Dec. 6, 1955 W. A. PRAIN 2,726,314

WALLPAPER STEAMERS

Filed Dec. 4, 1952 3 Sheets-Sheet 1

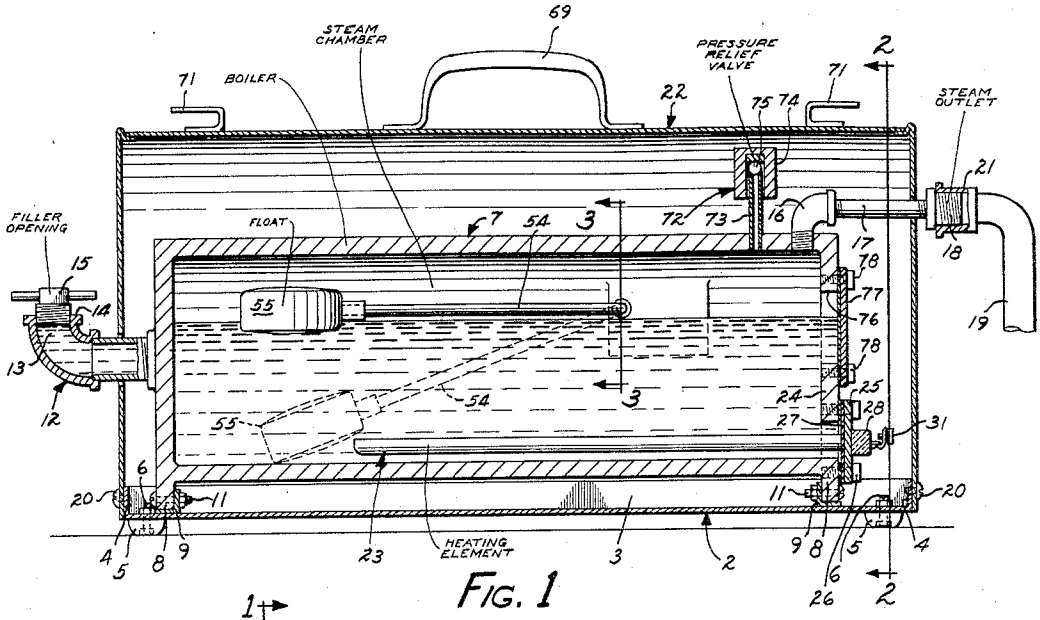


FIG. 1

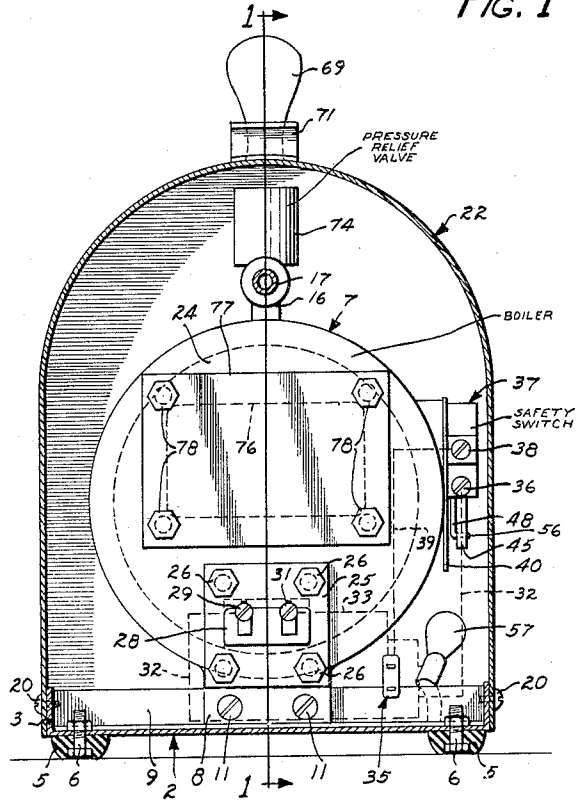


FIG. 2

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WALLPAPER STEAMERS

