July 5, 1949. E. P. SCHREYER 2,475,571

STEAM ELECTRIC IRON

Filed Sept. 25, 1946 2 Sheets-Sheet 1

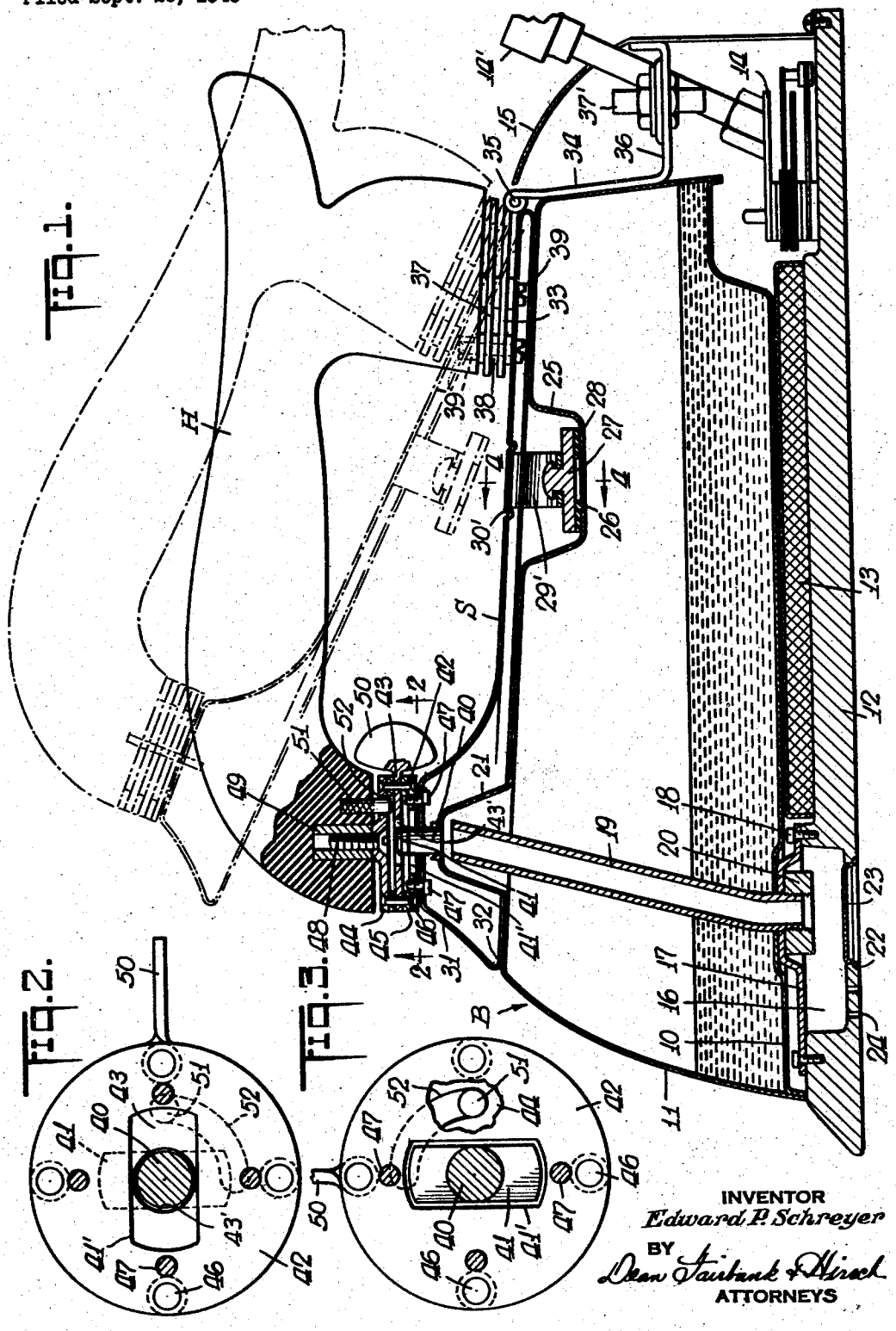


Fig. 1.

Fig. 2.

Fig. 3.

INVENTOR
Edward P. Schreyer
BY
Dean Fairbank & Hirsch
ATTORNEYS

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Fig. 4.

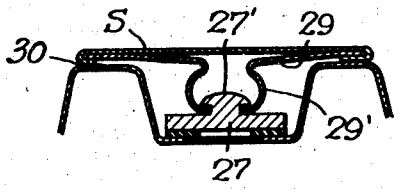


Fig. 6.

