A. NIOLA.

SMOOTHING OR LAUNDRY IRON.

APPLICATION FILED SEPT. 1, 1911.

1,068,812.

Patented July 29, 1913.

3 SHEETS—SHEET 1.

Fig. 1

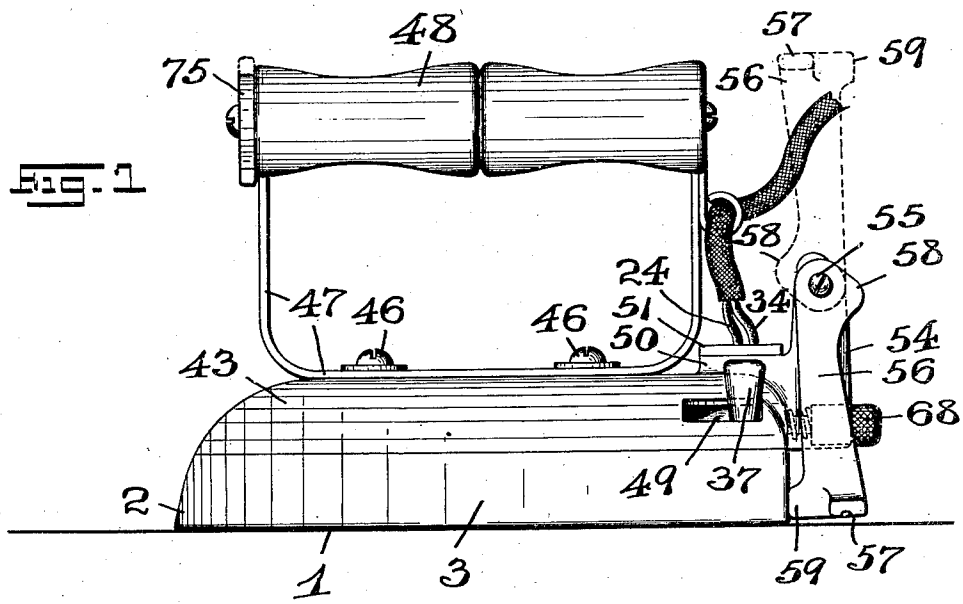
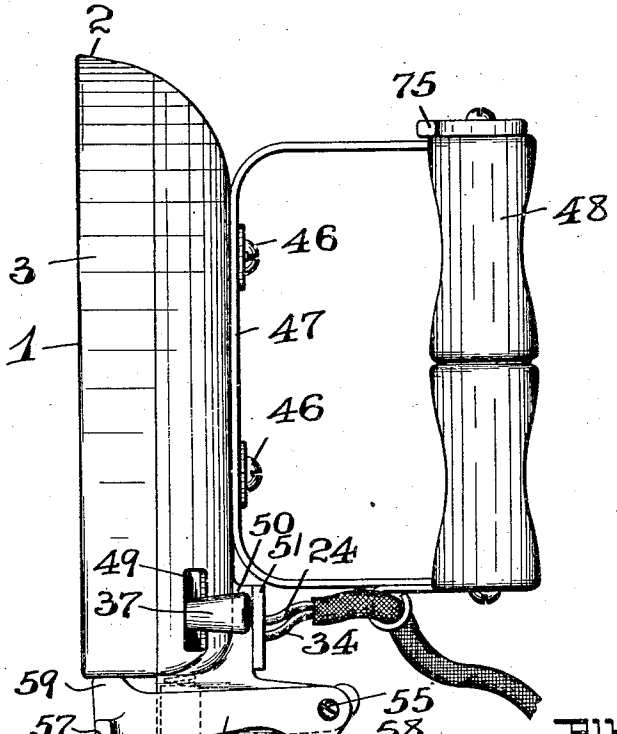


Fig. 2



WITNESSES:

Fredk. K. W. Fraentzel

Harry E. Pfeiffer

INVENTOR:

Albert Niola,

BY

Fraentzel and Richards,

ATTORNEYS

A. NIOLA.

SMOOTHING OR LAUNDRY IRON.

APPLICATION FILED SEPT. 1, 1911.

1,068,812.

Patented July 29, 1913.

