Sept. 30, 1941. J. G. MACDONALD 2,257,506

FLATIRON

Filed Feb. 27, 1940

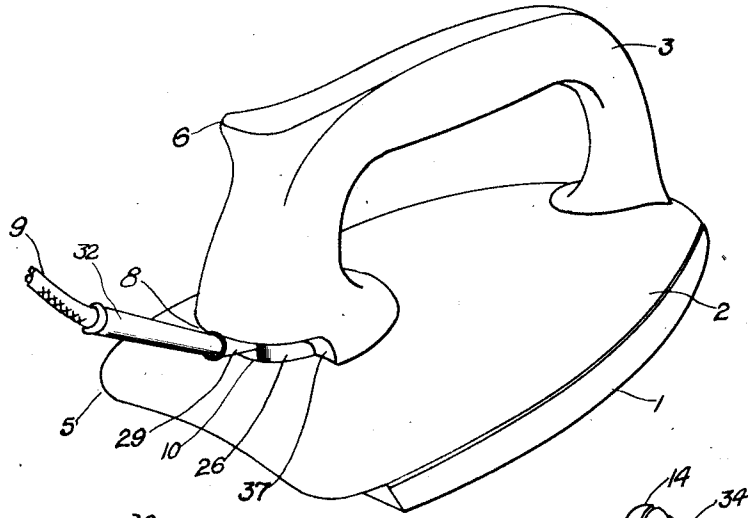


Fig. 1.

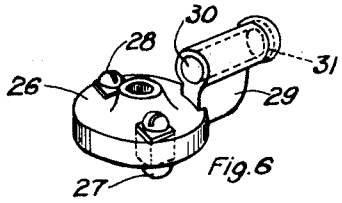


Fig. 6

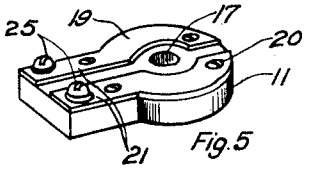


Fig. 5

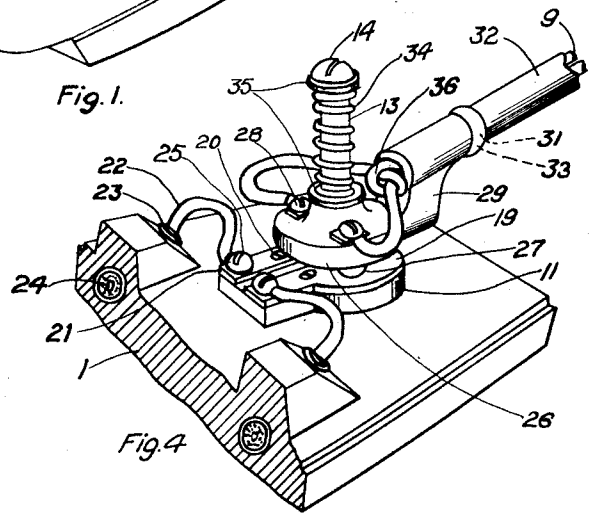


Fig. 4

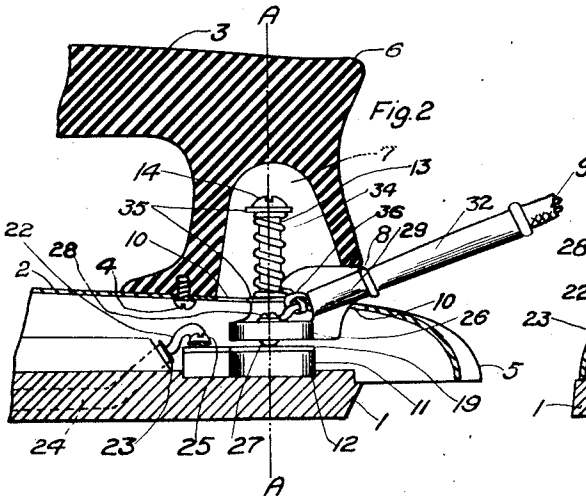


Fig. 2

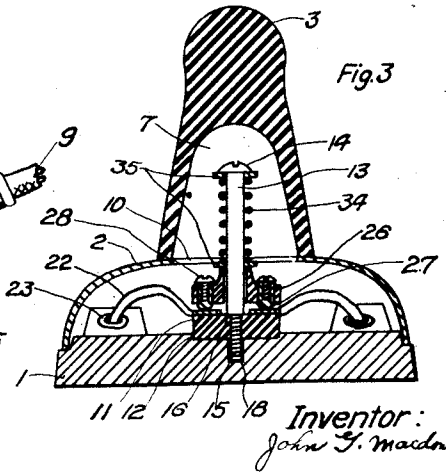


Fig. 3

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FLATIRON

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Application February 27, 1940, Serial No. 321,074

10 Claims. (Cl. 219—25)

My invention relates to flat irons and particularly to an arrangement for connecting the customary flexible supply conductors to electrically heated flat irons.

