Jan. 10, 1939. J. KELLY ET AL 2,143,701

HEAT CONTROL IRON AND PLUG

Filed Dec. 1, 1937

Fig. 1.

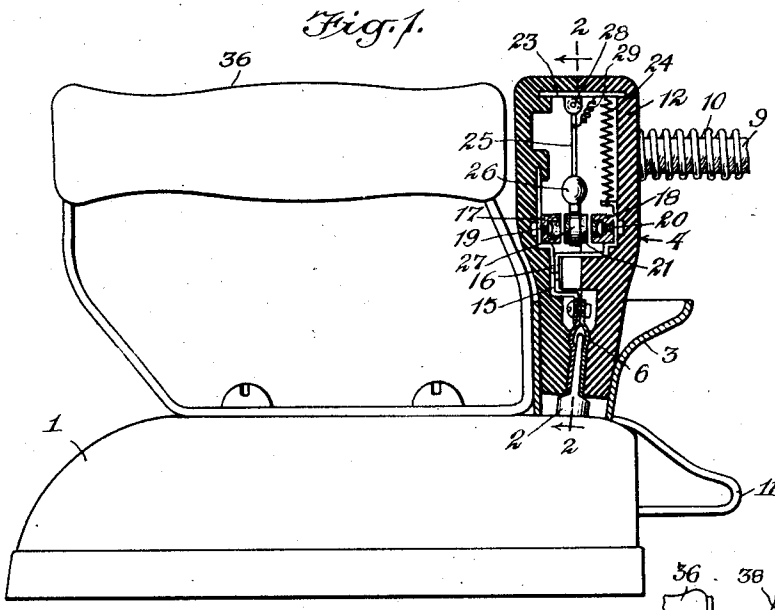


Fig. 2.

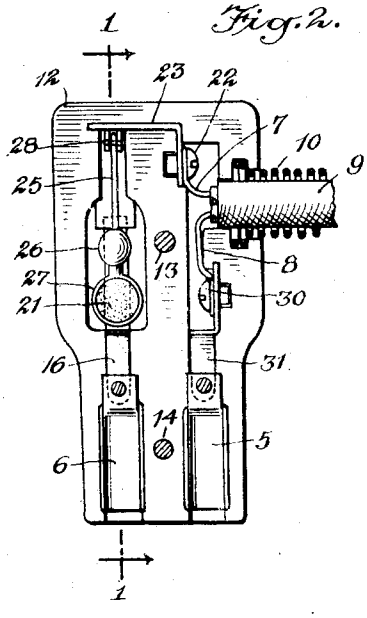


Fig. 4.

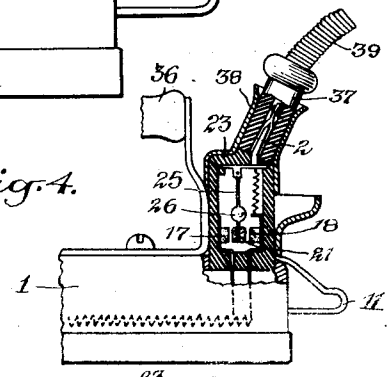
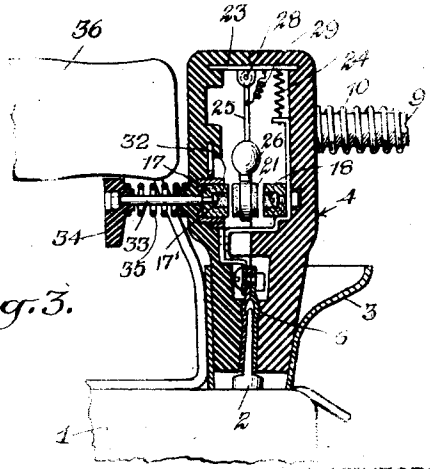


Fig. 3.



WITNESSES

George May Co

A. L. Ritchie

INVENTORS

John Kelly

and James J. Maloney

BY

Munn Anderson & Liddy

ATTORNEYS

Patented Jan. 10, 1939 2,143,701

UNITED STATES PATENT OFFICE

2,143,701

HEAT CONTROL IRON AND PLUG

John Kelly, New York, N. Y., and James J. Maloney, Leonia, N. J.

Application December 1, 1937, Serial No. 177,482

6 Claims. (Cl. 219—25)

This invention relates to heat control irons and plugs for electric irons or other electric utilizing devices, an object being to provide a construction which will automatically under certain circumstances provide a restricted amount of current and under other circumstances will automatically supply the full supply of current.

Another object of the invention is to provide a heat control plug for electric irons or the like wherein a constant flow of current is provided to the iron at all times and when the iron is in use an additional flow of current, so that the iron is maintained warm at all times and at full temperature while in actual use.

An additional object of the invention is to provide a heat control plug which will continually control the amount of current supply, or which may be manually adjusted to cause a constant full flow of current at all times.

A further object, more specifically, is to provide a heat control plug in which a double circuit in the plug is used, one of which includes a resistance and the other a short-circuiting structure designed to short circuit the resistance.

