Oct. 25, 1949. E. WITZEL 2,486,352

ELECTRIC IRON

Original Filed Sept. 4, 1945

Fig. 1.

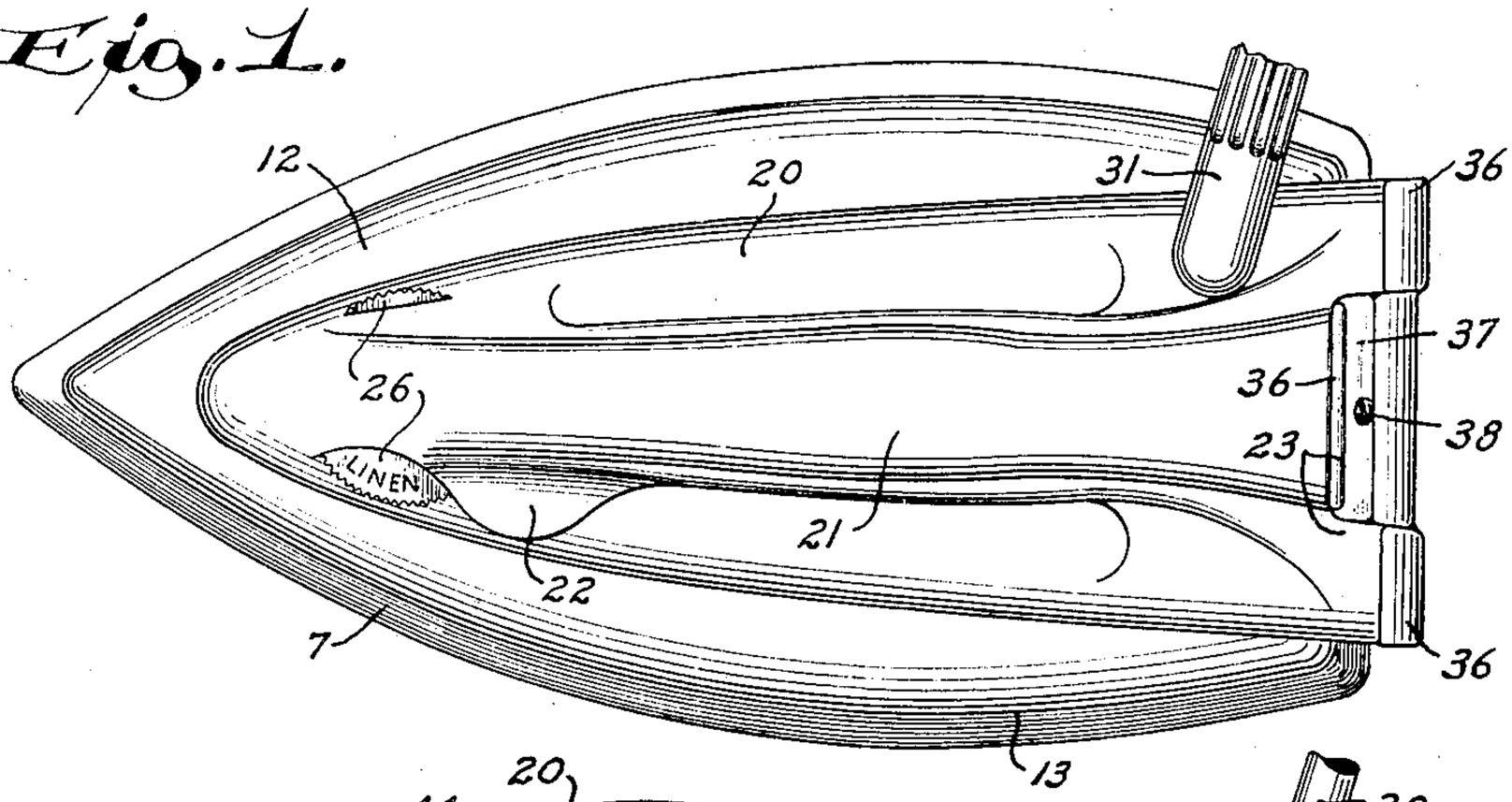
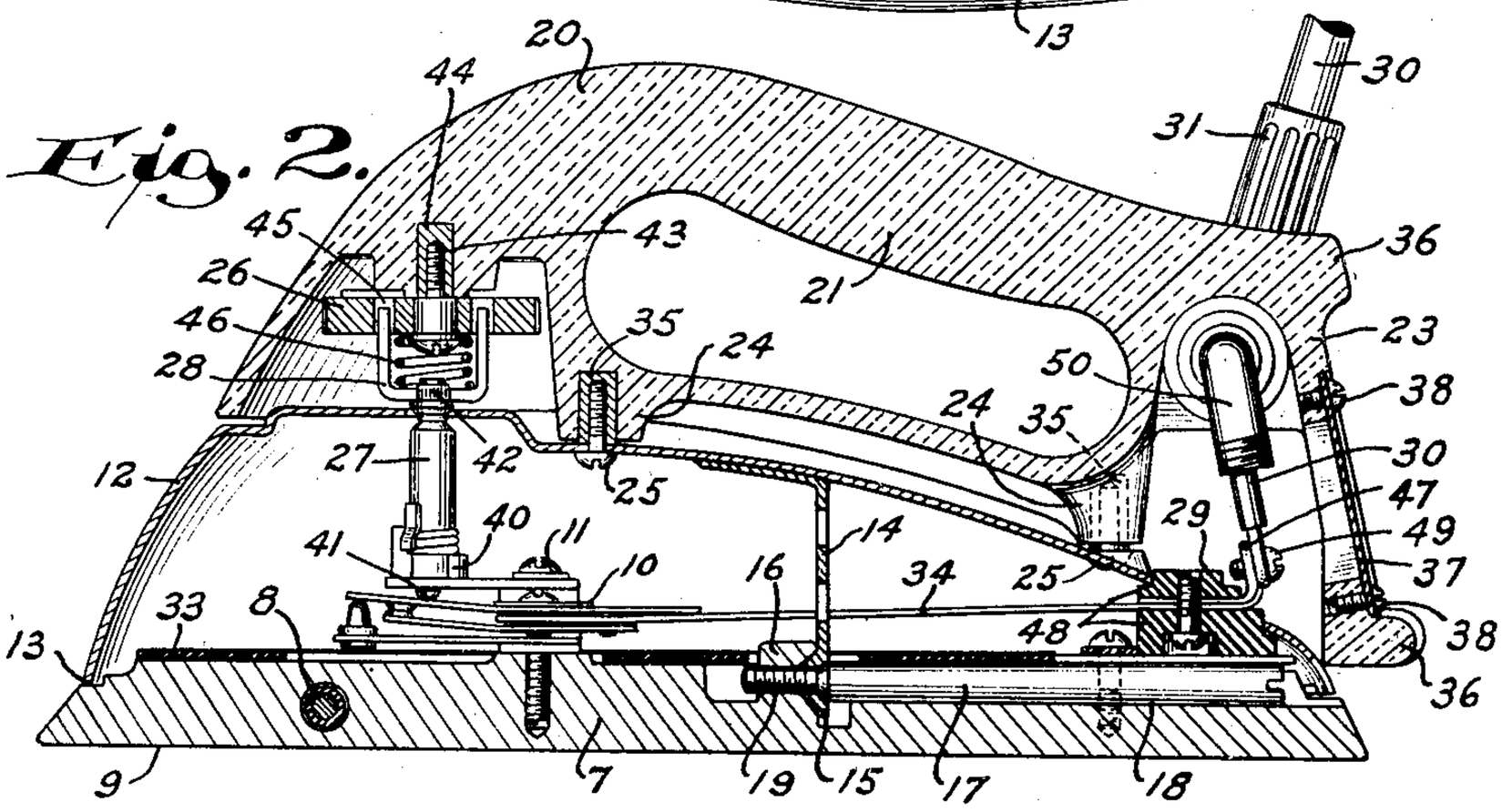