The supply conductors for electric flat irons are customarily connected to the flat irons either by means of an attachment plug mounted on the end of the conductors and adapted for detachable cooperation with rigid terminal posts on the flat irons, or by connecting the ends of the conductors directly to terminal posts within the flat irons.

With either of these methods of connecting the conductors, it has been found that in the erratic movements of hand ironing, frequent bending of the conductors occurs adjacent the connections, tending to weaken and eventually breaking the conductors at these points. This condition has been alleviated to some extent by the provision of a coil spring, or a molded rubber sleeve, surrounding the conductors at the usual points of breakage; but the objection has not been entirely overcome, as the conductors tend to have a sharp bend at the point of entry into the protecting spring or sleeve.

Electric flat irons are customarily provided with an inoperative resting position in which the iron may be placed when idle, whereby the soleplate is out of contact with the supporting surface. This inoperative resting position is customarily formed by projections at the rear of the flat iron which form a stand when the iron is stood on its rear end. Movement of the iron to its inoperative resting position further aggravates the condition indicated above, by subjecting the conductors to destructive short bends.

It is an object of my invention to provide an electric flat iron having an improved supply conductor connecting arrangement which obviates the above defects and permits the iron to be moved about in the erratic movement of hand ironing or stood in its inoperative resting position without subjecting the conductors to destructive short bends.

In accordance with the embodiment of my invention described herein, I provide a flat iron having conventional soleplate, heating unit, and cover shell, and with a handle fastened to the said cover shell. Projections on the rear of the cover shell and on the rear of the handle cooperate to provide an inoperative resting position for the flat iron. Supply conductors are connected to terminal posts within the flat iron, and the said conductors pass through an elongated opening in the rear of the flat iron to connect with a supply circuit. A fixed terminal block is mounted within the flat iron adjacent the rear end thereof and is provided with a pair of spaced apart contact surfaces connected to the terminals of the flat iron heating unit. A movable terminal block is pivotally mounted directly above the fixed terminal block on a rigid vertical post. The pivotally mounted terminal block is provided with a pair of contacts adapted to maintain constant rubbing engagement with the contact surfaces on the fixed terminal block. Terminal posts on the pivotable terminal block are adapted to receive the supply conductors for the flat iron. A protecting sleeve surrounds the conductors at their point of entry into the flat iron, and suitable strain relief is provided to protect the terminal connections from direct pulls on the supply conductors.

The spaced apart contact surfaces provided on the fixed terminal block are so dimensioned that the movable terminal block may be pivoted through a considerable angle about the vertical axes of the rigid post, without breaking the electrical connection between the cooperating contacts on the respective terminal blocks. The angle of pivot is limited by the extremities of the elongated opening through which the supply conductors and their protecting sleeve pass. To attain the objects of my invention, the elongated opening in the rear of the flat iron should extend sufficiently to allow pivoting through an angle of approximately 45° in each direction from the central longitudinal axes of the flat iron.

The length of the conductor protecting sleeve protruding from the elongated opening is such that if the flat iron is tilted back toward its inoperative resting position while the conductors are in the centre of the said opening, the outer end of the sleeve will contact the supporting surface and cause the movable terminal block to pivot about the vertical post; thus moving the conductors toward one or the other extremity of the elongated opening, into a position where the conductors are free from destructive sharp bends.

Likewise, in the erratic movements of hand ironing, the drag on the supply conductors is sufficient to pivot the movable terminal block relative to the flat iron, thus tending to keep the supply conductors straight, regardless of the position assumed by the flat iron body, and thereby preventing destructive bending of the conductors adjacent their point of entry into the flat iron.

For a complete understanding of my invention

reference should be had to the following description in accordance with the attached drawing in which the same reference characters refer to the same parts throughout the several views.