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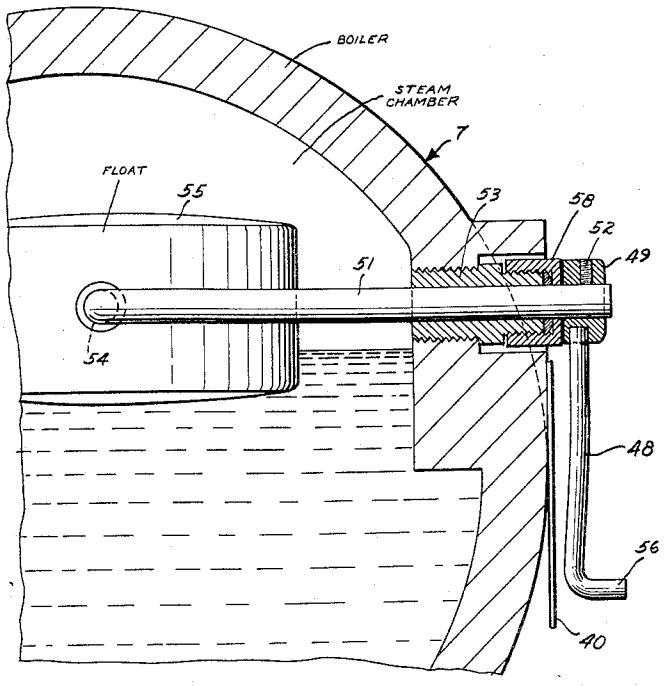


FIG. 3

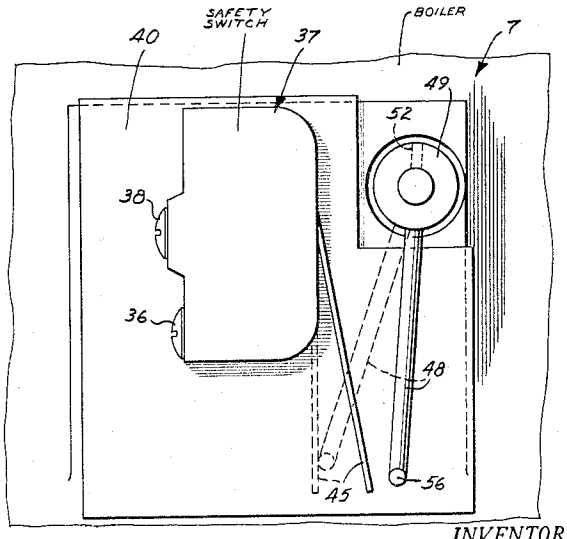


FIG. 4

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WALLPAPER STEAMERS

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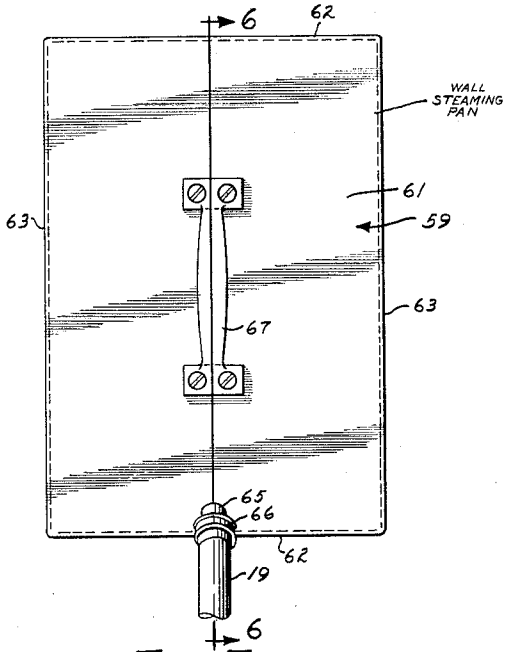


