

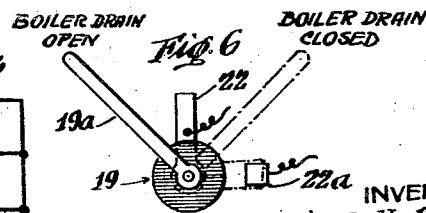
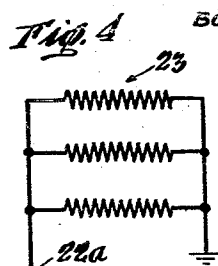
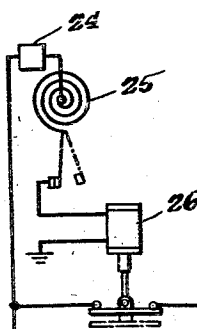
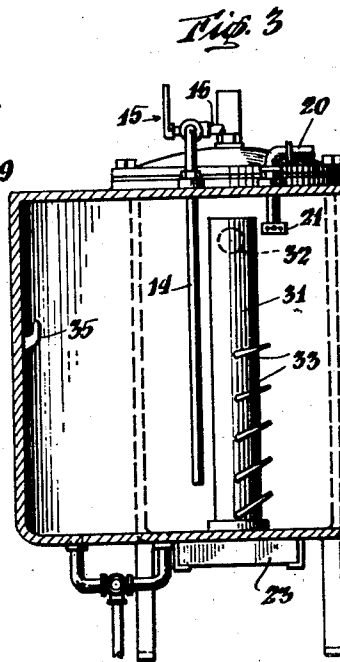
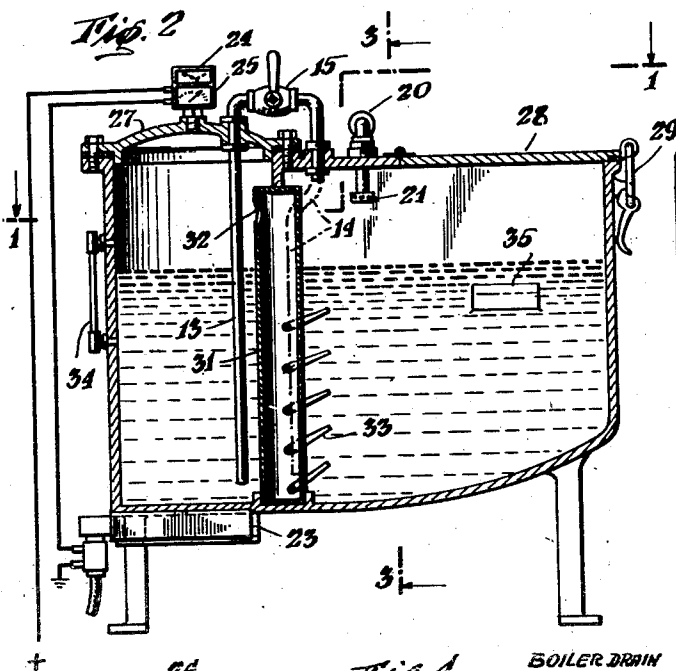
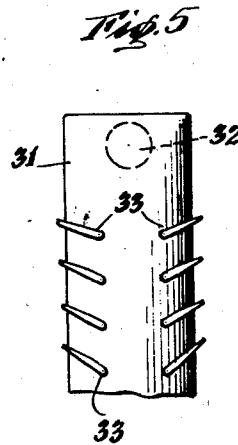
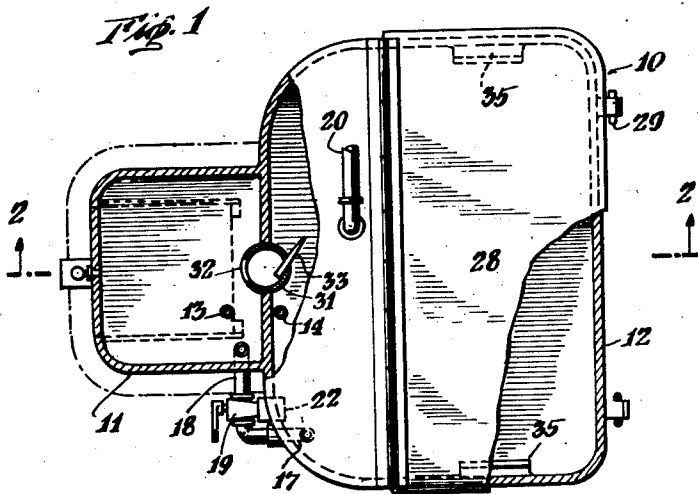
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E. R. HALLANAN

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DOMESTIC WASHING MACHINE FOR CLOTHES, DISHES, AND THE LIKE

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INVENTOR
Edwin B. Hallinan
BY *Wuell, Kane & Smoot*
ATTORNEYS

UNITED STATES PATENT OFFICE

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DOMESTIC WASHING MACHINE FOR CLOTHES, DISHES, AND THE LIKE

Edwin R. Hallanan, Staten Island, N. Y.

