

Sept. 16, 1924.

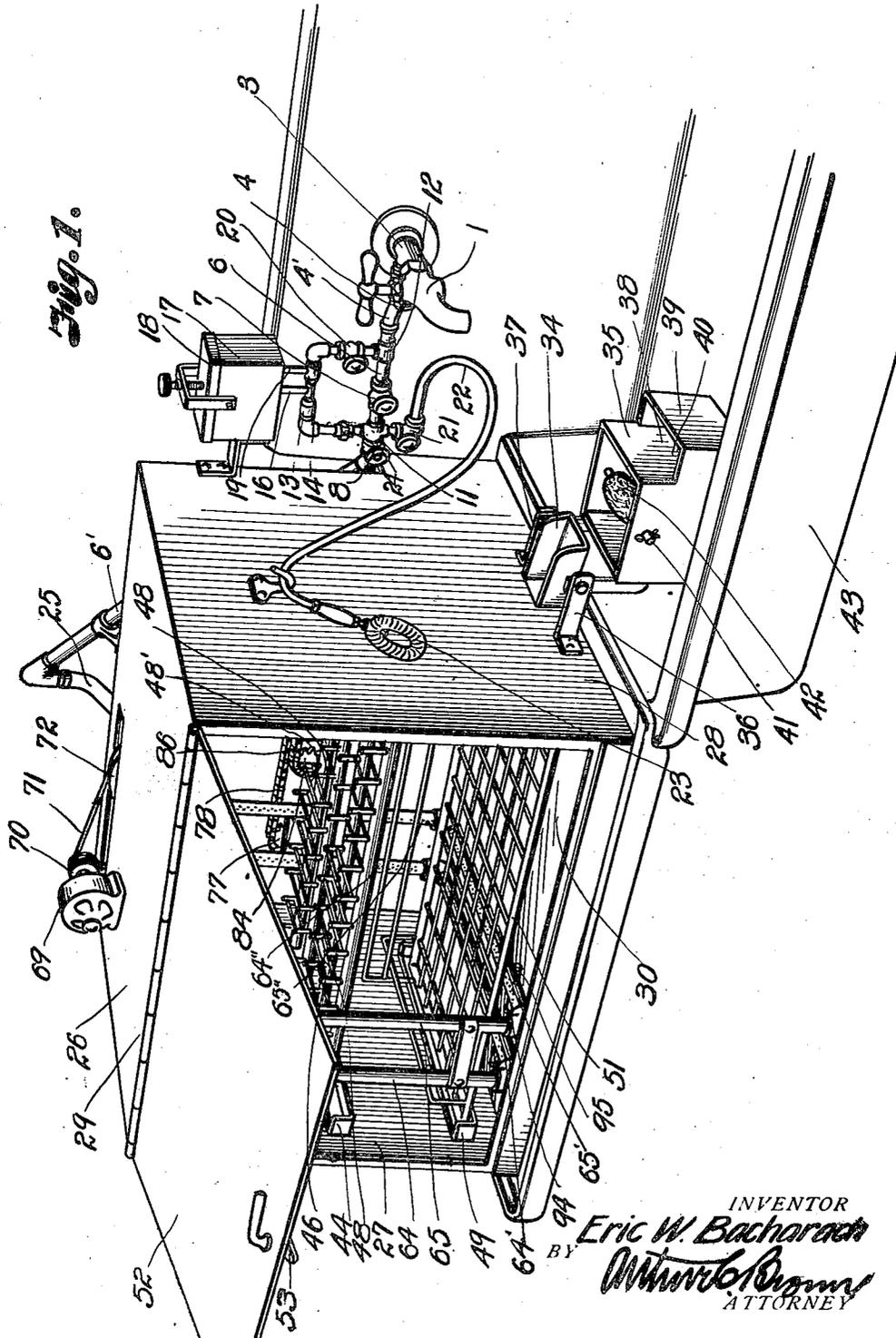
E. W. BACHARACH

1,508,495

DISHWASHER

Filed Jan. 7, 1922

3 Sheets-Sheet 1



Sept. 16, 1924.

