

Sept. 25, 1951

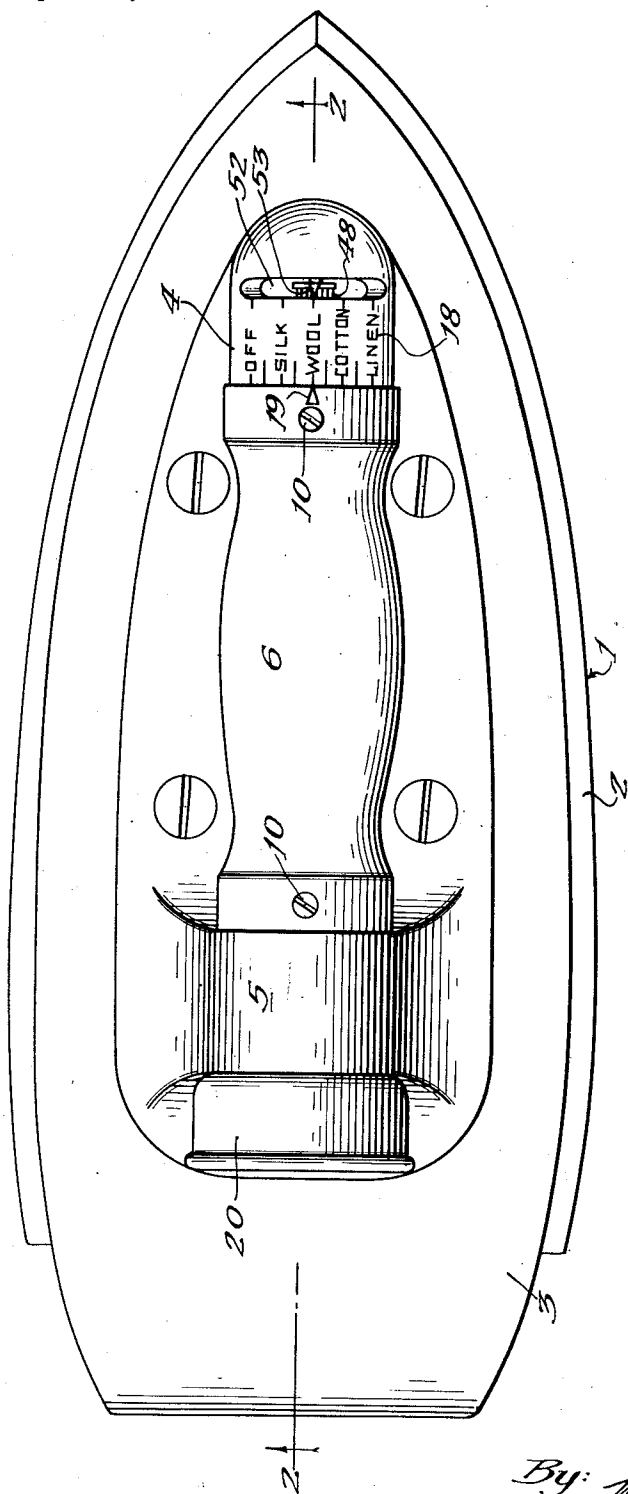
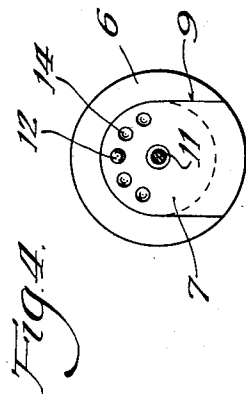
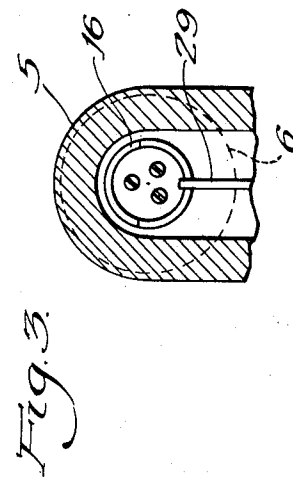
A. C. PURPURA
ELECTRIC FLATIRON

2,569,259

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2 Sheets-Sheet 1

Fig. 1.