3 SHEETS—SHEET 2.

Fig. 3

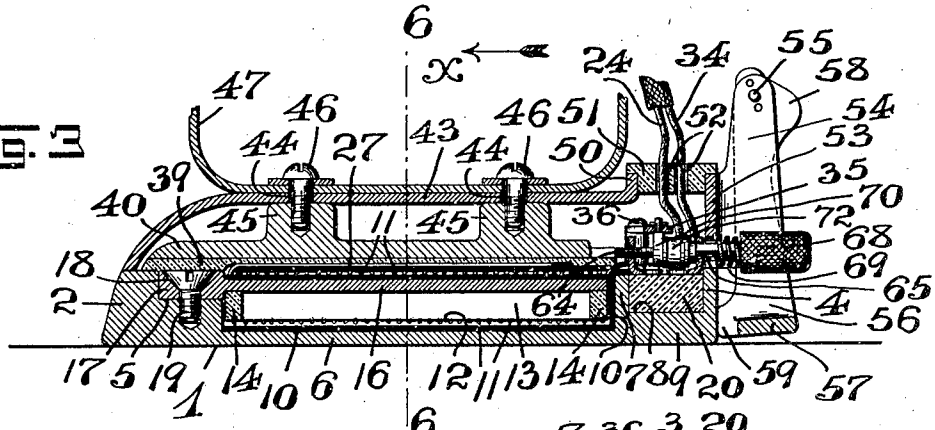


Fig. 4

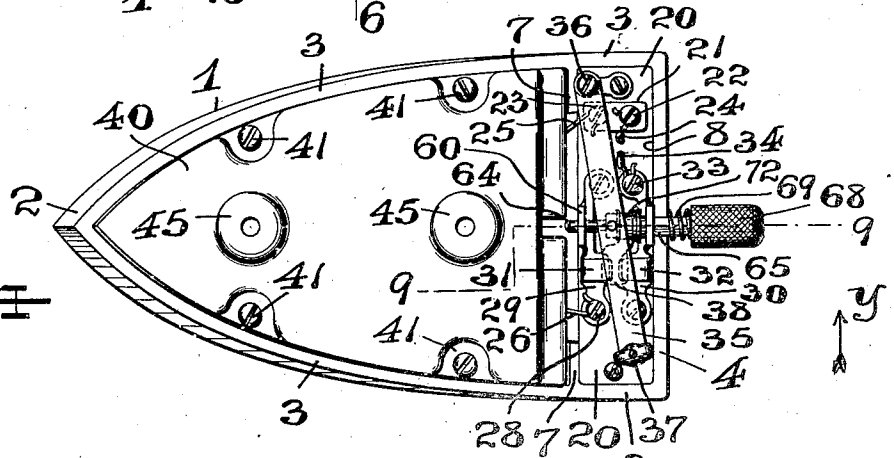
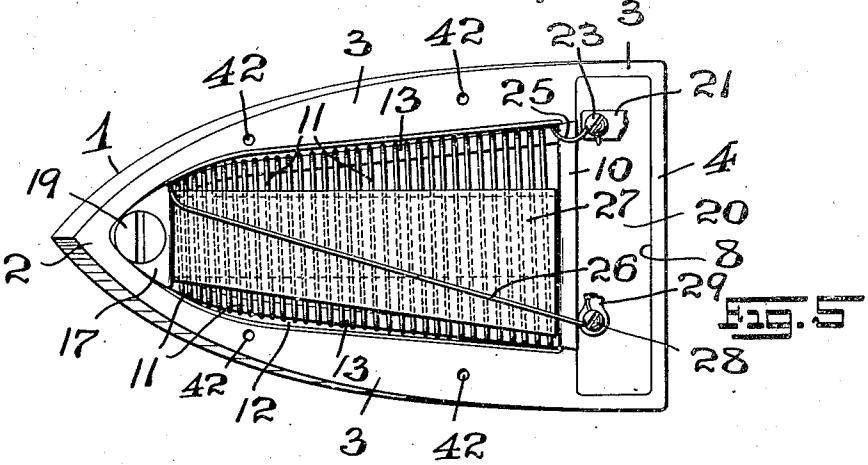


Fig. 5



WITNESSES:

Fredk. W. Wraentzel

Harry E. Pfeiffer

INVENTOR:

Albert Niola,

BY

Fraentzel and Richards,

ATTORNEYS

A. NIOLA.

SMOOTHING OR LAUNDRY IRON.

