

Aug. 24, 1965

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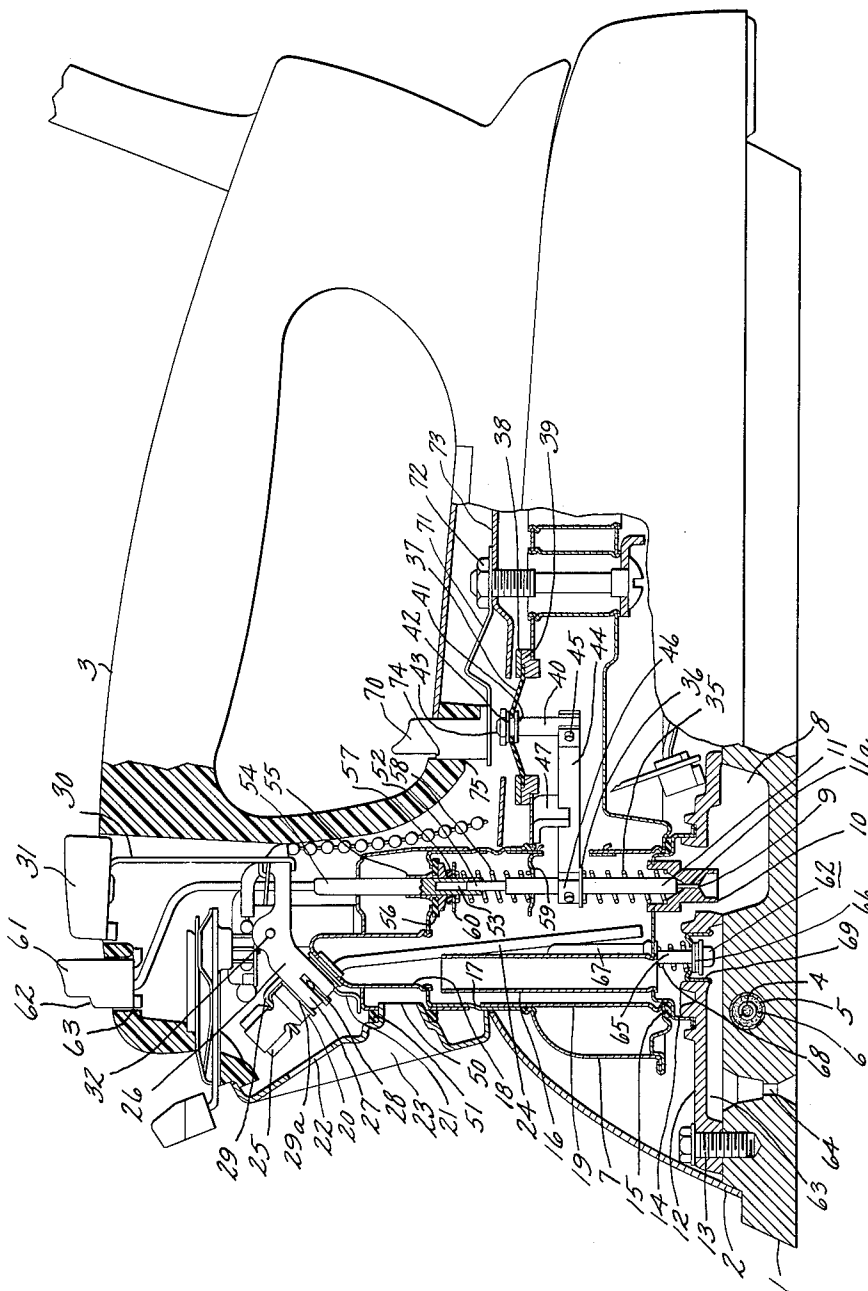
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AUTOMATIC SPRAY, STEAM, AND DRY IRON

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4 Sheets-Sheet 1

Fig. 1.



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Fig. 3.

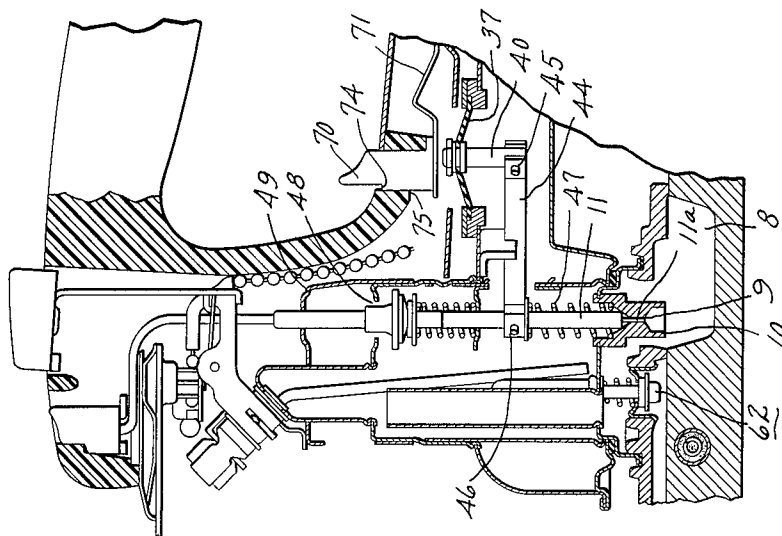
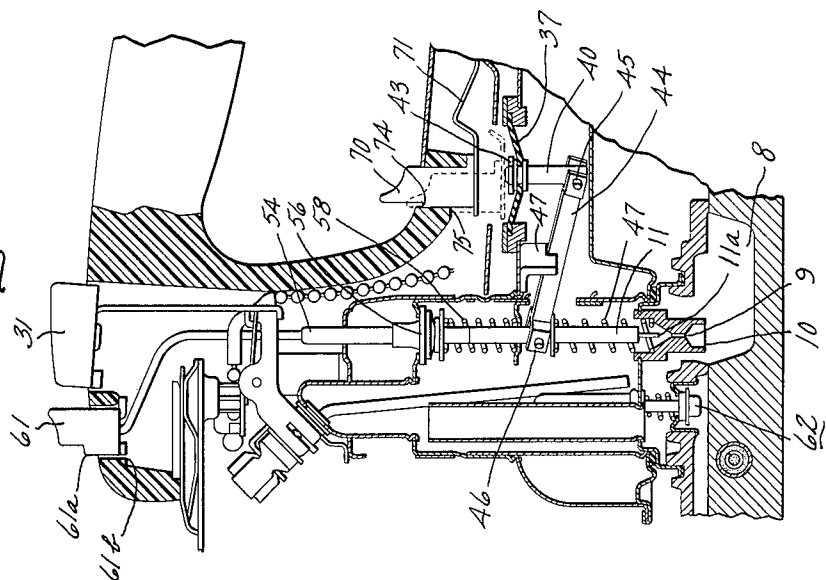