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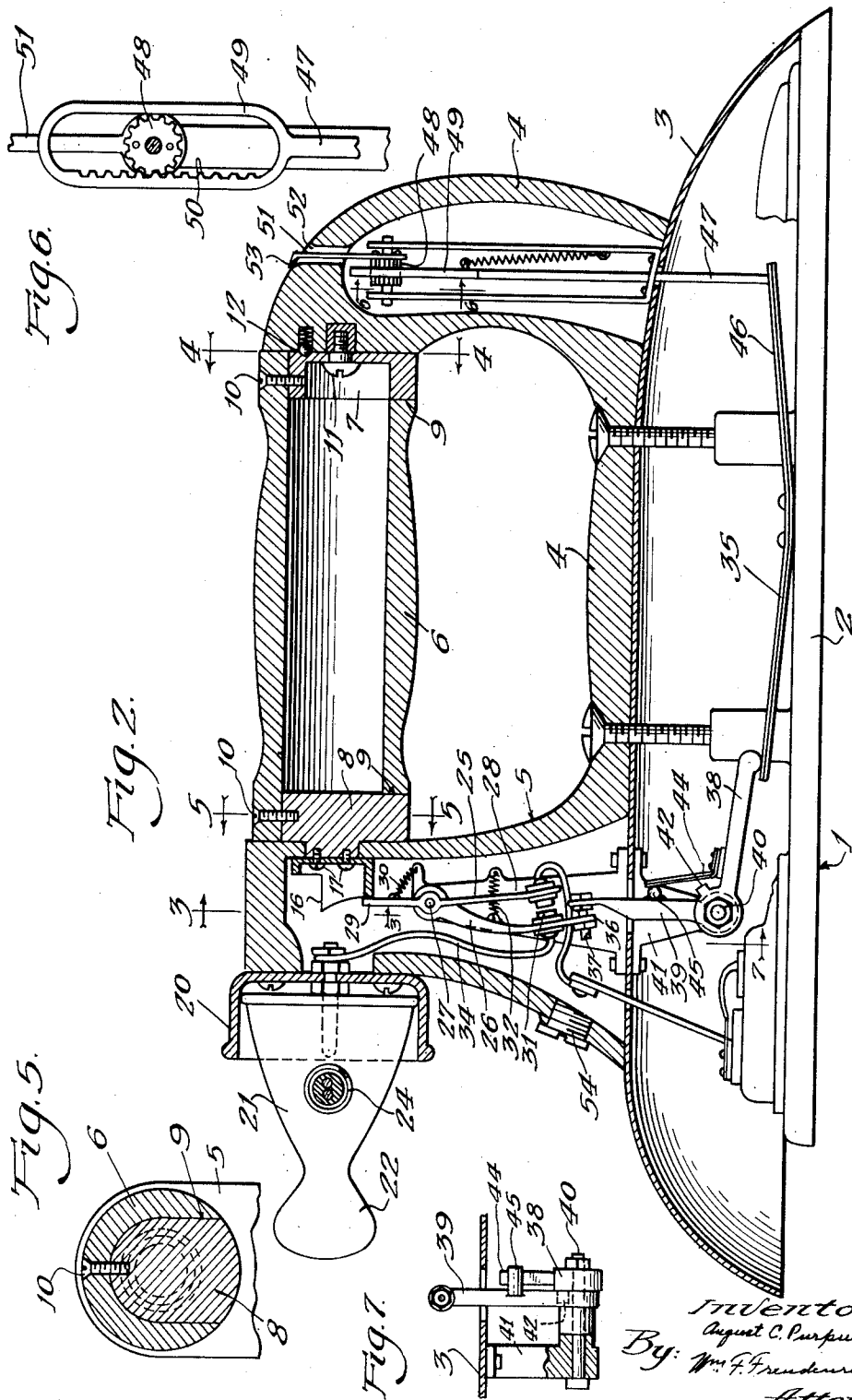
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UNITED STATES PATENT OFFICE

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ELECTRIC FLATIRON

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3 Claims. (Cl. 219—25)

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The present invention relates, primarily, to that type of electric flat iron the temperature of which can be regulated between that best adapted for things which must be ironed at low temperatures and a maximum high temperature at which other things can best be ironed; and has for its primary object to produce a simple and novel construction and arrangement whereby such regulation can be carried out easily and effectively.

A further object of the present invention is at all times to apprise the user of the iron what the temperature of the iron actually is and whether it corresponds to that desired.

A further object of the present invention is to control the shutting off of the current to the iron, as well as the temperature to which the iron will be heated, from a single movable member within reach of the hand gripping the handle of the iron, preferably the grip portion which is the part grasped in the hand in using the iron.

The various features of novelty whereby my invention is characterized will hereinafter be pointed out with particularity in the claims; but, for a full understanding of the invention and of its various objects and advantages, including those just enumerated, reference may be had to the following detailed description taken in connection with the accompanying drawings, wherein:

Figure 1 is a top plan view of an electric flat iron embodying the present invention in a preferred form; Fig. 2 is a section on line 2—2 of Fig. 1; Figs. 3, 4, and 5 are sections taken, respectively, on lines 3—3, 4—4 and 5—5 of Fig. 1; Fig. 6 is a section on a plane represented by the broken line intersected by the arrow 6 in Fig. 1; and Fig. 7 is a view, partly in elevation and partly in section, of the switch-opening rocker device and its immediate support.

