E. H. RICHARDSON.

ELECTRIC LAUNDRY IRON.

APPLICATION FILED FEB. 15, 1909.

946,070. Patented Jan. 11, 1910.

Fig. 1.

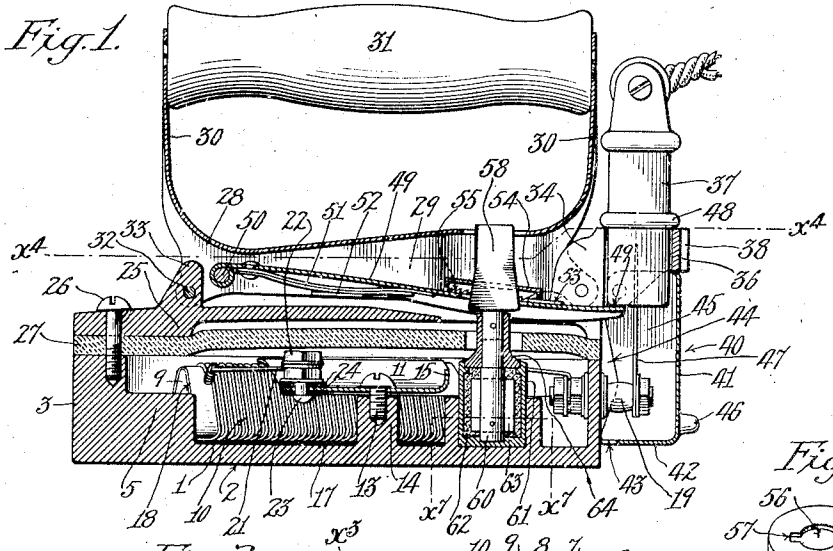


Fig. 6.

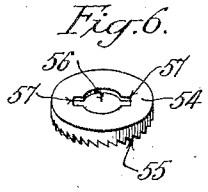


Fig. 2.

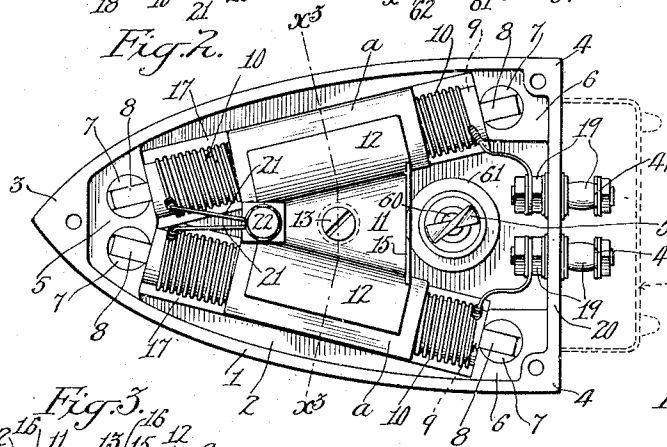


Fig. 7.

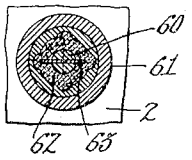


Fig. 3.

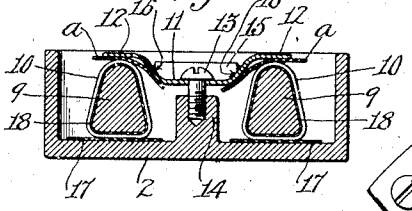


Fig. 4.