Fig. 2.



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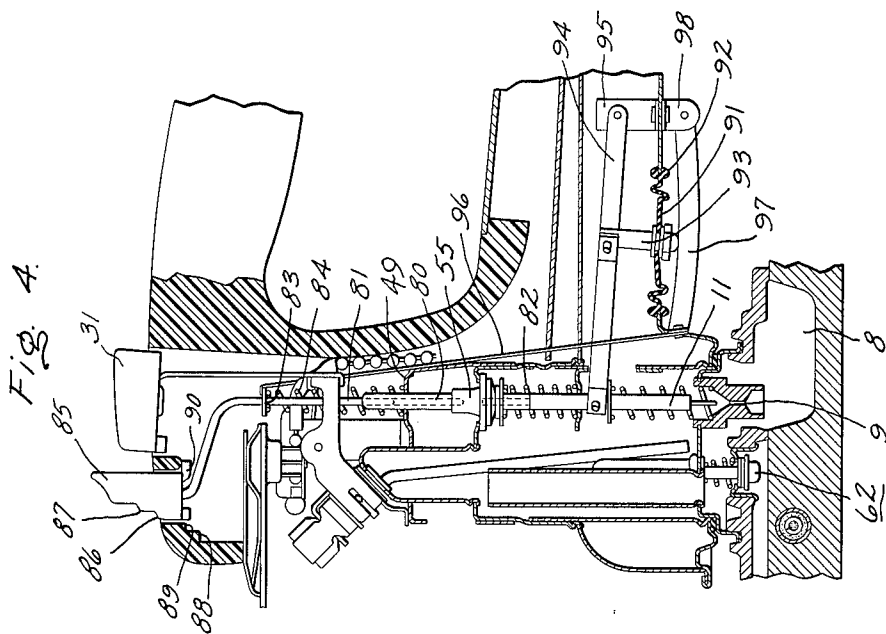
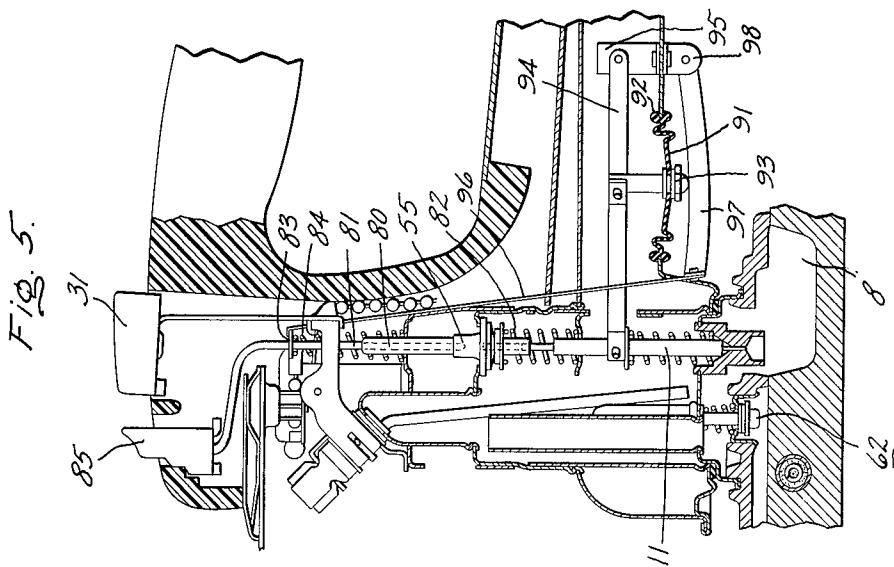
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AUTOMATIC SPRAY, STEAM, AND DRY IRON