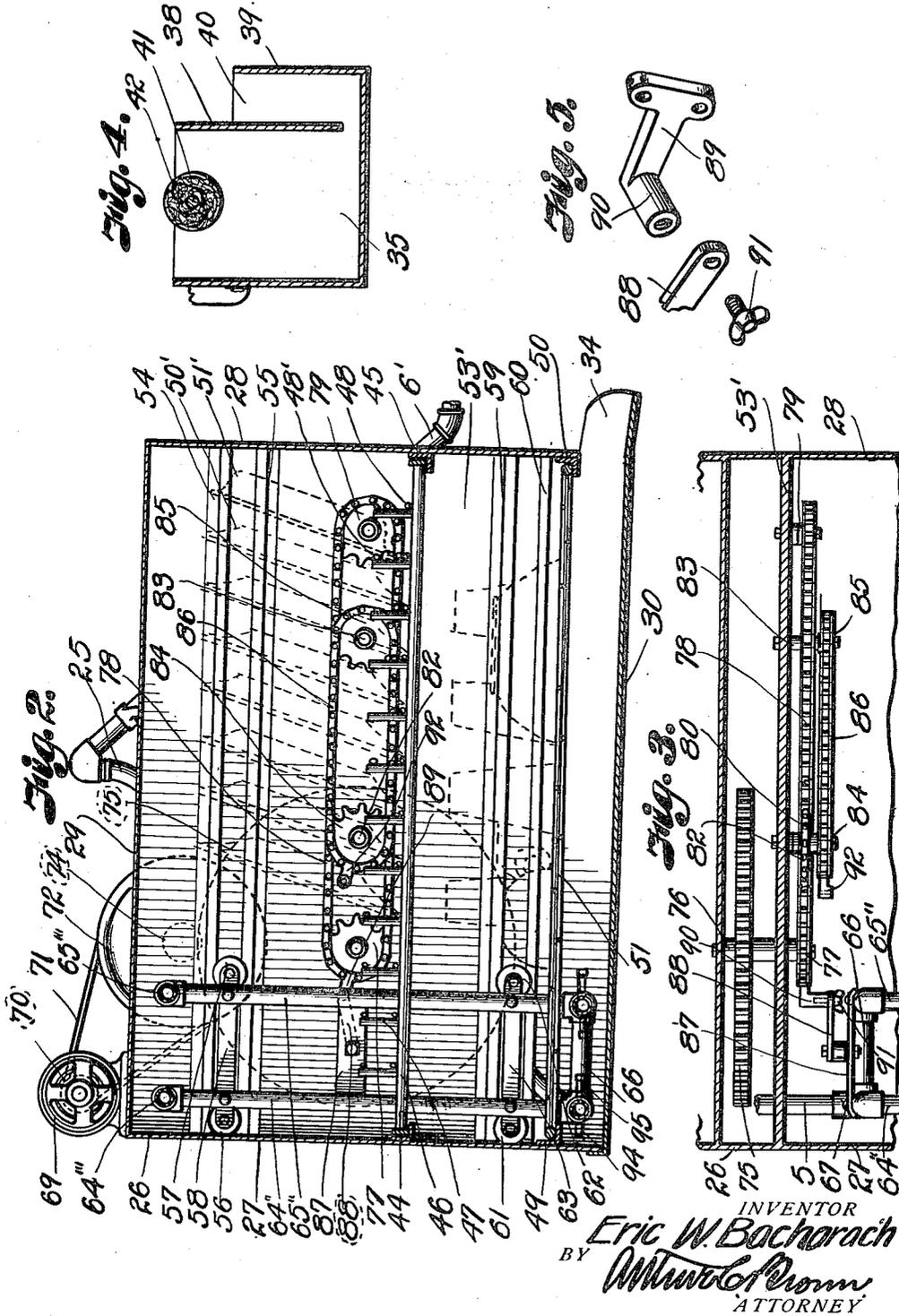
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3 Sheets-Sheet 2