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6 Claims. (Cl. 68-207)

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This invention relates to laundry equipment, and particularly to an improved domestic machine for washing clothes, dishes or the like.

It is a particular object of the invention to provide a washing machine in which water in the tub portion is circulated through the clothes or the like without employing motors or mechanical pumps or agitators.

It is another object of the invention to provide a washing machine in which steam under pressure is generated within a boiler and is ejected into the tub in which the material to be washed is placed, the ejection of steam serving to induce circulation of the washing water and to impart motion to the clothes within the tub.

It is another object of the invention to provide an improved washing machine in which water may be continuously circulated through the washing compartment for rinsing purposes.

It is still another object of the invention to provide a washing machine which contains no moving parts, and yet provides for creating a turbulent circulation of water within the washing compartment.

It is a further object of the invention to provide an improved washing machine embodying safety features rendering the apparatus completely safe for home use.

Other features and advantages will hereinafter appear.

In the accompanying drawings:

Fig. 1 is a plan view, partially in section, of a washing machine embodying the present invention;

Fig. 2 is a side elevation taken on lines 2-2 of Fig. 1;

Fig. 3 is a partial front elevation looking in the direction of 3-3 of Fig. 2;

Fig. 4 is a schematic wiring diagram illustrating certain control and safety features;

Fig. 5 is a front elevation of a second form of steam header and steam nozzle unit; and

Fig. 6 is a schematic diagram showing the mechanical association of the drain valve handle and a switch in the heating element circuit.

Referring to the drawings, my improved laundering machine or the like 10 comprises a boiler section 11 and a tub section 12 to receive the clothing, dishes or the like to be washed. Means are provided to fill the boiler section and the tub section independently, and to this end I provide a boiler fill pipe 13 and a tub fill pipe 14, respectively connected to a three-way valve 15, the inlet 16 of which is arranged to be connected to a suitable water supply source. Similarly, the

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boiler 11 and the tube 12 may be independently drained, and therefore the respective drain connections 17 and 18 enter a three-way valve 19 having a suitable bottom outlet connected to a conduit or the like for draining.

A continuously open overflow 20 having a strainer 21 may be connected to a sink or the like for drainage.

The three-way valves may be of any conventional construction in which moving the valve handle to one position provides for the drainage or filling of the boiler section, and in another position seals off the boiler section and provides for the drainage or filling of the tub section.

As later described, the drain valve handle 19a is preferably operatively connected to an electric switch arm 22 in circuit with the boiler heat coil 23; said switch is moved to closed circuit condition only when the drain valve handle is in position wherein the boiler drain is closed. Figure 6 schematically illustrates the switch operation.

Preferably, electric heating means are used for steam generation; gas or other fuels capable of automatic control may be used. As shown, the heating control circuit may be provided with a conventional timer 24 and pressurestat 25 which control the operation of the solenoid switch 26. Assuming the boiler drain valve 19 to be closed, in which switch arm 22 closes circuit with contact 22a, the heat coil may be energized by closing a suitable manual switch (not shown).

The boiler head 27 may be secured by a plurality of bolts and a suitable gasket. The lid 28 of the tub section is preferably closed by latch means 29.

Preferably welded into the wall common to the tub and boiler section is a steam header 31 having an entry port 32 near its upper end and having any desired plurality of relatively short nozzles 33 within the tub section. The nozzles are desirably substantially tangential to the header 31 and are arranged at variant angles to direct the outflowing steam in a plurality of angular paths and create a turbulent condition within the water in the tub. Preferably, the topmost nozzle is substantially parallel to the water level, and the angle of each successive nozzle increases, substantially as shown. As shown in Fig. 5, a relatively wider header may have two or more rows of nozzles, preferably oppositely directed.

Because there is no free interconnection between tub and boiler soapy water within the tub cannot enter the boiler; foaming or priming in the boiler is thus prevented.