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4 Sheets-Sheet 3



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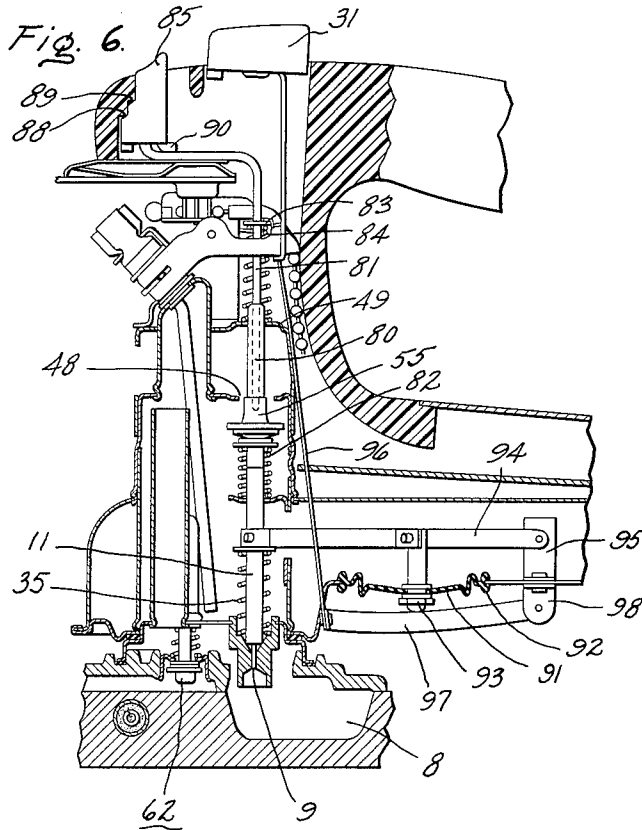
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AUTOMATIC SPRAY, STEAM, AND DRY IRON

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4 Sheets-Sheet 4



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3,201,880

AUTOMATIC SPRAY, STEAM, AND DRY IRON
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10 Claims. (Cl. 38-77)

This invention relates to electric steam or dry pressing irons of the type having a liquid spray mechanism powered by steam generated within the iron, and further relates to an automatic steam pressure control therefor which permits instant spray operation at any time when the iron is at operating temperature.

In a pressing iron having dry and steam operation, it is desirable that a liquid spray mechanism be provided to spray dry areas of the material being ironed or to add additional moisture to areas which are particularly difficult to press. Moreover, it is desirable that the spray mechanism be quickly operable by actuating a single manual control when the iron is set for either dry or steam ironing. One method of accomplishing this result is to maintain a certain minimum steam pressure at all times to operate the spray mechanism when needed. Since no steam is required for the pressing operation when the iron is set for dry ironing, it is desirable that the iron produce only sufficient steam to maintain the pressure needed to power the sprayer. Accordingly, it is necessary to control the amount of steam being produced.

It is a primary object of this invention to provide an improved dry-steam iron which maintains automatically steam pressure to operate a liquid spray mechanism at any time.

It is another object of this invention to provide a water valve for controlling the flow of water from a liquid supply tank into a steam generator in an electric iron in response to the steam pressure generated by the steam generator.

Another object of this invention is to provide a dry-spray iron with a pressure responsive valve arrangement whereby the amount of water converted into steam may be controlled in accordance with the consumption of the steam in connection with the spraying operation.

Another object of this invention is to provide an improved dry-spray-steam iron having a unique pressure responsive water valve and control assembly therefor which permits liquid spray operation when the iron is set for either dry or steam operation.

Briefly stated, in accordance with one aspect of this invention, an electric iron having a water tank and a steam generator is provided with a water valve controlling the flow of water from the tank into the generator, and the water valve is made responsive to the steam pressure within the generator in a manner such that the flow of water into the generator decreases as the pressure increases. With such an arrangement, a minimum steam pressure may be maintained automatically within the iron to provide the necessary power to actuate a liquid spray mechanism during dry operation as well as during steam operation of the iron.

Steam or dry operation may be provided by use of a two position setting for the pressure responsive water valve, the water valve being held in an open position independently of pressure for steam operation. A second pressure responsive valve in a steam passage conducts steam to the ironing surface. The second valve is set to open at a pressure higher than the closing pressure for the water valve so that steam will not be furnished to the ironing surface when the iron is set for dry operation.

Further features, objects and attendant advantages will

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become apparent with reference to the following drawings in which:

FIG. 1 is a partially sectionalized elevational view of a pressing iron embodying this invention;

FIGS. 2 and 3 are cut-away views of the iron of FIG. 1 with the components shown in different operational positions; and

FIGS. 4, 5 and 6 are cut-away, partially sectionalized, elevational views of another embodiment of this invention with the components shown in various operational positions in the three figures.

Referring first to the embodiment of FIGS. 1-3, there is shown a flatiron including a sole plate 1 over which is positioned a cover 2 and including an operating handle 3. The sole plate may be heated by a sheathed type electrical element having an electrical resistor 4 within an outer tubular sheath 5, with the electrical resistor separated from the sheath by a mass 6 of electrical insulating compound capable of withstanding heat, such as highly compressed granulated magnesium oxide.

Preferably the iron includes its own internal water supply reservoir, here shown as a tank 7 positioned under cover 2 and overlying the sole plate. Formed in the upper surface of the sole plate is a steam generating cavity 8 into which liquid may flow from the reservoir 7 through a water passage or orifice 9 in a valve seat member 10. Cooperating with the fixed valve seat 10 is a valve operating stem 11 which forms the lower section of a stem assembly to be hereinafter described. When valve stem 11 with its orifice clean-out pin 11a is seated against the fixed valve member 10, flow of liquid into the steam generator cavity is shut off; while with the valve stem in the position shown in FIG. 2, water may flow from the tank into the steam generating cavity drop by drop to be flashed into steam.