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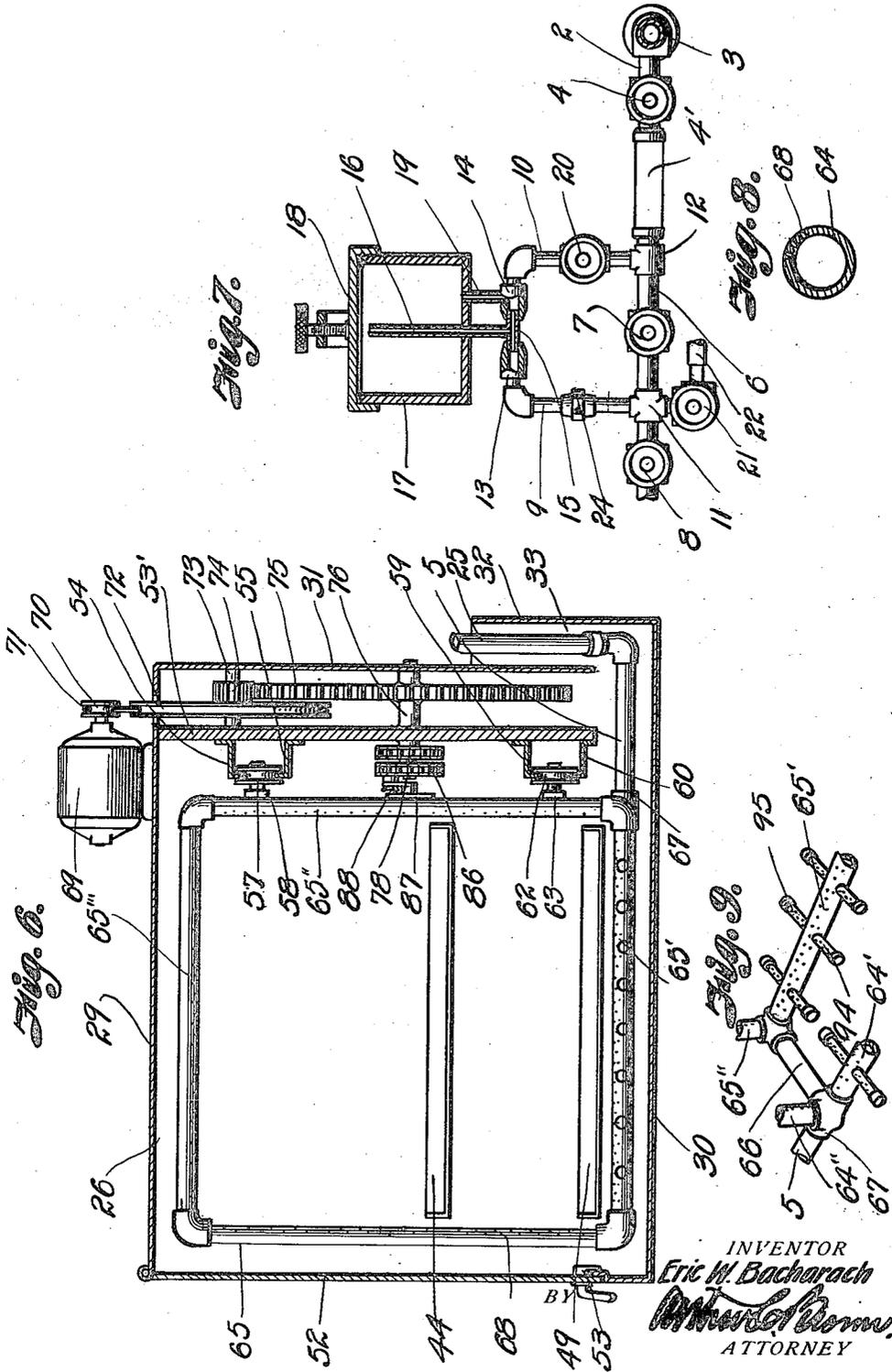
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E. W. BACHARACH

DISHWASHER

Filed Jan. 7, 1922

3 Sheets-Sheet 3



# UNITED STATES PATENT OFFICE.

ERIC W. BACHARACH, OF KANSAS CITY, MISSOURI.

DISHWASHER.

Application filed January 7, 1922. Serial No. 527,609.

*To all whom it may concern:*

Be it known that I, ERIC W. BACHARACH, a citizen of the United States, residing at Kansas City, in the county of Jackson and State of Missouri, have invented certain new and useful Improvements in Dish-washers; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

This invention relates to dish washing machines and the primary object of the invention is to provide an efficient, inexpensive and conveniently operated dish washing machine in which a spray of suds or saponified water may be directed upon and over the dishes to be freed of food fragments and other adhering matter.