FIG. 5

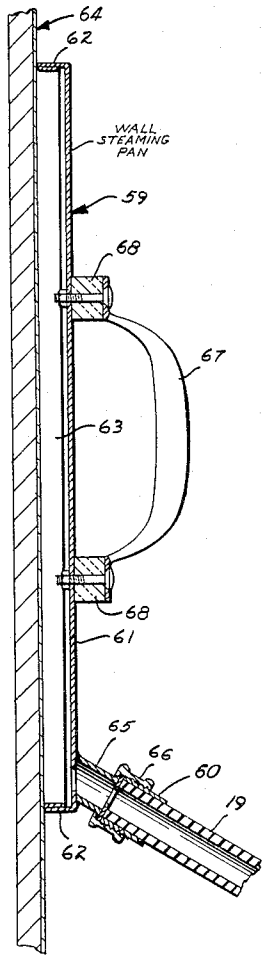


FIG. 6

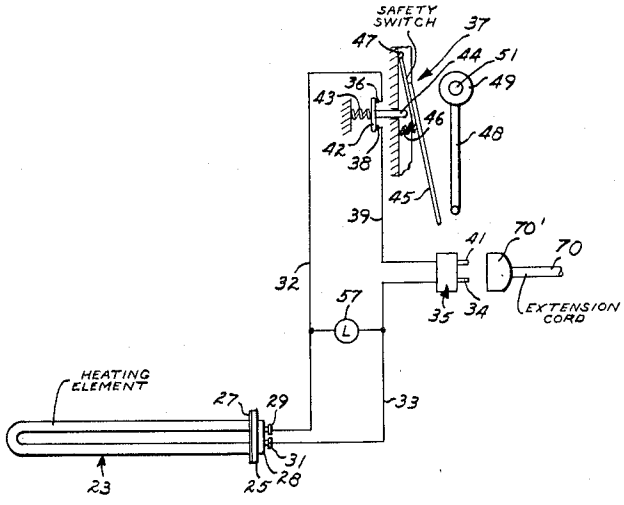


FIG. 7

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WALLPAPER STEAMERS

Willis A. Prain, Minneapolis, Minn.

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3 Claims. (Cl. 219—38)

This invention relates to new and useful improvements in wallpaper steamers and particularly to a small portable device of this general type which may readily be moved about from place to place when in use, without effort.

There are now available on the market wallpaper steamers which embody a boiler having means for heating a liquid therein and provided with a conduit for conducting the steam from the boiler to a wall surface, but to the best of my knowledge such devices have not proven entirely satisfactory.

It is therefore an object of the present invention to provide a wall paper steamer in which all of the objectionable features inherent in such devices now in common use, have been completely eliminated, resulting in the provision of a highly efficient and practical device of this general type.

A further object of the invention is to provide a wall paper steamer comprising a simple inexpensive boiler having a water intake or filler opening, the upper marginal edge of which determines the maximum operating level of the water in the boiler, and the upper portion of the boiler above the water level constituting a steam chamber having a suitable outlet to which one end of a service conduit may be connected.

A further object is to provide a wall paper steamer comprising a boiler having a heating device associated with the lower portion thereof, and a float being provided within the boiler and operatively connected with a control element for controlling the operation of the heating device, and whereby when the water in the boiler drops to a predetermined low level, said float will effect operation of said control element and automatically interrupt the operation of the heating device and prevent further operation thereof until the supply of water in the boiler has been replenished.

A further object is to provide an electrically heated wall paper steamer comprising a boiler having an electric heating element mounted in the lower portion thereof and normally submerged in the water in the boiler, the upper portion of said boiler, above the water level, constituting a steam chamber having an outlet to which one end of a flexible conduit may be connected for conducting steam from said chamber to a wall steaming pan or member, and float operated means being provided for automatically interrupting the flow of current to the heating element in the event the level of the water in the boiler drops sufficiently to expose the heating element, and said float-operated means automatically restoring the flow of current to the heating element, when water is again introduced into the boiler to submerge the heating element therein.