Referring to the drawings, 1 represents what may be called the main body member, including the sole plate 2, cover 3 and the usual parts essential to an electric iron. Rising from the top of the cover, along the longitudinal center, is a handle which, in the arrangement shown, comprises a U-shaped part the upright arms of which are in the form of hollow posts 4 and 5, together with a grip or part to be grasped when ironing, 6. The part 6 is shown as mounted for rotation about its axis so as to be capable of serving as the manually operable member of the circuit controlling means. The grip proper is supported by and detachable from a pair of blocks 7 and 8 rotatably held on the posts 4 and 5, respectively. The handle part 6 has at the ends sockets 9 which

open through the under side so that part 6 may be placed in position or be removed by a vertical movement. Normally the part 6 is secured to the blocks by screws 10. Therefore one need only remove two screws in order to leave the grip piece free to be lifted off. As best shown in Figs. 4 and 5, the blocks are noncircular so that they interlock with part 6 against relative rotary movements. Conveniently, the lower end of each block is curved on the same radius as the grip piece, while the side edges are flat.

The block 7 is held to the post 4 by a screw 11 which serves as a stub shaft on which it may rotate. In that part of the face of post 4 with which block 7 engages is a little spring-pressed catch or dog, preferably a ball 12, that cooperates with a group of holes 14 arranged in an arc of a circle in the near face of the block. Consequently the grip piece is yieldingly locked in any angular position within the length of the arc of holes in the block.

The block 5 is provided with a cylindrical hub 15 which extends through and has a bearing in the adjacent wall of the post 5. Within this post is a cup-shaped cam 16, larger in diameter than the hub and fastened to the latter by suitable screws 17. The hub being of the same length as the thickness of the wall through which the hub passes, the block may rotate but cannot move axially.

As best shown in Fig. 2, a column of legends 18 lies crosswise of the top of the post 4 which is rounded on about the same radius as part 6 of the handle. A pointer 19 cooperates with these legends as will be explained later.

The connection with a cord or cable for supplying current to the iron is made toward the top of the rear post 5. In the arrangement shown, the receptacle member 20 of a connector is secured to the rear side of the post as far up as possible without causing the receptacle to project objectionably above the top of the handle. Cooperating with this receptacle is a detachable plug 21 which is long enough to serve as a foot when the iron is set on end. The free end of the plug is preferably in the form of a knob 22 to be grasped when the plug is to be pulled out. The cord or cable 24 enters the side of the plug inwardly from the knob so as to remain out of contact with the ironing board or other support when the iron is standing on end.

The controlling switch for the iron comprises two arms 25 and 26, pivotally connected by a common pin 27 to a high, narrow bracket 28 rising from the cover 3 within the rear post. The

switch arm 25 has a finger 29 projecting up past the lower part of the rim of the cup-shaped cam. A spring 39, connecting the finger 29 with a corresponding element on the arm 26, tends constantly to draw the lower ends of the arms together to cause the contact pieces 31 thereon to engage and close the circuit. Another spring, 32, connected at its ends to the arm 26 and the bracket 28, respectively, exerts a constant pull in the direction to close the switch regardless of the position of the cooperating arm. One side of the energizing circuit, namely the wire 34, extends from a terminal on the receptacle, through the contacts, which are insulated from the arms, to the heating element of the iron.

Within the body portion of the iron there is a thermo-responsive element 35, the free end of which rises as the temperature increases. Co-operating with this element is an actuator for opening the switch which is essentially a bellcrank lever one arm of which rests on the free end of element 35, while the other end lies in front of a downward extension of switch arm 26, indicated at 36, and bears against an adjustable stop 37 on the latter. In order to compensate for the lag in the heating of the thermal element upon first turning on the current the actuator may be what is, in effect, an automatically adjustable bellcrank which narrows the angle between the arms thereof after all parts become thoroughly heated. As shown, the actuator comprises two lever arms, 38 and 39, mounted for independent angular movements about a common pin 40 projecting laterally from a bracket 41 that depends from the cover 3, just below the bracket 28. On arm 38 is a pin 42 that extends across the front edge of the arm 39 so as to be spaced apart from such edge when the switch is in the off position and the iron is cold. Mounted on the lever arm 38 is an auxiliary thermal element 44 that presses rearwardly against a lateral projection 45 on lever arm 26 under the conditions last mentioned, thereby taking up the slack in the bellcrank and causing pressure to be exerted immediately against switch arm 26 when the thermal element 35 starts to move upward at its free end. In other words, the switch starts to open more quickly than would be the case if the lever arm had to swing up far enough to take up the slack before pressure could be applied to switch arm in the direction to move it away from the cooperating switch arm. However, when the parts become properly heated, the upper end of thermal element 44 swings to the right, as viewed in Fig. 2, and lever arm 39 must thereafter be driven by pin 42 after the slack between the lever arms has been taken up.

