July 27, 1926. 1,593,638

C. L. MOYER

CONTROLLING DEVICE FOR ELECTRIC FLATIRONS

Filed Jan. 12, 1925

Fig. 1.

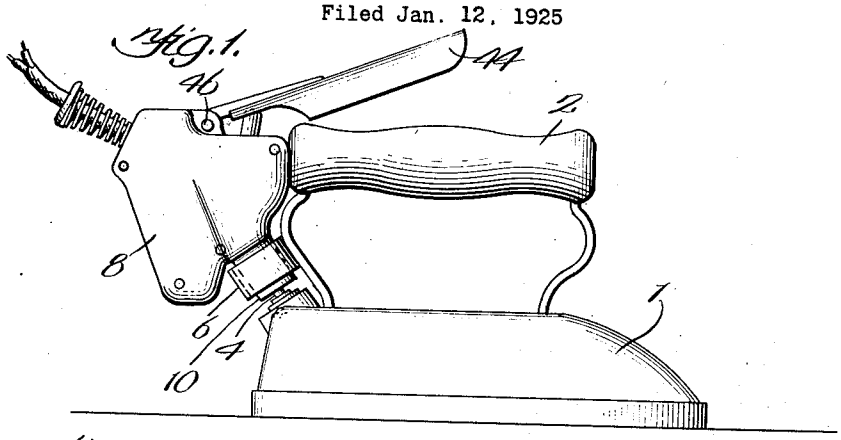


Fig. 2.

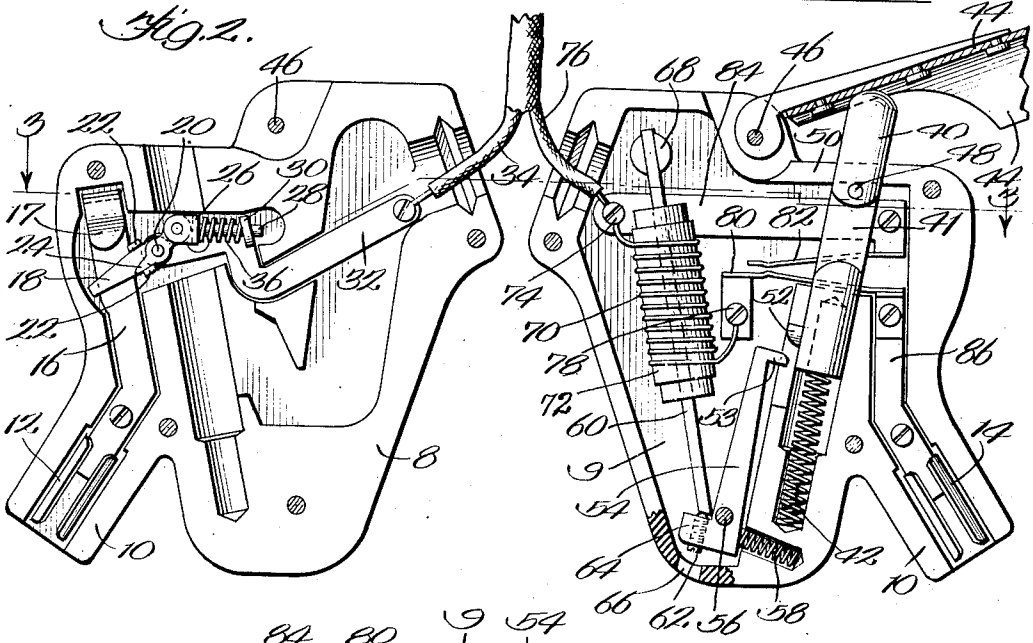
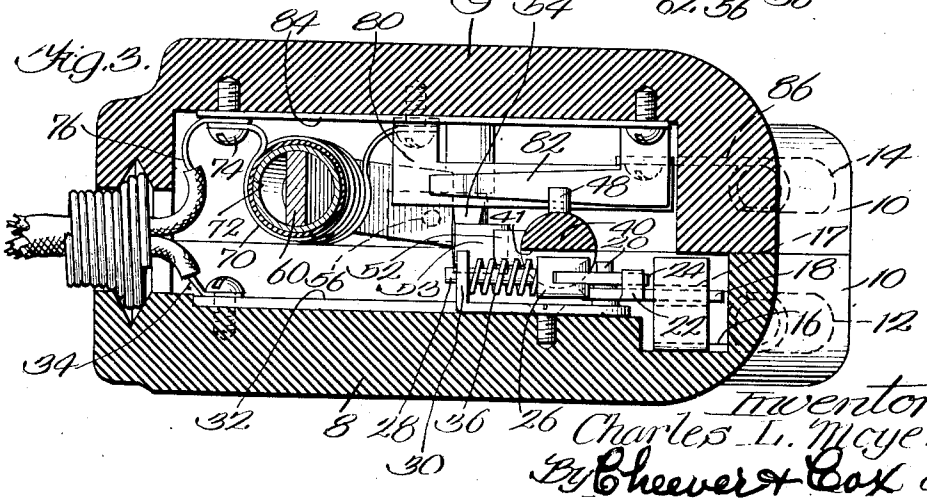


Fig. 3.