APPLICATION FILED SEPT. 1, 1911.

1,068,812.

Patented July 29, 1913.

3 SHEETS—SHEET 3.

Fig. 6

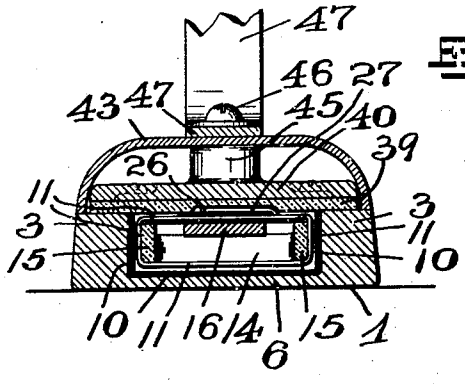


Fig. 7

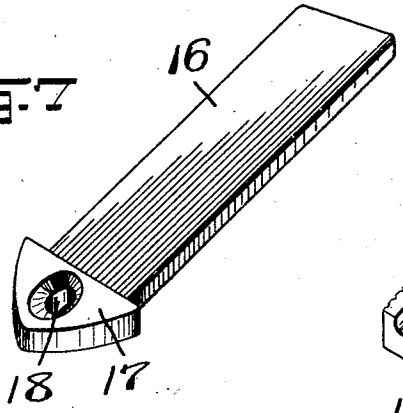


Fig. 8

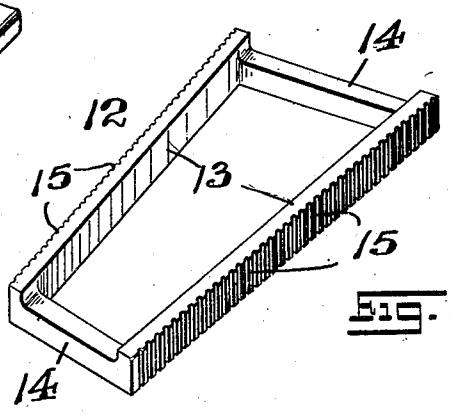
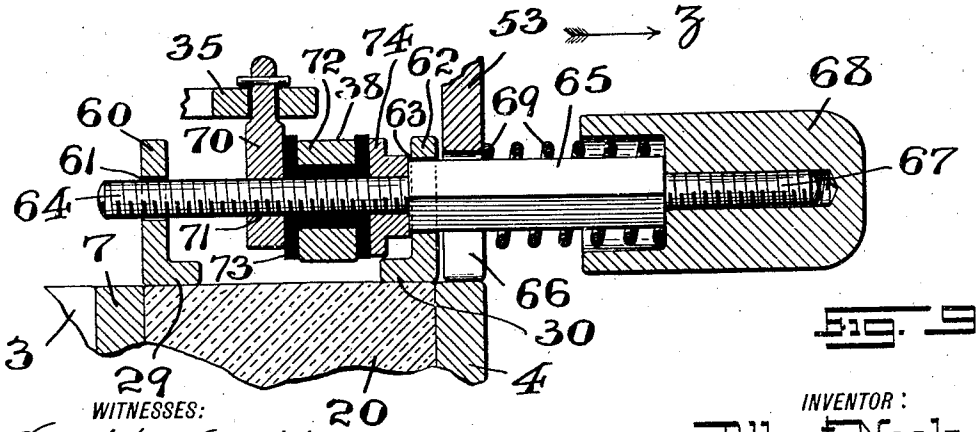


Fig. 9



WITNESSES:

Fredk. W. Fraentzel

Harry E. Pfeffer

INVENTOR:

Albert Niola,

BY

Fraentzel and Richards

ATTORNEYS

UNITED STATES PATENT OFFICE.

ALBERT NIOLA, OF NEWARK, NEW JERSEY.

SMOOTHING OR LAUNDRY IRON.