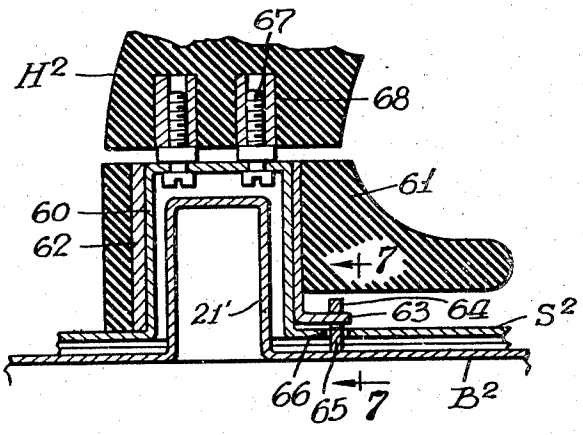


Fig. 7.

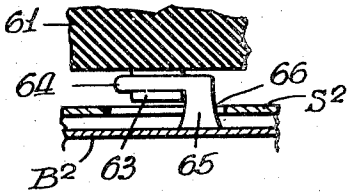
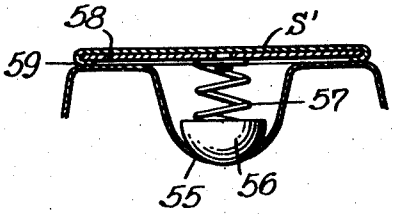


Fig. 5.



INVENTOR
Edward P. Schreyer
BY
Dean Fairbank & Hirsch
ATTORNEYS

Patented July 5, 1949 2,475,571

UNITED STATES PATENT OFFICE

2,475,571

STEAM ELECTRIC IRON

Edward P. Schreyer, Ridgefield, Conn.

Application September 25, 1946, Serial No. 699,141

12 Claims. (Cl. 38—77)

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The present invention relates more especially to steam electric irons.

It is among the objects of this invention to provide an electric steam iron in which the filling aperture is opened without the effort to manipulate a more or less inaccessible plug from between the legs of the handle, but in which such opening is effected by an easy manipulation at a readily accessible part of the iron and without the need for exercising much force or for the use of a tool, in which the need for a separable closure plug is avoided with the possibility of its loss, in which filling is readily accomplished by pouring from any vessel, even from a large glass that may be held immediately above the readily accessible filling aperture, and in which the filling aperture is closed as readily as it is opened and when closed is capable of sustaining the desired steam pressure to be generated within the boiler and yet inherently affords safety facilities for releasing excessive steam pressure thereat while protecting the user from being scalded in such release.

It is a feature of the invention to provide the filling aperture with a closure which is resiliently pressed against said aperture by a shield plate mounting said closure, and movably mounted upon the boiler. In a preferred arrangement, the shield plate extends the length of the boiler, is hinged to the rear thereof, mounts the handle and is releasably latched at its forward end to the boiler, in which latched position the closure effectively seals the aperture but by virtue of its resilient mount serves as a safety valve to release excess steam pressure, the shield plate protecting the user against scalding should such release occur during use.

All inventive disclosure which this patent application has in common with that of my copending application Serial No. 4,586, filed January 27, 1948, is claimed in the latter.

In the accompanying drawings in which are shown one or more of various possible embodiments of the several features of the invention,

Fig. 1 is a view in longitudinal cross section of one embodiment of the invention,

Fig. 2 is a sectional detail view on a larger scale taken on line 2—2 of Fig. 1, showing the parts in latched position,

Fig. 3 is a view similar to Fig. 2 showing the parts in unlatched position,

Fig. 4 is a transverse sectional detail view on a larger scale taken on line 4—4 of Fig. 1,

Fig. 5 is a view similar to Fig. 4 of a modification,

Fig. 6 is a fragmentary detail view of a modification of the shield plate latch and associated structure, and

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Fig. 7 is a detail section on line 7—7 of Fig. 6.

Referring now to the drawings, the steam electric iron comprises a sheet metal boiler B, the floor plate 10 of which may be welded at its periphery to the rim of the inverted bowl shaped body 11. The boiler may be affixed to the sole plate 12 and against the heating element thereon 13 by any suitable or conventional means. The iron may also present any desirable form of thermostat 14 illustratively mounted at the rear of the sole plate 12 with an adjusting knob 14' extending through heel plate 15.

Near the front the sole plate may present a steam well 16 which is closed by a cover plate 17 affixed to the top of the sole plate as by screws 18, through which cover plate rises the steam pipe 19 which is welded to floor plate 10 and threaded at its lower end into a nut 20 under the cover 17. The upper end of the steam pipe 19 is accommodated within a small dome 21 integral with and rising from the sheet metal boiler B. For access to the nut 20, the bottom of the sole plate 12 may have a port 22 sealed by a snap closure cap 23 and appropriate small perforations 24 for the generated steam are in the forward portion of the sole plate through the floor of the well 16.