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UNITED STATES PATENT OFFICE.

CHARLES L. MOYER, OF CHICAGO, ILLINOIS.

CONTROLLING DEVICE FOR ELECTRIC FLATIRONS.

Application filed January 12, 1925. Serial No. 1,757.

My invention relates to controlling devices for electrically heated flat irons and the general object of the invention is to provide safe and practical means by which the iron may be preheated, that is, by which it may be brought up to proper temperature preparatory to use without requiring the operator to hold the switch closed during this preparatory step. In carrying out this object I provide a main switch which is biased toward open position but may be held closed either by the user's hand when in place upon the handle of the flat iron, or by a detent which takes hold automatically as the switch is being closed, to hold it closed during the preheating stage. This detent is subject to the action of an electric thermomotive device whose heating coil is in series with the heating element of the flat iron and retracts the detent after a predetermined interval, thus releasing the main switch and permitting it to open before any damage can be done in case the user is absent. I have also provided a shunt switch which will occupy open position when the detent is operating, but will occupy closed position when the switch-operating hand lever is held close to the handle of the iron by the user. This shunt switch enables the current to bypass the heating coil of the thermomotive device while the iron is in actual use, thus avoiding waste of current and deterioration of said coil. The object of my invention is to provide flat iron controlling means operating upon these principles. Another object is to provide a construction such that a visible signal will be exhibited when the preheating has been accomplished, and this without the addition of any element not otherwise useful.

I accomplish my object by the mechanism illustrated in the accompanying drawings in which

Figure 1 is a side elevation of a flat iron showing my attachment in place.

Figure 2 is a spread-out view showing the inner surfaces of the two members which compose the body of my attachment.

Figure 3 is a plan section of the body taken on the line 3—3 Figure 2.

Like numerals denote like parts throughout the several views.

In the form selected to illustrate the invention the device has some of the characteristics shown in the application of J. N. Pagliarul, Serial No. 745,376, and in my prior application Serial No. 745,377.

In the form here illustrated the flat iron has a main ironing body 1 containing the usual electric heating element, not shown. The iron is also provided with the usual handle 2. It is also provided with terminal pins 4 and a socket 6 for guiding the plug to the terminal. These parts are well known and need not be described in detail.

My device has a body formed of two principal parts 8 and 9 which in practice are composed of vulcanite or other insulating material and are internally recessed for containing the elements of the controlling mechanism. They have branches 10 which together form a plug for entering the socket 6 on the iron. Within this plug are two clips or sockets 12, 14 for cooperating with the terminal pins 4 in the usual manner. A conductor 16 is electrically connected to the socket 12 and is provided with jaws 17 for receiving the blade 18 of the main switch which controls the flow of current to the heating element of the iron. The illustrated switch is similar to the one shown in my copending application. The switch blade 18 is pivoted upon a pin 20 and provided with a pair of lugs 22 projecting from the plane of the blade in position to be acted upon by one end of a lever 24 which is pivoted upon the same pin and is shackled by means of a shacklehead 26 to a rod 28 slidingly mounted in a lug 30 projecting from the side of a stationary bar 32. Said bar is connected to the supply conductor 34. A compression spring 36 is interposed between lug 30 and the shacklehead 26, and this tends to press the rod toward the pivot pin 20 which tends to tilt the lever 24 to one oblique position or another, depending upon which side of the straight line the lever happens to be lying at the moment. This construction produces a "snap switch", for the spring 36 tends to hold the lever 24 "past center" and a sudden movement will be imparted to the lever if and when pressure is exerted upon the shacklehead 26 in a direction crosswise of rod 28. Consequently the switch blade 18 will always have a rapid movement into and out of engagement with the jaws 17.

This crosswise pressure is exerted upon the shacklehead by a plunger or push button

40 which is slidingly mounted in the body of the device and has a recess 41 in the side in which the shacklehead is accommodated. The plunger is supported upon a compression spring 42 which is strong enough to force the shacklehead "past center" in a direction to keep the switch blade 18 out of engagement with the jaws 17. Thus if the push button is released at any time it will move the switch from "on" to "off" position. The mechanism just described will be termed the "main switch" and is of the same construction as the one described in my aforesaid copending application.

