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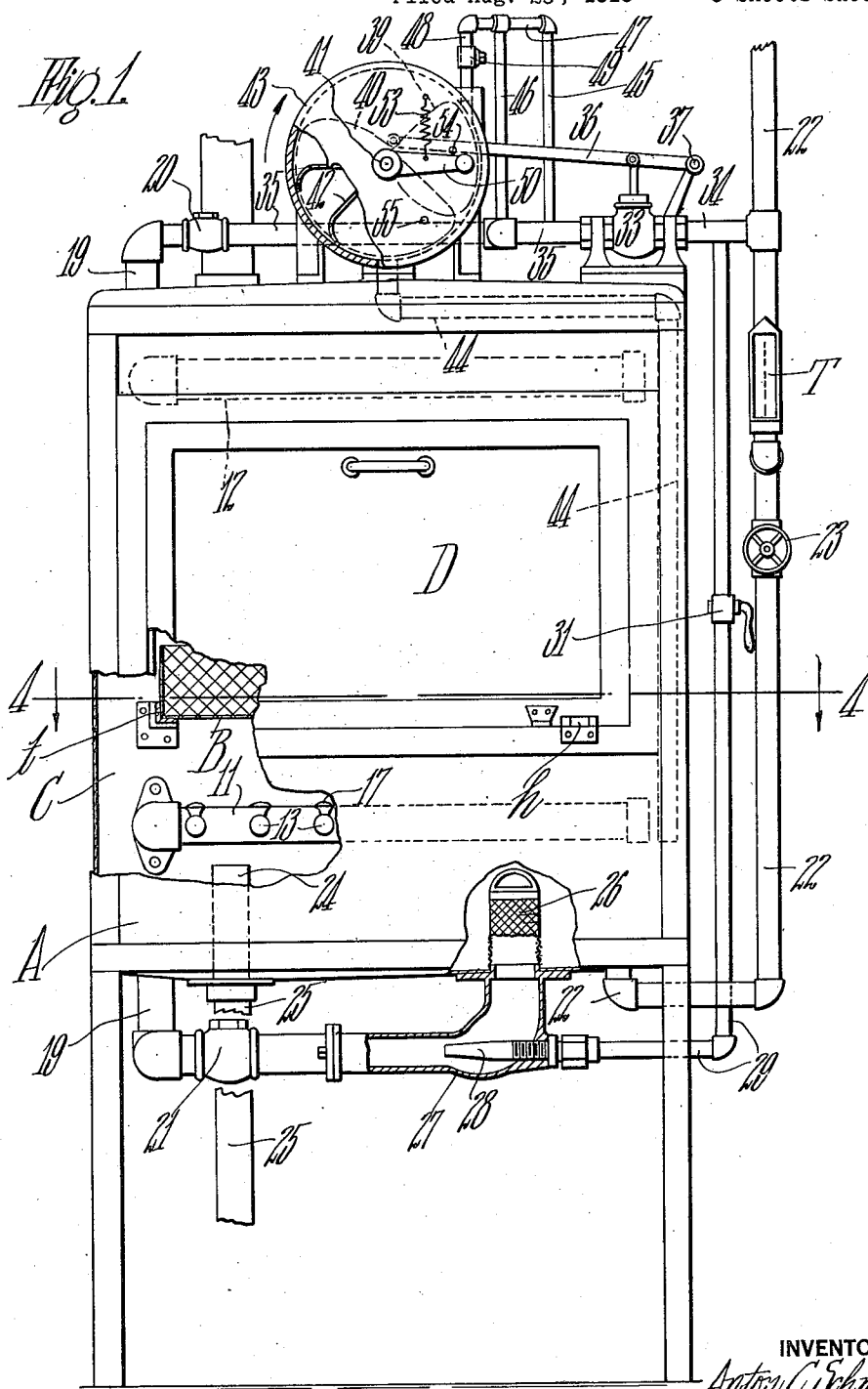
1,452,710

A. C. SCHMELZER

WASHING MACHINE

Filed Aug. 29, 1919

3 Sheets-Sheet 1



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Apr. 24, 1923.