A further object is to provide a wall paper steamer which is extremely simple and inexpensive in construction, comprising a suitable base having a boiler mounted thereon, said boiler having an electric heating element mounted in the lower portion thereof and normally submerged in the water within the boiler, said heating element having a control circuit for supplying current

thereto from a suitable source of electric energy, and a normally closed control switch being interposed in said circuit and disposed in operative relation to a float-operated crank arm, whereby when the water in the boiler drops to a predetermined low level, said crank arm will actuate the control switch and automatically interrupt operation of the heating element.

A further object is to provide an improved wall paper steamer which is highly efficient and economic in operation; is light in weight whereby it may readily be carried about from place to place with one hand, when in use; and which presents the utmost in simplicity and is so constructed that it does not require the services of a skilled operator, whereby it readily lends itself for home or domestic use, as it may readily be operated by a home owner with utmost safety.

Other objects of the invention reside in the provision of a wall paper steamer comprising a housing which completely encloses the boiler and the control mechanism, and has a handle secured to the upper portion thereof, whereby the entire apparatus may be readily and conveniently manually transported from one place to another; in the provision of a pressure relief valve on the boiler for automatically releasing excessive pressure therefrom; in the construction and mounting of the housing, whereby its walls are spaced from the walls of the boiler to prevent the conduction of heat from the boiler to the housing walls; in the unique construction of the wall-steaming pan, whereby all of the steam delivered thereto from the boiler is directed against the surface of the paper to be removed during the operation of the device, and whereby a minimum quantity of steam is permitted to escape into the room; in the provision of a warning device for indicating to the operator when the heating element is functioning and in the provision of such a device which is extremely neat and attractive and is very compact.

These and other objects of the invention and the means for their attainment will be more apparent from the following description taken in connection with the accompanying drawings.

In the accompanying drawings there has been disclosed a structure designed to carry out the various objects of the invention, but it is to be understood that the invention is not confined to the exact features shown, as various changes may be made within the scope of the claims which follow.

In the drawings:

Figure 1 is a vertical sectional view on the line 1—1 of Figure 2, showing the boiler disposed within the housing, and the float in circuit-closing position;

Figure 2 is a cross sectional view on the line 2—2 of Figure 1;

Figure 3 is an enlarged detailed sectional view substantially on the line 3—3 of Figure 1, showing the mounting of the crank arm of the float in the boiler wall;

Figure 4 is a fragmentary view showing in full and dotted lines the relative positions of the crank arm secured to the float for automatically opening the cut-out switch, when the water level in the boiler drops to a predetermined low level;

Figure 5 is a front view of the wall steaming pan only;

Figure 6 is a sectional view on the line 6—6 of Figure 5; and Figure 7 is a wiring diagram showing the electrical connections between the heating element, the control switch and the warning light.

The novel wall paper steamer herein disclosed is shown comprising a base member 2, preferably formed of sheet metal, and having upright marginal side and end walls 3 and 4. The base member 2 is shown supported on resilient buttons 5, secured thereto by bolts 6, as best illustrated in Figure 2. A boiler 7, preferably of cast alumi-

num, but not necessarily so, is shown provided at each end with depending portions 8 which may be secured to suitable angle brackets 9 by bolts 11, thereby to firmly anchor the boiler to the base 2 in spaced relation thereto. The angle brackets 9 may be welded to the bottom wall of the base and constitute, in effect, an integral part thereof. The boiler 7 is preferably cylindrical in cross section, as best shown in Figures 2 and 3.