A hand lever 44 is pivoted to the main body by a pin 46 and projects a considerable distance over the handle 2 of the iron, as a result of which it will come beneath the hand of the user when the latter grasps the iron. Said lever overlies the top of plunger 40 with the result that when the iron is within the grasp of the user the lever will hold the plunger down in opposition to the resistance of spring 42. This will cause the blade 18 of the main switch to snap into contact with the switch jaws 17. As soon as the push button is free to return the spring will return it to normal position, which will open the main switch. The rise of the plunger is limited by means of a pin 48 which projects from the side of the plunger in position to strike the flange 50 at the upper edge of the body.

I will now describe the parts most intimately concerned with my present invention. Projecting from the side of plunger 40 is a lug 52 adapted to be engaged by a hook 53 at the upper end of a detent 54 pivoted upon a stationary pin 56. A helical compression spring 58 tends to normally hold the detent in acting position. The bottom of the lug and the top of the hook of the detent are beveled so that in descending the lug will automatically pass the hook after which the latter will spring into the path of the lug and prevent it and the plunger from rising. Thus it will be evident that the plunger may be held down in position to maintain the closed switch in closed position, either by the hand lever 44 or by the detent 54. The function of the detent is to hold the plunger down for a limited period during which the iron will become hot enough for use.

The detent is retracted by means of a bar 60, the lower end of which engages an adjusting screw 62 screwing in an arm 64 projecting from the side of the detent near its fulcrum 56. An aperture 66 is formed in the body flange for permitting the end of a screw driver to be inserted to engage screw 62 and rotate it in one direction or the other to produce the desired adjustment. The bar 60 is composed of a metal which will expand and contract readily in response to heating and cooling, and the upper end is rigidly fastened to a post 68 located near the upper portion of the part 9 of the body. The heating is effected by a resistance coil 70 which surrounds the bar and is insulated therefrom by a tube 72 of any suitable insulating material. The parts are so constructed that when the electric current traverses coil 70 it will heat bar 60 and cause it to increase in length with the result that it will rotate the detent in a counter-clockwise direction Figure 2 and release the plunger 40 and open the main switch. Thus the heating coil and its associated parts constitute a thermomotive device for retracting the detent and permitting the main switch to open. The timing is such that the detent will be retracted about the time that the main heating element of the iron has made the iron hot enough for use. Thus it may be said that my device has a main switch biased towards open position, with a preheating detent for holding it closed during a predetermined interval and a thermomotive device subject to the current flowing through the iron for retracting the detent and permitting the switch to open. It will be evident that the hand lever 44 dominates over the detent 54 in the sense that if the lever is held down the main switch will be held closed regardless of the position of the detent. It will also be evident that the detent is self-acting in the sense that it normally tends to take hold of the plunger 40 automatically when the latter descends; also that the detent is positive acting in the sense that it will hold the plunger until positively moved away from it by the heating element, and is independent of the hand lever 44 in the sense that the hand lever is powerless to release the detent. After the detent has taken hold, the iron will either heat up to normal operating heat or the supply current must be shut off.

The upper end of the heating coil 70 is fastened to a binding post 74 to which the end of one of the supply conductors 76 is connected. The other end of said coil is connected to a binding post 78 mounted upon the depending arm of a stationary switch contact 80. Said contact 80 forms one of the cooperating elements of a shunt switch through which the current may travel to bypass the coil 70 when the main switch is being held closed by the hand lever 44. The movable element of this switch is a spring arm 82 which forms part of a conductive strip 84 into which the binding post 74 screws. The stationary contact 80 of the shunt switch is in permanent electric connection with the conductor 86 which at its lower end is provided with the socket 14 previously mentioned. Thus it will be evident that the shunt switch is arranged in parallel with the heating coil 70 and will shunt the cur-

rent around it when closed. The movable contactor 82 of the shunt switch is controlled by the pin 48 which projects out over it from the side of the plunger 40.

The shunt switch is normally open and remains so when the plunger is held in partially depressed position by the detent 54. Said switch does not close until the plunger has been still further depressed, to the position which it occupies when the hand lever 44 is down in the position which it will occupy when the iron is being used. Thus the plunger operates two switches and is capable of occupying three positions: first, the normal open position shown in Figure 2 in which both switches are open; second, a partially depressed position in which the main switch is closed and held so by the detent 54, and third, a fully depressed position in which the shunt switch is closed. The latter is the normal operating position.