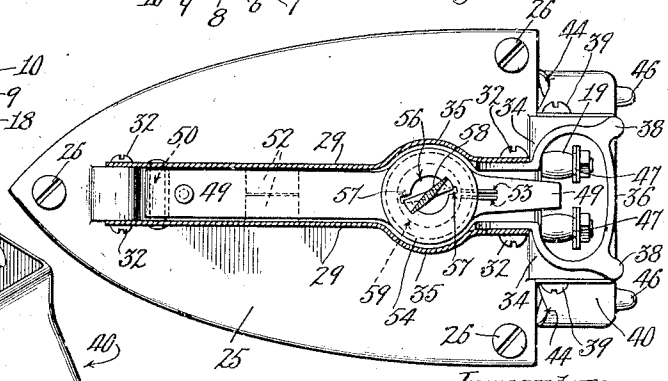
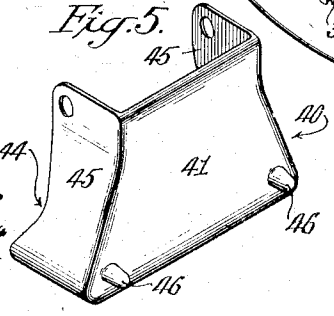


Fig. 5.



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UNITED STATES PATENT OFFICE.

EARL H. RICHARDSON, OF ONTARIO, CALIFORNIA, ASSIGNOR TO PACIFIC ELECTRIC HEATING COMPANY, OF ONTARIO, CALIFORNIA, A CORPORATION.

ELECTRIC LAUNDRY-IRON.

946,070. Specification of Letters Patent. Patented Jan. 11, 1910.

Application filed February 15, 1909. Serial No. 478,093.

To all whom it may concern:

Be it known that I, EARL H. RICHARDSON, a citizen of the United States, residing at Ontario, in the county of San Bernardino and State of California, have invented a new and useful Electric Laundry-Iron, of which the following is a specification.

This invention relates to electric laundry irons and has for its object to improve the construction of the same, one of the principal objects being to provide an improved device for automatically breaking the circuit through the heating element when the temperature of the iron reaches a certain degree, it being desirable to construct this circuit controlling device in as simple a form as possible and yet secure a positive and reliable operation thereof with the necessary accuracy.

A further object is to provide improved means for holding the heating elements in position and for permitting the removal of one element, if desired, for repair, without disturbing the other element.

A further object is to improve the construction of the hood which protects the terminals.

Referring to the drawings:—Figure 1 is a vertical longitudinal section through the iron. Fig. 2 is a plan view of the iron with the cover removed, the hood being shown in dotted lines. Fig. 3 is a vertical section on line x^3—x^3 Fig. 2, looking in the direction of the arrow. To render the view perfectly clear the back-ground has been omitted. Fig. 4 is a horizontal section on line x^4—x^4 Fig. 1. Fig. 5 is a perspective view of the hood. Fig. 6 is a perspective view of the ratchet. Fig. 7 is a section on line x^7—x^7 Fig. 1.

The iron comprises a body portion 1 having a flat sole 2, toe 3, and heel corners 4. The body portion is hollow, as shown, and in the toe it is provided with an extra metal portion 5, and in each corner of the heel it is provided with an extra metal portion 6. The toe portion 5 is bored out to receive two round plugs 7, arranged close together, while each heel corner portion 6 is provided with a similar plug 7. Each of the plugs 7 is slotted to receive a tongue 8 formed on the end of a core 9, on which is wound resistance wire 10, which latter in this embodiment forms the heating element. The heating elements and cores 9 are thus held in such a position that their front ends are close together and the heating elements diverge toward the rear. They are held from lateral displacement by the engagement of the tongues 8 in the slotted plugs 7, the tongues 8 fitting closely therein in order to give a good heat conduction, and the entire surface of each heating element rests flatly on the bottom of the iron, as clearly shown in Fig. 3. Each core 9 is preferably formed of copper or brass in order to give a good conduction of heat generated by the resistance wire, and the plugs 7 are also preferably of the same material, so that the heat generated by the resistance wire 10 is conducted to the toe and heel corners in greater amount than to the central part of the body.

