

Nov. 5, 1935.

S. A. DUVALL

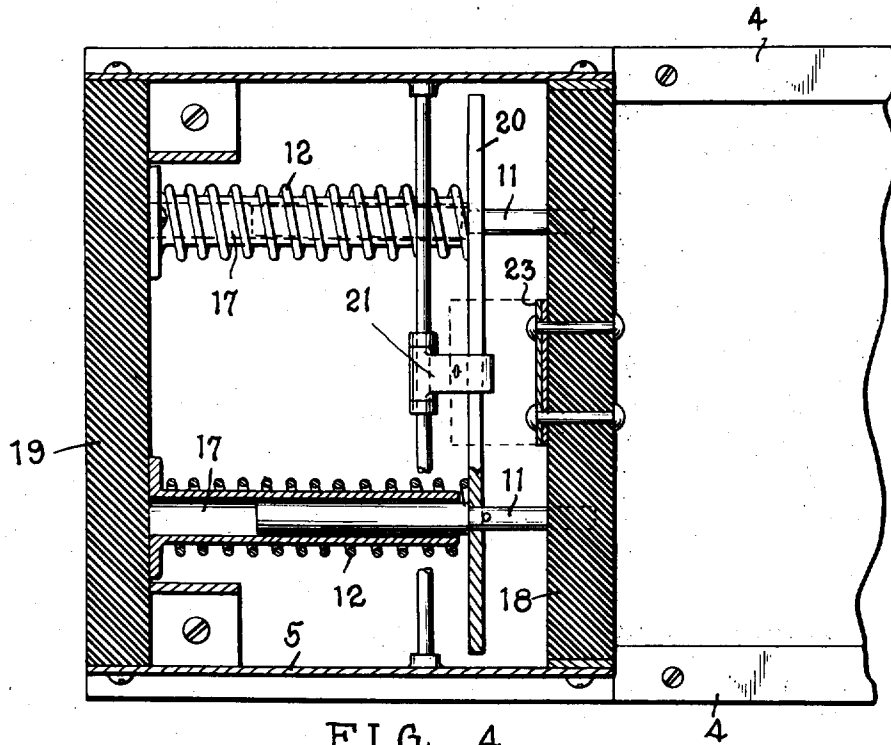
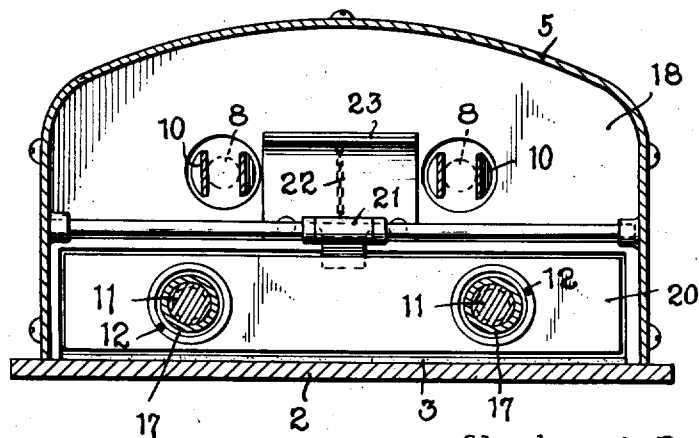
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AUTOMATIC THERMO MECHANICAL KICK-OFF OR DISCONNECTER

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3 Sheets-Sheet 2

FIG. 3.



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FIG. 5.

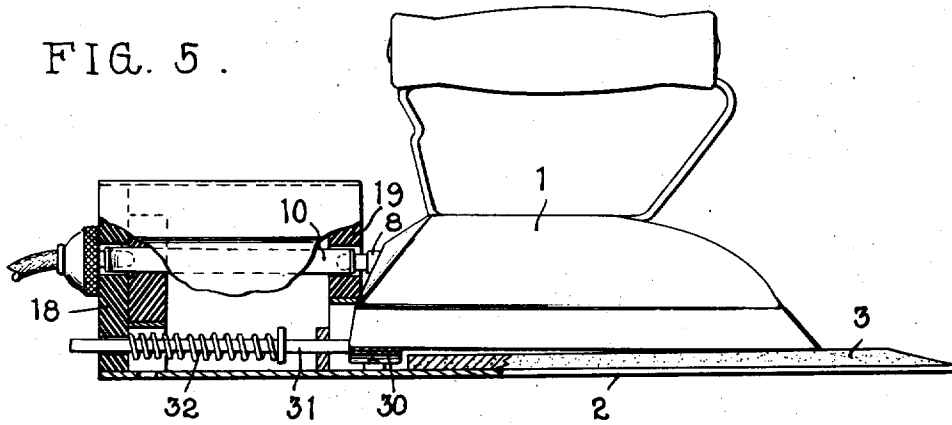


FIG. 6.