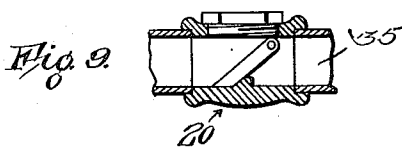
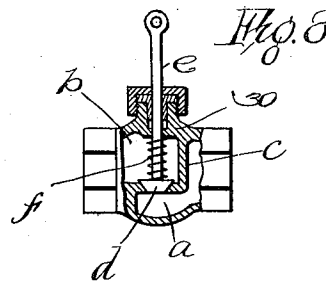
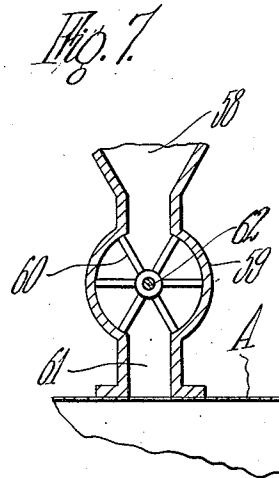
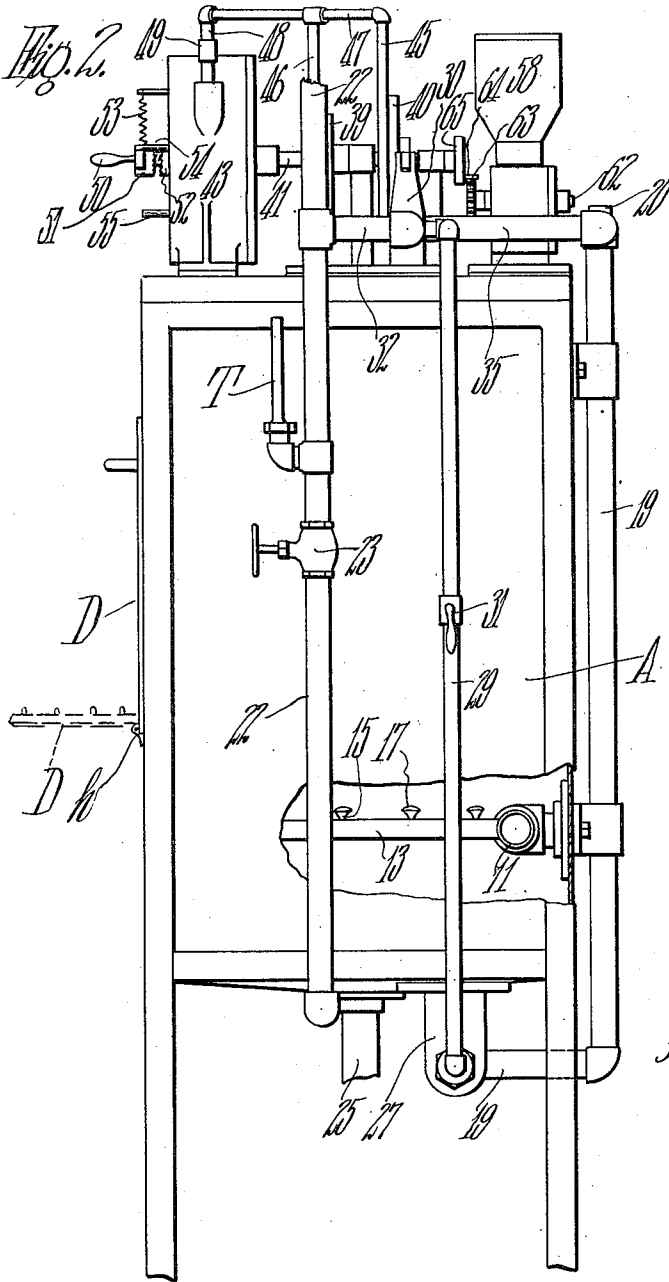
1,452,710

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WASHING MACHINE

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3 Sheets-Sheet 2



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WASHING MACHINE

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3 Sheets-Sheet 3

Fig. 3.