Fig. 2.



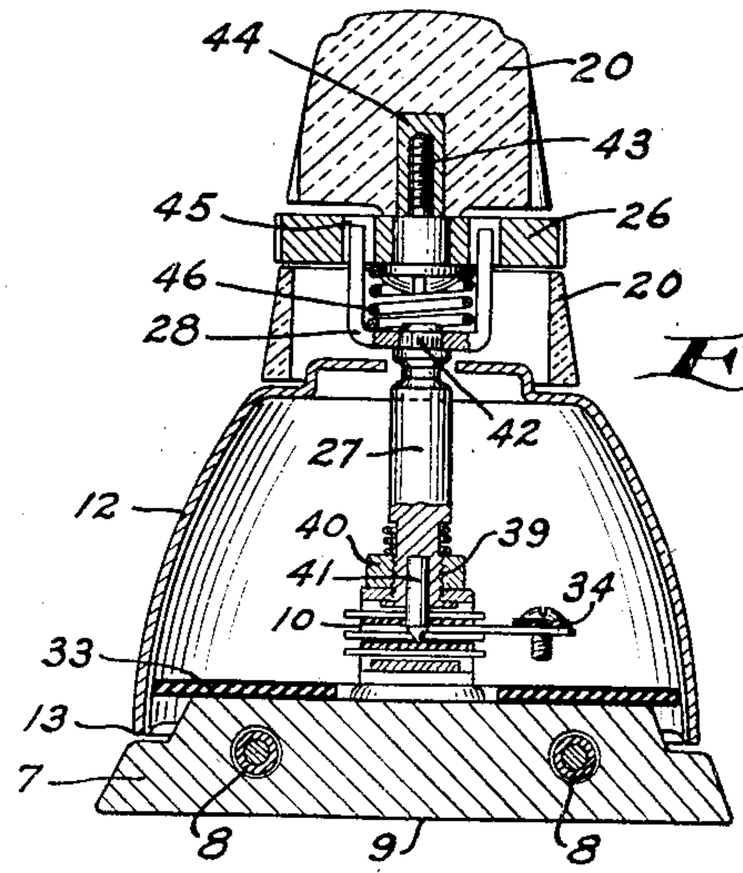


Fig. 3.

INVENTOR.
Ernst Witzel
BY
Lieber & Lieber
ATTORNEYS.

Patented Oct. 25, 1949

2,486,352

UNITED STATES PATENT OFFICE

2,486,352

ELECTRIC IRON

Ernst Witzel, Milwaukee, Wis., assignor, by mesne assignments, to Milsteel Products Co., Milwaukee, Wis., a corporation of Wisconsin

Original application September 4, 1945, Serial No. 614,160, now Patent No. 2,418,285, dated April 1, 1947. Divided and this application November 12, 1946, Serial No. 709,264

2 Claims. (Cl. 219—25)

1

The present invention relates generally to improvements in the art of fabricating household appliances, and relates more specifically to improvements in the construction and operation of electrically heated flat irons or the like.

The primary object of my invention is to provide an improved so-called electric flat iron which is simple and durable in construction and highly efficient in operation.

Many different types and styles of electrically heated pressing irons have heretofore been proposed and some of them have been sold and used quite extensively, but all of these prior devices are objectionable for diverse reasons. Some of the prior electric irons are relatively complicated and cumbersome thus making them difficult to operate and to manipulate; while others fail to provide for convenient access to internal parts, and are also dangerous to the user and as a fire hazard. Still others of the prior electrically heated iron assemblages are costly to manufacture and difficult to assemble; while still others do not clearly expose the work to the vision of the operator. All of the previous household electric flat irons are therefore objectionable for one or more of the above-mentioned specific reasons; and most of the prior electric irons wherein the conductor cords are permanently attached to the iron, are furthermore objectionable due to rapid deterioration and breakage of the wires.

It is therefore a more specific object of this invention to provide an improved electric iron assemblage which obviates all of the above-mentioned objectionable features, and which may be readily manufactured, conveniently assembled or dismantled, and safely manipulated.

Another specific object of the present invention is to provide improved mechanism for effecting rapid and safe adjustment of the heat in an electrically heated flat iron, which mechanism may also be readily assembled or dismantled.

A further specific object of my invention is to provide an improved electric sadiron composed of relatively few sturdy parts which are normally rigidly united, but which may also be quickly and easily disconnected so as to expose normally concealed mechanisms.

Another specific object of my invention is to provide a simple ironing assemblage which may be manufactured and sold at moderate cost, and which is easily operable and safely manipulable by a novice.

These and other specific objects and advantages of the invention will be apparent from the following detailed description; and the present application is a division of Patent 2,418,285, dated April 1, 1947.

A clear conception of the several features constituting my present improvement, and of the mode of constructing and of utilizing electric

2

irons built in accordance with the invention, may be had by referring to the drawings accompanying and forming a part of this specification wherein like reference characters designate the same or similar parts in the various views.