The invention also contemplates the provision of means whereby the same mechanism that is utilized for cleaning the dishes may serve as a rinsing means and the invention also contemplates the provision of means whereby the soap content of the wash water can be increased or diminished by regulating an automatic feed associated with the water, the soap feeding mechanism being adapted to be cut off so that only clear water will be directed over the dishes to rinse them.

I have further provided means whereby a fountain brush connected with the washer may receive its saponified and rinse water supply from the same source that supplies the wash water to the washing machine, the brush being so co-related with the washing machine apparatus that it may be used to scour and cleanse all kinds of cooking utensils, such as pots, pans, etc., with a minimum amount of work on the part of the operator, it also being unnecessary for the operator to get his hands in the wash water.

A silver cleaning device is also associated with the dish washer in such a manner that the suds from the washing machine may pass into the silver cleaner to be available for cleaning the silverware, such as knives, forks, spoons, etc., before it finally passes off as waste.

The novel details of construction in the embodiment of my invention selected for illustration will be specifically described hereinafter, reference being had to the accompanying drawings, in which—

Fig. 1 is a perspective view of a dish washing machine constructed in accordance with my invention, the front door or cover being raised to show the interior construction of the device.

Fig. 2 is a vertical, longitudinal, sectional view through the dish washer.

Fig. 3 is a cross sectional plan view through a part of the dish washer to show the arrangement of the carriage for moving the spray apparatus back and forth.

Fig. 4 is a detail cross sectional view through the silverware washer.

Fig. 5 is a disassociated fragmentary view of the carriage arm, the link for connecting it to the sprayer frame and fastening devices for connecting the link to the arm.

Fig. 6 is a cross sectional view through one end of the washing machine, the spraying mechanism being shown in elevation.

Fig. 7 is a view partly in elevation and partly in section, illustrating the water supply and the means for saponifying it.

Fig. 8 is a cross sectional view through any one of the top or side spray tubes, and

Fig. 9 is a fragmentary detail view of the bottom spray tubes.

The device is adapted to be supplied with hot water from any suitable source. For domestic purposes, small restaurants and the like, the ordinary hot water tap or spigot over the usual sink may be used for connecting the device to the service pipe. The device is especially adaptable to the use of hotels and other large institutions which require the cleansing of great quantities of dishes; as will be explained hereinafter, the dish washing capacity of this device is only limited by the rate of flow of hot water that is obtainable.

The supply pipe connection for the washer may be tapped in in rear of the spigot or attached directly on the end of the spigot by means of a slip-on connection, or may be connected in any suitable manner with any convenient source of hot water supply. The pipe 2, which is connected to the service

pipe 3 is provided with a valve 4, which may be opened to admit water into the washing machine from the pipe 3 or it may be closed when the spigot 1 is to be opened to the exclusion of the washing machine, as will be well understood by reference to Figs. 1 and 7.

The pipe 2 is connected to the washing machine supply pipe 5 through pipe 4, through pipe 6, in which is located a valve 7, pipe 6' in which is located a valve 8, and through a flexible tube 25. In spaced relation and connected to the pipe 6' is a proportional flow passageway, by-passing the valve 7 (see Figs. 1 and 7). The vertical pipes 9 and 10 on opposite sides of valve 7 in pipe 6 are connected by the fittings 11 and 12, and the pipes 9 and 10 are connected one to the other by the reducers 13 and 14 and the T-shaped pipe 15, the upper vertical legs 16 of which extends into a soap receptacle 17, suitably supported and normally closed by a cover 18 of appropriate construction.

The bottom of the receptacle 17 is tapped into the reducer 14 by the pipe 19, as will be clearly apparent by reference to Figs. 1 and 7.

The pipe 10 is provided with a valve 20 and the fitting 11 taps into a valve casing 21, discharging into a flexible hose or pipe 22, on the end of which is a fountain brush 23.