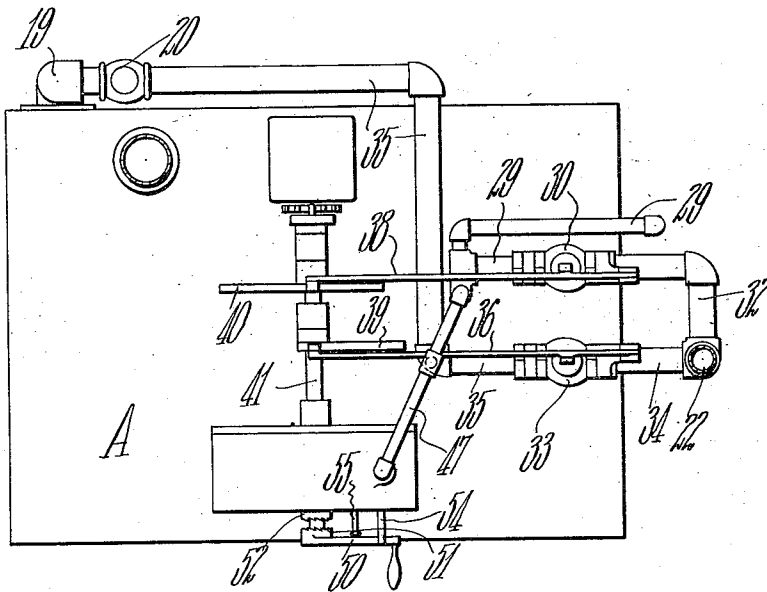


Fig. 4.

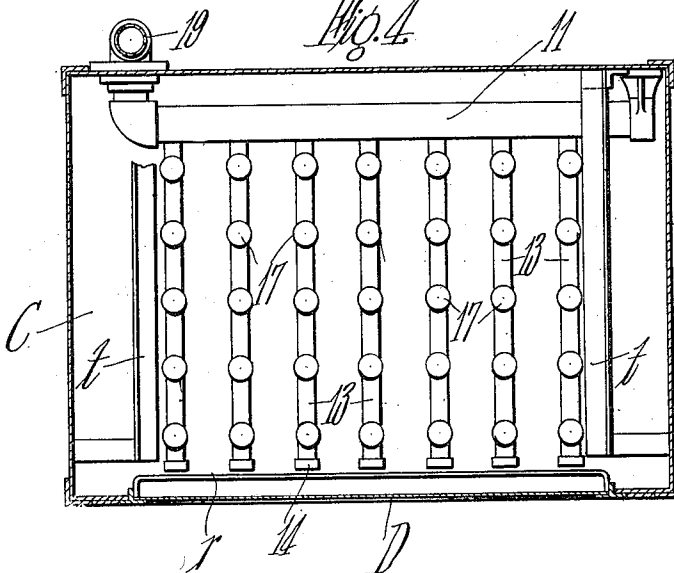


Fig. 5.

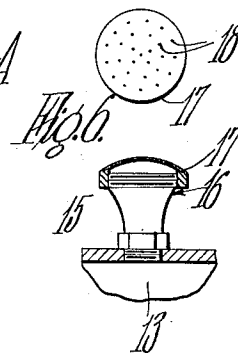
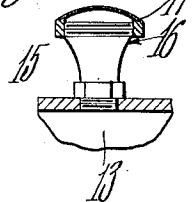


Fig. 6.



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Patented Apr. 24, 1923.

1,452,710

UNITED STATES PATENT OFFICE.

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WASHING MACHINE.

Application filed August 29, 1919. Serial No. 320,717.

To all whom it may concern:

Be it known that I, ANTON C. SCHMELZER, born in Hungary of Hungarian parents, now believing myself to be a citizen of that country, and having formally declared my intentions of becoming a citizen of the United States of America in conformance with the United States immigration laws, and now residing at Springfield, in the county of Hampden and State of Massachusetts, United States of America, have invented certain new and useful Improvements in Washing Machines, of which the following is a specification.

15 This invention relates to washing machines, and, more particularly, to machines for washing and rinsing or sterilizing drinking glasses, dishes and other articles of like nature.

20 An object of the invention is to provide a washing machine, wherein washing and rinsing water may be delivered into the washing compartment of the machine through separate and independently controlled means, and wherein timing mechanism is employed to actuate the controlling device of each such means at properly timed intervals.

30 Another object of the invention is to provide in a machine of the class described, a driving means for the timing mechanism arranged to utilize some of the washing and rinsing water as motive power.

35 Another object of the invention is to provide a washing machine having a compartment in which water may be maintained at substantially a constant level, means connecting the lower portion of such compartment to the upper portion thereof, together with means in the nature of an injector to circulate such water.