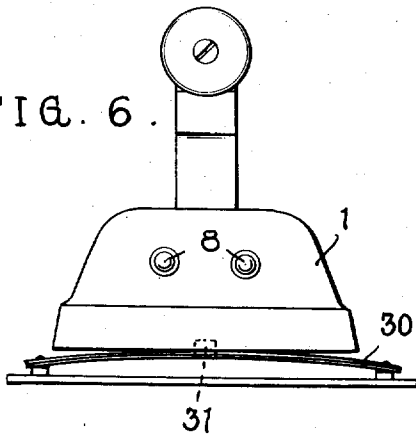


FIG. 7.

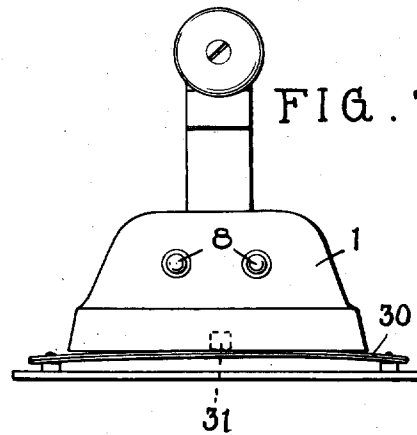
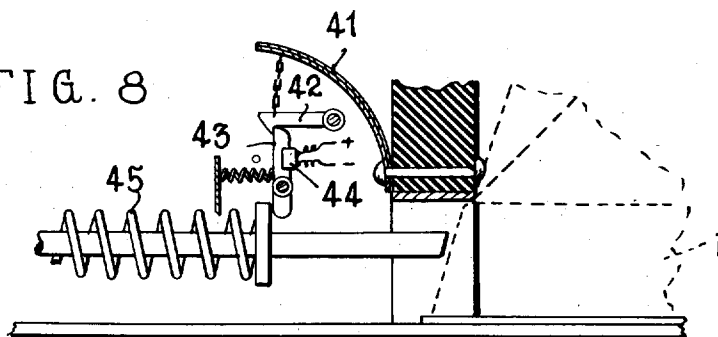


FIG. 8



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AUTOMATIC THERMO MECHANICAL
KICK-OFF OR DISCONNECTERStanley Alexander Duvall, Louisville, Ky., assignor
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11 Claims. (Cl. 219—25)

My invention relates to electrically heated flat-irons, and in certain particulars is an improvement in the device described and illustrated in my prior copending application Serial No. 649,605, filed December 30, 1932. In that case I provided a housing supported upon an ironing table with a runway projecting out from it over the table, said housing having a jack to receive the power plug and a pair of other jacks on the side toward the runway for receiving projecting plugs on the heel of the flatiron. The iron itself contains the usual heating coils having their terminal connected to said plugs and in order to heat the iron it was slid up the runway until its plugs engaged in the cooperating jacks. In order to prevent overheating of the iron I provided a thermostat inside the housing, in position to be heated from the heel of the iron. When the iron reached the desired temperature this thermostat would break the heating circuit.

I have found that in practice a thermostat such as I have described is liable to get out of order from the repeated clashing of the iron against the housing and the repeated and many times multiplied heatings and coolings to which it is subjected. I have therefore designed the improved device described herein for controlling the heat, which consists essentially of what I shall call a kick-off device and a thermostatic latch controlling the same. This kick-off device includes one or more mechanical plungers or the equivalent thereof which when the iron is in position on the runway with its plugs in the jack for heating are pressed back and latched. Controlling the latch is a thermostat which normally holds the latch in engaged position and which is in immediate conductive contact or equivalent heating relation with the heel of the iron. When the latter reaches the desired temperature the thermostat is operated to trip the latch and the kick-off then acts to push the iron down the runway a sufficient distance so that its plugs are clear of the jacks and the heating current in the main circuit is thereby cut off. The thermostat thus employed is made rugged and needs no fine adjustment. It is therefore free from the objections heretofore mentioned against the electrical thermostat referred to.

I intend to include in the foregoing description all forms of a trip and kick-off, which do not require such sensitive adjustment as the ordinary electrical thermostat. I shall describe hereinafter two forms of kick-off, one having two plungers with the thermostat and latch inside the housing and another form having a single

plunger and a thermostat constituting in itself the latch and lying beneath the heel of the iron outside the housing. I shall also describe a modification in which the thermostat trips a mechanical snap switch located inside the housing and acting when tripped to break the main circuit. This is free from the objections to a sensitive thermostat because the switch can be made rugged and substantial. Other possible changes and modifications will sufficiently appear to those skilled in the art from the detailed description hereinafter, and it is to be understood that I am not limited to any one form but contemplate all such changes and modifications as fall fairly within the scope and purview of the appended 15 claims.