Steam generated within cavity 8 is confined by means of a cover plate assembly 12 secured to the upper surface of the sole plate in a suitable manner, for example, by fastening devices 13. Secured to cover plate assembly 12, in any suitable manner, is a steam dome 14, preferably formed from relatively thin stainless steel or the like to retard the flow of heat from the sole plate and the cover plate assembly to reservoir 7. The valve member 10 is shown secured to the top wall of steam dome 14, although obviously other arrangements may be employed. Steam dome 14 is provided a shoulder upon which rests a gasket 15 to receive the marginal flange defining an enlarged aperture in the bottom wall of the liquid tank. The tank may be biased downwardly against gasket 15 to provide a liquid-tight seal.

A pressure equalization or balance tube 16 is secured to steam dome 14, and extends upwardly to a point above the normal water level in the tank. Any steam generated within generating cavity 8 may flow upwardly through the balance tube 16 into the upper portion of the reservoir. By this construction water will continue to flow through orifice 9 so long as it is open in that the tank is subjected to the pressure existing within the steam generator.

The upper end of tube 16 is positioned within a cylindrical riser 17 secured in suitable fashion to the tank 7 around an opening in the tank upper wall. Secured to the upper end of riser 17 is a steam tube 18, which in turn is connected to a liquid spray mechanism. In addition to balancing pressure between the steam generating cavity 8 and the water tank 7, balance tube 16 serves to direct the flow of steam from the steam generator to the spray mechanism. This arrangement minimizes the transfer of heat to the surrounding portions of the water tank 7. In this connection, the tank is also supplied with a cylindrical, apertured, baffle member 19 surrounding the balance tube 16 and the water valve assembly. The

cylindrical member 19 further impedes the flow of steam into the portions of the water tank beyond the member 19. Cylindrical member 19 also serves as a support for the tank.

A spray mechanism including a smaller steam tube 20 is secured by a clamp 21 to the upper end of steam tube 18. The upper end of steam tube 20 is provided with a small opening (not shown) which is directed to guide the steam through an opening 22 in an escutcheon plate 23 on handle 3 toward an area in front of sole plate 1. The spray mechanism also includes a water tube 24 having its lower end positioned adjacent the bottom wall of water tank 7, and having its upper end extending into steam tube 20 and terminating adjacent the orifice in the steam tube. The suction created by high speed steam flowing over the upper end of tube 24 out the orifice sucks water up tube 24 and atomizes the water into a fine spray which is directed onto the material being moistened. The steam pressure existing within the tank complements the suction force by forcing water up the tube 24. The orifice of steam tube 20 is normally closed by cap 25 which is slidably mounted over tube 20 and carried by a bracket 29, the outer movement of which is limited by retaining ring 29a.

To open the spray orifice there is provided a pivotally mounted lever 26 having a bifurcated end 27 which straddles steam tube 20. Each arm of the bifurcated lever end is slotted to receive a pair of pins, one of which is shown at 28. The pins are attached to bracket 29 which carries cap 25. The opposite end of lever 26 is secured to an arm 30 terminating in a pushbutton 31 extending through an opening in handle 3 to provide a convenient external control for actuating the sprayer. Depressing pushbutton 31 pivots lever 26 about pivot pin 32 in a clockwise direction to move bracket 29 and slide cap 25 away from the spray orifice. When button 31 is released, a spring (not shown) wound on pin 32 urges lever 26 to its original position wherein the orifice is once more covered. It should be realized that the constructional details of the sprayer mechanism do not form a part of this invention and accordingly other known spray mechanisms may be employed. However, the preferred form described briefly above, is covered in greater detail and is claimed in Patent No. 3,041,757 issued to A. G. Swenson and H. S. Foster and assigned to General Electric Company, assignee of this application.

When the iron is being operated strictly as a dry iron, there is of course no need to generate steam. However, it is desirable that steam for the spray mechanism be instantly available so that the sprayer may be operated by simply depressing pushbutton 31. On the other hand, there is no need to generate more steam than the minimum necessary to satisfactorily operate the sprayer. In accordance with the present invention, the amount of water allowed to flow into steam generating cavity 8 is controlled by the steam pressure within the cavity and the interconnected water tank 7.

This is accomplished by utilizing a pressure responsive mechanism to control the position of lower valve stem section 11. Valve stem 11 is normally biased away from the fixed valve seat member 10 by compression spring 35 which has its lower end abutting member 10 and its upper end abutting a washer 36 on the valve stem 11. The pressure responsive device employed to move the valve stem 11 includes a flexible diaphragm 37 secured by suitable retaining rings 38 and 39 in an opening of the upper wall of water tank 7. The steam pressure within the supply tank above atmospheric pressure causes the diaphragm 37 to move upwardly which provides the necessary force to move the valve stem downwardly.

To transmit this force from the diaphragm to the valve stem, there is provided a rod 40 extending through diaphragm 37 and secured thereto in sealed relation by means of washer 41 fixed to rod 40 and washer 42 which is pressed against the diaphragm by retaining member 43.