In order to hold the heating units in close contact with the bottom of the body 1 a clamping plate 11 is provided, the central portion of which is depressed, thus forming two wings 12 which rest upon the tops of the two heating units, as clearly shown in Figs. 2 and 3, there being mica insulation *a* between the wings and wire. The clamping plate 11 is detachably secured to the body 1 by a screw 13 which engages a boss 14 projecting up from the bottom of the body 1. In order to stiffen the plate 11 it is formed at the rear with an upwardly directed flange 15 the ends of which, as shown in Fig. 3, for the greater part abut the inclined portions 16 of the plate. The pressure of the plate 11 is directed downward against the heating units and does not produce any lateral pressure thereon, the heating units being held against lateral displacement by the engagement of the tongues 8 in slotted plugs 7. In this manner the entire lower surfaces of the heating units are kept in contact with the bottom of the iron and heat is conducted readily thereto. Mica plates 17 are arranged between the heating units and the bottom of the body 1, while the cores 9 are also insulated from the wire 10 by mica 18. The rear ends of the wires 9 are connected with binding posts 19 which extend through the rear wall 20 of the body 1. The front ends 21 of the wires 9 are secured by nuts and washers 22 on a stud 23 which passes up through the front end of the plate 11 the stud 23 being insulated from the plate 11 by insulating washers 24, and the hole through which the stud 23 passes is made larger than the stud so that contact of the stud with the

plate 11 is avoided. This manner of connecting the two heating units and of holding the two heating units in the iron enables either heating unit to be readily removed without disturbing the other by unscrewing nuts 22 which releases the wire end 21 of the unit to be removed, then by unscrewing the screw 13 plate 11 may be removed and the unit lifted out of the iron after detaching its wire from the terminal 19. Heretofore the wire ends 21 have been connected by simply twisting them together and when one unit was to be removed it was necessary to untwist the wire ends 21 which frequently caused the wire to break and then both heating units had to be rewound or replaced. With the present construction, however, if only one heating unit needs to be replaced it may be removed and replaced without in any way disturbing the other. Heretofore the plugs 7 have been slightly headed over the tongues 8 to hold the units in position which render the removal of a unit somewhat difficult, which is now avoided by the use of the plate 11 which obviates heading the plug 7 so that when the plate 11 is removed the tongues 8 may slide up out of the plug 7.

The cover 25 is secured to the body by three screws 26 and is insulated from the body by an asbestos plate 27. Attached to the cover is a bail 28 which is formed of sheet metal with an inverted trough shaped lower portion 29 and flattened vertical projections 30 to which latter the handle 31 is secured. Each end of the lower trough shaped portion 29 is secured by screws 32 to a front lug 33 and rear lugs 34 both of which are cast on the cover 25. Near its rear end the trough shaped portion 29 is formed with two circular bends 35 to form an enlargement for a purpose to be described. Cast with the rear lugs 34, as clearly shown in Figs. 4 and 1 is a strap 36 which forms a support to slidably receive the switch plug 37. The strap 36 is cast with two lugs 38, as clearly shown in Figs. 4 and 1. Attached by screws 39 to the lugs 34 is a hood 40, shown in detail in Fig. 5, having an imperforate back plate 41 and having a bottom plate 42 the latter being of such a width that a space 43 is formed which permits air to circulate within the hood, the air circulation being aided by large notches 44 which are cut in the side walls 45 of the hood. Projecting from the back plate 41 are two lugs 46. The hood 41 and strap 36 act as a stand for the iron, which stand is kept out of contact with the support by means of the lugs 46 and 38. The hood 41 also acts as a housing to protect two terminal blades 47 with which the connection plug 37 makes electrical connection when in its lowest position, as shown in Fig. 1, there being a flange 48 which abuts against the strap 36 and acts as a stop to limit the downward movement of the plug.

