Oct. 4, 1949. W. G. GREEN 2,483,579

STEAM IRON

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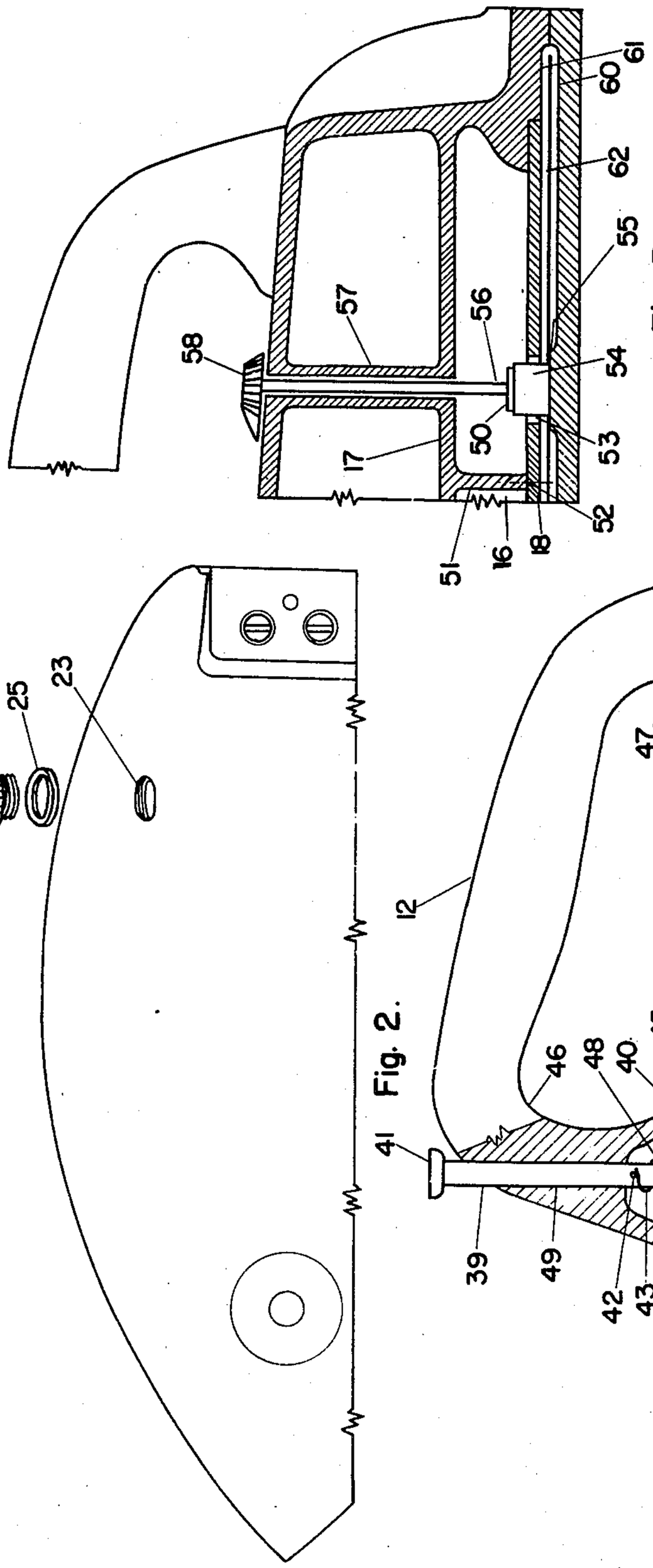

Fig. 2.

Fig. 3.

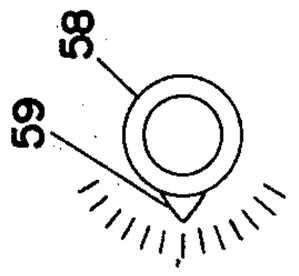

Fig. 4.

