

Jan. 30, 1945.

L. PALMIERI

2,368,563

WASHING MACHINE

Filed May 28, 1942

6 Sheets-Sheet 1

FIG. 1.

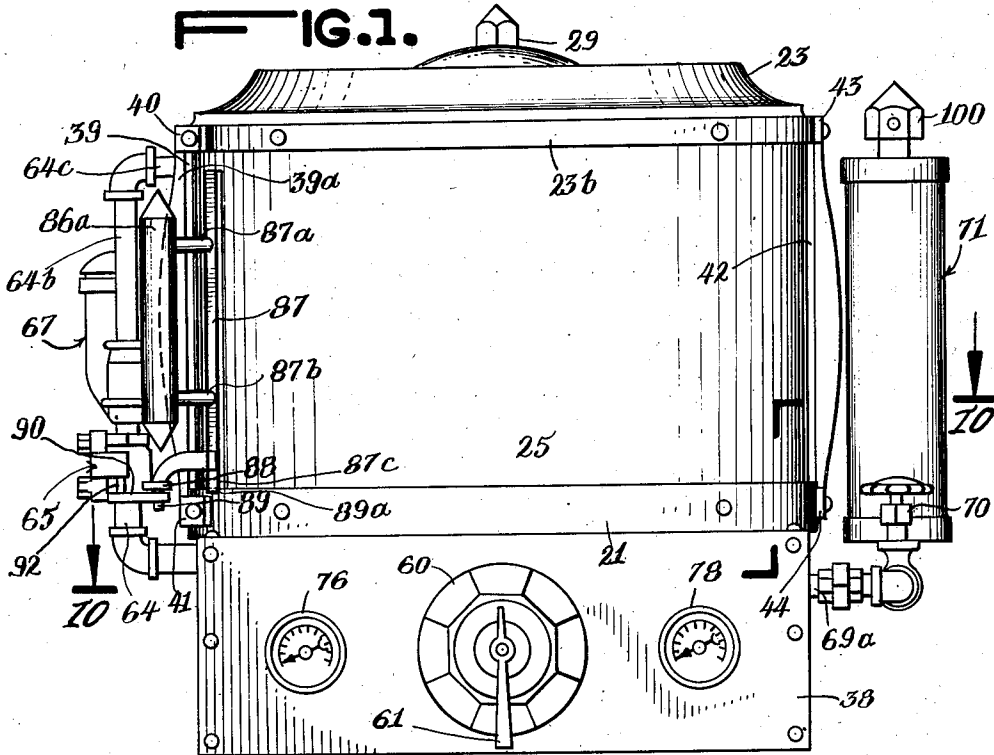
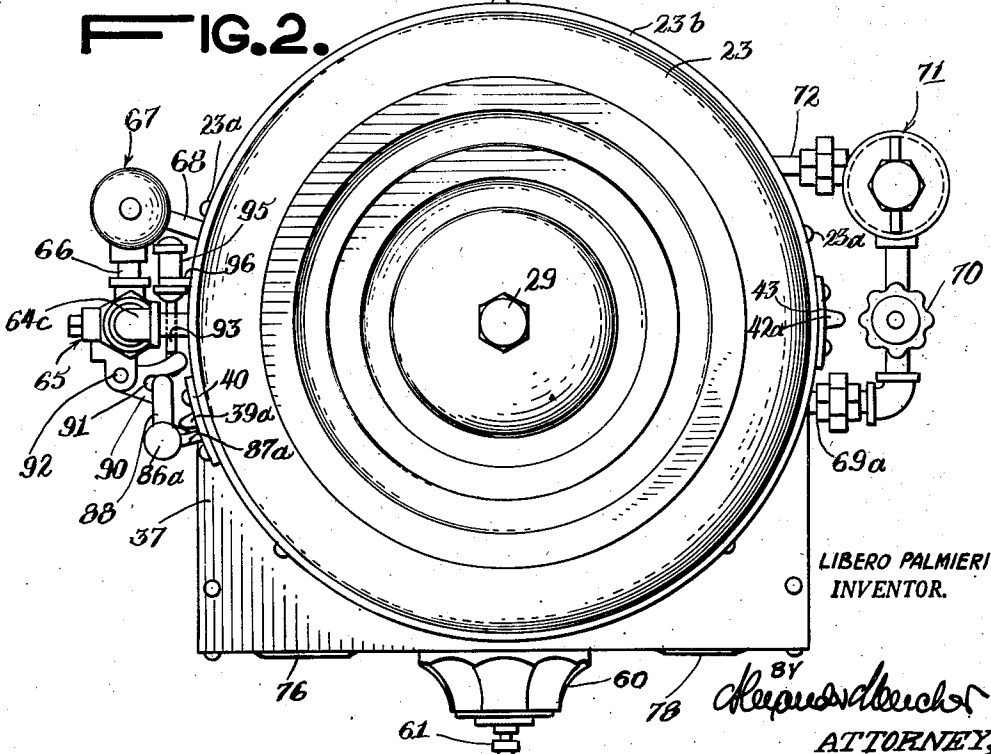


FIG. 2.