My invention is illustrated in the accompanying drawings, in which

Fig. 1 is a side view of the complete device and parts of the housing broken away, showing the iron in position to be heated and the kick-off latched.

Fig. 2 is a view similar to Fig. 1 but showing the latch tripped and the iron kicked off to disconnect its heating plugs from the jacks in the housing.

Fig. 3 is a horizontal section on the line 3—3 of Fig. 1 looking in the direction of the arrow.

Fig. 4 is a section on the line 4—4 of Fig. 1 looking in the direction of the arrow.

Fig. 5 is a diagrammatic side view of the modification having a single plunger and a combined thermostat and latch outside the housing.

Fig. 6 is a diagrammatic end view of the same parts with the iron cold.

Fig. 7 is a similar diagrammatic end view with the iron assumed to be hot and the thermostat thereby straightened out, the kick-off being shown in dotted lines.

Fig. 8 is a diagrammatic view showing a snap switch in the main circuit controlled by a thermostat and plunger similar to those in Figs. 5, 6, and 7.

Referring to the drawings and particularly to Figs. 1, 2, 3 and 4, 1 is an electric flatiron and 2 is a stand therefor, both of the same general type of construction as those shown in my prior application hereinbefore referred to. The stand 2 is essentially a metal strip having a facing or cover 3 of asbestos or similar heat resisting material. The stand 2 is secured at one end to the ironing table 14 by means of a stud 16 on the clamp 15. Mounted on this stand is a housing, shown in enlarged views in Figs. 3 and 4 and having end pieces 18 and 19 of insulating material 55

with a metal cover 5. Heating current is brought to the housing by a plug 6 to cooperate with jacks 10 which extend across the casing into openings in the end piece 18 in which the jack springs are adapted to be engaged by plugs 8 constituting terminals of the heating elements of the iron. Lying below these elements are a pair of parallel plungers 11 connected by a cross-head 20 and normally impelled forward in their respective bearing tubes 17 by compression springs 12. When the plungers 11 are forced back the cross-head is engaged by the latch 21 connected by a chain 22 to the thermostat 23 which is secured to the end piece 18 in such a manner as to have metal parts such as rivets or screws directly in contact with the heel of the iron when in heating position, as in Fig. 1.

The operation of the device thus described is as follows: To be heated the iron 1 is slid up on the asbestos cover 3 between the guides 4 until its plugs 8 engage in the jacks 10, when the heel of the iron will be in contact with the metal parts connected to the thermostat and the plungers 11 will be forced back and latched. When the iron however gets too hot or about 400° F. the thermostat 23 straightens up and lifts the latch 21 which trips the cross-head 20 and allows the springs 12 to force the plungers 11 forward against the iron so as to kick the iron away from the housing with its plugs 8 disconnected as shown in Fig. 2.

The foregoing is the form of my device in which all the operative parts are included within the housing, but in Figs. 5, 6 and 7 I have shown a simpler construction which has a single plunger and combined thermostat and latch lying outside of the housing. In these figures the iron rests as before on the slide or stand 2 and its plugs 8 engage the jacks 10 as before. When in this position, the heel of the iron rests upon a strip of thermostat metal 30 which extends across the stand or slide just outside of the housing and is normally slightly bowed as shown in Fig. 6. A single plunger 31 with a compression spring 32 is journaled so as to slide in suitable bearings in the end pieces 18 and 19. When the iron is cold and the thermostat metal 30 is therefore bowed said metal strip lies in the path of the plunger 31 as shown in Figs. 5 and 6, the plunger 31 being shown in dotted lines in Figs. 6 and 7. When the iron gets too hot however or about 400° F. the thermostat metal strip 30 straightens out as shown in Fig. 7 and releases the plunger 31, which thereupon kicks the iron forward so as to disconnect its plugs and leave it in the same position as shown in Fig. 2.

Referring now to Fig. 8, I have shown therein a snap switch 40 actuated by a plunger similar to that shown in Fig. 5. The contacts of this switch are of the familiar knife blade type connected as shown in the main circuit so that when the thermostat 41 acts to raise the latch 42 the knife blade 43 will snap away from the fixed contact 44. The heating circuit being thus opened it is unnecessary to kick the iron away and the spring 45 on the plunger may be made too weak to kick the iron away or if preferred it may be made to act as a kick-off in addition to opening the circuit.