The lower end of the plug 37 rests upon the end of a lever 49 which extends along in the trough shaped portion 29 being pivoted at 50 thereto. In the present embodiment a series of leaf springs 51 are riveted to the under side of the lever 49 and bear against a bridge 52 formed on the trough shaped portion 29 thus exerting an upward pressure on the lever 49. The lever 49 has two ribs 53 forming sharp teeth which are engaged by a cupped ratchet 54 having crown teeth 55. The ratchet 54 has a central orifice 56 with two notches 57 which notches permanently engage opposite edges of a twisted or spiral blade 58, the latter passing up freely through a large hole 59, shown by dotted lines in Fig. 4, in the lever 49, the blade 58 being secured to the upper end of a vertical shaft 60 which extends into a well 61 in which is a fusible material 62, the shaft 60 having a blade 63 which is immersed therein. The upper part of the well 61 is closed by a thimble 64 which also serves as a bearing for the shaft 60.

When the plug 37 is in its lowest position with the lever 49 depressed and the springs 57 under tension the lever is maintained in such lower position by a downward pressure exerted on it by the ratchet 54, and the ratchet 54 in turn is prevented from upward movement by the curvature of the spiral blade 58, and the latter is incapable of upward movement. Manifestly in order for the ratchet 54 to move upwardly either the blade 58 must turn or else the ratchet 54 must turn. Inasmuch as the ratchet 54 is prevented from turning by the teeth 53, and as at this time the blade 58 cannot turn, the ratchet 54 is prevented from upward movement, and thus the lever 49 is held in depressed position with plug 37 closing the circuit through the heating units. When the fusible material 62 melts or softens to a certain consistency on account of heat imparted to it from the iron the shaft 60 is enabled to turn and at such time the upward pressure of springs 51 act against lever 49 and the latter in turn moves up the ratchet 54, and as the ratchet 54 is prevented from turning by teeth 53, its notches 57 impart rotation to the twisted blade 58 thereby turning the shaft 60. It will be understood that this action takes place with great rapidity when the temperature of the iron reaches a degree so that the fusible material softens, and in practice the connection plug 37 is snapped from the terminals 47 thus making a quick break of the circuit and preventing arcing. If after thus being moved up, the plug 37 is immediately pushed down by hand it will not be retained in its lower position until the fusible material 62 hardens, because while it is in a soft condition it

permits the twisted blade 58 to turn. When the material 62 hardens sufficiently, upon depressing the plug 37 the twisted blade 58 will not rotate but will cause a reverse rotation of the ratchet 54 as the lever 49 moves down, the teeth of the ratchet during this movement clicking reversely over the teeth 53, but preventing forward rotation of the ratchet and thus the lever is held from upward movement at any point. It should be fully pressed down by the plug so that the plug will make full connection with the terminals. The weight of the ratchet 54 is sufficient to keep it in operative position resting against the lever 49. Obviously the plug 37 may manually be lifted to break the circuit at any time desired and when it is so lifted by hand or automatically lifted by the thermic device, just described, it remains slidably supported in the strap 36, although it may at any time be removed therefrom, if desired, by pulling it out farther.

Should it be desired to release the lever other than by the automatic action described, it may be done manually by inserting a rod or stick between lugs 34 and pressing against the end of lever 49 to relieve the spring produced pressure between the ratchet teeth 55 and teeth 53, then by inverting the iron the ratchet 54 will drop away by gravity from the lever 49 and teeth 53 turning backward on the twisted blade, whereupon the lever will be moved out by the spring.

What I claim is:—

1. In an electric laundry iron, a hollow body, a plurality of electric heating units therein, means engaging the ends of the units for preventing their lateral movement in either direction, and a plate above the bottom of the body and detachably secured thereto, said heating units being interposed between said plate and the bottom of said body, whereby said plate exerts a vertical downward pressure on said units, holding them in close contact with the bottom of the body.

2. In an electric laundry iron, a hollow body, a plurality of heating units therein, each unit comprising a core and wire wound thereon, said body being provided with means having notches engaging the ends of said cores preventing lateral movement of the cores, and a plate supported upon the top of said heating units and detachably secured to said body.

3. In an electric laundry iron, a hollow body, a plurality of heating units therein, each unit comprising a core with wire wound thereon, the end of each core having a tongue, means on said body provided with notches for receiving said tongues, a plate having a depressed central portion with wings on each side thereof bearing upon the top of said heating units, said plate having at its rear an upwardly directed flange stiffening the plate, and means detachably fastening the plate to the body.