1,068,812. Specification of Letters Patent. Patented July 29, 1913.

Application filed September 1, 1911. Serial No. 647,176.

To all whom it may concern:

Be it known that I, ALBERT NIOLA, a citizen of the United States, residing at Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Smoothing or Laundry Irons; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to characters of reference marked thereon, which form a part of this specification.

This invention has reference, generally, to improvements in heating devices; and, the present invention relates, more particularly, to a novel smoothing or laundry iron, and especially to an electrically heated iron and such details of improvements therein, as will hereinafter be more fully set forth.

The invention has for its principal object to provide a heating device, in the form of a smoothing or laundry iron, which will be very simple in its construction and of few parts, and the heating element of which is arranged in such a manner within the chambered body of the iron so that the heat which is generated by means of the said heating element is readily distributed to that portion or portions of the said body where it will produce the best results, and with the least expenditure of electric current.

The invention has for its further object to provide a smoothing or laundry iron in which all of the parts are made so as to secure economy and facility in construction, the parts being readily assembled, and just as quickly removed for repairs; and, when assembled producing a rigid, strong and durable smoothing or laundry iron.

The invention has for its further object to provide in connection with the electrical heating element of the iron, an automatically operating electric switch or current interrupter, by means of which when the iron is set upon end or upon its heel-portion, the electric circuit is immediately interrupted, so that there will be no consumption of the electric current when the iron is not in use.

The invention also has for another object to provide in connection with the smoothing or laundry iron, means in the form of, and which may be used as, standards or supporting members, by means of which the iron can be supported in its reversed position, so as to serve as a heating device, for readily moving back and forth over the heated flat surface of its body such articles, as narrow ribbons, neck-ties, and the like, which are to be ironed out, or for using the said flat surface for other heating purposes.

Other objects of this invention not at this time more particularly enumerated will be clearly understood from the following detailed description of the present invention.

With the various objects of the present invention in view, the said invention consists, primarily, in the novel smoothing or laundry iron hereinafter set forth; and, the invention consists, furthermore, in the novel arrangements and combinations of the various devices and parts, as well as in the details of the construction of the said parts, all of which will be more fully described in the following specification and then finally embodied in the clauses of the claim which are appended to and which form an essential part of the said specification.

The invention is clearly illustrated in the accompanying drawings, in which:—

Figure 1 is a side elevation of a smoothing or laundry iron made according to and embodying the principles of the present invention, representing the iron in the position when it is being used for smoothing or ironing out garments, and the like; and Fig. 2 is a similar view of the iron, showing the same, however, set on end or upon its heel, so as to cause the automatically operating switch or current interrupter to interrupt or break the electric circuit. Fig. 3 is a longitudinal vertical section of the iron, showing the bail which carries the handle broken away; Fig. 4 is a plan or top view of the chambered main body of the iron and its closing plate, said view showing in connection therewith, one arrangement and construction of automatically operating electric switch or current interrupter; and Fig. 5 is a similar view of the said main body with its cover-plate removed, showing within the chambered portion of the body, and in

plan view, one arrangement and construction of ventilated electrical heating element and heat-conducting or distributing plate for conducting the heat which is being generated to the said main body. Fig. 6 is a transverse vertical section of the smoothing or laundry iron, said section being taken on line 6—6 in said Fig. 3, looking in the direction of the arrow *x*; Fig. 7 is a perspective view of the said heat-conducting or distributing plate or element; and Fig. 8 is a similar view of the supporting frame or core of the electrical heating element, with the electric wires removed therefrom. Fig. 9 is a detail longitudinal vertical section, taken on line 9—9 in said Fig. 4, looking in the direction of the arrow *y*, said view being made on a considerably enlarged scale.

Similar characters of reference are employed in all of the above described views, to indicate corresponding parts.