In the drawing:

Fig. 1 is a perspective view of a flat iron in accordance with my invention.

Fig. 2 is a central longitudinal section through the rear portion of the flat iron of Fig. 1.

Fig. 3 is a transverse section through the flat iron along the line A—A of Fig. 2.

Fig. 4 is a perspective view of the rear portion of the flat iron of Fig. 1, with the cover and handle assembly removed to clearly illustrate the terminal connections within the flat iron.

Fig. 5 is a perspective view of the fixed terminal block in accordance with my invention.

Fig. 6 is a perspective view of the movable terminal block in accordance with my invention.

Referring to the drawing, 1 represents a flat iron soleplate, 2 is a cover shell detachably secured to the soleplate, and 3 is a handle fastened to the cover shell, as at 4. The rear of the cover shell 2 projects beyond the soleplate as shown at 5, and this projection together with the projection 6 at the rear of the handle, are adapted to act as a rest, whereby the flat iron may be stood on its rear end with the soleplate out of contact with the supporting surface.

The rear of the handle 3 is provided with an inner recess 7 and an elongated opening 8 through which the flat iron supply conductors 9 pass for connection to a supply circuit. The cover shell 2 is provided with an opening 10 communicating with the recess 7 in the handle 3.

The fixed terminal block 11, of insulating material, is non-rotatively mounted in a recess 12 in the upper surface of the soleplate 1. The block 11 is held in position by the vertically mounted post 13, the upper end of which extends through the opening 10 in the cover shell 2 and into the recess 7 of the handle 3. The post 13 is provided at its upper end with an enlarged head 14, and at its lower end with a reduced threaded portion 15, and a shoulder 16. The reduced portion 15 passes through the central bore 17 in the fixed block 11 and engages the tapped hole 18 in the soleplate 1. When the post 13 is firmly seated in the hole 18, the shoulder 16 bears upon the top surface of the block 11 holding the block fixedly in position in the recess 12. The fixed terminal block 11 is provided with a pair of spaced apart metal contact surfaces 19 held in position on the top surface of the fixed block by flat headed drive screws, or the like, 20. The contact surfaces 19 are of a general semi-circular configuration and are provided with terminal connecting extensions 21. The leads 22 extend from the terminals 23 of the flat iron heating unit 24 and are connected to the said extensions 21 by suitable connecting means, such as screws 25.

The movable terminal block 26, of insulating material, is pivotally mounted on the post 13, directly above the fixed terminal block 11. Spaced-apart metal contacts 27 project from the under side of the pivotable block 26 and are adapted to cooperate with the contact surfaces 19 mounted on the upper surface of the fixed terminal block 11. The contacts 27 extend through the pivotable terminal block 26 and are provided at their upper ends with terminal posts 28 adapted to receive supply conductors 9. The pivotable block 26 is further provided with an integral extension 29 extending through the elongated opening 8 in the handle 3. The extension 29 is provided with an internal bore 30 through which the supply conductors 9 pass. Adjacent the outer end of the bore 30 is an inner annular recess 31. A protecting sleeve 32, of molded rubber or the like, surrounds the conductors 9 adjacent their point of entry into the flat iron, and the inner end of the sleeve 32 is provided with an annular ridge 33 seated in the recess 31.

The compressed coil spring 34 together with spacing washers 35, are mounted on the vertical post 13 between the lower side of the post head 14 and the upper side of the pivotable block 26. The compression spring 34 urges the pivotable block 26 toward the fixed block 11 and assures continuous rubbing contact between the contacts 27 and the contact surfaces 19.

In assembling the parts, the fixed terminal block 11 is first positioned in the recess 12, and the leads 22 extending from the heating unit terminals 23 are fastened to the screws 25. The spacing washers 35, coiled spring 34, and pivotable terminal block 26, are next positioned in proper relation on the post 13; and the threaded end 15 of the post is passed through the central bore 17 in the fixed terminal block 11 into engagement with the tapped hole 18 in the soleplate 1. The post 13 is then rotated until firmly seated in the hole 18, with the post shoulder 16 bearing against the top surface of the block 11.