4. In an electric laundry iron, a plurality of heating units therein, each comprising a core with wire wound thereon, a plate bearing against the units and detachably secured to said body, a binding post mounted on and insulated from said plate, the wires from each of said units being secured to said binding post and thereby electrically connected.

5. In an electric laundry iron, a plurality of heating units each comprising a core with wire wound thereon, a body containing said heating units, a binding post rigidly supported inside said body and insulated therefrom, the ends of the wires of the heating units being attached to said binding post and thereby electrically connected.

6. In an electric laundry iron, a body, electric heating means therein, a circuit closing device, and means for controlling the same comprising a confined fusible material, a shaft embedded therein, a twisted blade on the shaft, a ratchet bodily slidable on the twisted blade, and means engaged by the ratchet and having operative connection with said circuit closing device.

7. In an electric laundry iron, a body, electric heating means therein, a circuit closing device therefor, a spring pressed lever for actuating the circuit closing device, a confined fusible material, a shaft embedded therein, a twisted blade on the shaft, a ratchet slidable on the twisted blade, and teeth on said lever engaging said ratchet.

8. In an electric laundry iron, a body, electric heating means therein, terminals for the electric heating means, a plug slidably mounted on the body for controlling the circuit through said terminals, a pivoted lever extending into engagement with the plug, a spring for actuating said lever, a well within the body, a fusible material in the well, a shaft in the fusible material, a twisted blade on the shaft extending freely through said lever, and a ratchet slidable on said twisted blade with its teeth engaging said lever.

9. In an electric laundry iron, a body, electric heating means therein, terminals for the electric heating means, a switch plug slidably mounted on the body and adapted to control the circuit through said terminals, a spring pressed lever engaging said plug, a well, a thimble closing the upper end thereof and forming a bearing, a shaft journaled in said bearing and extending into the well, a fusible material in the well, a wing on the shaft normally anchored in said fusible material, a twisted blade on said shaft extending freely through said lever, a cupped ratchet having crown teeth and provided with a central orifice with diametrically arranged notches, said notches engaging the edges of the

twisted blade, and teeth formed on said lever engaging the teeth of the ratchet.

10. In an electric laundry iron, a body, electric heating means therein, a cover secured to the body, said cover having a forward lug and rear lugs, the rear lugs being cast with a strap forming a switch plug support, a bail formed of sheet metal with a lower trough shaped portion secured to the front lug and to the two rear lugs, said bail having upright extensions, and a handle secured thereto.

11. In an electric laundry iron, a body, electric heating means therein, a cover secured to the body, said cover having a forward lug and rear lugs, the rear lugs being cast with a strap forming a switch plug support, a bail formed of sheet metal with a lower trough shaped portion secured to the front lug and to the two rear lugs, said bail having upright extensions, a handle secured thereto, said trough shaped portion having at the rear two circular bends forming an interior cavity, a ratchet in said cavity, a lever pivoted in said trough portion and having means engaging said ratchet, a fusible material, a shaft therein, a twisted blade on the shaft, said blade extending through said ratchet, and a plug in said plug support and having operative engagement with said lever.

12. In an electric laundry iron, a body, electric heating means therein, terminals for the heating means outside the body, and a hood secured to the body, said hood having a back plate and a bottom plate with lugs projecting from the back plate.

13. In an electric laundry iron, a body, electric heating means therein, terminals for the heating means outside the body, a hood secured to the body, said hood having a back plate and a bottom plate with lugs projecting from the back plate, a cover for the body, lugs cast on the cover united by a strap cast therewith, and lugs on said strap.

In testimony whereof, I have hereunto set my hand at Ontario California this 6th day of February 1909.

EARL H. RICHARDSON.

In presence of—

EDMUND L. COLLING,

C. W. NICHOLS.