In the said drawings, the reference-character 1 indicates the hollow or chambered main body of the smoothing or laundry iron, which may be of any desirable thickness and marginal configuration, the same, however, being preferably made with the pointed toe-portion 2, the curved side-walls 3, and the rear wall or heel-portion 4. As shown in Figs. 3 and 5 of the drawings, the toe-portion 2 is made with an off-set, as 5, and the side-walls 3 are not of the same thickness throughout, but are made of greater thickness at their middle portions and toward the heel-portion of the iron, being of least thickness at points near the toe-portion 2 of the iron. The purpose of this is that the generated heat, after the electric current has been shut off when the iron is set upon end or upon its heel-portion, will be retained much longer in the thick parts of the said side-walls 3, and a radiation of the heat is consequently maintained in the directions toward the interior or chamber of the main body of the iron, and is taken up by the thin bottom 6 of the iron, so as to keep said bottom hot for some length of time, even after the electric current has been interrupted.

At a point near the rear end of the main body of the iron, said body is made with a laterally extending wall or partition 7 which is not quite as high as the side-walls 3, and whereby an auxiliary chamber, as 8, is provided, the bottom-portion 9 of which is preferably of greater thickness than the thin bottom 6 of the iron. Within the said chambered main body is a thin layer of suitable insulating material, as 10, such as mica, or the like, said insulating material being arranged upon said bottom 6 and extending up the inner surfaces of the walls 3 of the said chamber, substantially as shown in Figs. 3 and 6 of the drawings. Arranged upon this insulation is the heat-producing element or unit, the same in this instance being in the form of a wire-resistance or coil, as 11, made from suitable wire which is wound in the form of a substantially flat coil upon an open frame-work or core 12, substantially of the configuration shown in the several figures of the drawings, and more especially in Fig. 8. This frame-work or core consists, essentially, of a pair of longitudinally extending members 13 and a pair of laterally extending connecting members 14, all of which are made from suitable insulating material and are preferably integrally united, as will be cleary evident from an inspection of said Fig. 8 of the drawings. As shown, the outer faces of the said members 13 are preferably serrated or provided with grooves, as 15, for the arrangement of and the proper winding of the wire upon said frame-work or core 12, and the said end or laterally extending connecting members 14 being of less thickness than the thickness of the said side or longitudinally extending members 13, for the purpose to be presently more fully specified. The general outline of the said supporting frame or core 12 and the windings of the wire-coil thereon are such that the heating element thus produced will closely fit within the chambered portion of the main body of the iron, substantially in the manner represented in Figs. 3, 5 and 6 of the drawings. The heating element or coil 11 is suitably maintained in its proper position within the chambered body 1 of the iron, by means of a metal plate or bar 16, preferably of the general configuration shown in the drawings, the said plate or bar 16 being comparatively thin, so as to be a good conductor of heat, and having a somewhat enlarged head or end-portion 17 which is provided with a screw-receiving hole 18 for the reception of a screw 19, by means of which the said end-portion of the iron plate or bar 16 is secured upon the off-set portion 5 of said main body, substantially in the manner illustrated. As will be seen from Figs. 3 and 6 of the drawings, the main body of the iron plate or bar 16 when thus secured in place rests firmly upon the upper surfaces of the said cross or laterally extending members 14 of the supporting frame or core 12, whereby the latter is securely held in place, the said plate or bar 16 also being arranged directly within the heating coil.

Within the previously-mentioned auxiliary chamber 8 is a block or body 20 which is made of a suitable insulating material and is provided with a terminal-plate 21 upon which there is an arrangement of terminal-posts or screws 22 and 23. Suitably connected with the post or screw 22 is a leading-in wire 24, and connected with the post or screw 23 is the leading-in end-ter-

minal wire 25 of the previously-mentioned wire-resistance or coil 11. The return-wire or leading-out terminal 26 of the said wire-resistance or coil 11, and which is preferably insulated from the said coil by means of a sheet of insulating material 27, such as mica, is connected with the post or screw 28 of one of a pair of switch-elements 29 and 30. The element 29 is provided with a contact-member 31, and the element 30 is provided with a contact-member 32. The other switch-element 30 has attached to a binding post or screw 33 thereof, the leading-out wire 34 of the main circuit.