40 Another object of the invention is to provide in a washing machine automatic feeding means to periodically supply measured quantities of soap or the like thereto.

45 A further object of the invention is to provide in a washing machine generally improved mechanical structure.

50 Other objects and advantages will appear in the following description and in the illustrative embodiment of the invention in the accompanying drawings, in which—

Fig. 1 is a front elevational view of a washing machine embodying the invention;

Fig. 2 is a side elevational view thereof; 55
Fig. 3 is a top plan view of the machine;
Fig. 4 is a sectional plan view taken on the line 4—4 of Fig. 1;

Figs. 5 and 6 are plan and elevational views respectively of nozzles used with the machine; 60

Fig. 7 is a sectional elevational view of a soap dispenser used with the machine;

Fig. 8 is a sectional view of one of the control valves; and 65

Fig. 9 is a sectional view of one of the check valves.

Referring to these drawings: A represents the casing of the machine which affords a chamber or washing compartment C. A door D hinged along its lower edge at *h* affords access to compartment C and is movable to a horizontal position, as shown by dotted lines in Fig. 2, to provide a shelf upon which the articles to be washed may be placed. Such articles are preferably placed in a wire mesh tray or basket B (Fig. 1), which may be supported by a plurality of cross rods *r* on door *d* (Figs. 2 and 4), and the tray, after the articles have been assembled therein, may be pushed along the shelf forming door D into the compartment C. In the latter, and suitably supported from casing A as indicated, are two spaced angle iron tracks *t* along which the tray may be slid and thereafter supported for the washing and rinsing operations. 75

The washing and rinsing operations are accomplished by the use of the same two sets of nozzles, one set being located above and the other below the basket B. As shown in Fig. 4, a header pipe 11 is supported along the rear wall of casing A and this pipe supplies all the nozzles of the lower set. There is a corresponding and similarly located header pipe 12 located above the basket B, as indicated in dotted lines in Fig. 1. Connected to the header pipe 11 at suitable intervals therealong, and extending forwardly toward the front of casing A, are a plurality of nozzle pipes 13, the outer ends of which terminate closely adjacent the front wall of the casing and are capped, as indicated at 14. Removably connected to each pipe 13 at regularly spaced intervals therealong are a series of nozzles 15 which project upwardly therefrom. One of these nozzles is shown in Figs. 5 and 6 and as indi- 85 90 95 100 105

cated is provided with an upwardly diverging outlet end 16, which end is capped by a removable crowned member 17. The top face of the latter is provided with a large number of openings 18, preferably arranged in circular series as indicated. The upper nozzles are of identical construction and are similarly mounted, except that their outlets are directed downwardly.

It will be seen that each nozzle is so constructed as to emit a large number of separate streams, which streams are directed at many different angles. The several nozzles are also spaced uniformly so as to cover the entire area of the compartment C beneath, or above, the basket B. The result is that there is no part of the basket B which is not reached by the streams from the nozzles and, in fact, the streams from adjacent nozzles overlap and the streams from one criss-cross those from the next to insure that all parts of the basket B will be reached from many and widely varying angles. This arrangement is important as providing for effective washing and rinsing operations.

The header member 11 is connected, as shown in Fig. 4, to a pipe 19 which extends vertically along and outside the rear wall of casing A to positions above and below the compartment C (see Fig. 1). At its upper end pipe 19 is connected to a check valve 20 (see also Fig. 9), and such valve permits water to enter, but not to leave the upper end of pipe 19. At its lower end pipe 19 is connected to a check valve 21 which likewise permits water to enter, but not to leave the lower end of the pipe and which may be of the same construction as the valve 20. The upper header pipe 12 is connected to pipe 19, in a manner similar to that in which header pipe 11 is connected, and at a point between the check valves. Through the check valve 21 the washing water is forced upwardly through pipe 19 to both sets of nozzles, and through the check valve 20 the rinsing water is forced downwardly through the pipe 19 to the same two sets of nozzles. There are separate, alternately operable, and automatically controlled means to deliver washing and rinsing water to the pipe 19, as will appear.