It need only further be said that the parts, including the cam 16, are so proportioned that when the pointer 19 registers with "Off" in the column 18 of legends, the lower end of switch arm 25 is held so far to the right, as viewed in Fig. 2 that the switch cannot be closed; the finger 29 being now on the high point of the cam. If it be desired to iron woolen goods, for example, the grip piece 6 is turned until the pointer thereon registers with "Wool," the finger 29 riding down hill on the cam into the position indicated in Fig. 2. The switch is thus caused to close and remains closed until the free end of thermal element 35 rises high enough to move switch arm 26 far enough toward the left to break the circuit. This latter condition is the one illustrated in Fig. 2, the switch being open while the aux-

iliary thermal element 44 is still serving as the immediate means for driving switch arm 26. Then, when element 44 becomes heated sufficiently, it swings forward and out of the way so that thereafter the pin 42 on lever arm 38 becomes the pressure transmitting medium between the two levers. So, for any other goods in the column or list, the turning of the grip element to the proper name or graduation insures that the temperature of the iron cannot rise above a safe level. It will of course be understood that the temperature of the iron is not held exactly at a given level, but that, as in the case of all thermostatically controlled temperatures, the switch opens at one temperature and closes again at a slightly lower temperature; thereby maintaining what can be regarded as a temperature which for all practical purposes is constant.

It is advantageous to have at hand means to ascertain whether the regulating means is functioning as intended. To this end I have provided a second pointer for cooperation with the column or list of names of goods, this pointer being operated by a thermo-responsive element which need not be the element 35. In the arrangement shown, there is a single, double ended main thermo-responsive element of which element 35 forms one half, the other half, 46, extending forwardly to a point under the front post 4. Resting on the free end of element 46 is a rod 47 that rises into the interior of the post. Mounted within the post, near the top, is a thick gear wheel 48 that revolves about a horizontal axis extending lengthwise of the iron. At the upper end of the rod is a loop 49 that embraces the gear wheel and is provided at one side with rack teeth 50 meshing with the teeth on the wheel. Therefore, when the iron begins to heat, the rod is pushed up and turns the toothed wheel. Fastened to one side or face of the wheel is a stem 51 that extends radially therefrom through a transverse slot 52 in the top of the post and near the column of names. At the extreme upper end of the stem is a little pointer 53 that moves along the column of names on the opposite side from that on which the pointer 19 is located.

The parts are so proportioned and calibrated that when the iron is cold the pointer 51 stands at "Off" and remains there, regardless of the position into which the handle member 6 is turned, until the iron begins to become heated. As the iron heats, after the handle member 6 has been turned to close the switch, the pointer 51 moves along the column of names or legends and should stop directly opposite the other pointer. If, after the iron is thoroughly heated, the two pointers are not aligned, the user knows that adjustment is required. If too great an adjustment is not required, this may be accomplished by adjusting the stop 37. To this end the stop 37 is preferably in the form of a screw, and a plug 54 is placed in the wall of the rear post 5, directly behind the screw. When the plug is removed, ready access may be had to the stop.

While I have illustrated and described with particularity only a single preferred form of my invention, I do not desire to be limited to the exact structural details thus illustrated and described; but intend to cover all forms and arrangements coming within the definitions of my invention constituting the appended claims.

I claim:

1. An electric flat iron provided with a handle of which the part adapted to be grasped in the hand in using the iron is mounted for turning

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movements about its long axis, a controller for the heating circuit, a thermo-responsive element, means operated jointly by turning movements of the said handle part and by said element to operate the controller, graduations on a stationary portion of the handle at one end of the movable part, legends beside individual graduations to indicate different goods adapted to be ironed at the respective temperatures corresponding to such graduations, a pointer actuated by said thermo-responsive element to move along said graduations as the temperature of the iron varies to indicate the actual temperature of the iron, and a pointer on said movable handle part also cooperating with the graduations.

2. In a flat iron, a main body member, two posts rising from said body member in spaced relation to each other along the longitudinal center of the iron, two blocks mounted on the inner sides of said posts, near the upper ends of the latter for rotation about a common axis, and a handle part adapted to be grasped in the hand in using the iron, said handle part having sockets entering through the under side at the ends to receive said blocks, the parts being so proportioned that said blocks can enter said sockets from be-

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low and, when so entered, are thereby interlocked with said handle part to prevent relative rotation between the blocks and said handle part.

3. A flat iron as set forth in claim 2, wherein means are provided between one of the blocks and the adjacent post yieldingly to hold the handle part in any one of a plurality of angular positions about its axis of rotation.

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