The manner of completing an electric circuit through the resistance or coil 11 is by means of a switch-lever 35, which is pivoted at 36 and has a handle or finger-piece, as 37, by means of which it may be manually operated, if desired. The said lever 35 is provided upon its under surface with a contact-making member 38, see the dotted outline in Fig. 4 of the drawings, which when it makes contact with both contact-members 31 and 32, as shown, establishes or completes an electric circuit through the said resistance or coil 11. Arranged above the said resistance or coil 11 is an insulating plate or sheet 39, of asbestos, or the like, and suitably disposed upon said plate or sheet 39 is a metal closing plate 40, which is secured to the said main body 1 by means of screws 41, said screws being screwed into screw-receiving holes 42 in the said side-walls 3 of said body. The said closing plate 40 is of the same marginal configuration as the main body 1 of the iron, but is somewhat smaller than said body so as to expose a portion of the toe and side-walls, and also the heel-portion of said body, thereby forming a suitable rim for the marginal edge of an outer hollow or chambered cover 43. This cover 43 is provided with suitably disposed holes or openings 44 which correspond to the correspondingly located screw-threaded bosses or enlargements 45 with which the closing plate 40 is provided, all being arranged to receive screws 46 by means of which the said cover 43 is secured in place, and by means of which the usual bail 47 and handle 48 are also operatively connected with the smoothing or laundry iron. The previously mentioned handle or finger-piece 37 of the switch-lever 35 extends through and is movably arranged in an opening 49 with which the said cover 43 is provided. The said cover 43 is also made with an open part, as 50, which is closed by means of a block or cover 51 of a suitable insulating material, and which is provided with perforations 52 through which the previously mentioned main circuit wires may pass, substantially in the manner illustrated. Extending rearwardly and upwardly from the rear wall-portion 53 of the said cover 43 are a pair of bracket-like members 54, and pivotally connected with said members 54, by means of screws 55, or in any other suitable manner, is a heel-support in the form of a frame which comprises a pair of arms 56 and a connecting plate-like member 57. Each arm 56 is formed with a rearwardly projecting lug 58 and a forwardly extending lug 59, and when these parts are in the positions shown in said Figs. 1, 2 and 3 of the drawings, the said yoke-shaped frame or heel-support serves as a means for standing the smoothing or laundry iron upon its rear end, in the manner illustrated in said Fig. 2 of the drawings.

In order to interrupt the electric circuit, when the iron is placed upon its end, in the manner hereinabove stated, the contrivance illustrated more particularly in Fig. 9 has been devised. Referring now to the said Fig. 9 of the drawings, the reference-character 60 indicates a post which extends upwardly from the switch-element 29, the said post being formed with a circular hole 61 which provides a bearing-portion. Extending upwardly from the other post 30 is another post 62 which is formed with a hole 63 of an angular conformation, said hole 63 also forming a bearing-portion.

Slidably arranged in the circular hole 61 of the post 60 is the end-portion of a screw-threaded shank 64 with which is connected a stem 65 of angular cross-section, corresponding to that of the hole 63 in the post 62, said stem being slidably arranged in said hole 63, but on account of the angular cross-section of the said stem 64 and the angular conformation of the hole 63, said stem and said shank are non-rotatably mounted in the said bearing-portions of the respective posts. The said stem 65 extends through a slot or elongated opening 66 in the rear or end-wall 53 of the cover 43, having suitably screwed and adjustably arranged upon another screw-threaded shank 67 which is connected with the stem 65, a knob or enlargement, as 68. Encircling the said stem 65, between the said rear or end wall 53 and the said knob 68, is a coiled spring 69, the tendency of the said spring being to normally move the parts in the direction of the arrow z in said Fig. 9. The adjustable arrangement of the said knob or enlargement 68 permits of the proper regulation or adjustment of these parts, as will be clearly evident. Suitably connected with the said switch-lever 35 and extending downwardly therefrom is a member 70, said member having an internally screw-threaded part 71 into which the screw-threaded shank 64 is screwed and is adjusted with relation to the said switch-lever 35. The previously mentioned contact-making member 38 is also connected with the said shank 64 by means of a hub-portion 72 which is insulated from the said shank 64 by means of a sleeve 73 of

a suitable insulating material, as shown in said Fig. 9, the parts being retained in their adjusted relations by means of a nut 74, substantially as illustrated.