The top well of the boiler is countersunk as at 25 near the rear end thereof in advance of the rear leg of the handle H, a filling aperture 26 being in the bottom of said depression. A closure 27 for aperture 26, desirably provided with an appropriate sealing gasket 28 at its under face, is carried by a shield plate S movably mounted on the boiler B. A leaf spring 29 with a U-conformation 29' at its middle serves as a valve suspension member to mount the head 27' of closure 27 which head is upset over the spring as shown. The leaf spring 29 extends transversely of the shield plate S and is retained at its ends by the inturned lateral borders 30 of the latter, which are indented at 30' laterally of the spring to retain the closure 27 in registry with aperture 26.

The movable shield plate S is desirably hinged to the boiler B at its rear end and extends forward from said hinge substantially the entire length of the boiler. The forward portion of said shield plate is domed as at 31 to accommodate the small steam dome 21 on the boiler and the forward edge of said shield plate is turned inward as at 32 and resiliently pressed against the boiler B with the face of said shield plate and the lateral edges

thereof being slightly spaced from the top of the boiler when the shield plate is in closed and latched position, as shown and described below.

Preferably the shield plate is of sheet metal and is hinged by affixing the rear part thereof to the underface of leaf 33 of a hinge, the complementary leaf 34 of which is connected thereto by pintle pin 35 at the rear of the shield plate, said second leaf 34 being desirably affixed as by welding to the rear of the boiler. Leaf 34 presents a horizontal ledge 36 rigid therewith for mounting the terminal posts 37'.

The shield plate S in a preferred embodiment shown, serves also as the mount for the handle H which handle is desirably of heat insulating material and of more or less conventional shape. Preferably the rear of the handle is affixed to the shield plate by heat insulating means. To this end the base of the rear leg of the handle is affixed to the hinge leaf 33 which mounts the shield plate S with the interposition of one or more cooling vanes between said elements. The drawings show a single cooling vane 37 in addition to the hinge leaf 33, spaced from the latter, which in turn is spaced from the shield plate S by interposed spacer collars 38. Fastening screws 39 extend through the shield plate S, the various collars 38, the hinge leaf 33 and the cooling vane 37 into corresponding sockets 39' in the rear base of the insulating handle, thus affixing the latter rigidly to the hinged shield plate S.

Latch means releasably locks the forward part of the rearwardly hinged shield plate to the front end of the boiler. Said latch means is interposed between the base of the forward leg of the handle H and the boiler B and also may afford heat dissipating vanes.

The latch may comprise a stud 40 rigidly affixed to and rising from the dome 21 and provided with a wing head 41. The complementary latch is illustratively shown incorporated in a heat dissipating vane structure interposed between the shield plate S and the forward end of the handle H and rotatable about its axis for latching and unlatching the same with respect to the winged stud. The vane structure preferably comprises a stack of small metal disks 42, 43 and 44 spaced from each other by collars 45 and held in assembled relation by rivets 46 through said disks and spacing collars and near the peripheries of the disks. The lowermost of said disks 42 is rotatably affixed at the circular rim aperture of dome 31 on the shield plate S by means of hooks 47 threaded into disk 42 and has an aperture 41' through which head 41 can pass. The uppermost of the disks 44 is rotatably affixed to the under face of the forward end of the handle by means of a screw 48 threaded into an inset 49. The intermediate disk 43 is formed with a thumb piece 50 rigid therewith and extending outward in a plane at right angles thereto. A pin 51 protruding downward from the under face of the forward end of the handle H rides in a quadrant slot 52 in the upper disk 44, the ends of which slot determine the limits of movement of the disk stack in latching and unlatching operation.

From the foregoing, the mode of operation will be apparent, but it will now be briefly summarized.

With the handle in the released position and tilted backward with the shield plate S to and beyond the position shown in dot-and-dash lines in Fig. 1, the filling aperture 26 is accessible for convenient filling of water thereinto, as shown. The aperture is fully exposed so no filling appurtenance is required. The water may be poured in directly from a glass that may be held immediately over the aperture without danger of spilling. To close the aperture 26, the handle is merely moved forward to the full-line position shown in Fig. 1 in which the winged head 41 of the rising stud 40 enters aperture 41' in disk 42, as shown in Fig. 3. The portion of the stud 40 above the winged head 41 is shown as entering an aperture 43' in the disc 43. Upon simply pushing the thumb piece 50, the stack of disks is moved through a quadrant until the end of slot 52 in disk 44 abuts pin 51, when the winged head 41 extends across the slot 41' in plate 42, as shown in Fig. 2, and the parts are thus latched. The mounting shield plate S in latched position exerts considerable leverage, resiliently to press the closure 27 to seal the filling aperture 26.