The pipe 9 is provided with a union 24. The connecting pipe 15 forms a restricted passageway for the water passing through it which causes a drop in pressure of the water. This will cause a portion of the water going through pipe 10 to pass upwards through pipe 19 into the soap box 17, then down through pipe 16 and back into the main flow of water which passes on through pipes 9, 6', 25 and 5 to the washing machine, the volume of water thus passing through the soap box will therefore always be proportionate to the main flow going into the washing machine. The size of the pipe 15 will be proportioned to the size of the pipe 10 so that the amount of saponified water entering the main flow will conform with a predetermined required volume. The pressure of the water coming from the service pipe 3 may be regulated either by valve 4 or by inserting an automatic pressure regulating valve in pipe 4'. Therefore, when valves 4, 20 and 8 are open and valves 7 and 21 are closed, water will pass through pipe 10, will combine with a proportionate volume of soap solution entering into pipe 15 and the water mixed with soap solution will then pass through pipes 9 and 6', flexible tubular connection 25 and pipe 5 into the washer. When the valves 4, 7 and 8 are open and valves 20 and 21 are closed, fresh rinsing water will

by-pass the soap box and flow into the pipes 6', 25 and 5 into the washing machine. When valves 4, 7 and 21 are open and valves 20 and 8 are closed, fresh rinsing water will flow through the fountain brush.

The pipe 5 discharges into a hollow rectangular frame, which is supported within the washer casing or housing 26. The washer casing or housing is substantially rectangular, having end walls 27 and 28, a top 29, a bottom 30 and a rear wall 31, which extends toward but not quite to the bottom 30 of the casing. There is also a supplemental wall 32 which extends from the rear edge of the bottom 30 in spaced relation but overlapping the wall 31, as clearly seen in Fig. 6, to provide an opening 33 for the introduction of the flexible tubular connection 25 into the casing. The wall 32 will be of sufficient height to prevent the water within the casing escaping through the opening 33, the discharge for the casing being shown as a sluice-way or spout 34 at the end 28 and discharging into a silver-cleaning box 35, which is connected to the end 28 by the brackets 36 and 37. The box 35 has staggered vertical baffles or panels 38 and 39 so that water can pass into the top of the box, pass downward under the baffle 38, then upward through channel 40 and be discharged over end baffle 39, permitting a flow but at the same time maintaining a certain level within the box, as will be clearly understood by reference to Figs. 1 and 4.

Across the box or receptacle 35 is a wiper or cleaner consisting of a shaft 41, around which is wound or fastened a covering 42 of fibrous material, such as cotton waste or the like so that when the silver, such as knives, forks and spoons, is withdrawn from the receptacle 35, it may be wiped on the cleaner or wiper 42, which will be free to rotate, so that a constantly new surface will be presented to each article presented to it. The wiper 42 will be cleansed by the water that falls upon it as it issues from the spout 34.

The water, after passing through receptacle 35, may discharge into the sink 43 or to a suitable waste, not shown.

The rectangular casing is provided with rack brackets 44 and 45 to support a dish rack 46 consisting of a grid having up-standing pins or projections 47, all of which are connected across the bottom by cross wires or bars 48 and others of which have in addition to bars 48, other bars 48' connected across the pins near the top and parallel with the lower bar 48. The up-standing members are so disposed that they will support dishes, such as plates 50' as shown in the dotted lines in Fig. 3, the plates being slightly inclined from the vertical, so that the sprays of water will strike them

at definite angles most effective in cleansing them. The dish rack pins 47 are so arranged and proportioned that the ordinary shallow plates 50' irrespective of their size or pattern will all stand at approximately the same angle with the vertical, the bottom edge of each plate catching under the cross wire 48. Soup plates and other deep plates 51' will be placed in the rack so that their bottom edges will be held between cross wires 48 and 48' which will incline them at approximately the same angle as the ordinary shallower plates 50'.

Below the rack supports 44 and 45 are additional rack supports 49 and 50, which carry a dish rack 51 of appropriate construction, on which additional dishes such as bowls, cups or glassware may be supported above the bottom of the rectangular casing. All of the bowls, dishes, glassware and the like to be washed may be introduced through the opening closed by the hinged door 52, which, when closed, will constitute the front cover wall for the casing, said door being adapted to be latched by the latch 53 during the washing operation.

Secured within the casing and spaced inwardly from the rear wall 31 is a bracket supporting wall 53', which carries the Z-bars 54 and 55, constituting a guideway for the rollers 56 and 57 of the spray frame carriage 58, and the brackets 59 and 60, which constitute a guideway for the rollers 61 and 62 of the bottom carriage 63 to which the frame is secured.

