the magnet, a spring connected with the armature of the magnet, aids in separating the contacts through which the current passes, one of said contacts being on the bar of the thermostat and the other on the armature of the magnet.

My improved heater and controlling means may be employed in many different relations, two only of which are illustrated in the drawing. One of these devices is an electrically heated sadiron; and the other a radiator which may be employed in all relations where steam and hot water radiators are generally used for house warming purposes.

Having briefly outlined my improved construction as well as the function it is intended to perform, I will proceed to describe the same in detail reference being made to the

accompanying drawing in which is illustrated an embodiment thereof.

In this drawing, Figure 1 is a top view of an electrically heated sadiron with the top plate removed. Fig. 2 is a top plan view of the same with the top plate in place. Fig. 3 is a cross section taken on the line 3—3 Fig. 1. Fig. 4 is a view illustrating the improvement as applied to a radiator for house warming purposes, the construction being somewhat modified as required by the different function to be performed.

The same reference characters indicate the same parts in all the views.

Referring first to Figs. 1, 2 and 3 of the drawing, let the numeral 5 designate the body of the sadiron which is provided with a removable top 6 secured in place by screws 7 or other suitable fastening devices. To this top plate is attached a handle 8. Within the casing is located a series of open ended tubes 9 composed of insulating material. These tubes are provided with resistance coils 10 surrounding the same exteriorly. The said tubes are composed of insulating material of such a nature that they constitute good heat-radiating devices. These tubes are mounted on a suitable frame 12.

In one extremity of the casing is located the electro-magnet composed of double tubes 13 and 14. The special construction of the magnet tubes is illustrated in the upper part of Fig. 4 which is a section of the magnet tubes. These tubes are provided with hollow cores 13^A and 14^A, respectively and with outer shells 13^B and 14^B, respectively. The members 13^A and 14^A are provided at their extremities with heads which the extremities of the shells engage. The hollow cores are wound with coils while the shells are also wound, both sets of coils being in the circuit of the heating coils proper. The double tubes of the magnets perform the heating and radiating function as well as the electro-magnet function. Pivotaly connected with the frame 15 of the magnet as shown at 16, is an armature 17 provided at one extremity with an insulating piece 18 to which is attached a contact 19 preferably composed of carbon. This contact 19 is connected with a circuit wire 20 by a screw 21 with which is connected one extremity of a coil spring 22 made fast to the magnet frame. Within the sadiron casing is also located a thermostat bar 23 composed of two metal plates riveted

together and possessing the properties of expansion and contraction in unequal degrees. This thermostat bar has one extremity located adjacent the contact 19, the bar being
 5 also provided with a smaller contact 24 located on the cold side of the bar. The extremity of the bar remote from the contact 24 is connected with a lever-like adjusting device 25 fulcrumed on the base of the sad-
 10 iron as shown at 26, one extremity of the device 25 being bent upwardly as shown at 27 and passing through a curved slot 28 formed in the top of the sadiron. This protruding extremity of the device 25 is provided with
 15 a manipulating projection 29 carrying a pointer 30 located adjacent a graduated plate 31. By manipulating the device 25, the thermostat bar may be set to open and close the circuit at predetermined tempera-
 20 tures. It will be understood that if the pointer extremity of the device 25 is moved toward the left referring to Figs. 1 and 2, the contact extremity of the thermostat bar will be thrown toward the contact 19; while if
 25 the pointer extremity of the device 25 is moved in the opposite direction the thermostat bar will be actuated to separate the contacts 19 and 24.

The circuit wires may be connected with
 30 any suitable source of electricity. These wires leading from the opposite poles of the electrical source may be designated A and B, respectively. One of the wires, A leads to the thermostat bar which is insulated from
 35 the device 25 as shown at 39; while the other wire B leads to the resistance coils of the various tubes comprising the heating feature proper as well as the combined heating and electro-magnet features. The resistance
 40 coils may be designated C. After leaving the various tubes of the sadiron, the coils C merge into a circuit wire 20 (heretofore referred to) which passes thence to a contact screw 21 whereby the current passes to the
 45 contact 19 of the armature 17.

When the device is in use the operator will first set the pointer 30 in such a position on the graduated scale, that the circuit shall be closed by the thermostat bar 23 when the
 50 temperature reaches a certain degree. It will be understood that as the temperature lowers the tendency of the thermostat bar is to approach the contact 19 whereby the two contacts 19 and 24 are brought into engage-
 55 ment to close the circuit. By the proper adjustment of the pointer, the operator is enabled to accurately control the circuit whereby it shall be made and broken at the desired or predetermined temperatures.

60 In the construction shown in Fig. 4, the magnet composed of the double tubes 13 and 14, is mounted on a base plate 32 separate from the plate 33 upon which the heating tubes 9^a are mounted being supported in
 65 suitable frame plates 34 secured to the base

by screws 35 passed through lugs 36. For all practical purposes the construction shown in this view is the same as that disclosed in Figs. 1 to 3 inclusive except that in one case the invention is employed as a sadiron
 70 heater, while in the other case it is employed for heating rooms or heating purposes generally. For the purpose of controlling a radiator for heating rooms it is advantageous to have the thermostat placed
 75 in a different location from that of the radiator itself. For this reason, in illustrating this use of the device, I have shown the two features mounted on separated base plates whereby they may be placed as far apart as
 80 desired. In the construction illustrated in this view a conductor 37 is employed to connect the coils of the magnet with the resistance coils of the radiator heater proper. The manner of regulating the thermostat is the
 85 same in this construction as in that disclosed in the other views and therefore need not be further explained in detail.