It is seen that the closure 27 is suspended from the shield plate and is not a separable or removable part that is apt to be lost, nor is it a screw plug or cap that is apt to jam or the threads of which are apt to be stripped. The thumb piece 50 is readily accessible at the front of the iron and is shifted with the exercise of but little effort both in the opening and in the latching operation.

In use the steam generated by the heating element 13 will find its way through the steam tube 19 and apertures 24 in desired manner. Even in overlong ironing, the handle H will not overheat as it is not only of insulating material but the heat dissipating stacks of vanes interposed between the mounting ends of the handle and the shield plate S contribute to this end. The pressure exerted by the compressed resilient spring 29, 29' against the closure 27 is adequate to sustain the desired steam pressure during use. The closure functions as a safety valve, for should an excess of steam pressure be developed, the same will be released by overcoming the pressure of the holding spring 29, 29' and the steam when thus released will pass outward horizontally past the lateral edges of the shield plate S so that the user is protected from scalding.

In the alternative form of closure shown in Fig. 5, the filling aperture rim 55 in the boiler is generally spherically concave and the closure is a button 56 desirably in the shape of a hemisphere and entirely of gasket material, as for instance of molded rubber and asbestos composition or the like. A valve suspension member connects the button to the shield plate. This suspension member comprises a coil spring 57, attached at its lower end to the button and is desirably affixed at its upper end to the mid-portion of a transverse metal bar 58, in turn affixed to the hinge plate S' by the inturned lateral borders 59 embracing the ends of the bar 58 and indented in the manner shown in Fig. 1 to retain said metal bar in place on the hinge plate.

In the embodiment of Figs. 6 and 7, the shield plate S^2 which may be mounted in manner similar to that of Fig. 1 and which may carry a closure (not shown) similar in construction to those of Figs. 4 or 5 for the filling aperture, has a small domed conformation 60 of cylindrical form near the forward end thereof which encompasses the steam dome 21' on boiler B^2. Telescoped over the domed conformation 60 is a cylindrical member which may be of plastic such as Bakelite and has a protruding thumb piece 61. Member 61 is bonded about a cylindrical liner 62 that has a bearing fit about the domed

conformation 60. The liner 62 has a lateral hook extension 63 at its lower end, adapted to interengage a complementary hook element 64 on a bracket piece 65 welded to the top of the boiler B^2 and extending upward therefrom through a corresponding slot 66 in the shield plate. The handle H^2 is of thickness such as to overlap the Bakelite thumb piece so that the latter cannot be removed from the dome even though not otherwise restrained against removal, and said handle is attached by screws 67 through the top of domed conformation 60 threaded into insets 68 in the adjacent base of said handle.

By moving the thumb piece 61 in one direction, the latch hook 63 is disengaged and the handle may be tilted upward in the manner shown in dotted lines in Fig. 1 for refilling and upon reclosing the handle, a mere shift of the thumb piece 61 in opposed direction will cause the latch 63, 64 to become reengaged. Obviously heat dissipating fins or vanes similar to those shown in Fig. 1 could, if desired, be interposed between the dome 60 and the handle H^2.

As many changes could be made in the above construction and many apparently widely different embodiments of this invention could be made without departing from the scope of the claims, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent of the United States is:

1. An electric steam iron of the type comprising a boiler, a sole plate, a handle, an electric heating element under said boiler and in heat conductive relation to both the boiler and the sole plate, and a displaceable closure for a filling aperture in the top of said boiler and displaceable from such aperture to permit filling the boiler with water; the combination therewith of a shield structure having an area greater than that of said aperture, said structure being movably mounted upon the steam iron to expose the filling aperture in open position of said shield structure and to extend over the entire area of said aperture in closed position of said shield structure, the closure being a valve, and a resilient valve suspension member substantially immovably affixed at the upper part thereof to and depending from said shield structure and connected to said valve yieldingly to restrain opening of said valve under steam pressure within the boiler for safety valve action, and means releasably to lock the shield structure in closed position over the filling aperture.

2. The combination recited in claim 1 in which the resilient valve suspension member includes a spring member from which the valve is suspended and extending transversely of the shield structure and secured at its ends to near the lateral edges of said structure.

3. The combination recited in claim 1 in which the resilient valve suspension member is a bowed leaf spring mounting said valve at its middle and the ends of said leaf spring are retained by inturned lateral edges of the shield structure.