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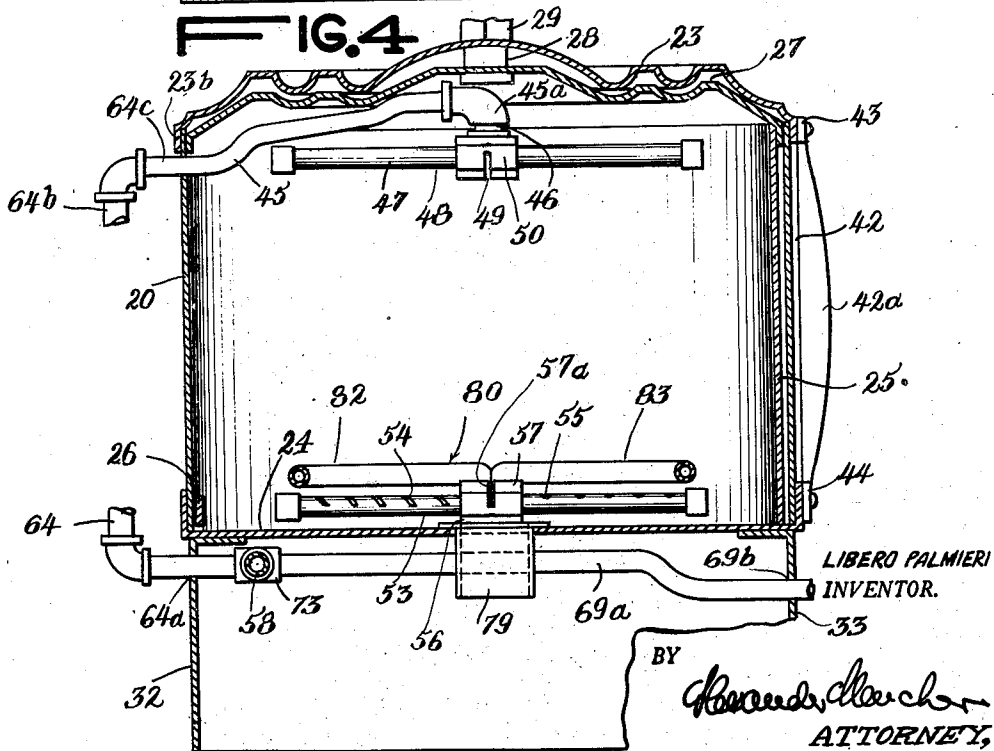
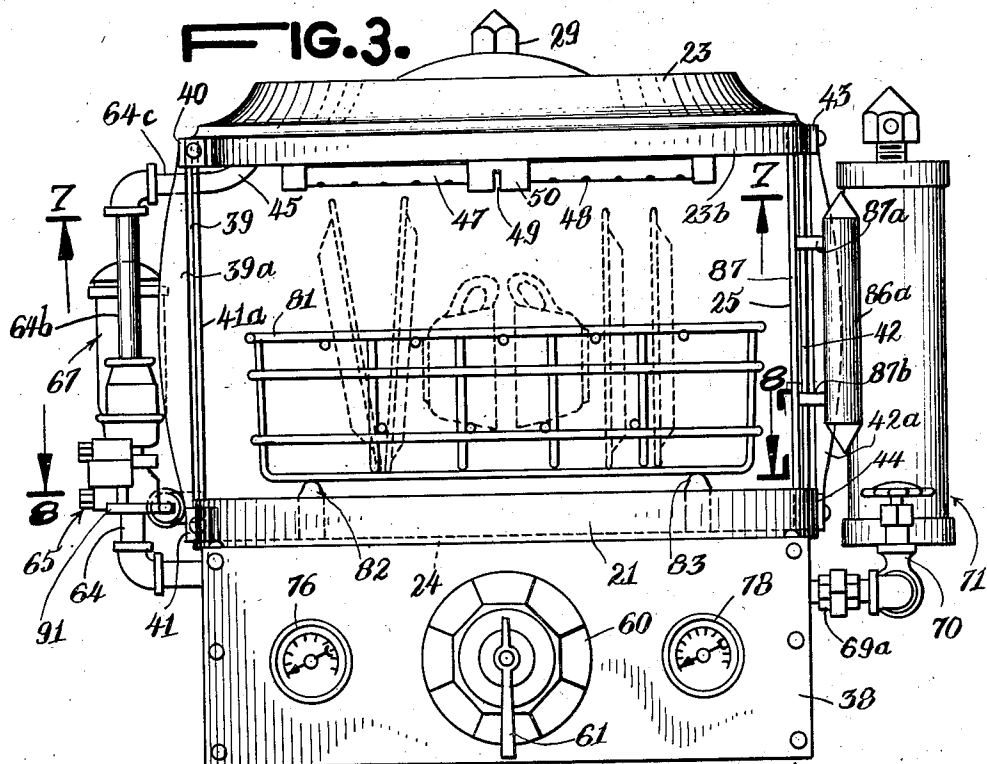
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WASHING MACHINE

Filed May 28, 1942

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WASHING MACHINE

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FIG 7.