The supply conductors 9, together with the protecting sleeve 32 mounted adjacent the flat iron end thereof, are drawn through the bore 30 until the end of the sleeve 32 reaches the end of the extension 29. The end of the sleeve 32 is then compressed and forced into the end of the bore 30 until the annular ridge 33 is seated in the cooperating annular recess 31 within the bore. A simple means of strain relief against longitudinal pulls on the conductors is provided by tying together the ends of the conductors which extend through the bore 30, making a knot 36 which is large enough to prevent the ends from being pulled back through the bore. The ends of the conductors are then stripped and fastened to the terminal posts 28. The assembly up to this point is illustrated in Fig. 4 of the drawing.

The final step of the assembly is to locate the cover assembly, comprising the cover shell 2 and the handle 3, in position on the soleplate 1. This is accomplished by passing the free end of the conductors 9 through the opening 10 in the cover shell and opening 8 in the handle, and finally locating the cover assembly in the position illustrated in Figs. 1, 2, and 3 of the drawing.

The cover assembly is fastened in position by suitable holding means, such as by a flat-headed threaded bolt passing through an opening in the cover shell and engaging a tapped hole in the soleplate (not shown).

Either a manually-operated, or a thermostatically-operated switch, may be mounted on the flat iron and electrically connected into the circuit in the manner well known in the art (not shown).

In accordance with my invention the coiled spring 34 is chosen sufficiently strong, and is mounted under sufficient compression, to insure good rubbing electrical contact between the cooperating metal parts on the two terminal blocks. However, in accordance with my invention, the spring does not offer enough frictional resistance to prevent the pivotable terminal block from moving freely about the post 13 when the supply conductors are moved through the arc limited by the extremities 37 of the elongated opening 8.

In the embodiment of my invention illustrated and described herein I have shown the part **29** as an integral extension of the pivotable terminal block **26**. However, the results of my invention could be successfully attained by utilizing a separate bushing-like part receiving the conductors and their protecting sleeve, and clamped to the terminal block **26**.

As best seen in Fig. 2 of the drawing the part **29** preferably projects obliquely from the pivotable terminal block, whereby the supply conductors and their protecting sleeve are supported in a position where they will not interfere with the flat iron when in use. In any case, the part **29** preferably acts as a rigid extension of the pivotable terminal block through which movements of the conductors are transferred to the said block.

While I have illustrated and described herein a particular embodiment of my invention, it is understood that I am not restricted thereto, but aim to include within the scope of the appended claims all modifications falling within the scope of my invention.

What I claim as new and desire to secure by Letters Patent for the United States is:

1. In an electric flat iron having a body, a heating unit in said body and a handle connected to said body; a post rigidly mounted in said body, a terminal block pivotally supported on said post, supply conductors passing through an elongated opening in said flat iron and connected to terminal means on said pivotally supported terminal block, said terminal means maintained in continuous rubbing contact with fixed terminals directly connected to said heating unit.

2. In an electric flat iron having a body, a heating element in said body and a handle mounted on said body, terminals connected to said heating element, a rigid post vertically mounted in said flat iron, a block of insulating material pivotally mounted on said post, said block provided with a pair of contacts adapted to retain electrical contact with said terminals when said block is pivoted about the axes of said post; supply conductors for said flat iron passing through an elongated opening in the rear of said handle and connected to said contacts on said pivoting block, whereby movements of said conductors pivot said block through an arc restricted by the extremities of said elongated opening.

3. In an electric flat iron having a body, a heating unit in said body, and a handle mounted on said body; a pivotally mounted terminal block within said body, said terminal block provided with contacts in rubbing engagement with fixed contact surfaces electrically connected to the terminals of said heating unit, supply conductors for said flat iron connected to the said contacts on said pivotally mounted terminal block; whereby movement of said supply conductors pivots said terminal block through an arc limited by stops on said flat iron, and the rubbing engagement between said contacts and said contact surfaces is continuously maintained.

4. In an electric flat iron having a body and a handle fastened to said body, supply conductors connected to terminal means supported on a terminal block pivotally mounted within said flat iron, said conductors extending through an elongated opening in the handle of said flat iron for connection with an external supply circuit; a resilient protecting sleeve surrounding said conductors adjacent said elongated opening, said sleeve supported in an integral extension of said pivotally mounted terminal block, whereby in the normal operations of ironing movements of said conductors are transferred to said sleeve and said sleeve pivots said terminal block through an arc limited by the extremities of said elongated opening in the handle of said flat iron.