In the accompanying drawing—

Figure 1 is a side view of a well-known electric iron, the plug embodying the invention being shown in connection thereof and in vertical section, said vertical section being taken on the line 1—1 of Figure 2;

Figure 2 is a sectional view through the plug shown in Figure 1, said view being taken on the line 2—2;

Figure 3 is a sectional view similar to that shown in Figure 1 but illustrating a modified form of the invention; and

Fig. 4 is a view similar to the right-hand end of Fig. 1 but showing how the device may be used with an ordinary plug.

Referring to the accompanying drawing by numerals, 1 indicates an electric iron of any desired type provided with suitable terminals 2 and a plug guide 3. As is well known there are provided two terminals 2 for each iron and when the plug 4 is inserted guide 3 guides the lower part thereof so that the socket members 5 and 6 of the plug 4 will slide over the terminals 2 and make a good electrical contact. The plug 4 in addition to being provided with the conventional socket members 5 and 6, is provided with suitable lead-in wires 7 and 8 which extend from a cord 9 guided by a spring guard 10. The plug 4, however, is made special and coacts with the members just described to secure certain other desirable results which include the use of a limited amount of electricity when the iron is stationary and in an upright position as shown in Figure 1. When the iron is moving or is tilted up so as to rest on the member 11, the full current is applied to the heating coil of the iron 1.

The plug 4 is preferably made with a casing 12 of insulating material, for instance, rubber, Bakelite, fibre, or the like. This casing is preferably divided into two parts which may be secured together by suitable bolts 13 and 14. Arranged within the casing is a conductor 15 which is preferably made from flat strips of metal riveted together at 16, with said strips at the upper part divided and spaced apart whereby stationary contacts 17 and 18 carried thereby are also spaced apart, and suitable screws 19 and 20 hold these stationary contacts in position ready to be engaged by a movable contact 21 at any time. As the stationary contacts are both clamped by metal screws to the metal conductor 15 they are, therefore, both connected with the socket terminal 6.

The lead-in wire 7 is connected by a screw 22 to a metal plate 23 to which is secured one end of a resistance wire 24. The opposite end of the resistance wire 24 is secured to one of the prongs of the conductor 15 so that current passing from the lead-in wire 7 will pass through the resistance 24 and conductor 15 to the terminal 16. This occurs when the pendulum 25 is stationary or in the position shown in Figure 1. The pendulum 25 is preferably made from some good conducting material and is also preferably provided with a weight 26 and at the lower end with a strap 27 which encircles and pinches the movable conductor 21 so as to support the same. The conductors or contacts 17, 18 and 21 are preferably carbon so as to take care of any possible slight sparking upon the making and breaking of the circuit. Ordinarily there will be no sparking as the current will not be completely broken at any time. The pendulum 25 is pivotally mounted at 28 on the plate or conductor 23 and is also connected to the plate or conductor through a coil wire 29. It will be noted that the pendulum 25 and also one of the resistance coils 24 are both connected through plate 23 to the same lead-in wire 7. The lead-in wire 8 is connected by a screw 30, for instance as shown in Figure 1, to a conducting strip 31 which is bolted or otherwise rigidly secured to one end of the socket terminal 5.

When the parts are positioned as illustrated in Figure 1 and current is turned on, current will pass through lead-in wire 7, conductor plate 23,

resistance wire or coil 24, conductor 15, to the socket terminal 6, and thence through the winding in the iron 1 and back to the socket terminal 5 and thence through members 30 and 31 to the lead-in wire 8. The resistance 24 may be of any desired strength but preferably it reduces the amount of current supplied to the iron so that the iron never becomes too much heated when the parts are arranged as shown in Fig. 1. In fact, an appreciable amount of current is saved by maintaining the iron at a desired warmth when the same is not in use.

When the iron is moved over an article during an ironing operation, the pendulum 25 will swing and engage one of the stationary contacts 17 and 18 and, consequently, will short-circuit the resistance 24 whereupon the full current will be supplied to the heating coils of the iron. As long, therefore, as the iron is in actual use pressing an article, substantially full current is being provided and, consequently, ample heat is secured to perform the desired ironing operation. As soon as the iron stops moving and is placed on the holder the parts will assume the position shown in Figure 1 and the current will immediately and automatically be reduced so that the iron never overheats while it is standing still.

In Figure 3 a modified form of the invention is shown wherein the parts are identical with those shown in Figure 1 so that the same reference numerals will be used except for certain detail parts. In this form of the invention the contact 17' is slidably mounted in a metallic socket 32 connected to or formed integral with conductor 15. A rod 33 is secured to the contact 17' and is provided with a shoulder and head so that when the rod is reciprocated the contact will also be reciprocated. The hand-engaging member 34 of insulation is secured to the outer end of rod 33 and confines a spring 35 between the member 34 and the body of the plug 4. This spring acts to hold the parts in the position shown in Figure 3.