An L-shaped fitting 12 is secured to one end wall of the boiler 7 and provides a filler opening 13 through which water may be introduced into the boiler, as will be understood by reference to Figure 1. The filler opening 13 is so located that the upper edge 14 of the fitting 12 determines the maximum water level in the boiler. In other words, when the filler plug 15 is removed, the water is introduced into the boiler, when the water overflows from the filler opening 13, the water is at its maximum operating level in the boiler and the filler plug 15 is then secured in the fitting 12 to seal the filler opening 18.

The boiler is provided at its oposite end with a steam outlet fitting 16 having one end of a pipe section 17 connected thereto, which extends horizontally from the fitting 16 and has a male coupling member 18 secured to its opposite end. One end of a flexible service conduit or hose 19 may be coupled to the male coupling member 19 by a female coupling member 21 which may be similar to the corresponding members of a conventional hose coupling.

A suitable housing, generally designated by the numeral 22, completely encloses the boiler 7 and has its lower marginal edge detachably secured to the upright walls 3 and 4 of the base 2 by suitable bolts or screws 20, as shown in Figures 1 and 2. The walls of the housing are spaced outwardly from the walls of the boiler to prevent conduction of heat from the boiler walls to the walls of the housing, as will be understood.

The means provided for bringing the water in the boiler to boiling temperature, is shown comprising a suitable electric heating element, generally designated by the numeral 23. The heating element has one end secured to the end wall 24 of the boiler by a suitable anchor plate 25, secured to the boiler wall by such means as cap screws 26. An insulating element 27 is shown interposed between the anchor plate 25 and the end wall 24 of the boiler, as clearly indicated on Figure 1. The heating element is of conventional design and is preferably U-shaped in form, as illustrated in Figure 7, and has a conventional resistance wiring extending through the metallic tube thereof, as is well known in the art.

A suitable terminal block 28 is secured to the anchor plate 25 and supports a pair of spaced terminals 29 and 31 having wires 32 and 33, respectively, electrically connected thereto, as illustrated in Figure 7. Wire 33 is connected to the terminal 34 of a suitable insulating block or plug 35, and wire 32 is connected to a fixed contact 36 of a safety switch, generally designated by the numeral 37. The complementary fixed contact of switch 37 has a wire 39 electrically connecting it to the other terminal or contact element 41 of the insulating block 35.

Fixed contacts 36 and 38 of the safety switch 37 are normally electrically connected by a movable bridge member 42, having a spring 43 normally retaining it in circuit-closing engagement with the fixed contacts 36 and 38. The bridge member 42 is shown having one end of an operating rod 44 engaged therewith, the opposite of which is positioned to be engaged by a pivoted element 45 which is normally retained in switch opening position by a spring 46, as shown in Figure 7. The member 45 is pivoted at 47 by suitable means, not shown in the drawings.

Means is provided for automatically opening the safety switch 37, when the water in the boiler drops to a predetermined low level. Such means is shown comprising a rod 48 having one end secured to a collar 49, which, in turn, is fixed to one end of a shaft 51 by such means as a set screw 52. The shaft 51 is pivotally supported in a bushing 53 secured in the wall of the boiler 7, and extends into the boiler and is bent at right angles therein to provide a longitudinally extending arm 54 having a float 55 secured to its swingable end, as clearly illustrated in Figure 1.

The rod 48 is shown provided at the lower end with an offset portion 56 adapted to engage the pivoted member 45 of the safety switch 37 and effect opening of said switch, when the float drops to a predetermined position wtihin the boiler, as a result of the water level therein receding. When the float thus drops within the boiler, the offset end portion 56 will engage and depress the member 45 which, in turn, will actuate the push rod 44 and thereby cause it to move the bridge member 42 out of electrical engagement with the contacts 36 and 38. Such automatic opening of the safety switch, which preferably has a quick make and break action, will immediately interrupt the flow of current to the heating element 23, thereby to prevent further generation of steam within the boiler until the water therein has again been replenished.