4. The combination recited in claim 1 in which the closure is a button of gasket material, in which the resilient suspension member is a coil spring affixed to the upper face of said button at one end thereof and the other end of which is centrally affixed to a transverse plate, the shield structure having inturned lateral borders accommodating and affixing the ends of said transverse plate.

5. An electric steam iron of the type comprising a boiler, a sole plate, an electric heating element in heat conductive relation to both the boiler and the sole plate, a filling aperture in the top of said boiler, a shield structure hingedly connected to the steam iron, a handle affixed at its ends to said shield structure, said shield structure having an area which in closed position extends over the entire area of said aperture, means for releasably latching the shield structure to the boiler, a valve closure for said aperture and resilient means depending from said shield structure and interposed between said closure and said shield structure for safety valve action of said closure under steam pressure within the boiler; the combination therewith of heat insulating connections between the shield structure and the underface of each end of the handle, said heat insulating connection at at least one end of the handle comprising a stack of parallel metal plates with intervening spacer collars.

6. The combination recited in claim 5, in which the shield structure comprises a shield plate, hingedly mounted upon the boiler at its rear end, and in which the hinge therefor has one leaf affixed to the rear of said boiler and a second leaf mounting said shield plate, said leaf constituting the lowest plate of the stack of parallel metal plates.

7. The combination recited in claim 6 in which the hinge plate affixed to the rear of the boiler has a rearwardly extending ledge for the electrical terminals of the iron and in which a heel plate covers said ledge and extends from the rear of the sole plate to the top of the boiler.

8. The combination recited in claim 5, in which the stack of parallel metal plates is rotatably mounted upon the lower surface of the forward end of the handle, the boiler having a stud with a winged head rising therefrom and adapted to register with an opening substantially of the size and shape of said head in the lowermost of said plates, and a thumb piece on one of said plates for turning the stack of plates for latching the same under said winged head.

9. An electric steam iron of the type comprising a boiler, a sole plate, an electric heating element in heat conductive relation to both the boiler and the sole plate and a displaceable closure for a filler aperture in the top of said boiler and displaceable from such aperture to permit filling the boiler with water; the combination therewith of a shield plate hinged to the rear of the boiler, said closure being a valve under said shield plate and completely covered by the latter in closed position of the shield plate and resilient means depending from said shield plate and resiliently pressing said closure to seating position for safety valve action under steam pressure within the boiler, a handle affixed to said shield plate, a stack of parallel metal plates with intervening spacer collars, said stack being rotatably affixed to and extending under the front end of the handle and above the shield plate, and a latch including one latch element rising from the front end of the boiler, one of said metal plates being the coacting latch element and having a thumb piece for rotating the same to latch and unlatch the front end of the shield plate and its carried handle with respect to the boiler.

10. An electric steam iron of the type comprising a boiler having a steam dome rising from near the forward end thereof, a sole plate, an

electric heating element in heat conductive relation to both the boiler and the sole plate, and a displaceable closure for a filling aperture in the top of said boiler; the combination therewith of a shield plate extending over substantially the entire area of the top of the boiler, hinged at its rear end near the rear end of said boiler and having a domed conformation near its front to encompass the steam dome, said closure being a valve resiliently suspended from said shield plate for safety valve action under steam pressure within the boiler, said shield plate having a handle affixed thereto, and a latch construction for releasably affixing the forward end of the shield plate to the boiler, said latch construction including one latch element rising from the boiler and extending through an aperture in the shield plate and a complementary latch element rotatably mounted between the shield plate and the underface of the forward end of the handle, said complementary latch element having a thumb piece adjacent said handle end.

11. The combination recited in claim 10 in which the movable latch element comprises a stack of parallel metal plates with intervening spaced collars, one of which said plates has the thumb piece protruding beyond the companion plates, a pin protruding downwardly from the underface of the forward end of the handle, the upper plate of the stack having a slot therein coacting with the pin for limiting the movement of the latch element between closed and open positions, and in which the fixed latch element is a headed stud rising from the steam dome upward through an opening in the domed conformation through an aperture in the lowermost of said parallel plates of dimensions corresponding to those of the head and having keying coaction with said plate.

12. The combination recited in claim 10 in

which the latch includes a hook element rigid with and rising from the boiler adjacent the domed conformation of said shield plate, in which said domed conformation is cylindrical and the complementary latch element comprises an insulating cylindrical member with a thumb piece, said insulating cylindrical member having a cylindrical liner bonded thereto and having a bearing fit upon said domed conformation, said liner having a hook element at its lower end for latching coaction with the hook element on said boiler.

EDWARD P. SCHREYER.

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