5. In an electric flat iron including a soleplate, a cover shell and an operating handle, a fixed terminal block and a movable terminal block mounted on said soleplate independently of said cover and of said handle, said fixed terminal block provided with contacts cooperating with contacts on said movable terminal block, the contacts on said fixed terminal block electrically connected to a heating unit embedded in said soleplate and the contacts on said movable terminal block electrically connected to supply conductors for said flat iron; said movable terminal block pivotally mounted on a vertical post extending through said fixed terminal block and engaging said soleplate, spring means mounted on said post above said movable block, said spring means urging said movable terminal block towards said fixed terminal block, whereby continuous rubbing contact is maintained between said cooperating contacts.

6. In an electric flat iron including a body and a handle fastened to said body, a fixed terminal block non-rotatively mounted within said body and a movable terminal block pivotally mounted adjacent said fixed terminal block; said fixed terminal block provided with a pair of spaced apart contact surfaces electrically connected to a heating element in said body and said movable terminal block provided with a pair of contacts in rubbing engagement with said contact surfaces, an integral extension projecting axially from said movable terminal block, said extension provided with an internal bore; supply conductors for said appliances extending through said bore and connected to terminal posts on said movable block, a resilient protecting sleeve surrounding said supply conductors and fixedly supported at the outer end of said integral extension, whereby sideways movements of said conductors are transferred to said integral extension and pivot said movable terminal block to follow the said conductor movements and prevent destructive bending of said conductors adjacent said terminal posts.

7. In an electric flat iron including a soleplate, a heating unit in said soleplate, a cover shell and handle assembly mounted on said soleplate; the combination of terminal connecting means for said heating unit comprising a first terminal block non-rotatively mounted on said soleplate and a second terminal block pivotally mounted directly above said first terminal block, said first terminal block provided with a pair of fixed contact surfaces electrically connected directly to said heating unit and said second terminal block provided with a pair of movable contacts electrically connected to supply conductors extending through an opening in said cover shell for connection to an outside source of supply; said pair of movable contacts spring-biased into continuous engagement with said pair of fixed contact surfaces, whereby when said second terminal block is pivoted through an angle limited by stops on said flat iron, continuous rubbing contact is maintained between said pair of movable contacts and said pair of fixed contact surfaces.

8. The combination in an electric flat iron of a soleplate provided with an embedded heating element, a metal post projecting vertically from said

soleplate adjacent the rear end thereof, a terminal block of insulating material pivotally mounted on said post above said soleplate, a pair of metallic members supported on said pivotal terminal block, said metallic members maintained in continuous rubbing contact with a pair of terminal members electrically connected to said heating element; supply conductors for said flat iron connected to the said metallic members on said terminal block, a cover shell and handle assembly supported on said soleplate independently of said vertical post; said cover shell and said handle provided with adjacently located openings through which the said supply conductors are connected to an outside source of supply.

9. An electric flat iron comprising a soleplate, a heating unit embedded in said soleplate, terminals for said unit projecting above the upper surface of said soleplate, said terminals electrically connected to a pair of spaced apart metallic contact surfaces supported on a block of insulating material mounted on said soleplate, a vertically mounted post rigidly seated in the upper surface of said soleplate, a terminal block pivotally mounted on said vertical post, said terminal block provided with a pair of terminal posts receiving supply conductors for said flat iron, extensions of said terminal posts projecting from said terminal block and spring biased into engagement with metallic contact surfaces; a combined cover shell and handle assembly removably located on said soleplate, the said supply conductors extending through adjacently located openings in said cover shell and in the rear support of said handle for connection to a source of supply, said supply conductors free to move within the limits of the opening in said handle, said terminal block free to follow the movements of said conductors, and said extensions of said terminal posts maintained in continuous rubbing contact with said metallic contact surfaces throughout the limited movement of said supply conductors.

10. In an electric flat iron having a body, a handle grip and a handle support mounted on said body, a heating unit enclosed in said body, terminal means for said unit comprising cooperating fixed and movable contact members, said fixed contact members electrically connected to said heating unit and said movable contact members receiving supply conductors for said flat iron; said handle support provided with a hollow portion directly above said body, an elongated opening in the rear wall of said handle support, an opening in said body connecting said body with the hollow portion of said handle support, said movable contact members extending through said body opening into the enclosure formed by the hollow portion of said handle support, and said supply conductor extending through the said elongated opening in the rear wall of said handle support.

JOHN G. MACDONALD.