The water, used for both washing and rinsing, enters through a pipe 22 which is adapted for connection to a suitable supply of hot water. Pipe 22 extends downwardly and is connected through the bottom wall of casing A to the compartment C. A thermometer T may be provided in pipe 22, if desired, and a valve 23 is interposed in pipe 22 and normally is closed, but can be opened to fill the lower part of compartment C, when necessary or desired. An overflow pipe 24, adapted for connection through pipe 25 to the sewer or other drain, provides for a substantially constant level

of water in compartment C. In the lower part of the latter is a screened outlet 26 through which water from compartment C may flow into an elbow-shaped casing 27, which is connected, as indicated, to the check valve 21. Mounted in casing 27, and in line with its outlet end, is a nozzle 28 and such nozzle is connected by a pipe 29 to a valve 30, (Fig. 3) mounted on the upper wall of casing A. The members 27 and 28 constitute an injector, operable by using water admitted into pipe 29 by valve 30 to force water, taken from the lower part of compartment C, through valve 21 and upwardly through pipe 19 to the nozzles 15. A regulating valve 31 is interposed in pipe 29 to control the flow to the injector 28 and to vary such flow as is necessary or desired.

The main inlet pipe 22, is connected above valve 23 to the valve 30 by means of a pipe 32. A second valve 33, similar to valve 30, is likewise connected to pipe 22, and above valve 23 by a pipe 34. The other end of valve 33 is connected by a pipe 35 to the check valve 20, so that, when valve 33 is opened, clean hot water may be passed downwardly through pipe 19 to both sets of nozzles.

Both valves 30 and 33 are similar and are of the well-known type which automatically close. As shown in detail in Fig. 8, the valve 30 is formed with two chambers *a* and *b* separated by a partition *c* having an opening extending therethrough in which a valve *d* is normally seated. The valve *d* is carried at the lower end of a valve stem *e* which extends through a stuffing box in the valve casing and is adapted to be lifted to open the valve. The valve is rendered self-closing by means of a spring *f* which surrounds the valve stem between the valve and the inside of the valve casing. The valve 33 may be opened by a lever 36 which is pivoted at 37 to a bracket on casing A and is connected intermediate its ends to the stem of the valve. The valve 30 may be opened by a similarly mounted lever 38 (Fig. 3). The free ends of levers 36 and 38 rest upon cams 39 and 40, respectively, which cams are fixed upon a shaft 41, suitably supported from the top wall of casing A. Consequently, on rotation of shaft 41 in a clockwise direction (as viewed in Fig. 1) the lever 38 will be first lifted by cam 40 to open valve 30 and thereby permit the washing water to be forced into compartment C by the injector device described. Eventually, cam 40 will allow lever 38 to drop and close valve 30. About this time, preferably shortly before, cam 39 raises lever 36 and opens valve 33 to admit rinsing water into compartment C. The two valves 30 and 33 have a function in controlling the rotation of shaft 41 and it is therefore desired to have the latter open slightly before the

former closes, merely to insure continued rotation of the shaft. The two valves are, however, substantially alternately operable.

The shaft 41 is rotated as follows. On this shaft is the rotor of a water motor, herein shown as a bucket wheel 42. This wheel is revoluble in a closed casing 43 supported on the top of casing A. An outlet pipe 44 leads from casing 43 into the lower part of the compartment C, as indicated in Fig. 1. The water used for washing and rinsing,—that passing through valves 30 and 33,—is made to operate the water motor and subsequently discharges into the compartment C to be later used. Thus, no water is wasted. From pipes 29 and 35, two smaller pipes 45 and 46 extend upwardly and connect with a horizontal pipe 47 which in turn delivers into a pipe 48 extending downwardly and tangentially into casing 43. A regulating valve 49 is preferably provided in pipe 48 to control the flow of water to the water motor and thus the speed of the latter.