Fig. 1 is a top view of the improved electrically heated flat iron;

Fig. 2 is a central longitudinal vertical section through the typical electric iron of Fig. 1; and

Fig. 3 is a slightly enlarged transverse vertical section taken through the front heat adjusting mechanism of the improved iron assemblage.

Although the invention has been shown and described herein as being especially applicable to a typical electrically heated household type of flat iron, it is not my desire or intent to unnecessarily restrict the utility of the improved features by virtue of this specific and limited disclosure, and it is also my intention that specific terms used herein be given the broadest possible meaning and interpretation consistent with the prior art.

Referring to the drawings, the typical electrically heated flat iron shown therein, comprises in general a shoe or sole plate 7 having a heating coil 8 embedded directly therein adjacent to its work engaging lower face 9; a thermostatically controlled heat regulating switch 10 firmly but detachably mounted upon the upper medial portion of the sole plate 7 by means of one or more screws 11; a mound shaped hollow sheet-metal body 12 having a lower rim 13 coacting with the upper peripheral portion of the sole plate 7, and being provided with an inner central bracket or strap 14 the lower central portion of which has an integral tapered ferrule 15 coacting with a lug 16 formed integral with the sole plate 7; an elongated body and sole plate uniting screw rod 17 normally confined within a central recess 18 formed in the top of the sole plate 7, and having a reduced threaded end 19 coactable with the ferrule 15 and lug 16; a heat insulated manipulating handle 20 having a medial grip portion 21, a lateral thumb rest 22, and an integral downwardly projecting rear iron supporting and contact housing wall 23, and also being provided with lower bosses 24 adapted for attachment to the top of the body 12 with the aid of normally concealed screws 25; a heat adjusting wheel or dial 26 rotatably suspended within the front portion of the handle 20 and being cooperable with the thermostat of the switch 10 through a stem 27 and a bifurcated or pronged element 28; and a terminal connecting assemblage 29 mounted upon the rear portion of the sole plate 7 within the rear of the handle 20, and cooperating with electrical conductors 30 penetrating the handle through a resilient laterally and upwardly extending bushing 31.

The shoe or sole plate 7 is relatively pointed

at its forward end, widest at its medial portion, and converges toward its rear end, and may be formed of cast metal with the electrically energized heating coil 8 embedded directly therein during the casting operation. The periphery of this sole plate 7 also preferably tapers downwardly and outwardly in order to provide a smooth lower work engaging face 9 of maximum area; and the lower rim 13 of the casing or body 12 may be caused to coact with local nibs or projections formed on the sole plate 7 in order to facilitate firm clamping of the body to the sole plate with the aid of the single central clamping rod 17. The upper surface of the sole plate 7 is also provided with a rigid top plate 33 formed of heat insulating material and secured to the shoe in any suitable manner, and this plate 33 spans the rod confining recess 18 but is cut away in the locality of the thermostatic switch 10.

The switch and terminal housing and handle supporting casing or body 12 is formed of relatively thin and light but durable sheet-metal, and may be readily produced with the aid of punches and dies, and the inner attaching strap 14 may also be formed of sheet-metal and is rigidly secured to the upper inner medial portion of the body 12 as by welding or riveting. The tapered ferrule 15 which is formed integral with the lower extremity of the strap 14, is formed to snugly engage a similarly tapered socket in the sole plate lug 16, and electrical conductors 34 may be located on opposite sides of the relatively narrow strap 14 without danger of contacting this strap. As previously indicated, the screw clamping rod 17 is snugly rotatably confined within the sole plate recess 18 beneath the plate 33, and the front end 19 of the rod 17 is of reduced diameter and has screw thread coaction with the lug 16, strap ferrule 15 and sole plate, so that the lower rim 13 of the casing body 12 may be readily firmly clamped against the local sole plate nibs as by merely applying a screw driver to the slotted outer end of the rod 17 and screwing the threaded end 19 thereof into the boss 16 through the ferrule 15. The electrical thermostat or switch and other mechanism may thus be effectively confined within the space between the sole plate 7 and body 12, but the body may be just as easily removed to permit access to the normally confined structure.