A sheet-like member 40, preferably of non-conductive material, is shown interposed between the boiler wall and the pivotally mounted switch opertaing rod 48, as shown in Figures 3 and 4. The member 40 is secured in fixed position relative to the boiler by suitable means, not shown in the drawings.

A warning light, indicated at 57 in Figures 2 and 7, is interposed in the electric circuit for the heating element, and is normally on, or lighted, when the heating element is functioning. To prevent steam leakage around the shaft 51 through the bearing 53, a suitable packing 50 is shown seated against the outer end of the bushing 53, and is firmly compressed thereagainst by a packing gland 58, received in threaded engagement with the bushing 53.

Another important feature of the invention resides in the construction of the wall steaming pan, generally designated by the numeral 59. This pan, as best illustrated in Figures 5 and 6, comprises a main wall 61 formed of sheet metal and having its marginal edges bent to provide end walls 62—62 and side walls 63—63, which, in the present instance, are shown constructed by folding the metal upon itself to provide a rounded edge adapted to engage the surface of the wall paper, indicated at 64 in Figure 6.

A nipple 65 is secured to the wall 61 of the steaming pan and is shown having a female coupling member 66 mounted thereon, adapted to be received in threaded engagement with a male coupling member 60 provided at the end of the service conduit or hose 19, as will be understood by reference to Figure 6. A handle 67 is also secured to the pan wall 61 and is preferably insulated therefrom by suitable insulating blocks 68—68, which are of ample size to sufficiently outwardly space the handle from the heated wall 61 of the pan to eliminate any danger of the operator contacting the wall 61 with his fingers, when manipulating the pan over the surface of a wall.

The housing 22 has a carrying handle 69 whereby the entire apparatus may be readily and conveniently carried about from place to place with one hand, when the apparatus is in use, or when transporting it from one place to another. Opposed hook elements 71—71 are preferably secured to the top wall of the housing for supporting a conventional electric extension cord 70, partially shown in Figure 7. The extension cord 70 has a socket member 70' at one end thereof which may be electrically engaged with the terminals 34 and 41 of the insulating block 35, as will be understood by reference to Figure 7. The insulating block 35 is fixedly secured to the adjacent end wall of the tank, and a suitable opening, not shown in the drawings, is provided in the adjacent end wall of the housing 22, through which the socket member 70' of the extension cord 70 may be in-

serted, when it is desired to electrically connect the heating element to an electric supply circuit. The opposite end of the extension cord is provided with the usual male socket member for connecting it to the supply circuit. When the apparatus is not in use the electric extension cord **70** is wound about the hooks **71**, as will be understood.

Means is also provided for preventing excessive pressure to develop within the steam chamber of the boiler, and is shown comprising a pressure relief valve, generally designated by the numeral **72**. The pressure relief valve is shown comprising an upright nipple or tube **73** having its lower end received in threaded engagement with the upper wall of the boiler **7**, and has a weighted cap loosely fitting over the upper end thereof. A suitable spherical valve element **75** is normally seated on the upper end of the tube **73**, and is retained in sealtight engagement therewith by the weighted body or cap **74**, under normal operating conditions of the apparatus. Should the pressure within the steam chamber become excessive, said pressure will lift the valve element **75** from its seat whereby excessive pressure within the steam chamber may escape therefrom to the atmosphere through the tube **73**. An enlarged opening **76** is provided in the end wall **24** of the boiler directly above the anchor plate **25** of the heating element, and is normally closed by a plate **77** secured to the end wall of the boiler in leaktight relation by suitable cap screws **78**. The opening **76** provides means for gaining access to the inside of the boiler and is made large enough to permit free insertion of the float thereinto when assembling the apparatus.