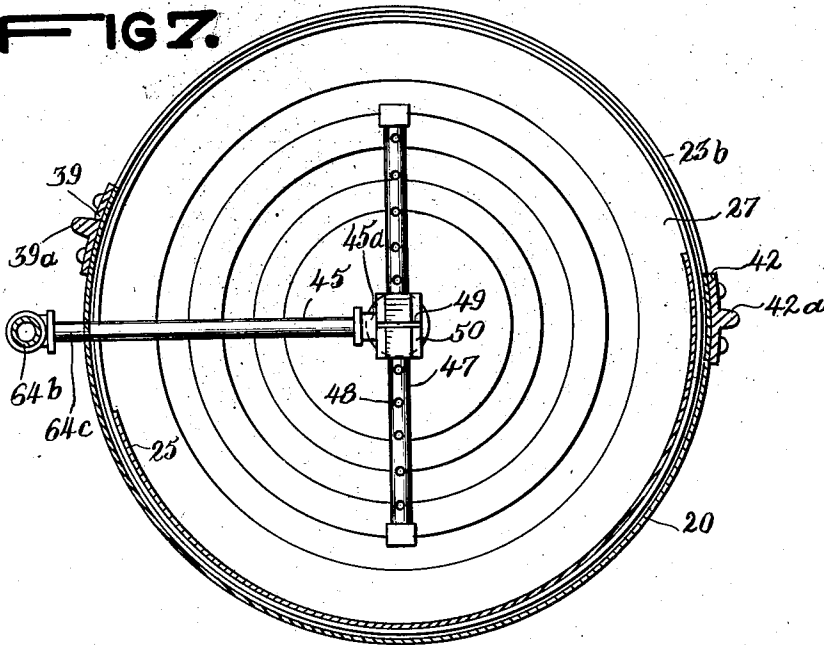
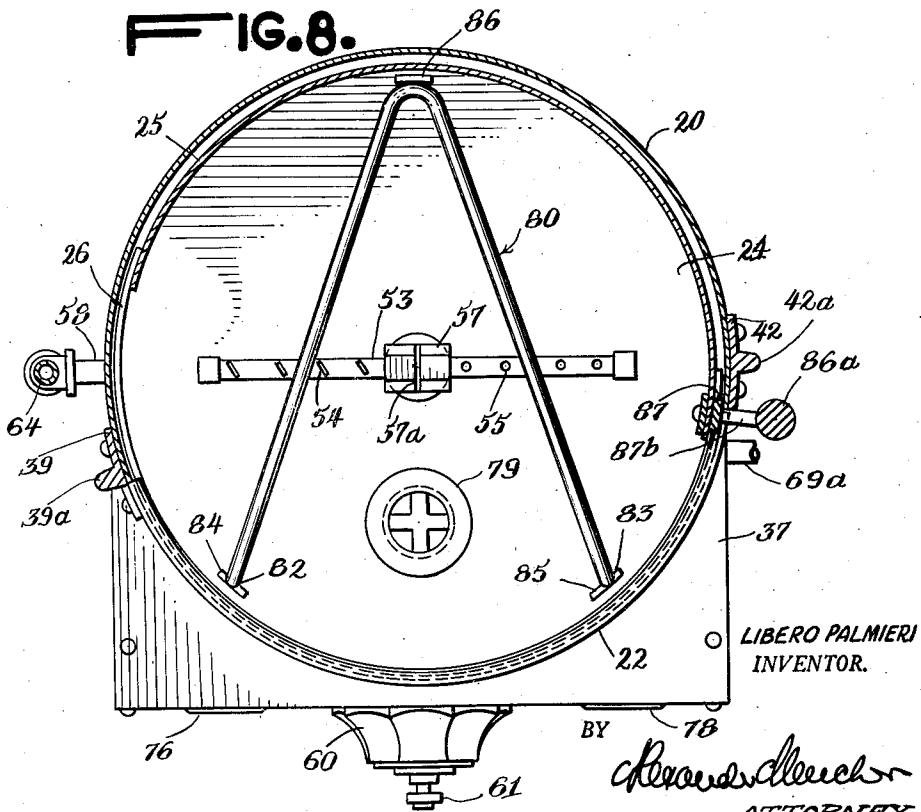


FIG. 8.



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WASHING MACHINE

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FIG. 9.