Assuming the tub section and boiler to be filled

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to the desired water level as indicated in the gauge glass 34, and the clothes and detergent material placed within the tub, the heating element is energized to raise the temperature of water within the boiler section to the steaming point. It is obvious that the header 31 will contain water to the level of the tub because of the open nozzles 33, and the steam pressure will first empty the header of its water content. The nozzles are inadequate to pass the total amount of steam being generated, and pressure begins to build up within the boiler. The size and discharge capacity of the respective nozzles can be calculated to take steam from the boiler at a rate which will provide a maximum boiler pressure of from two to five pounds per square inch, and this, together with the pressure at which has the conventional upper and lower operating limits, provides a safety factor which prevents the creation of abnormally high or unsafe boiler pressures. It is contemplated that the outlet 20 will be piped to an available open drain such as a sink or the like, and thus the pressure within the tub portion is held at approximately atmospheric pressure.

At the end of the time period for which the timer 24 is set the current to the heat coil will be shut off. After a suitable interval, rinsing water may be introduced into the tub through the inlet 14 and will be discharged through the open overflow connection 20. After rinsing is completed, the cover 28 of the tub may be raised and the laundered clothes removed therefrom.

The apparatus may be used as a dishwasher by suspending a rack containing the stacked dishes from the brackets 35 formed in the side wall of the tub section.

It will be apparent that the three-way inlet valve 15 permits the rinsing or flushing operation to be carried out while the ejection of steam through the respective nozzles is maintaining a turbulence or water movement within the tub, thus insuring adequate rinsing. When the apparatus is being used as a dishwasher, the tub section may be emptied, and the rinsed dishes subjected to live steam for sterilization.

Although the invention has been described by making a fully detailed reference to a certain presently preferred embodiment, such detail of description is to be understood in an instructive rather than a limiting sense.

I claim:

1. A washing machine comprising a tub portion having closure means and a boiler portion; means for generating steam under pressure in said boiler portion; an overflow conduit opening into said tub for maintaining said tub portion at substantially atmospheric pressure; a header communicating with said boiler portion and extending vertically downwardly in said tub portion adjacent a wall thereof; and a plurality of upwardly inclining steam discharge nozzles in said header and extending into said tub portion at an acute angle with respect to said tub wall from a position below the normal waterline of said tub portion to substantially the bottom of the tub.

2. A washing machine, comprising a boiler, and a tub to receive articles to be washed; means for generating steam in said boiler; and a steam pipe disposed vertically in said tub adjacent a wall thereof and communicating with said boiler por-

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tion above the waterline thereof; said steam pipe having a plurality of nozzles arranged in a vertical row over a portion of said pipe commencing below the normal waterline of said tub and terminating adjacent the bottom of said tub, said nozzles extending into said tub at an acute angle with respect to the said wall of the tub.

3. A washing machine, comprising a boiler, and a tub to receive articles to be washed; means for generating steam in said boiler; and a steam pipe disposed vertically in said tub adjacent a wall thereof and in communication with said boiler above the waterline thereof; said steam pipe having a plurality of nozzles arranged in a vertical row over a portion of said pipe commencing below the normal waterline of said tub and terminating adjacent the bottom of said tub, said nozzles extending into said tub at an acute angle with respect to a transverse vertical plane of said steam pipe and at an acute angle with respect to a horizontal plane therethrough.

4. A washing machine comprising a boiler, and a tub to receive articles to be washed, said tub and said boiler having a common wall; means for generating steam in said boiler; and a vertical steam header formed in said common wall and communicating with said boiler above the normal waterline thereof; said steam header having a vertically arranged line of nozzles projecting into said tub from a point below the normal waterline thereof to a point adjacent the base, said nozzles being inclined at an acute angle relative to the said wall and sloping increasingly upwardly in progression from top to bottom.

5. A washing machine as in claim 3, in which said steam pipe has a plurality of vertical rows of nozzles, respectively facing in different direction.

6. A washing machine comprising a tub and a boiler; means for generating steam in said boiler; a conduit disposed vertically in said tub and in communication at an upper end with said boiler above the normal waterline thereof; and a plurality of nozzles fixed to said conduit at various levels from a point below the normal waterline of the tub to a point adjacent the bottom thereof to afford means of discharging steam from said conduit into said tub, said nozzles being directed toward a side wall of said tub.

EDWIN R. HALLANAN.

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