The manipulating handle 20 is preferably formed of plastic, wood or other suitable heat insulating material which will not readily conduct excessive heat to the grip and thumb portions 21, 22, and the front of the handle is provided with a relatively deep recess within which the dial 20 is normally disposed, while the rear wall 23 which is formed integral with the handle 20 also provides a deep recess within which the electrical connections are normally confined. The attaching bosses 24 are likewise formed integral with the handle 20, and there are three of these bosses 24, each of which is provided with a metallic screw threaded socket 35 with which the handle attaching screws 25 coact. The handle 20 may obviously be firmly secured to the upper portion of the sheet metal body 12 with the aid of the screws 25 and sockets 35, but this can be accomplished only when the body 12 has been removed from the sole plate 7, since the heads of the fastening screws 25 are normally totally confined within the body. The handle 20 is also of artistically streamlined construction; and the integral rear wall 23 is provided with three iron supporting legs 36 for supporting the iron assemblage when not in use, and is also provided with a rear opening normally

closed by a plate 37 which is removably attached to the wall 23 with the aid of screws 38.

The combined thermostat and electric control switch 10 may be of any suitable and well known type with which the rotary adjusting stem 27 is cooperable to vary the current delivered to the heater or coil 8 in accordance with the requirements for the particular type of fabric which is to be ironed or pressed. This switch 10 itself may be of any suitable type constituting no specific part of my present invention, and as previously indicated, the switch or thermostat is mounted directly upon the sole plate 7 where it will be most sensitive to changes in temperature of the sole plate as created by the heating coil 8. However, the mechanism for effecting adjustment of the thermostatic switch 10 is an important part of the invention, and the lower screw threaded end 39 of the adjusting stem 27 is cooperable with a fixed internally threaded member 40 and carries a pin 41 which cooperates with the switch 10 in a manner whereby rotation of the stem 27 will move the pin 41 either up or down, and will thereby produce the desired switch and thermostat adjustment, see Fig. 3. The upper extremity 42 of the stem 27 is serrated for coaction with internal serrations within the hub of the bifurcated or forked element 28, so that the element 28 may be applied to the stem end 42 in various angular positions, and the element 28 is applicable to the stem externally of the main casing body 12.

The adjusting wheel or dial 26 has calibration markings for the various types of fabrics, on its upper face, and has a serrated periphery projecting outwardly beyond the opposite sides of the front portion of the handle 20, as clearly shown in Fig. 1. This adjustable indicating dial 26 is rotatably suspended from within the handle 20 by means of an inverted screw 43 coacting with a socket 44 embedded in the handle and coacting with a central bore of the dial, and the dial 26 is also provided with several eccentric holes 45 with which the prongs or tines of the bifurcated element 28 are loosely cooperable, see Figs. 2 and 3. A helical spring 46 may be interposed between the dial 26 and the hub of the element 28 in order to maintain the latter upon the stem end 42 and to eliminate looseness of parts; and the assemblage is obviously such that when the dial 26 is rotated upon its bearing screw 43, in either direction, rotary motion will be transmitted through the connecting element 28 to the stem 27 and this stem will coact with the screw threads of the fixed member 40 so as to move the pin 41 up or down, thereby effecting the desired adjustment of the pre-set thermostatic switch 10.

The switch 10 is connected in series with the electric heating coil 8 by means of conductors 34 and the terminal assembly 29 associated with the rear portion of the sole plate 7, and this assembly 29 comprises a pair of terminal attaching plates 47 secured to insulating blocks 48 resting upon the sole plate 7, as indicated in Fig. 2. The opposite ends of the heating coil 8 are connected to the terminal plates 47 in series with the switch 10 in an obvious manner, and the current conductors or wires 30 are attachable to the plates 47 by means of screws 49. These attaching screws 49 are freely accessible through the opening in the rear wall 23 of the handle 20 upon removal of the closure plate 37 and screws 38, and the conductors 30 may be snugly confined within an elbow conduit 50 detachably secured to the inner end of the flexible elongated

bushing 31. The bushing 31 is preferably formed relatively long and of rather stiff but flexible material so that it may be inserted in the handle through the rear deep recess thereof, and will eliminate sharp kinks or curves in the conductor cord or wires 30.