The rod 40 may of course be secured to the diaphragm by other suitable means. A pivotally mounted lever 44 extending through an opening in baffle member 19, provides the necessary linkage to transmit the movement of rod 40 to move valve stem 11. The opposite ends of the lever 44 are bifurcated so that one end 45 is pivotally connected to rod 40 while the opposite end 46 is pivotally connected to valve stem 11. It should be noted that lever end 46 serves as a stop for washer 36 abutting compression spring 35. Lever 44 is pivotally mounted on fulcrum 47 which is a fixed member secured to the upper wall of water tank 7. It will be realized that as the pressure within the tank increases, diaphragm 37 moves upwardly causing lever 44 to pivot in a counterclockwise direction, as viewed in FIG. 1, thus causing valve stem 11 to be moved downwardly against the force of spring 35 into a valve closing position. Conversely, as the pressure within the tank decreases, the spring 35 moves valve stem 11 upwardly and diaphragm 37 is moved downwardly.

To replenish the water supply in water tank 7, and to empty the tank if desired, there is provided a water inlet opening 48 in the upper wall of riser 17, as viewed in FIG. 3. A water inlet guide 49 is secured to the upper portion of riser 17 to provide a passage for connecting inlet opening 48 with an external opening 50 in the funnel-shaped escutcheon 23. Guide 49 is sealed with respect to member 23 by means of a suitable gasket 51. In adding water to the tank 7, the iron is placed on its heel rest so that water will flow through opening 50.

When water is being added to the supply tank the water valve orifice 9 should, of course, be closed. To minimize the number of controls required, a combined valve stem assembly for controlling both water inlet opening 48 and orifice 9 has been provided. As may be seen in the drawings, the lower valve stem section 11 has a reduced portion 52 on its upper end which is telescopically received within a slot or socket 53 formed in the lower end of an upper valve stem section 54. A valve member 55 slidably carried on valve stem section 54 supports a sealing disk 56 adapted to cooperate with inlet opening 48. A secondary sealing washer 57 is pressed against the lower end of valve member 55 to prevent leakage along the valve stem 54 when the fill valve is closed. A compression spring 58 having its lower end supported by lug 59 of the water tank reacts against retaining washer 60 to press sealing washer 57 against valve member 55; and more importantly, the spring biases member 55 and sealing disk 56 into a closing position with respect to inlet opening 48. The upper end of valve stem section 54 has an irregular shape terminating in a pushbutton 61 extending through an opening in the upper surface of handle 3. Pushbutton 61 is formed with a step 61a adapted to cooperate with an internal shoulder 61b of handle 3 to retain the button and the valve assembly in a depressed position.

To open inlet opening 48 and simultaneously close water valve orifice 9, pushbutton 61 may be depressed so that step 61a engages shoulder 61b as shown in FIG. 3. In depressing the valve stem assembly, upper stem section 54 is moved downwardly against the resistance of spring 58, moving the secondary sealing disk 57 away from valve member 55, whereby steam pressure within the water tank is gradually relieved by the leakage along the valve stem as it passes slidably through valve member 55. Such gradual pressure release is desirable to avoid sudden boiling and surging of water in the tank if the pressure were suddenly released. Valve disk 56 is, in the meantime, held closed by the steam pressure within the tank. When the steam pressure has decreased to approximately atmospheric pressure, valve member 55 along with disk 56 slide downwardly on valve stem 54, and the fill valve is fully open. The particular construction of this fill valve does not form a part of the present invention, but is claimed in the aforementioned Patent No. 3,041,757.

As the upper stem 54 moves downwardly as above described, it slides or telescopes onto the reduced portion 52

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of the lower valve stem section 11 until the lower section is forced downwardly against the resistance of spring 35 causing section 11 to close orifice 9. The unique telescopic action of the two valve stem sections is necessary to permit operation of the water valve pressure responsive mechanism when the inlet opening is closed, as shown in FIG. 1. There it can be seen that the upper valve stem section 54 is in its uppermost position closing the inlet or fill opening into the tank; while the lower valve stem section 11 is in its lowermost position closing the water valve. Section 11 is in this position by virtue of pressure existing within the tank 7, causing diaphragm 37 to be moved to its upper position as shown in FIG. 1. When the pressure decreases, spring 35 will move valve stem section 11 upwardly to open the water valve, and this movement will not disturb the upper valve stem section 54, in that reduced portion 52 of valve stem 11 merely slides into the lower end of valve stem 54.

The iron so far described will operate as a dry iron with the provision for spray operation when desired. While such an iron would be very useful, it is desirable to also include provision for steaming operation independently and in combination with the spray mechanism if desired. For this purpose, a steam delivery system is provided including a network of passages leading from steam generating cavity 8, past a pressure responsive valve assembly 62 to passage 63 leading to a plurality of sole plate ports, one of which is shown at 64. The valve assembly 62 includes a valve stem 65 carrying a valve member 66, which is secured to valve stem 65 in a suitable manner. Valve stem 65 extends upwardly through an opening in the steam dome 14 into a protective housing 67 supported by the steam dome. A spring 68 is secured to the upper end of valve stem 65 and abuts the fixed valve member 69 to bias stem 65 and valve member 66 upwardly so that member 66 cooperates with the opening in fixed valve member 69 to close the opening. A steam and spray iron having such a pressure regulator construction is disclosed and claimed in Patent No. 3,041,756 issued to H. S. Foster and also assigned to the General Electric Company.