The armature 17 of the electro-magnet is provided with an opening in the extremity
 90 remote from the contact 19, through which a screw 38 passes. The opening in the armature is sufficiently large to allow the latter to move freely back and forth on the screw, in response to the influence of the magnet or
 95 the tension of the spring 22 as circumstances may require.

From the foregoing description the use and operation of my improved device will be readily understood. In the first place the
 100 pointer of the lever-like device for controlling the thermostat should be adjusted to occupy a position on the graduated scale 31, corresponding to the temperature at which it is desired to make and break the circuit by
 105 the movement of the thermostat bar. When the circuit is closed, the electric current may be said to pass from one pole of the electric source through the conductor A, the thermostat bar 23, the contacts 24 and 19, the con-
 110 ductor 20, the coils of the electro magnets, the resistance coils of the heating tubes, and out through the conductor B to the other pole of the electrical source (not shown). When the circuit is closed the heat generated
 115 by the passage of the current through the resistance coils, will raise the temperature in the vicinity of the thermostat bar, and after this temperature has reached a predetermined limit, the expansion of the bar located
 120 nearer the armature of the magnet, will cause the bar to curve in such a manner as to separate the two contacts 24 and 19. This separation is aided or facilitated by the spring 22 which is under tension and acts to quickly
 125 separate the two contacts and thus prevent arcing of the current which would be injurious and have a tendency to quickly burn out the engaging contacts. It will be under-
 130 stood as soon as the electro-magnet ceases to

act on the portion of the armature 17 at the left of the fulcrum 16, the action of the spring 22 connected with the armature at the right of the fulcrum, will serve to pull the contact 19 away from the contact 24, in which event the opposite extremity of the armature 17 will be thrown outwardly toward the head of the screw 38. After the circuit is broken, the radiating tubes, will gradually cool and after the temperature has fallen sufficiently, the thermostat bar will move in the opposite direction and bring the contacts 19 and 24 again into engagement. As soon as this occurs the influence of the electro-magnet, acts to draw the portion of the armature 17 at the left of its fulcrum, inwardly toward the coils of the magnet, thus forcing the contact 19 tightly against the contact 24 whereby a perfect electrical connection is made.

There is another difference not heretofore specified between the construction shown in Figs. 1 to 3 inclusive and that shown in Fig. 4, since in the latter the magnet coils should not be resistance coils since it is not desired that the magnet coils should be heating coils but that the heat should all come from the construction mounted on the base plate 33.

There is another feature which I deem of considerable importance, namely that the carbon contacts 19 and 24 have their engaging faces beveled whereby as they come together there is a sliding action which has a tendency to keep them clean and prevent corrosion thereby keeping the contacts in condition to maintain a perfect circuit when they are in engagement.

Having thus described my invention, what I claim is:

1. In an electric heater, the combination with a circuit, of a series of cores composed of insulating material and surrounded by resistance coils located within the circuit, a thermostat for controlling said circuit, and an electro-magnet having coils within the circuit and provided with an armature coöperating with the movable element of the thermostat, to make and break the circuit.

2. In an electric heater, the combination with a circuit, of a series of hollow, open-ended, insulating cores adapted to radiate heat from their interior and exterior surfaces,

resistance coils surrounding said cores and located in the said circuit, an electro-magnet comprising cores also surrounded by resistance coils and also located in the circuit, an armature located adjacent the electro-magnet and provided with a contact forming an element of the circuit, a thermostat whose movable element is provided with a contact also located in the circuit and coöperating with the contact of the armature to make and break the circuit, and a spring connected with the armature to facilitate the breaking of the circuit as the movable element of the thermostat begins its circuit breaking movement.

3. An electric heater, comprising a series of hollow insulating cores adapted to radiate heat both from their interior and exterior surfaces, resistance coils surrounding said cores, an electro-magnet having coils located in the same circuit as the coils of the heating cores, an armature located adjacent the magnet and provided with a contact located in the circuit, a thermostat provided with a movable bar also having a contact coöperating with the contact of the armature, and a lever-like device connected with the bar of the thermostat for adjusting the latter to regulate the movement of the bar necessary for closing the circuit, and a spring connected with the armature to facilitate the breaking of the circuit.

4. The combination with an electric heater, of an electro-magnet whose coils are in the same circuit with the coils of the heater, the armature of the magnet being provided with a beveled contact located in the circuit, and a thermostat for automatically making and breaking the circuit, the movable bar of the thermostat also having a beveled contact adapted to engage that of the armature when the circuit is closed, the beveled faces of the two contacts being arranged to engage each other for the purpose set forth.

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

PEABODY A. BROWN.

Witnesses:

A. H. BROWN,

E. S. CHENOWETH.