Now, when the smoothing or laundry iron is placed upon end, in the manner represented in Fig. 2 of the drawings, the spring 69 becomes compressed, and the angular stem 65 and screw-threaded shank 64 will move in a direction opposite to that indicated by the arrow *z*, whereby the contact-making member 38 is moved from its electrical contact with the contact-member 32, so that the electric circuit through the resistance or coil 11 is immediately broken or interrupted. As soon as the iron is again taken up and used upon a garment, the said spring 68 causes the parts to again assume their normal initial positions so that the member 38 again bridges the two contact-members 31 and 32, and a complete electric circuit through the resistance or coil is immediately produced, as will be clearly evident.

At one end of the handle of the smoothing or laundry iron is a reversible plate 75 which, with the previously mentioned yoke-shaped frame or heel-support, may be turned into the reversed positions indicated in the dotted outlines in said Fig. 1 of the drawings, and whereby the iron may be placed in a reversed position, with the electric current turned on, so that the heated body-portion 1 may be used in the manner of a small heater, or for the purpose of smoothing out narrow ribbons, neck-ties, and the like.

I am aware that some changes may be made in the general arrangements and combinations of the various devices and parts, as well as in the details of the construction of the said parts, without departing from the scope of the present invention, as set forth in the foregoing specification, and as defined in the clauses of the claim which are appended thereto. Hence, I do not limit my invention to the exact arrangements and combinations of the various devices and parts as described in the said specification, nor do I confine myself to the exact details of the construction of the said parts, as illustrated in the accompanying drawings.

I claim:—

1. A smoothing or laundry iron comprising a chambered main body, an electric resistance coil within said body, said coil being of oblong conformation in cross-section, and a heat-conducting plate rigidly secured at one end in engagement with the toe-portion of said main body and its free end-portion extending longitudinally through the chamber of said body and within the interior of the said resistance coil, substantially as and for the purposes set forth.

2. A smoothing or laundry iron comprising a chambered main body, an electric resistance coil within said body, said coil being of oblong conformation in cross-section, a heat-conducting plate secured at one end in engagement with the toe-portion of said main body and extending longitudinally through the chamber of said body and within the interior of the said resistance coil, and an automatically operating cut-out switch mounted in said main body for interrupting the electric circuit to said electric resistance coil, substantially as and for the purposes set forth.

3. A smoothing or laundry iron comprising a chambered main body, an electric resistance coil within said body, said coil being of oblong conformation in cross-section, the said body comprising a toe-portion, side-walls, and a heel-portion, the said side-walls being of greater thickness at their middle portions and toward said heel-portion, and being of least thickness at points near the toe-portion, and a heat-conducting plate secured at its one end upon the toe-portion of said main body and extending longitudinally through the chamber of said body and within the interior of the said resistance coil, substantially as and for the purposes set forth.

4. A smoothing or laundry iron comprising a chambered main body, an electric resistance coil within said body, said coil being of oblong conformation in cross-section, the said body comprising a toe-portion, side-walls, and a heel-portion, the said side-walls being of greater thickness at their middle portions and toward said heel-portion, and being of least thickness at points near the toe-portion, a heat-conducting plate secured at its one end upon the toe-portion of said main body and extending longitudinally through the chamber of said body and within the interior of the said resistance coil, and an automatically operating cut-out switch mounted in said main body for interrupting the electric circuit to said resistance coil.

5. A smoothing or laundry iron comprising a chambered body formed with a toe-portion, side-walls and a heel-portion, said toe-portion being provided within said body with an offset, a heating element within the chambered body, a heat-conducting plate having one end-portion resting upon and rigidly secured to said offset, and the free end-portion of said plate extending longitudinally through said chambered body.

6. A smoothing or laundry iron comprising a chambered body formed with a toe-portion, side-walls, and a heel-portion, said toe-portion being provided within said body with an offset, a core-frame of insulating material arranged within said chambered body, an electric resistance coil wound upon said core-frame, said coil being of oblong

conformation in cross-section, a heat-conducting plate having one end-portion resting upon said offset, and means for rigidly securing said end-portion to said offset, the free end-portion of said plate extending longitudinally into said core-frame and co-operating with the electric resistance coil so as to receive the heat from said coil and convey the heat to the toe-portion of the iron, and the said free end-portion of said plate being freely supported upon said core-frame, substantially as and for the purposes set forth.