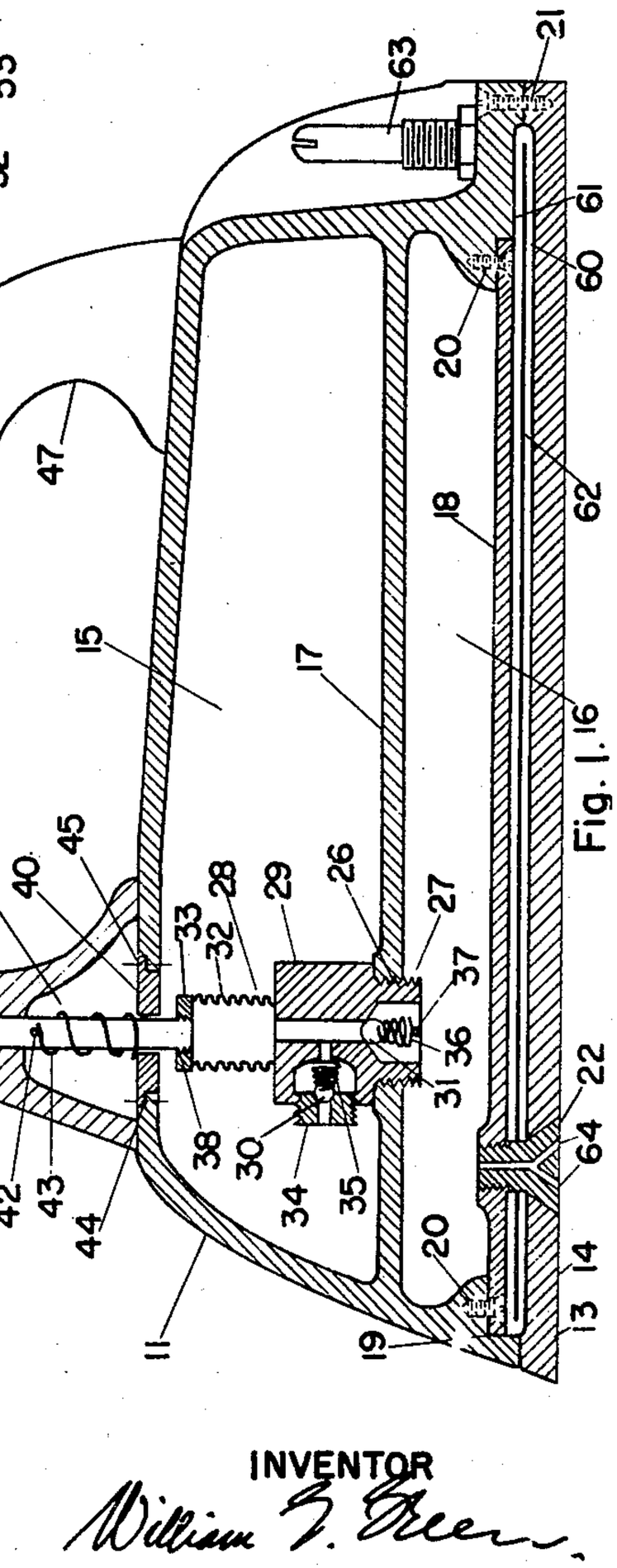

Fig. 1.

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STEAM IRON

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4 Claims. (Cl. 38—77)

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This invention relates to pressing irons, and it has for its object the provision of an improved pressing iron which is arranged so that it may be used as a conventional "dry" iron, and also to generate steam so that it may be used as a "steam" iron.

More particularly, this invention relates to a steam iron provided with a water reservoir from which the water is fed into a steam generating chamber and it contemplates the provision of a steam iron of this character having an improved organization of parts; this improved organization includes suitable means for controlling the amount of the generated steam that is applied to the pressing surface and preventing any water from flowing from the water reservoir to the steam generating chamber. The use of such irons eliminates the need for sprinkling before ironing or the use of damp cloth during pressing operations.

Pressing irons of the type to which this invention relates should, if such irons are to be capable of efficient use, be provided with means for controlling and preventing the discharge of steam from the iron. This is true because of the fact that in pressing certain fabrics varying amounts of steam are required, and also at times it is necessary to entirely cut off the discharge of steam from the iron so that it may be used as a dry iron. One object of the present invention, therefore, is to provide a steaming pressing iron which includes as an integral part of its structure a steam controlling valve of such improved construction and arrangement that any amount of steam discharge, from the minimum to the maximum steam discharge of which the iron is capable may be obtained by merely manipulating, before or during an ironing operation, a valve operating element arranged in convenient relation with respect to the handle of the iron. Also, when desired the valve operating element referred to may be actuated to close entirely the steam controlling valve, and thereby completely cut off the discharge of steam from the iron when it is desired to use the iron as a dry iron.

Among the objects of this invention is to provide a construction that will stop water in the iron from entering the steam chamber adjacent the water reservoir so as to prevent water from passing out the discharge openings. My invention also contemplates such other objects, advantages and capabilities as will later more fully appear and which are inherently possessed by my invention.

Another object is the construction of an article as mentioned which is simple and durable and

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which may be manufactured and sold at a reasonable cost.

For further comprehension of the invention and of the objects and advantages thereof, reference will be had to the following description and accompanying drawing, and to the appended claims in which the various novel features of the invention are more particularly set forth.

In the accompanying drawing forming a material part of this disclosure:

Fig. 1 is a longitudinal sectional view of a steam generating iron embodying the present invention.

Fig. 2 is a top plan view of a portion thereof showing means for introducing water into the storage chamber of the steam iron.

Fig. 3 is a fragmentary section of a modified embodiment of the present invention.