In accordance with this invention, steam valve 62 is set to open automatically at a pressure slightly greater than the pressure needed to cause diaphragm 37 to fully close water valve orifice 9. This relationship is essential to obtain the desired spray operation when the iron is set for dry ironing. The pressure responsive water valve mechanism will maintain the necessary minimum pressure for operating the sprayer; and by setting steam valve 62 above this minimum pressure, steam will not be permitted to flow through the sole plate ports 64.

To obtain steam operation, an additional external control button 70 is provided extending through an opening in the handle 3 above rod 40 and diaphragm 37. Button 70 is mounted on one end of a flexible spring arm 71 having its opposite end secured by a suitable fastening member 72 to a fixed structural support 73, as seen in FIG. 1. Like pushbutton 61, button 70 may be provided with a step 74 for engaging an internal shoulder 75 on the handle 3. Button 70 is shown in its depressed position by dotted lines in FIG. 2. In this position, it may be seen that the button and the flexible spring member press against the end of retaining member 43 over the diaphragm to positively hold the water valve open. Steam will then be generated with sufficient pressure to flow through valve 62 and out through discharge ports 64 in the sole plate.

It will be appreciated that since the steam valve 62 is not set to open until the pressure is higher than the minimum pressure required to operate the spray mechanism, sufficient pressure is continuously maintained within the water tank to operate the sprayer whenever the iron is ready for steam operation. From the foregoing, it will be realized that the arrangement of FIGS. 1-3 provides a convenient drysteam iron with provision to operate a

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liquid sprayer at any time, regardless of the steam or dry setting of the iron controls.

In the above described embodiment of FIGS. 1-3, selection of steam or dry operation is controlled by the position of button 70. When button 70 is up, the flexible diaphragm controls the water valve responsive to pressure, and the iron operates as a dry iron since steam valve 62 remains closed. Depression of button 70 overrides the diaphragm action to hold the water valve open regardless of pressure, whereupon the iron operates as a steam iron. In both cases, pressure is available for the liquid sprayer. Obviously, the mechanical override by means of pushbutton 70 could be connected to change the spring force on steam valve 62, rather than to act on the diaphragm with substantially identical overall results. In other words, a manually selected change of the spring force against steam valve 62 so that it will open slightly before closure of the water valve responsive to steam pressure would convert the iron from dry to steam operation. At the same time, steam valve 62 could still hold sufficient pressure at all times for operation of the spray mechanism.

The embodiment of FIGS. 4-6 also utilizes a pressure responsive water valve and provides essentially the same results as the embodiment of FIGS. 1-3. However, in the FIGS. 4-6 arrangement, the steam control button has been eliminated and its function is combined with the control for the water tank inlet. Accordingly, there is provided, in accordance with the invention, a unique three-position pushbutton valve stem assembly for performing these combined functions.

As may be seen from the drawings of FIGS. 4-6, the water tank inlet-outlet valve stem assembly includes a lower section 11, a middle valve stem section 80, and an upper section 81. Lower section 11 is biased upwardly away from water valve orifice 9 by means of compression spring 35. The middle stem section 80 carrying valve member 55 is biased upwardly by spring 82 to close the water tank fill opening. The upper valve stem section 81 carries a fixed washer 83. A spring 84 extending between washer 83 and the upper end of water guide 49 biases the valve stem section 81 upwardly. A pushbutton 85 secured to the upper end of valve stem section 81 provides the necessary manual control for operation of the valve stem assembly. The pushbutton 85 is provided with two steps 86 and 87 for cooperation with internal shoulders 88 and 89 on the handle 3. When the pushbutton valve assembly is in a non-depressed position as shown in FIG. 4, the upward movement of valve stem section 81 is limited by an ear 90 extending laterally from pushbutton 85 and engaging an inner portion of the handle. It should be noted that the valve stem sections are telescopically connected. More specifically, the upper end of section 11 slides within the lower end of middle section 80; and the lower end of section 81 slides within the upper end of middle section 80.

The lower valve stem section 11 is controlled during a pressing operation by a pressure responsive diaphragm 91 positioned in the bottom wall of water tank 7. The diaphragm is shown in this embodiment secured to the tank wall by means of an integrally formed peripheral bead 92. Further, the diaphragm is shown to be of the convoluted type which permits increased diaphragm movement. The linkage connecting the movement of the diaphragm to valve stem section 11 includes a rod 93, preferably centrally secured to diaphragm 91, and a lever 94 having one end secured to valve stem 11 and its opposite end secured to a fixed lug 95 secured to the bottom wall of tank 7. The upper end of rod 93 is connected to the lever 94 at a point intermediate the lever ends. Consequently, an increase in pressure within the tank will cause the diaphragm 91 to move downwardly pulling rod 93 and moving lever 94 so that the valve stem section 11 is moved in a valve closing direction. Since valve section 11 is biased upwardly by spring 35, it is not essential that

the lever 94 be a rigid member for transmitting upward motion. Instead, lever 94 may be composed of two sections connected in a manner such that downward movement of the diaphragm will cause downward movement of the valve stem section, while upward movement of the diaphragm need not move the valve stem.