The novel wall paper steamer herein disclosed has been found extremely practical and efficient in actual use. It is very compact and of light weight so that it may readily be moved from place to place within a room when necessary. The wall steaming pan **59** is unique in construction and is extremely light in weight so that it may readily be manipulated over the surface of a wall without fatigue. An important feature of its construction resides in the fact that the pan, including the main wall **61** and the end and side walls **62** and **63** thereof, are imperforate, whereby the steam is confined within the pan and is maintained in direct contact with the surface of the paper whereby quicker penetration into the paper is obtained, which expedites the loosening of the paper from the wall surface. The pressure of the steam within the pan may conveniently be controlled by the operator as he moves the pan over the surface of the wall paper, by simply tilting the pan to permit the steam to escape therefrom. Ordinarily it is not necessary to so tilt the pan, bacause wall paper is usually sufficiently porous to permit portions of the steam to continually escape from beneath the wall-engaging edges of the pan, but not in sufficient quantities to become a hazard to the operator manipulating the pan over the wall surface.

The provision of the safety switch **37** in the electric supply circuit of the heating element also constitutes an important feature of the present invention, in that it automatically interrupts the flow of current to the heating element, should the load of the water in the boiler drop sufficiently to expose the heating element, thereby eliminating all danger of the heating element becoming damaged or burning out, as a result of insufficient water in the boiler; said safety switch being adapted to automatically close and restore the flow of current to the heating element, when the water is again introduced into the boiler to submerge the heating element therein. Thus, the operator of the novel wall paper steamer herein disclosed is dependent largely upon the supply of water in its boiler.

The foregoing detailed description has been given for clearness of understanding only, and no unnecessary limitations should be understood therefrom, but the appended claims should be construed as broadly as permissible in view of the prior art.

I claim as my invention:

1. A readily carryable walipaper steamer comprising a base, a horizontal boiler mounted thereon and having a filler opening at one end, said boiler being adapted to contain a supply of water the maximum level of which is determined by the upper edge of the filler opening, and whereby a steam chamber is provided in the upper portion of the boiler above the water level, said boiler having an outlet in its upper wall portion having means for connecting one end of a service conduit thereto, a plate secured to an end wall of the tank and having an electric heating element secured thereto and extending into the tank, said heating element being submerged in the water in the lower portion of the boiler, an electric circuit for the heating element having a normally closed switch therein, said switch having a movable contact, a float in the boiler having a crank arm disposed exteriorly of the boiler in operative relation to said movable switch contact, said crank arm being adapted to engage and actuate said movable contact to open the switch and interrupt current flow to the heating element, each time the water level in the boiler drops to a predetermined low, a warning device in said circuit for indicating the operating condition of the apparatus, a housing secured to the base and completely enclosing the boiler, and a wall-steaming pan or member detachably secured to the opposite end of said conduit.

2. A readily carryable wallpaper steamer comprising a base, a horizontal cylindrical boiler mounted in said base in spaced relation thereto to permit air circulation between the boiler and base, an L-shaped fitting secured to one end wall of the boiler and providing a filler opening for introducing water into the boiler, the top of said filler opening determining the maximum level of the water in the boiler and whereby a steam chamber is assured over the water level, said boiler having a steam outlet in its upper wall portion, an elongated electrical heating element detachably mounted in the other end wall of the boiler and extending well into the boiler adjacent to the bottom thereof, an electric circuit for energizing the heating element, a control switch in said circuit comprising a movable switch element normally in circuit-closing position, a shaft mounted in the cylindrical wall of the boiler and having an arm at its inner end disposed at right angles to said shaft, a float secured to the swingable end of said arm, a switch-actuating member secured to the shaft exteriorly of the boiler and normally in circuit-closing position, said switch-actuating member being adapted upon lowering of the float within the boiler, as the water level therein drops, to subsequently engage and actuate said movable switch element, thereby to automatically open the control switch and cut-off the supply of electric energy to the heating element, when the water level drops to a predetermined low.

3. A wallpaper steamer according to claim 2, wherein the boiler is completely enclosed within a housing having a carrying handle whereby the steamer may readily be carried about from place to place in the operation thereof.

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