Fig. 4 shows the operating knob for the thermostat adjustment in the modified embodiment of Fig. 3.

The embodiment selected to illustrate the invention, as illustrated in Fig. 1, comprises a body member 11, a handle 12, and a soleplate 13 having a smooth outer bottom ironing or pressing surface 14. The body member 11 consists of a hollow body preferably cast in one piece of any suitable material, or made up of a number of pieces stamped and formed from any suitable material, the pieces then being assembled and joined by welding, brazing, or other suitable means. Said body member 11 comprises a water storage chamber 15 extending throughout its upper portion and a steam generating chamber 16 extending throughout its lower portion, the water storage chamber 15 and the steam generating chamber 16 being separated by the partition 17. The steam generating chamber 16 is closed in at the bottom by the steam chamber cover plate 18, which is positioned by the annular recess 19, and retained by the screws 20, the joint between the steam chamber cover plate 18 and the annular recess 19 being gasketed or otherwise sealed to render it water and steam tight. The soleplate 13 is releasably secured to the body member 11 and the steam chamber cover plate 18 by means of screws 21 and the combination steam nozzle and retaining screw 22. Water is introduced into the water storage chamber 15 through opening 23, which may be closed after filling the water storage chamber 15 by means of the screw plug 24 and gasket 25 (see Fig. 2).

In the partition 17 is a tapped hole 26 into which is screwed the threaded neck 27 of the water valve assembly 28. The water valve as-

sembly consists of a body 29, an inlet ball check valve 30, an outlet ball check valve 31, a bellows 32, and a top plate 33. The inlet ball check valve 30 is positioned by the hollow retaining screw 34 and the return spring 35. The outlet ball check valve 31 is positioned by the return spring 36 and the retaining pin 37. The bellows 32 is made of any suitable material, preferably metallic in nature, and is secured to the water valve body 29 by welding, brazing, spinning or other means, and to the top plate 33 by similar means. The top plate 33 bears a hole 38 to admit the lower end of push rod 39; the hole may be tapped or not, depending on whether push rod 39 is screwed, pinned, welded, or otherwise secured to top plate 33. This valve assembly may take other forms than that shown.

The valve operating mechanism consists of the push rod 39, one end of which is secured to the top plate 33, and which extends upwardly through a hole in the valve opening cover plate 40 and the handle 12, and terminates at the thumb piece 41, which may be of any suitable material, preferably a moulded plastic. A pin 42 and return spring 43 may be used to assist in returning push rod 39 to its upper position. The valve cover plate 40 is positioned by the annular recess 44 and retained by the screws 45, the joint between the recess 44 and plate 40 being gasketed or otherwise suitably sealed.

I provide a sadiron handle which is preferably made with a forwardly depending supporting member 46 and a rearwardly depending supporting member 47. The forwardly depending supporting member 46 may contain an opening 48 to house spring 43 and a hole 49 through which passes the push rod 39.

In a variation of this iron, a manually settable thermostatic control assembly 50 may be introduced. In this case the iron may assume the form shown in Fig. 3. In this form the steam generating chamber 16 is rearwardly limited by the partition 51 depending from the partition 17. In this form the steam chamber cover plate 18 is additionally secured to the partition 51 by screws 52, the joint between partition 51 and cover plate 18 being gasketed or otherwise suitably sealed. Steam chamber cover plate 18 in this form is provided with an opening 53 to admit placing thermostatic element 54. Thermostatic element 54 is positioned on boss or bosses 55, preferably cast integral with the soleplate 13, and secured thereto by screws or other suitable means. The thermostat adjustment rod 56 extends upwardly from thermostatic element 54 through tube 57 and terminates in the operating knob 58. Tube 57 may be cast in place, or may be inserted through holes in body member 11 and partition 17, being secured in this case by welding, brazing, spinning, or other suitable means. Operating knob 58 may be made of any suitable insulating material, for instance a moulded plastic, and may have marked on its upper visible surface any temperature setting information found desirable. As shown in Fig. 4 the operating knob 58 may be provided with an indicating pointer 59 and the desired temperature information suitably marked on the body member. The manner in which the above described thermostatic control is manufactured and operated is well known to those versed in the art and need not be described here.

In these instances the bottom of the body member 11 and the top of the soleplate 13 are provided with meeting recesses 60, 61 to accommodate a conventional heating element 62 preferably electrical, although a gas or vapor may also be used. The heating element 62 constitutes no part of my invention, and is shown for illustrative purposes only, as being electrical in nature and provided with conventional terminals 63 at the rear of the body portions and connected to the element in the usual manner.