Whenever it is desired to have the full current on at all times the hand of the operator grasping the handle 36 will merely move slightly toward the plug 4 and push the member 34 and associated parts to the right as shown in Figure 3 until the contact 17' shifts the movable contact 21 over into continuous engagement with the stationary contact 18. When this occurs the resistance is completely short-circuited and the full current will flow through the heating coils in the iron as long as the parts remain in this position. However, if the iron is actuated as described and then placed on the holder, the parts will quickly resume the position shown in Figure 3 as soon as the hand of the operator moves away from the hand member 34.

It will be observed that the plug has been shown in connection with a certain kind of iron, but it will be understood that it can be used in connection with other types of irons and when the terminals 2 extend at an angle to the horizontal the lower part of the plug is bent at a desired angle so that the upper part will be vertical when the bottom of the iron is in a horizontal position.

In Fig. 4 the invention has been applied permanently to the iron 1 and, consequently, an ordinary plug 37 may be used. The form of the invention shown in Fig. 1 has been illustrated in Fig. 4 and therefore will need no additional description except that the form shown in Fig. 4 is mounted as a permanent part of the iron and provided with a plug socket 38 having the usual terminals 2 designed to accommodate the plug 37 of the kind that is now commonly in use on the open market. If desired, instead of having the structure shown in Fig. 1, the structure shown in Fig. 3 could be used. In this latter structure there is provided the member 34 whereby a manual closing of the circuit may be secured. When an ordinary iron is used as shown in Figs. 1 and 3, one of the special plugs illustrated in Figs. 1 and 3 must be used. If the structure shown in Fig. 4 is provided then an ordinary cord 39 and an ordinary plug 37 could be used.

We claim:

1. A heat control plug comprising a casing, a pair of terminals, means for connecting one lead-in wire to one of said terminals, and means for connecting the other lead-in wire to the other terminal, said last-mentioned means including a conductor formed with a resistance section, a stationary contact at the end of said resistance section nearest said other terminal, a second stationary contact electrically connected to said other terminal, a swinging pendulum electrically connected to the second of said lead-in wires, and a movable contact carried by said pendulum between said stationary contacts whereby when said movable contact is free of said stationary contacts current will flow to said other terminal only through the conductor having said resistance section and when in engagement with either of said stationary contacts current will flow to said other terminal through the conductor including said resistance section and through said pendulum and one of said stationary contacts said pendulum being positioned to short circuit said resistance when the iron using the plug is set on end.

2. A heat control plug for electric irons having a pair of terminals, comprising a casing of insulating material, a pair of socket terminals adapted to fit over the terminals of said iron, a conductor for connecting one of said socket terminals with a source of current, and means for connecting the other socket terminal with said source of current, said means including a pair of spaced stationary contacts, a conductor secured to said other socket terminal connecting said stationary contacts, a resistance connecting one of said stationary contacts with said source of current, a pendulum formed of conducting material electrically connected with said source of current, and a swinging contact carried by said pendulum between said stationary contacts whereby when the pendulum swings in one direction said swinging contact will engage one of said stationary contacts and when swung in the opposite direction will engage the other stationary contact for switching said resistance in and out of the circuit.

3. A heat control plug for an electric iron including a pair of terminals, a conductor for connecting one of said terminals to a source of current, means for connecting the other terminal to said source of current, said means including a resistance and a swinging pendulum for short-circuiting said resistance when moved to either of its extreme positions and hand-actuated means for holding said pendulum in one of its extreme positions.

4. A heat control plug comprising a pair of terminals, a conductor connecting one of said terminals to a source of current, means connecting the other terminal to said source of current.

said means including a conductor secured to said other terminal, a pair of spaced contacts carried by said second-mentioned conductor, a resistance connecting said second-mentioned conductor to said source of current, a pendulum of conducting material electrically connected with said source of current and positioned to swing back and forth between said contacts whereby whenever the pendulum engages either of said contacts said resistance will be short-circuited, a sliding bar for moving one of said contacts toward the other sufficiently to cause said contact to grip part of said pendulum between said contacts and a hand-actuated member for moving said bar.

5. A heat control plug for electric irons comprising a casing, a pair of terminals, a conductor for connecting a lead-in wire to one of said terminals, a preliminary terminal connected to the other lead-in wire, and a swing switch member for connecting said preliminary terminal to the other terminal of said iron, said swing switch being positioned to function when said iron is resting on one end.

6. In a device of the character described, a pendulum actuated switch including a pair of terminals, a conductor for connecting one of said terminals to a source of current, and means for connecting either of said terminals with said source of current, said means including a conductor electrically connected to said other terminal and a pair of spaced contacts carried by the last-mentioned conductor, a resistance connecting said last-mentioned conductor to said source of current and a pendulum connected to said source of current positioned to swing back and forth between said spaced contacts and to engage a contact when swinging to an extreme position in either direction for throwing said resistance in and out of circuit.

JOHN KELLY.
JAMES J. MALONEY.