What I claim is:

1. An electric flatiron containing a heating element and terminal contacts therefor in combination with a stand comprising a runway for the iron, terminal contacts adapted to receive the contacts on the iron when the latter is on the

runway, a mechanical kick-off normally latched when the iron is in position to be heated, a latch controlling the same and a thermostat directly exposed to the heat of the iron and controlling said latch, said kick-off when released acting directly upon the iron to push it down the runway and disconnect the heating contacts.

2. The combination described in claim 1, in which the kick-off consists of a plunger element, a helical spring normally pressing the same forward, a latch engaging the plunger and a thermostat acting when heated to lift the latch.

3. An electric flatiron containing a heating element and terminal contacts therefor in combination with a stand comprising a runway for the iron, a housing on one end of said runway with means to secure the housing and the runway to an ironing surface, insulating end pieces for said housing, a power jack connection in one of said end pieces, a pair of jacks connected thereto and extending through the other end piece to receive the terminal contacts of the iron when the latter is in heating position on the runway, plunger means carried by the housing and adapted to slide in bearings below said jacks, 2 spring actuating means for moving said plunger means against the iron, a latch for said plunger means, a thermostat connected so that when heated it will retract said latch, and means for conveying heat from the heel of the iron when 3 in heating position to said thermostat.

4. An electric flatiron containing a heating element and terminal contacts therefor in combination with a stand comprising a runway for the iron, fixed terminal contacts adapted to receive 3 the contacts on the iron when the latter is on the runway and in heating position, a strip or bar of thermostatic metal extending across the runway in contact with the iron when the latter is in heating position, a mechanical kick-off adapted when 4 actuated to push the iron a limited distance down the runway and thereby disconnect its terminals from the fixed power terminals or jacks, said thermostatic bar when cold shaping itself so as to lie in the path of and to constitute a latch for said 4 kick-off device but also adapted when heated to a predetermined limit as for example 400° F. to alter its shape so as to release said kick-off and push the iron away so as to disconnect its heating element from the power supply.

5. An electric flatiron containing a heating element and terminal contacts therefor in combination with a stand comprising a runway for the iron, terminal contacts adapted to receive the contacts on the iron when the latter is on the 5 runway, a mechanical kick-off for separating the contacts, a thermostat adapted to receive heat from the iron and constitute a latch for said kick-off and means for storing kick-off operating energy in the kick-off by movement of the iron 6 against an element of the kick-off.

6. The combination of fixed power contacts, an electric flatiron with cooperating contacts, kick-off mechanism adapted to disconnect said contacts, a thermostat bar adapted to receive heat 7 from the iron and constitute a latch for the kick-off device, and means for storing kick-off operating energy in said mechanism by movement of a portion of the iron against an element of said mechanism.

7. The combination of fixed power contacts, an electric flatiron with cooperating contacts, kick-off mechanism adapted to disconnect said contacts, a latch for the kick-off mechanism, thermostatic means for controlling said latch adapted

to receive heat from the iron, and means for storing kick-off operating energy in said mechanism by movement of a portion of the iron against an element of said mechanism.

- 5 8. An electric flatiron containing a heating element and terminal contacts therefor in combination with a stand comprising a runway for the iron, terminal contacts adapted to receive the contacts on the iron when the latter is at one
10 end of the runway, a mechanical kick-off carried by the stand and adapted to move the iron from said end of the runway, a latch normally restraining the kick-off, and thermostatic means adapted to receive heat from the iron to release the latch.
9. The combination of an electrically heated flatiron having electric contacts, a support having fixed contacts, a mechanical kick-off adapted to disconnect said contacts, a latch for normally restraining the kick-off, and thermostatic means
15 adapted to receive heat from the flatiron for releasing the latch.

10. The combination of an electric flatiron containing a heating element and plug contacts therefor, a stand comprising an insulated housing at one end containing a supply jack, and

other jacks extending across the housing for engagement with the plug and the plug contacts of an electric flatiron, a pair of parallel plungers mounted below the jacks within the housing, a crosshead to connect the plungers together
5 compression springs adapted to normally impel the parallel plungers forward, a latch to hold the parallel plungers within the housing, and means to release the latch from holding the plungers within the housing, when an iron resting on the
10 stand reaches a predetermined temperature.

11. The combination of an electric iron having plug contacts therefor, a stand having contacts cooperating with plug contacts when an iron is in operative position on the stand, plunger
15 means associated with the stand tending normally to move the iron to inoperative position on stand, a latch in the stand to hold the plunger in non-iron moving position and thermostatic means in the stand responsive to temperature of
20 the iron to operate the latch whereby the plunger will cause the iron to move to inoperative position when the iron reaches a certain temperature.

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