The manner in which the above described steaming iron is operated may be explained as follows:

When the article being ironed is too dry, and it is desirable to moisten it, the thumb piece 41 is pressed downwardly. Motion is thereby transmitted through the push rod 39 to the bellows 32, causing the bellows 32 to contract and eject water through the outlet ball check valve 31 onto the heated steam chamber cover plate 18, thereby generating steam which, passing through the ports 64 in the combination steam nozzle and retaining screw 22, comes into intimate contact with the material being ironed, and thereby moistens same. The amount of steam generated is controllable, a short contracting motion of the bellows 32 ejecting a small quantity of water, thereby generating a small quantity of steam; a longer contracting motion ejecting a greater quantity of water and thereby generating a greater quantity of steam. Releasing pressure on the thumb piece 41 allows spring 43 to move push rod 39 upwardly, thereby expanding bellows and drawing water from the storage chamber 15 into the bellows through the inlet check valve 30, thereby preparing the system for the next cycle of operations. When it is desired to finish the article by ironing dry, the thumb piece 41 is not depressed. In such case, no water being ejected onto steam chamber cover plate 18, no steam is generated, and the iron may therefor be used as a conventional sadiron.

The foregoing description of the invention is explanatory thereof and various changes in the size, shape and materials, as well as in the details of the illustrated construction, may be made, within the scope of the appended claims, without departing from the spirit of the invention.

What I claim and desire to secure by Letters Patent is:

1. A steam iron comprising a hollow body structure having a soleplate, a handle fixedly secured to said body structure and provided with an internal cavity at one end thereof, means dividing the space within said body structure into a steam generating chamber and a liquid storage chamber arranged one above the other in the order named, intercommunicating means between said chambers, means for heating said soleplate and liquid in said steam generating chamber, a pump disposed within said liquid storage chamber connected to said inter-communicating means for delivering measured quantities of liquid from said storage chamber to said steam generating chamber, said pump including an elongated actuating element movable between two positions to actuate said pump, said element extending downward into said liquid chamber through said cavity and said one end of said handle, and spring means disposed within said cavity to bias said element toward one of its two settings.

2. A steam iron comprising a hollow body structure having a soleplate, a handle fixedly secured to said body structure and provided with an internal cavity at one end thereof, means dividing the space within said body structure into a steam generating chamber and a liquid storage chamber arranged one above the other in the order

named, means defining a passageway interconnecting said chambers, means for heating said soleplate and liquid in said steam generating chamber, a pump disposed within said storage chamber connected to said passageway for delivering measured quantities of liquid from said liquid storage chamber to said steam generating chamber, said pump including an elongated actuating element movable longitudinally between two settings to actuate said pump, said element extending downward into said liquid chamber through said cavity and said one end of said handle and being provided with a finger seat adjacent said one end of said handle, and spring means disposed within said cavity to bias said element toward one of its two longitudinal settings.

3. A pressing iron comprising a base having a pressing face, a body portion mounted above said base and providing a liquid storage chamber and a steam generating chamber, said liquid storage chamber being disposed immediately above said steam generating chamber and having a top opening therein, means defining an outlet for said liquid storage chamber for discharging liquid into said steam generating chamber, heating means for heating said base and for heating said steam generating chamber so as to convert liquid supplied thereto into steam, a steam discharge orifice formed in said base interconnecting said steam generating chamber with said pressing face, a pump having a body physically disposed in said liquid storage chamber with one end thereof extending into said outlet, said pump body including a valve mechanism operatively associated therewith, said valve mechanism including means having an inlet check valve for introducing liquid from said liquid storage chamber into said pump body, an outlet check valve positioned in said outlet for introducing liquid from said pump body into said steam generating chamber, said pump body including an elastic membrane operatively associated therewith and capable of being expanded and compressed alternately to provide a suction and compression within said body thereby to control said valve mechanism, and a manually controllable plunger rigidly connected to said membrane to vary its

condition with reference to expansion or compression thereof, said plunger projecting through said top opening for manual manipulation.

4. A steam iron comprising a sole plate, a hollow body structure supported on said sole plate including a partition for dividing said hollow body structure into a liquid storage chamber and a steam generating chamber, a pump mounted on said partition within said liquid storage chamber so as to extend into said steam generating chamber and operative to deliver liquid from said liquid storage chamber to said steam generating chamber, said pump comprising a hollow body having an internal cavity communicating directly with both of said chambers, said body including a valve mechanism for controlling the flow of liquid from said liquid storage chamber through said cavity to said steam chamber, said pump including flexible diaphragm means defining with said cavity a chamber of variable volume, movement of said diaphragm causing alternate suction or compression in said valve body in dependence upon whether the volume of said chamber is increased or decreased to actuate said valve mechanism to effect liquid flow from said storage chamber through said cavity to said steam chamber, means for conducting steam from said steam generating chamber to the ironing surface of said sole plate, and an elongated actuating element connected to said diaphragm means and projecting outwardly from said storage chamber for manual actuation externally of said body.

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