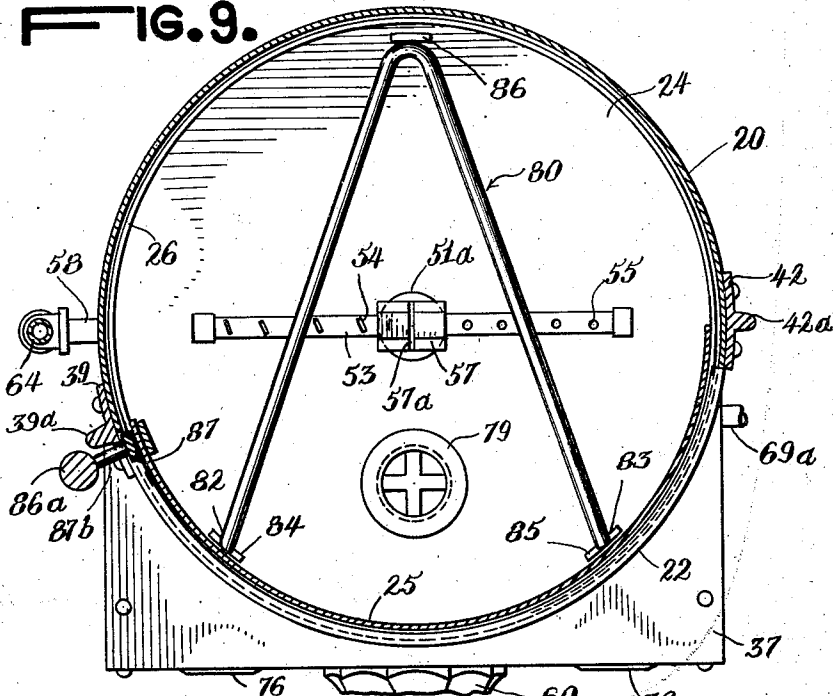
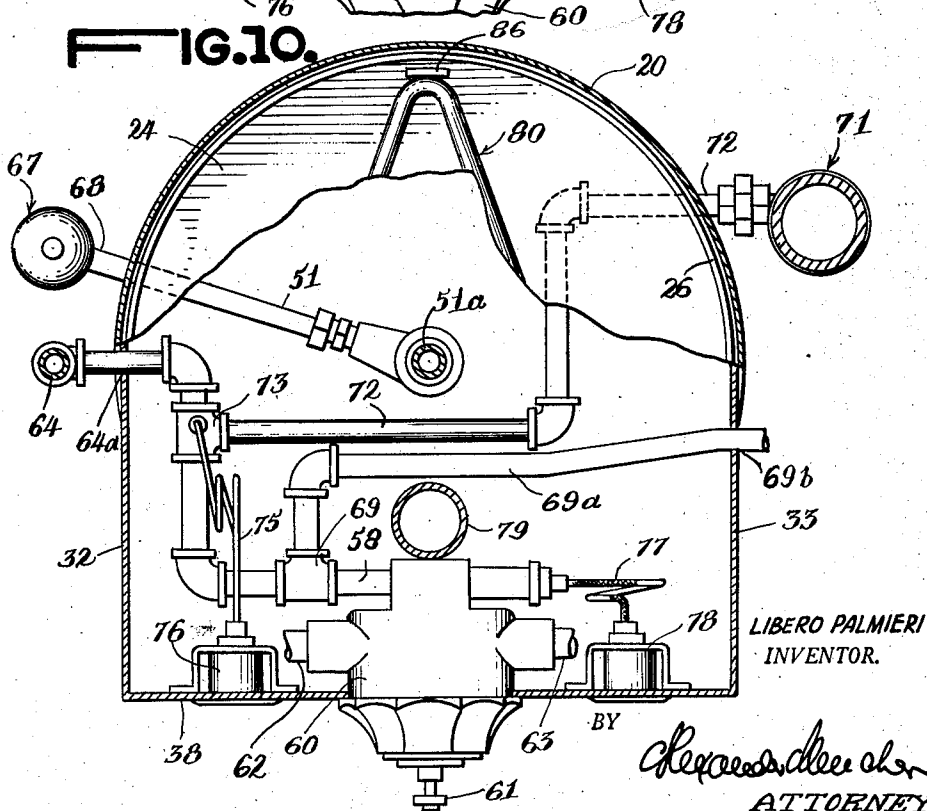


FIG. 10.



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FIG. 11.

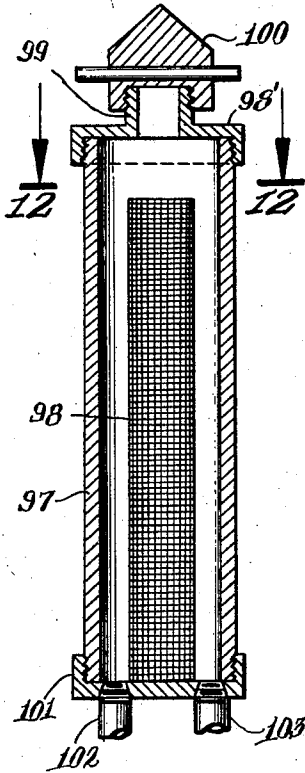


FIG. 14.

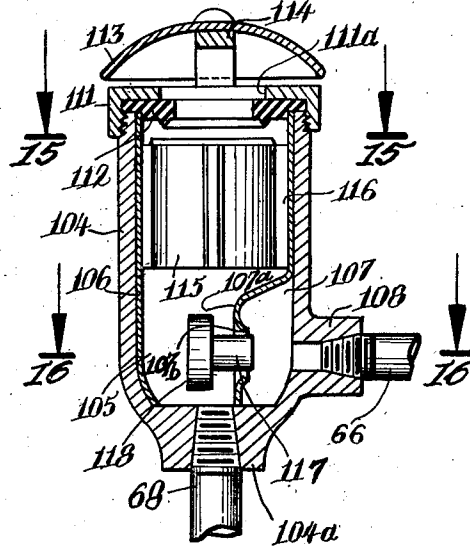


FIG. 15.

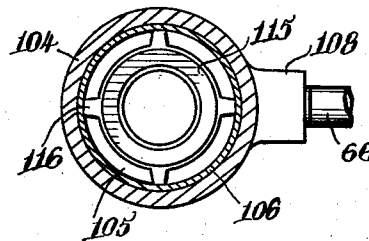


FIG. 12.