To provide control of the pressure responsive water valve for the steaming operation, the upper valve stem section 81 is connected to diaphragm 91. More specifically, a flexible connector 96, for example of ribbon-like character, has one end connected to fixed washer 83 and its opposite end connected to one end of lever 97 which is pivoted at its opposite end to a lug 98 depending from the lower wall of the water tank 7. The lever 97 is positioned to engage a retaining member on the lower end of rod 93 so that when the valve stem section 81 is in its extreme upward position under the influence of spring 84 (FIG. 4), the flexible member 96 holds lever 97 in the position shown in FIG. 4 wherein rod 93 is held in its upper position, thus positioning valve stem section 11 in its extreme upper position wherein the water valve is fully opened, for the maximum steam generation rate.

With the valve stem assembly positioned as shown in FIG. 4, the water tank inlet opening is closed and the pressure responsive diaphragm mechanism is held inoperative by the ribbon-like member 96 so that the iron is set for steam operation. Steam will be allowed to escape through valve assembly 62 leading to the sole plate ports whenever the pressure in the steam generating cavity exceeds the pressure setting of the valve. With the pushbutton 85 in its extreme upper position, the spray mechanism is of course instantly operable by depressing pushbutton 31, as previously described.

To set the iron for dry ironing operation, pushbutton 85 is moved to its first depressed position wherein step 86 engages shoulder 89 of the handle, as shown in FIG. 5. This action moves valve stem section 81 downwardly a sufficient amount to lower lever 97 and permit diaphragm 91 to control the position of the lower valve stem section 11. The middle valve stem section 80 remains in the same position as shown in FIG. 4, with valve 55 closing the water inlet opening. The reason that section 80 does not move is that the downward movement of section 81 is accommodated by the socket in the upper end of section 80. Similarly, the sliding telescopic relation between section 11 and section 80 permits section 11 to move without being affected by the position of section 80. In the FIG. 5 position, steam pressure within the water tank controls the water valve. As the pressure increases, the diaphragm moves to its extreme lower position, as shown, wherein valve stem section 11 completely closes orifice 9 leading to the steam generating cavity. A decrease in the pressure will allow section 11 to move upwardly, under the influence of spring 35. As previously explained, the pressure maintained in the inter-connected steam generating cavity and water tank is sufficient to obtain instant operation of the sprayer mechanism upon depression of pushbutton 31. However, valve 62, which is set to open at a higher pressure, remains closed and the iron operates as a dry iron, with pressure still available for the sprayer.

In FIG. 6, pushbutton 85 has been moved to its fully depressed position wherein step 86 cooperates with shoulder 88 and step 87 cooperates with shoulder 89. In this position, the valve stem assembly is in its fully depressed and axially compressed position wherein the water inlet opening is open and the water valve orifice 9 is closed.

While preferred embodiments and modifications of this invention have been disclosed, various other embodiments and modifications thereof will occur to those skilled in the art; and it is intended that such will fall within the scope of the invention as defined in the following claims.

What is claimed is:

1. In combination, a pressing iron having a sole plate, heating means supported by and in heat conducting rela-

tion with reference to said sole plate, means forming a steam generating chamber receiving heat from said heater, delivery means connected to said steam generating chamber and delivering steam to the work, a water tank disposed above said sole plate, water conducting means connected to said water tank and communicating with said steam generating chamber, a water regulating valve disposed in said water conducting means for controlling the flow of water into said steam generating chamber and having a fixed valve member and a movable valve member cooperating therewith, pressure responsive means including a flexible wall forming a part of the wall structure of said tank and subject to the pressure in said steam generating chamber connected to and operating said movable valve member to meter the flow of water into said chamber in accordance with the amount of steam used.

2. In combination, a pressing iron having a sole plate, heating means supported by and in heat conducting relation with reference to said sole plate, means forming a steam generating chamber carried by and disposed in heat conducting relation with reference to said sole plate, delivery means connected to said steam generating chamber and delivering steam to the work, a water tank disposed above said sole plate, water conducting means connected to said water tank and communicating with said steam generating chamber, a water regulating valve disposed in said water conducting means for controlling the flow of water into said steam generating chamber and having a fixed valve member and a movable valve member cooperating therewith, pressure responsive means subject to the pressure in said steam generating chamber connected to and operating said movable valve member to meter the flow of water into said chamber in accordance with the amount of steam used, and means forming a vent extending from the steam generating chamber to the top of the tank.

3. In a pressing iron having a sole plate, heating means supported by and in heat conducting relation with reference to said sole plate, means forming a steam generating chamber receiving heat from said heater, steam delivery means connected to said steam generating chamber and delivering steam to the work, valve means in said steam delivery means, a water tank disposed above said sole plate, water conducting means connecting to said water tank and communicating with said steam generating chamber, the combination of a water regulating valve disposed in said water conducting means for controlling the flow of water into said steam generating chamber and having a valve seat and a valve member engageable therewith, and pressure responsive means subject to the pressure in said steam generating chamber connected to and operating said valve member to meter the flow of water into said chamber in accordance with the amount of steam used.

4. In an electric pressing iron, a sole plate having a plurality of steam ports in its ironing surface, an electric heater embedded in said sole plate, a steam generating cavity formed in the upper surface of said sole plate, a water tank disposed above said sole plate, a water passage connecting said water tank and said steam generating cavity, a water regulating valve disposed in said passage for controlling the flow of water into said steam generating cavity, pressure responsive means subject to the pressure in said steam generating cavity connected to and operating said water valve to meter the flow of water into said cavity, a steam outlet passage connecting said steam generating cavity to said sole plate ports, and a valve positioned in said steam outlet passage to control the flow of steam therethrough.