7. A smoothing or laundry iron comprising a chambered body, an open and ventilated coil-supporting frame within said body, said frame being made of insulating material and consisting of a pair of longitudinally extending members and a pair of laterally extending connecting members, a resistance coil wound upon the said longitudinally extending members, a heat-conducting plate secured at one end to the toe-portion of said chambered body, said plate extending longitudinally within the chamber of said body and through the interior of said resistance coil, and said heat-conducting plate having portions resting upon the said laterally extending connecting members of the coil-supporting frame, substantially as and for the purposes set forth.

8. A smoothing or laundry iron comprising a chambered body, an open and ventilated coil-supporting frame within said body, said frame being made of insulating material and consisting of a pair of longitudinally extending members and a pair of laterally extending connecting members, a resistance coil wound upon the said longitudinally extending members, a heat-conducting plate secured at one end within said chambered body, said plate extending longitudinally within said chamber of said body and through the interior of said resistance coil, and said heat-conducting plate having portions resting upon the said laterally extending connecting members of the coil-supporting frame, for securing said frame and coil in their assembled relations within the chamber of said main body, a closing plate arranged above said resistance coil and the said heat-conducting plate, a chambered cover arranged above said main body and said closing plate, and a bail carrying a handle secured to said cover, substantially as and for the purposes set forth.

9. In a smoothing or laundry iron, a main chambered body provided with a heating element, a chambered cover arranged above and secured upon said body, a bail provided with a handle mounted upon said cover, and means connected with said iron for supporting it in its reversed position, consisting of a reversible plate rotatably connected with one end of the said handle, and a reversible hinged supporting frame connected with the rear end of said cover, substantially as and for the purposes set forth.

10. An electric flat iron provided with a switch that supports the iron and cuts off the current when the iron is tilted up on its heel, and a handle which is separate and distinct from the switch.

11. An electric iron provided with a switch operated by the weight of the iron for cutting off the current when the iron is resting in a tilted position, and a handle which is separate and distinct from the switch.

12. An electric flat iron provided with an automatic switch for cutting off the current when the iron is tilted out of working position, and a handle which is separate and distinct from the switch.

13. An electric flat iron provided with a skeleton heel-piece, a heating element, a handle, a switch for controlling circuit through said heating element, said switch having an operating member which engages the support upon which the said heel-piece rests when the iron is tilted up on its rear end, and a handle which is separate and distinct from the switch.

14. An electric flat iron provided with a switch for automatically cutting off the current when the iron is turned up on its heel, and a flexible circuit cord connected to feed current directly to and through the switch to the iron.

15. In a smoothing or laundry iron, a main chambered body provided with an electrical heating element, a chambered cover arranged above and secured upon said body, a bail provided with a handle mounted upon said cover, and means connected with said iron for supporting the same on end or upside down, comprising a pair of bracket-like members rigidly connected with the heel of said cover, a frame-member pivotally connected with said bracket-like members comprising, a pair of arms connected at their free ends by a connecting-plate, a forwardly projecting lug connected with the lower end of each arm for engaging the heel of the iron to position said frame-member in its folded position, a rearwardly projecting lug connected with each arm which acts as a rest in conjunction with said connecting-plate of the frame-member when supporting said iron on end, and a reversible plate rotatably connected with one end of said handle, which when positioned assists in supporting said iron upside down.

16. A smoothing or laundry iron comprising a main chambered body provided with a laterally extending partition forming at the heel-portion of the iron an auxiliary chamber, an electric heating element within the main chamber of said body, and an electric switch within said auxiliary chamber

normally closing the electric circuit through said electric heating element, said switch being provided with means extending from the heel-portion of the iron for automatically operating the switch so as to interrupt the said electric circuit, when the iron is placed upon its heel.

In testimony, that I claim the invention set forth above I have hereunto set my hand this 31st day of August, 1911.

ALBERT NIOLA.

Witnesses:

FREDK. C. FRAENTZEL,

FREDK. H. W. FRAENTZEL.