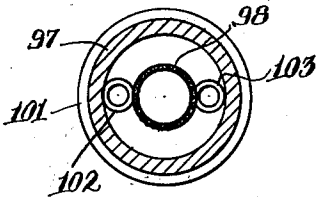


FIG. 13.

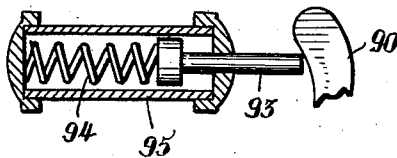
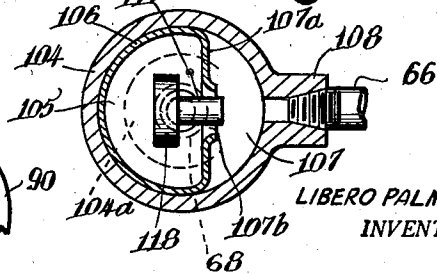


FIG. 16.



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WASHING MACHINE

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Application May 28, 1942, Serial No. 444,807

5 Claims. (Cl. 141—9)

This invention relates generally to washing machines but more specifically to a washing machine operated by house water pressure and having a mixing valve, a disinfectant chamber and a vacuum breaker in the water pipe circuit.

The main object of the invention resides in the provision of a compact washing machine for glasses, dishes and other china-ware in the form of a complete unit, the only connections for operation necessary being to sources of hot and cold water and to a drain pipe for waste, the washing machine being wholly operated by water pressure and having in its simplified pipe circuit a chemical chamber provided with a manual adjustment valve, a vacuum breaker connected to the feed sources for upper and lower rotatable spraying members within the washing chamber, a temperature control valve, and a cut-off valve for the water supply opened by the closure of the washing machine door and closed by the opening of the said washing machine door.

Another object of the invention resides in the provision of a washing machine of the above type wherein all parts are accessible for purposes of repair and replacement, wherein the washing chamber is cylindrical and provided with substantially flat top and bottom pieces to prevent trapping of water therewithin, and wherein a temperature control valve, a thermometer and a pressure gauge are mounted on the washing machine unit to keep the operator acquainted with all conditions taking place within the chamber.

Another object of the invention resides in the provision of a washing machine which is economical to manufacture, simple in construction, aesthetic in appearance, efficient and easy to operate and economical in use.

These objects and other incidental ends and advantages of the invention will hereinafter appear in the progress of the disclosure and as pointed out in the appended claims.

Accompanying this specification are drawings showing a preferred form of the invention, wherein corresponding reference characters designate corresponding parts throughout the several views, and wherein:

Figure 1 is a front view in elevation showing the washing machine with a rotatable door for the washing chamber in closed position.

Figure 2 is a top plan view in elevation of Figure 1.

Figure 3 is a front view in elevation similar

to Figure 1 except for the showing of the washing chamber door in open position.

Figure 4 is a vertical sectional view of the washing machine taken inwardly of the diameter and forwardly of the washing chamber drain, with parts omitted.

Figure 5 is a right side view in elevation of the washing machine, shown in closed condition.

Figure 6 is a left side view in elevation of the washing machine, shown in closed condition.

Figure 7 is a sectional view of Figure 3 along the plane 7—7 thereof.

Figure 8 is a sectional view of Figure 3 along the plane 8—8 thereof, with the closure valve parts omitted.

Figure 9 is a sectional view similar to Figure 8 showing the rotatable door of the washing chamber in closed position.

Figure 10 is a transverse sectional view of the washing machine similar to Figure 9 showing the floor of the washing chamber and the projecting apron thereof cut-away.

Figure 11 is a vertical sectional view of a chemical chamber.

Figure 12 is a sectional view of Figure 11 along the plane 12—12 thereof.

Figure 13 is a longitudinal sectional view of a springable piston member cooperating with the closure valve for the main water supply.

Figure 14 is a vertical sectional view of a conventional vacuum breaker used to cooperate with the pipe system for the washing machine.

Figure 15 is a sectional view of Figure 14 along the plane 15—15 thereof.

Figure 16 is a sectional view of Figure 14 along the plane 16—16 thereof.

In accordance with the invention and in accordance with the preferred form thereof shown in the drawings, the washing machine is comprised of a cylindrical water-proof washing chamber formed from a rear semi-cylindrical wall 20 provided with a lower front semi-cylindrical wall 21 of the same diameter and having a top flange 22. Wall 20 has a circular top piece 23 with a peripheral skirt 23b secured to the rear wall 20 at the upper edge by any suitable means such as bolts 23a. A circular horizontal floor 24 is provided for the washing chamber and is suitably secured as by brazing to wall 20 above the lower edge thereof and to the lower edge of wall 21. The opening for the washing chamber is defined by the forward edges of rear semi-cylindrical wall 20, the front portion of peripheral skirt 23b and flange 22 of the lower front semi-cylindrical wall 21. This opening is com-

pleted by a rotatable door to serve as a water-proof closure therefor.