The spray frame consists of the pipes or tubes 64, 65, 64', 65', 64'', 65'', 64''' and 65''' suitably joined together so as to form two hollow rectangular members parallel with each other and fastened at their tops and bottoms to the carriages 58 and 63 and communicating through the tubular connector 66 (see Fig. 2). The connector 66 is in communication with the pipe 5 through a connection 67 so that when the valves 4, 20 and 8 are open and valves 7 and 21 are closed, saponified water will pass into the connection 66 and into the two rectangular pipe frames. The top members 64''' and 65''' and the side spray members 64, 65, 64'' and 65'' each contain perforations pointing at various angles toward the upper sides or insides of the plates or other dishes standing in the rack 46 so that these perforations will direct streams of water against the faces of the dishes. The dishes in the rack 46 are inclined from the vertical as shown in Fig. 2. The annular direction of the sprays will permit the water to strike against the top surface or inner face of each dish and the velocity of the sprays falling at their respective angles will cause the water to be splashed from the inner face of each dish against the back of the dish immediately in front of it. The

water will then fall from the dishes on rack 46 and pass over the bottoms of the down-turned bowls and other dishes resting in the rack 51.

The bottom spray members 64' and 65' are perforated on both sides of the vertical axis and are tapped at regular intervals horizontally on both sides and smaller tubes 94 and 95 are inserted into these openings. The smaller tubes 94 and 95 are capped on the outer ends and are perforated on both sides of the central axis; therefore sprays of water will be thrown upwards out of spray members 64' and 65' in planes parallel with the bracket supporting wall 53' and sprays of water will also be thrown upwards out of the smaller tubes 94 and 95 in planes at right angles to those thrown by the pipes 64' and 65' so that the entire inner surfaces of the bowls and other dishes resting on the tray 51 will be reached by these up-thrown sprays.

Since the opening 33 extends practically the entire length of the washer casing and in view of the fact that the pipe 5 is connected to the pipe 6' by a flexible connection, it will be apparent that the rectangular sprayer frame consisting of the members 64, 65, 64', 65', 64'', 65'', 64''' and 65''' and the carriages which support them can be moved longitudinally with respect to the casing so that they will pass over the entire batch of dishes within the casing to apply water thereto. In order to illustrate the principle involved only two spray members have been shown, but a greater number of such rectangular members may be used in the spray frame. Furthermore, the details of the spray frame may be altered in any way that will accomplish the results aimed at most efficiently. The main idea involved consists of a spray frame composed of a number of vertical and rectangular members spaced at equal distances parallel with each other, and containing perforations that will throw water downward and from both sides inward against the plates and other shallow dishes standing in rack 46 and that will simultaneously spray water upward into the down-turned bowls, glasses, cups and other deep dishes that are resting on rack 51. The number of spray frames used in the device is only dependent upon the rate of flow of the water supply. Therefore, for hotels and other institutions requiring the washing of large numbers of dishes, this washing machine may be easily adapted thereto by elongating the outer casing and dish racks and increasing the number of spray frames to meet the requirements. Where more than one spray frame is used, each frame will be connected with the water supply through an independent flexible tube similar to 25 and all spray frames will be recipro-

cated by means of one common source of power.

A novel means is provided for effecting the movement of the sprayer and for convenience I have shown the mechanism as driven from an electric motor 69, which may be fastened to the top 29 of the casing or at some other convenient place. The driving shaft of the motor 69 is shown as provided with a pulley 70, around which a belt 71 passes to drive a pulley 72 on a shaft 73, mounted in the partition 53' and the wall 31.

On the shaft 73 is a pinion 74, which meshes with a gear 75 to drive the shaft 76 which carries it at a relatively low speed. The shaft 76 extends through the partition 53 and carries a sprocket 77, which drives a sprocket chain 78, passing around an idle sprocket 79 and an intermediate sprocket 80 on shaft 82, carried by the partition 53. The shaft 82 carries an additional sprocket 84 and a shaft 83 carries a sprocket 85 around which passes a sprocket chain 86.

The two members 64' and 65' of the sprayer frame are connected by a cross bar 87, on which is pivotally mounted a link 88, adapted to engage the carriage arm or connector 89, fastened to one of the links of the chain 78. (See Fig. 5.)