5. An electric pressing iron for steam and dry ironing and liquid sprayer operation selectively, comprising: a sole plate having a steam generating chamber formed in its upper surface; an electric heater embedded in said sole plate adjacent said chamber; a water tank positioned

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over said chamber; a pressure balance tube connecting said chamber to the upper portion of said water tank; a water passage connecting said tank to said chamber; a water valve positioned within said passage for controlling the flow of water from said tank into said chamber; means responsive to the pressure within said chamber for controlling said water valve; a steam distribution network including a plurality of ports within said sole plate for ducting steam from said chamber to the material to be pressed, and a spray mechanism powered by steam generated in said chamber for spraying liquid from the iron onto the material to be pressed.

6. An electric flatiron comprising: a sole plate including electric heating means therefor; a water tank; a steam generating chamber, a water passage connecting said tank to said chamber; a pressure balance tube for equalizing pressure between said chamber and said water tank; a steam distribution network for ducting steam from said chamber to the material to be pressed; a spraying mechanism powered by steam from said chamber for spraying water from the iron onto the material to be pressed; a water valve positioned within said water passage for controlling the flow of water from said tank into said steam generating chamber; means responsive to the pressure within said chamber for controlling said water valve; a steam pressure valve in said steam distribution network set to automatically open at a pressure greater than the steam pressure needed to cause said pressure responsive means to close said water valve; and manual means for overpowering the force produced by said pressure responsive means and for opening said water valve, so that dry operation is obtained when the water valve is not controlled by said manual means, steam operation is provided when the water valve is held open by said manual means and instant spray operation may be obtained during either dry or steam operation.

7. In combination, a pressing iron having a sole plate, a heater supported by and in heat conducting relation with said sole plate, a steam generator receiving heat from said heater, a water tank disposed above said sole plate, and steam generator water conducting means connected to said water tank and communicating with said steam generator, a water regulating valve disposed in said water conducting means for controlling the flow of water into said steam generator and having a fixed valve member and a movable valve member cooperating therewith, a flexible wall forming a part of the wall structure of said tank and subject to the pressure in said steam generator, a mechanical linkage connecting said flexible wall to said movable valve member to meter the flow of water into said chamber in a manner such that an increase in pressure within the chamber reduces the flow of water into the chamber, a water spray mechanism powered by steam from said steam generator, a steam delivery system connected to said steam generator for delivering steam to the material to be pressed, a steam pressure valve included within said delivery system with said valve being set to automatically open at a pressure greater than the pressure needed to cause said flexible wall to move and automatically close said water valve, and manual means for moving said flexible wall in a manner to open said water valve.

8. An electric steam and dry iron comprising: a sole plate with an electric heating element therefor; means providing a sealed pressure system including a steam generating cavity in which water is converted to steam substantially instantaneously, a water tank positioned to supply water to said cavity with a water valve providing controlled liquid flow from said tank to said cavity, means biasing said water valve to its open position; a pressure balancing tube to maintain equal pressure in said water tank and said cavity, a normally closed inlet valve into said water tank and a spring closed outlet valve for steam

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generated in said system; said outlet valve opening at a first predetermined pressure within said system; pressure responsive means included in said sealed system connected to close said water valve responsive to a second predetermined pressure within said system lower than said first pressure; and manually operable means to maintain said water valve open independently of said pressure responsive means.

9. In a pressing iron, a sole plate, a heater for heating said sole plate, a steam generator formed in the upper surface of said sole plate, delivery means connected to said steam generator and delivering steam to the work, a water tank disposed above said steam generator, water conducting means connected to said water tank and communicating with said steam generator, a water regulating valve disposed in said water conducting means for controlling the flow of water into said steam generating chamber and having a fixed valve member and a movable valve member cooperating therewith, a flexible diaphragm forming a part of the wall structure of said tank adjacent said water valve, means connecting said steam generator and said water tank above the water level therein to equalize pressure between said steam generator and said water tank, a pivotally mounted lever connected to said movable valve member and to said diaphragm to move said movable valve member in the valve closing direction responsive to increasing pressure within said water tank.

10. An electric iron having a sole plate, a heater for heating said sole plate, a steam generator receiving heat from said heater, delivery means connected to said steam generator and delivering steam to the work, a water tank disposed above said sole plate, an inlet opening in said tank for adding water to the tank, a passage connecting said tank and said steam generator for permitting water to flow from the tank into the generator, an elongated valve stem assembly having three axially slidable sections including a lower section cooperating with said passage to control the amount of water flowing through said passage, a middle section for controlling said inlet opening, and an upper section providing a manual control for operating the valve stem assembly, pressure responsive means subject to the pressure in said steam generator connected to and operating said lower valve stem section to meter the flow of water into said generator, means connecting said pressure responsive means and said upper valve stem section for moving said pressure responsive means to a position wherein said lower valve stem section is moved to its fully open position with respect to said water passage, said valve stem assembly being manually movable into three positions which determine the operation of said iron, including a water fill position wherein said lower valve stem section is positioned to prevent the flow of water through the passage connecting the tank in the steam generator and said middle section is positioned so that the fill opening is open, a dry-spray position wherein said lower section is controlled by said flexible wall and said middle section closes the water inlet opening, and a steam-spray position wherein said upper section by means of said connecting means and said pressure responsive means holds said lower section in its fully open position with respect to said water passage leading to said generator.

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