The rotatable door is comprised of a cylindrical section 25 exceeding 180 degrees and being smaller in diameter than wall 20, the lower edge thereof extending below flange 22 and having a circular connecting piece 26. Door section 25 has a circular top piece 27 secured to the upper edge thereof, the said top piece 27 being concentrically arranged of and spacedly secured to top piece 23 by means of a central pivot 28 penetrating top piece 23 and secured thereto by any means such as nut 29 as best shown in Figure 4 of the drawings. When the closure door above described is rotated by hand into open position as shown in Figures 3, 4 and 8, connecting piece 26 is disposed below flange 22 of lower front wall 21 and the door section 25 is spacedly and concentrically disposed opposite rear wall 20. When the closure door is rotated into closed position, the edges thereof are disposed inwardly of the front edges of rear wall 20.

A lower support for the washing machine is provided, as shown in Figures 5 and 6, wherein 30 represents an extension to rear wall 20, said extension being reinforced by a semi-circular band 31 secured to wall 20 as by bolts 31a, the said band 31 at each end being provided with downwardly extending portions 31b. Lateral tangential plates 32 and 33 are secured at the rear ends thereof to the forward ends of extension 30 by means of downwardly extending portions 31b in any suitable manner such as by brazing, the said tangential plates 32 and 33 at the lower corners of the forward edges being provided with downward extensions 34 to form engaging shoulders with the forward edge of a supporting table for the machine. A forwardly projecting horizontal apron member 37 is brazed or suitably secured to the underside of the floor 24 of the washing chamber and is provided with a downwardly turned front flange 38, the edges of apron member 37 being suitably secured to the upper edges of the tangential plates 32 and 33, and the edges of flange 38 being secured to the front edges of said plates. As will hereinafter appear, flange 38 serves as a mounting wall for a temperature control valve, a thermometer and a pressure gauge.

At the open edges of wall 20 are reinforcing members adapted to give rigidity to the washing chamber walls. Thus, at the inner forward edge of wall 20 is a vertical reinforcing member 39 provided with a web 39a and having upper and lower transverse lugs 40 and 41 respectively, lug 40 on one side being secured to the skirt 23b of top piece 23 and on the other side being secured to the overlapping portions of skirt 23b and wall 20. The lower lug 41 is secured on one side to the lower front wall 21 and on the other side to rear wall 20 by any suitable means such as bolts.

A similar reinforcing member 42 having a web 42a is similarly secured to the outer forward edge of wall 20 by upper and lower lugs 43 and 44 respectively. Inwardly of the inner edge of wall 20 is a vertically disposed stop member 41a suitably secured to wall 20 and serving to engage the outer edge of rotatable door 25 when in closed position.

Associated with the washing machine frame as above described is a water distributing system wherein an upper inlet pipe 45 disposed within the washing machine chamber and adjacent the inner top piece 27 terminates in a downward tubular

extension 45a, the said extension 45a being along the vertical axis of the chamber. Secured to extension 45a by means of a tubular pivot 46 on a fitting 50 is a rotatable spraying tube 47. The length of spraying tube 47 is shorter than the diameter of top piece 27 and is provided with a series of spaced circular openings 48 along the lower wall, while the fitting 50 secured intermediate the length of tube 47 is provided with a lower slit 49. Thus, when a supply of water passes through the upper inlet pipe 45, the rotatable spraying tube 47 is caused to rotate by water pressure and to throw fine jets of water through openings 48 and 49 in a downward direction within the washing chamber. Similarly, a lower inlet pipe 51 projecting through an opening 52 in lateral tangential plate 32 is disposed under the floor or bottom 24 of the washing chamber and connects with an upwardly extending tubular fitting 51a, the said fitting 51a being secured to and centrally of the bottom 24 and to which fitting is rotatably secured a lower spraying tube 53 of the same length as spraying tube 47 and having angularly disposed slits 54 along one half of the upper wall thereof and circular openings 55 along the upper wall of the other half of its length. The spraying tube 53 intermediate its length is provided with a fitting 57 having along its upper wall a slit 57a and at its lower wall a pivot 56 adapted to be secured to tubular fitting 51a. The lower spraying tube is made to rotate in an opposite direction to tube 47 by water pressure when water passes through inlet pipe 51.

The water source for the upper and lower inlet pipes 45 and 51 is a feed pipe 58 disposed below floor 24, the feed pipe being connected to the outlet of a temperature control or mixing valve 60 mounted on and centrally of flange 38. Mixing valve 60 has an exposed handle 61 on the forward side of flange 38 for temperature control and on the inner side thereof has source openings 62 and 63 for hot and cold water, respectively. Feed pipe 58 proceeds from the outlet 59 of the mixing valve 60 through an opening 64a of tangential plate 32 and is connected to a vertically disposed pipe 64 adjacent wall 20, said pipe 64 having a supply closing valve generally designated by numeral 65 above the bottom and an upward vertical extension 64b provided with an elbow 64c penetrating and secured to the top of wall 20, the end of said elbow 64c being connected within the washing chamber to one end of the upper inlet pipe 45. Intermediate the vertical branch pipe 64b and externally of wall 20 is a by-pass 66 leading into an external vacuum breaker generally designated by numeral 67, the vacuum breaker being also connected by means of a pipe 68 penetrating extension 30 at 68a and connecting with the lower inlet pipe 51. The feed pipe 58 adjacent the mouth thereof is provided with a T-connector 69 engaging a tube 69a of smaller diameter. The tube proceeds along the underside of bottom piece 24 and penetrates an opening 69b in the tangential plate 33, the tube 69a being provided with a hand valve 70 disposed externally and laterally of wall 20 and then proceeding from said valve 70 into a chemical chamber generally designated by numeral 71, all as best shown in Figures 1, 2, 5, 6 and 10.