In practice, if the iron is cold and the operator does not wish to hold the hand lever 44 down while the iron is becoming sufficiently heated for use the operator momentarily depresses the hand lever, thus causing the lug 52 to pass the hook 54 of the detent. The hand lever may then be released, but the plunger will remain down and the main switch will remain closed. The operator may then leave the iron and attend to other duties. Meanwhile the current will traverse the heating coil 70 of the thermomotive releasing device. After the predetermined interval of time, when the iron has become hot enough for use, the heating coil will have become heated and thereby lengthened the rod 60 sufficiently to rotate the detent away from lug 52 and release the plunger 40. The spring 42 is strong enough to thereupon not only open the main switch but suddenly throw the lever 44 upward, thus giving a visible signal that the iron is ready for use. If the operator pays no attention to the signal and neglects the iron no harm can occur for the current is off and the iron will soon cool off automatically. If on the other hand the operator commences to use the iron, the hand in grasping the iron will hold the lever 44 down low enough to keep the shunt switch 82 closed. Thus current will continue to be supplied to the iron although it will not be required to traverse the heating coil 70.

From the foregoing it will be evident that I have produced an automatic safety attachment which makes it impossible for the iron to set fire to anything or otherwise do any damage. Furthermore this is accomplished without the need of placing the iron on end or otherwise exercising care or foresight. The iron may be handled in the ordinary manner, and besides, requires no special adaptation, for it will be observed that no changes are required in the iron itself. My device is purely an attachment which may be applied to any flat iron having the usual terminal socket.

Having thus described my invention what I claim as new and desire to secure by Letters Patent is:

1. In an electrically heated flat iron, a main switch biased toward open position, a detent for holding it closed for preheating, an electric thermomotive device having a heating coil in series with the main switch for retracting the detent and manually operated means including a handle extending parallel and adjacent to the handle of the iron for holding the main switch closed regardless of the position of the detent.

2. In an electrically heated flat iron, a main switch biased toward open position, a detent for holding it closed for preheating, an electric thermomotive device having a heating coil in series with the main switch for retracting the detent, yieldable means for normally urging the detent toward acting position whereby it will automatically take hold when the main switch is closed and means for closing said main switch regardless of the position of the detent including a hand lever parallel and adjacent to the handle of the flat iron in position to be grasped and held in acting position by the operator when the iron is in use.

3. In a controlling attachment for electrically heated flat irons, a main switch, a hand lever for controlling it arranged parallel to the handle of the flat iron, said lever being downwardly movable for closing the switch, and means for raising said lever after a predetermined interval after the switch is closed for signaling the operator.

4. In an electrically heated flat iron, a main switch, a movable controlling element therefor, biased toward open position, a detent for holding the controlling element in closed position for preheating the iron, an electric thermomotive device having a coil in series with said main switch for retracting said detent, and a hand lever for moving the controlling element in a direction to close the main switch, said lever when in acting position holding the main switch closed regardless of the position of the detent, and said lever being adjacent to and parallel with the handle of the flat iron for being held in acting position by the hand of the operator in grasping the handle of the flat iron.

5. In an electrically heated flat iron, a main switch, a movable controlling element therefor, biased toward open position, a detent for holding the controlling element in closed position for preheating the iron, an electric thermomotive device having a coil in series with said main switch for retracting said detent, and manually operated means for holding said controlling element

in closed position regardless of said detent, said manually operated means including a lever parallel to the handle of the flat iron adapted to be grasped and held in acting position by the hand grasping the handle of the iron.

6. In an electrically heated flat iron, a heating coil, a main switch biased toward open position, a lever associated with the handle of the flat iron for underlying the hand of the operator to keep the switch closed, a detent for holding the switch closed for preheating, an electric thermomotive device for retracting said detent, the heating coil of said device being in series with the heating element of the iron, and a shunt switch in parallel with said coil for shunting the current around it, said shunt switch being held closed by said hand lever when the latter is in acting position.

7. In a controlling device for electrically heated flat irons, the combination of a hand lever associated with the handle of the iron, a main switch for controlling the current to the heating element in the iron, a movable controlling element actuated by said lever for controlling the main switch, said controlling element being biased toward open position, a detent for holding said controlling device in a position corresponding to the closed position of the main switch, an electric thermomotive device for releasing said detent, said device having a heating coil in series with the heating element of the iron, and a shunt switch arranged in parallel with the heating coil, said controlling element being capable of occupying three positions, first normal open position, second an intermediate closed position where it is held by the detent, and third an extreme closed position in which it holds the shunt switch closed.

In witness whereof, I have hereunto subscribed my name.

CHARLES L. MOYER.