The link 88 may be fastened to the barrel portion 90 of the carriage arm or connector 89 by a winged screw 91 (see Fig. 5), and since the link is pivoted to the bar 87, it can have relative play, the connector 89 acting as a crank to pull the sprayer carriages along their guideways from left to right when the bottom of the chain 78 is moving from left to right and when the link carrying the connector 89 is moving from right to left or is at the top of the chain, the sprayer will be pushed from right to left; that is, the sprayer will be reciprocated back and forth around the dishes and since there are two or more hollow rectangular frames surrounding the dishes with sprayer openings preferably directing the fluid in intersecting streams from the rectangular frames, it will be apparent that the spraying device will pass back and forth, traversing a path equidistant with the length of the frame so that all of the dishes will be subjected to a direct application of the water.

If a few dishes are to be washed, they will be placed in the center of the racks or in the middle of the frame and then the link 88 will be uncoupled from the barrel 90 and attached to a similar arm or connector 92 on one of the links of the chain 86. The action during the rotation of the operating mechanism will be exactly the same as above described except that the amplitude of movement of the sprayer will be reduced, resulting in a more concentrated application of the wash water and thereby

a saving of the wash water because if the sprayer passed through the entire length of the machine, there would be an unnecessary waste of wash water.

From the description so far, it will be evident that the dishes can be readily placed in the receptacle, the door 52 closed and the necessary valves opened to spray saponified water over the dishes, the waste water finally discharging from the washer into the silver cleaner. When the dishes have been thoroughly washed, fresh hot rinsing water may be applied to the dishes by means of a simple system of control valves, after which the water supply to the washer may be shut off by the valve 8 and the dishes left to dry. While the dishes are being washed, the silverware may be withdrawn from the box 35, wiped across the cleaner 41 so as to remove any adhering substances and then dried by hand. The box 35 may then be folded back against the washer and the waste water falling from the spout may be permitted to flow over cooking utensils so as to soak them preparatory to washing them. Either before or after the dishes are washed, the cooking utensils, such as pans, pots, etc., may be cleaned by means of the fountain brush 23 which may be supplied with either saponified or fresh water as required.

It is apparent that the device is simple in construction, inexpensive to manufacture and adapted to adequately cleanse all kinds of silverware, glassware, dishes and cooking utensils, and that this may be accomplished with a minimum of labor on the part of the operator. It is furthermore unnecessary for the operator to put his hands into the wash water during any of the washing processes.

It is further apparent that the device can be built to wash a small number of dishes, such as is required in a residence, or that it can be built to wash a large number of dishes, the capacity being dependent solely upon the volume of water available for supplying the machine.

It is further apparent that the device may be easily adjusted so as to economically operate without waste of water, soap or power when the number of dishes to be washed is less than the total capacity of the machine.

It is further apparent that the device may be built to fit on a drain board on the left side of a sink, or that it can be built to fit on the opposite side of the sink, or that when desired, it can be mounted upon a suitable base and be located at any convenient place.

It is also apparent that the spray frame may be reciprocated, as shown, by means of power derived from an electric motor, or that the same reciprocatory motion may be accomplished by means of a hand crank, or that a reciprocating water motor may be used to perform this function.

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

1. In a washing machine, a casing, means within the casing for supporting dishes, 5 tracks at the side of the supporting means, spaced pipes surrounding the supporting means, having traveling support on said tracks and having openings adapted for delivering jets at different angles towards the 10 top, sides and bottom of the supporting means to contact with dishes supported thereon, means for reciprocating the pipes, and means for supplying water to the pipes, the 15 perforated branches for delivering jets upwardly at different angles to supplement the jets from the pipes proper.

2. A washing machine comprising a casing, means for supporting dishes within the casing, a water distributor within the casing 20 and mounted for reciprocatory movement, a driven belt within the casing, and means for connecting the water distributor to the belt.

3. A washing machine comprising a casing, 25 means for supporting dishes within the casing, a water distributor within the casing and mounted for reciprocatory movement, a plurality of drive belts of different lengths, the means for interchangeably connecting 30 the water distributor to the several belts.

In testimony whereof I affix my signature.

ERIC W. BACHARACH.