A return pipe 72 from chemical chamber 71 proceeds through an opening 72a in the tangential plate 33 and is connected with a T-fitting 73 secured to feed pipe 58 below the T-fitting 69. A pressure tube 75 is connected on the T-fitting 73 to a water pressure gauge 76 secured

to flange 38 while at the closed and opposite end of feed pipe 58 is a thermal conductor 77 connected to a thermometer 78 also secured to the flange 38 at the opposite side.

The flow of water proceeds from mixing valve 60 through feed pipe 58, partially by-passed through tube 69a and returned to feed pipe 58 from the chemical chamber 71 from which feed pipe the water proceeds through pipe 64 and divides between pipe extension 64b leading to the upper inlet pipe 45 and pipe 68 having vacuum breaker 67 at the upper end thereof and leading to the lower inlet pipe 51.

The floor 24 of the washing chamber is provided with a drain 79 and a member in the form of an inverted V-shaped tube 80 to support a dish tray 81, tube 80 having downwardly turned leg ends 82 and 83 detachably engageable with brackets 84 and 85 secured to the bottom piece 24, while the junction portion of tube 80 is provided with a supporting bar 86 resting on the bottom piece 24.

Closure door 25 is provided with cooperating means for operation of supply valve 65. Thus, the door 25 is provided with a vertically disposed and spaced handle 86a secured thereto by means of supporting bolts 87a and 87b penetrating door 25 and a reinforcing bar 87. Bar 87 has a downward extension 87c carrying a protruding horizontal lug 88, said extension having a shoulder portion 89a on the inner side engageable with flange 22 and lower front wall 23 as seen in Figures 1, 2 and 6, such engagement serving to properly guide the rotation of the closure door 25 within the washing chamber. Lug 88 at one end has a downwardly extending stud 89 engageable with a yoke member 90 through a flared U-shaped opening 91 therein, the said yoke member 90 being secured to an operating valve stem 92 of supply or closure valve 65. When the door 25 is closed, stud 89 engages flared U-shaped opening 91 and carries yoke member 90 inwardly turning the operating valve stem 92 into open position. In this manner, the washing machine is in operating condition when door 25 is closed. When opening door 25 by handle 86a, the yoke member 90 is carried outwardly until stud 89 is free from the flared U-shaped opening 91 thereby turning the operating valve stem 92 in the opposite direction and closing the closure valve 65. Thus it is seen that when the door 25 is in open position, closure valve 65 is closed and no water is distributed through the spraying tubes 47 and 53. In order to aid the outward movement of yoke member 90 when opening closure door 25 so that the flared U-shaped opening 91 of the yoke member is in engageable position with stud 89 when closing door 25, a plunger 93, actuated by a spring 94 is provided, said spring having a housing 95 secured to wall 20 by means of a bracket 96, the plunger being disposed opposite to the rear wall of yoke member 90 and being adapted to engage the said rear wall as shown in Figure 2.

The chemical chamber used herein and as shown in Figures 11 and 12 in the water circuit is of the conventional type consisting of a cylinder 97 having a concentrically disposed cylindrical mesh receptacle 98 adapted to contain a cleaning or disinfecting compound soluble in water. Cylinder 97 at the top thereof is provided with a threadedly engageable top wall 98', an inlet portion 99 through which receptacle 98 is fed, a closure nut 100 being threadedly engageable with inlet 99. A bottom wall 101 is thread-

edly engageable with cylinder 97 to which receptacle 98 is attached, the said bottom wall 101 having inlet and outlet connections 102 and 103. It is to be observed that the reduced by-pass tube 69a connects with the inlet connection 102 and the return pipe 72 leading into the feed pipe 58 connects to outlet connection 103. By manipulating the hand controlled valve 70 leading to the chemical chamber 71, the supply of cleaning or disinfectant compound in the circuit may be controlled. Where desirable the supply of cleaning or disinfectant compound may be cut off altogether by closing valve 70 thereby cutting off the by-pass tube or pipe 69a branching off from the feed pipe 58.

In connection with the closure valve 65, it has not been deemed necessary to show the internal construction thereof in view of the fact that any type of valve having a main operating stem 92 may be used in conjunction with a yoke member 90 having a flared U-shaped opening 91 hereinbefore described.

The vacuum breaker, generally designated by numeral 67, and as shown in Figures 14, 15 and 16 is of the standard type, but especially adapted for a water distributing system as used in the washing machine herein described. The vacuum breaker is provided with a cylindrical casing 104, a reduced bottom wall 104a, a main chamber 105 and an auxiliary chamber 107. The main chamber 105 is formed from a substantially cylindrical lining 106, a portion of said lining at the lower end and to one side of the casing 104 being inwardly turned to form a transverse wall 107a having an opening 107b. The auxiliary chamber 107 is formed between the walls of lining 106 and a portion of the inner surface of cylindrical casing 104. Communicating with auxiliary chamber 107 is a nipple 108 to which is secured the by-pass tube 68 as shown in Figure 6. Tube 68 communicates with chamber 105 through the lower wall 104a of the cylindrical casing as also seen in Figure 6. A top closure member 111 having a central opening 111a and provided with a gasket 112 is threadedly engageable with casing 104, the said closure member 111 being provided with a spaced protecting member 113 secured thereto by means of a bracket 114.