When assembling the improved electric flat iron, after the various parts have been properly constructed, the insulating plate 33 and thermostatic switch 10 may be readily attached to the sole plate 7 in an obvious manner, and the switch should be initially set to operate properly for predetermined variations in temperature to which the thermostat may be subjected. The bushing 31 and wires 30 should also be initially applied to the handle 20. The dial 26 may then be applied within and mounted upon the handle 20 with the aid of the screw 43, and the bifurcated element 28 and spring 46 should then be applied to the dial 26 with the prongs of the element 28 loosely but slidably engaging the holes 45. The casing 12 should thereafter be attached to the handle 20 with the aid of the screws 25 so as to hold the dial 26, element 28, and spring 46 in assembled condition. The thermostat of the switch should then be placed in "off" position, and the dial 26 should also be held by the assembler in "off" position, whereupon the serrated upper end 42 of the stem 27 which is mounted upon the sole plate 7, may be passed through the upper front opening in the casing or body 12, and slipped into the internally serrated hub of the element 28 to provide a positive driving connection between the dial 26 and the stem 27. The sole plate 7 may then be finally secured to the body 12 with the aid of the clamping rod 17 in order to conceal the switch 10, and since the bushing 31 and the conducting wires 30 have been properly applied to the handle 20, the conducting wires may be secured to the terminal plates 47 either before the casing 12 is clamped to the sole plate 7, or through the opening in the rear wall 23 of the handle with the aid of the screws 49. The iron assembly may thus be readily assembled, but it may also be just as conveniently dismantled.

During normal operation of the improved electric iron, the operator may grip the handle portion 21 and may rest his or her thumb upon the thumb plate 22. The operator may also conveniently adjust the wheel or dial 26 so as to insure proper heating of the sole plate 7 to temperatures corresponding to the work to be done, and this wheel or dial 26 may be quickly adjusted to entirely disconnect the current. If the operator desires to discontinue the use of the iron, he or she may rest the same upon the rear legs 36 of the handle 20, thus suspending the sole plate 7 in mid air and eliminating necessity of providing a special insulated support for the iron.

From the foregoing detailed description it will be apparent that my present invention provides an improved electrically heated iron which besides being simple and durable in construction is highly effective in normal use and may be readily assembled or dismantled. The improved mechanism for effecting adjustment of the thermostatic switch 10, is conveniently operable by virtue of the location of the control dial within easy reach of the thumb and forefinger of the operator, and is also plainly visible at all times. The adjusting dial is out of direct contact with the thermostat

adjusting stem, thereby eliminating excessive heating of the dial, and the bifurcated connecting element 28 obviously prevents strain from being placed upon the dial 26 and stem 27 due to possible misalignment of parts. The independent mounting of the dial within a handle 20, avoids excessive friction and facilitates movement of the dial during adjustment thereof, and no set screws are required for proper positioning of the adjusting dial. The one-piece dial can be readily inserted within and attached to the handle and the serrated periphery of this dial further enhances the ease of adjustment. It is also unnecessary to remove the dial from the handle when replacing or repairing the thermostatic switch, and the adjusting assemblage is therefore extremely simple and readily manipulable.

The entire assemblage is obviously highly aesthetic in appearance and conveniently manipulable and can be manufactured and sold at moderate cost because of the avoidance of complicated structure and mechanism. It should, however, be understood that it is not desired to limit this invention to the exact details of construction or to the precise mode of use, herein shown and described, for various modifications within the scope of the appended claims may occur to persons skilled in the art.

I claim:

1. A flat iron comprising, a sole plate having an electric heater associated therewith, a thermostatic control switch for said heater carried by said sole plate, a hollow body normally concealing said switch, a manipulating handle secured to said body, and adjusting mechanism for said switch including a dial journalled for rotation in said handle, a longitudinally movable stem rotatably supported from said switch, and a motion transmitting bifurcated element having a prong slip-fitted within an eccentric hole in said dial and also having a central hub angularly adjustably attached to said stem.

2. A flat iron comprising, a sole plate having an electric heater associated therewith, a thermostatic control switch for said heater carried by said sole plate, a hollow body normally concealing said switch, a manipulating handle secured to said body, and adjusting mechanism for said switch including a dial journalled for rotation in said handle, a longitudinally movable stem rotatably supported from said switch, a motion transmitting bifurcated element having a prong slip-fitted within an eccentric hole in said dial and also having a central hub angularly adjustably attached to said stem, and a spring interposed between said dial and said element for normally maintaining said element upon said stem.

ERNST WITZEL.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,916,673	Kuhn et al.	July 4, 1933
2,258,639	Barnes	Oct. 14, 1941
2,333,521	Clark et al.	Nov. 2, 1943
2,353,151	Elsenheimer	July 11, 1944
2,370,146	Clark	Feb. 27, 1945