The chamber 105 is provided with a float 115 having a plurality of web members 116 engaging the inner surface of lining 106, the said float 115 being adapted to close opening 111a when chamber 105 is flooded with water. A second valve is provided between chambers 105 and 107, the said valve having a valve stem 117 loosely held within opening 107b and a valve head 118 situated within chamber 105. If back pressure should take place within the system, the float valve 115 would sink and admit air to flow through opening 111a into chamber 105 through chamber 107 and into feed by-pass 66 thereby preventing siphonage.

The washing machine above described may be operated by any inexperienced attendant. When the rotatable door 25 is opened as shown in Figure 3, a tray 81 containing dishes, glasses or china-ware is introduced and set on the V-shaped support 80 projecting above the lower rotating spraying tube 53 within the washing chamber. Upon manual closing of door 25, the closure or supply valve 65 is closed admitting water to the upper and lower spraying tubes 47 and 53. Thereupon the operator manipulates handle 61 of the temperature control or mixing valve 60 until a desirable temperature is

attained as indicated on thermometer 78 mounted on the front flange 38. Moreover the attendant by observing the water pressure gauge 76 also mounted on the front flange 38 is apprised of the pressure flowing through the water system.

Introduction of the cleaning or disinfectant compound into the water supply is brought about by manipulation of hand valve 70 situated externally of the washing chamber, the said valve 70 controlling the amount of water flowing through the chemical chamber 71 and returning to the main water supply which then proceeds to the spraying tubes. The supply of the cleaner or disinfectant may be cut off altogether by the complete closing of valve 70.

To remove the dishes from within the washing chamber after subjection thereof to the cleaning operation, door 25 is opened by the operator by pulling on handle 86a. The opening of the door cuts off the water supply at which time the attendant withdraws tray 81 containing the cleaned dishes from the chamber. Thus, the door control of the water supply makes it impossible for an attendant to be scalded. The space between top piece 23 of rear wall 20 and rotatable top piece 27 of door 25 serves as insulation for the top of the washing chamber preventing dissipation of heat within the washing chamber.

The washing machine is constructed essentially of sheet metal, properly reinforced to give rigidity to the parts, is light in weight, durable, and operable solely by water pressure from the water supply. It is understood that minor changes and variations in the integration, position, and the material of the several parts may be resorted to without departing from the spirit of the invention and the scope of the appended claims. Moreover the feature of concealing the drain pipe connection to drain 79 and the source pipe connections to openings 62 and 63 of the mixing chamber 60 in the base or support formed between flange 38, tangential plates 32 and 33, and extension 30 makes the machine a complete and compact unit in itself wherein all parts are easily accessible for purposes of repair and replacement.

Minor changes and variations in the location of the pipes and tubes in the water circuit, the integration, connections, diameters and materials thereof may also be resorted to without departing from the spirit of the invention and the scope of the appended claims.

I claim:

1. In a dish-washing machine, a chamber

having an opening, a movable closure therefor, inlet pipes penetrating said chamber, a valve connected to the said inlet pipes, a valve engaging member secured to the closure for opening and closing the said valve when said closure is in closed and open position respectively, a support for said chamber, a mixing valve for hot and cold water secured to said support and being connected to the first mentioned valve.

2. In a dish-washing machine, a chamber having an opening, a movable closure therefor, inlet pipes penetrating said chamber, a vacuum-breaker device connected to said inlet pipes, a supply valve connected to the said inlet pipes, a supply valve engaging member secured to the closure for opening and closing the said supply valve when said closure is in closed and open position respectively, a support for said chamber, a controllable mixing chamber secured to said support and being connected to the supply valve.

3. In a dish-washing machine, a chamber having an opening, a movable closure therefor, water pressure operated spray members rotatably mounted within said chamber, water inlet pipes secured to said chamber and being connected to said spray members, a supply valve connected to the said inlet pipes, a supply valve engaging member secured to the closure for opening and closing the said supply valve when said closure is in closed and open position respectively, a support for said chamber, a controllable mixing chamber secured to said support and being connected to the supply valve, an optional chamber containing a cleaner or disinfectant connected between the mixing chamber and the supply valve.

4. In a dish-washing machine as set forth in claim 3 wherein a vacuum breaker is connected to the water inlet pipes.

5. In a dish-washing machine, a cylindrical chamber having an opening, a movable door therefor, spraying means mounted within the said chamber, inlet pipes connected to said spraying means, a closure valve for said inlet pipes mounted externally of said cylindrical chamber and having an operating and movable valve stem member, means secured to and externally of the door adapted to engage and move said valve stem member for opening and closing the closure valve when said door is in closed and open position respectively, a source of water supply from the house main pipe feeding said inlet pipes under pressure thereof.

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