To start the water motor, an operating crank 50 is loosely mounted on shaft 41 and is provided with a clutch element 51 which, when crank 50 is moved inwardly, may engage a mating clutch element 52 fixed on shaft 41 (Fig. 3). A spring 53 (Fig. 1) tends to hold crank 50 in the illustrated position, wherein it abuts a stop 54 on casing 43. The crank 50 may, however, be moved downwardly against the tension of spring 53 until it abuts a second stop 55 on casing 43. The limits of movement of crank 50 are sufficient to permit shaft 41 to be manually turned by it until cam 40 has raised lever 38 sufficiently to open valve 30. The opening of valve 30, of course, admits a regulated quantity of water into casing 43 to fill one bucket of rotor 42, whereupon the latter turns bringing a succeeding bucket into position to receive water from pipe 46, and so forth, whereby the member 42 may be rotated until the water supply thereto is cut off by the closing of valve 33, the parts coming to rest in the illustrated position. Thus, each of the valves 30 and 33 are automatically held open for a predetermined interval.

Associated with the casing A is an automatic means to supply measured quantities of soap or the like to the water in the lower part of casing A. Such means includes a container 58 for soap or the like, preferably in either powdered or liquid form. The outlet end of container 58 communicates with a cylindrical casing 59 in which is rotatably mounted a pocketed feed wheel 60, which is arranged to turn step by step and to carry measured charges of soap from the container and deliver them into and through a passage 61 into casing A. On one end of the shaft 62 of wheel 60 is a toothed wheel 63 (Fig. 2) and above the latter is a crank pin 64, carried by a disk 65 fixed on the de-

scribed shaft 41. The arrangement is such that on each revolution of shaft 41, the pin 64 will engage the toothed wheel 63 and turn it one step, whereby the feed wheel 60 is turned to empty one its pockets into the casing A. The actuation of the wheel 63 occurs just prior to the closing of valve 33.

The operation will largely appear from the foregoing description and need only be briefly summarized. Having a suitable supply of water, at the proper temperature as shown by thermometer T, the lower part of casing A is filled to the desired level by opening the valve 23. Having filled the casing to the desired level and closed valve 23 and having placed the basket B within compartment C and closed door D, the operator pushes crank 50 inwardly to engage the clutch elements 51 and 52 and then turns it clockwise until it strikes the stop 55. This effects an opening of valve 30 and admits water to the rotor 42, which controls the timing cams 39 and 40. The cam 40 first operates and holds valve 30 open for a predetermined interval during which water, a large part of which is taken from the base of compartment C and therefore has soap or the like therein, is forced through the many nozzles to effectively wash the articles in basket B. At or about the time that valve 30 automatically closes, cam 39 comes into play and opens valve 33 to admit clean hot water to the nozzles for the rinsing function. The rinsing continues for a predetermined interval which is terminated by the automatic closing of valve 33.

The invention has been disclosed herein for illustrative purposes, but the scope of the invention is defined by the appended claims rather than by the foregoing description.

What I claim is—

1. In a washing machine, a washing compartment, sprinklers located in said compartment, separate means to deliver washing and rinsing water to said sprinklers, a self-closing valve associated with each of such means, means actuated by the flow of water to control the closing of the washing water valve and the opening and closing of the rinsing water valve, and manually operable means to open the washing water valve and start said mechanism in operation.

2. In a washing machine, a washing compartment, separate means to deliver washing and rinsing water thereto, a self-closing valve associated with each of such means, means including a water motor to control the closing of the washing water valve and the opening and closing of the rinsing water valve, connections from each of the first-named means to said motor, and manually operable means to open the washing water valve and start said mechanism in operation.

3. In a washing machine, a washing compartment, separate means to deliver washing

and rinsing water thereto, a self-closing valve associated with each of such means, means including a water motor to control the closing of the washing water valve and the opening and closing of the rinsing water valve, connections from each of the first-named means to said motor, manually operable means to open the washing water valve and start said mechanism in operation, and regulating means associated with said connections to control the flow of water to said motor, whereby the speed of said motor and the duration of the washing and rinsing operations may be controlled.

4. In a washing machine, a washing compartment, sprinklers located in said compartment, means for supplying washing and rinsing water to said sprinklers including a common conductor for both, a connection to deliver washing water to one end of said conductor, means including a valve to control said delivery, a check valve to prevent return flow into said connection, a connection to deliver rinsing water to the other end of said conductor, a valve to control said delivery, a check valve to prevent return flow into the last named connection, means for opening the wash water control valve, and means actuated by the pressure of the water passing through said valve for closing the latter and for opening and closing the other control valve.

5. In a washing machine, a washing compartment, a conductor to deliver washing water therein, a second conductor to deliver rinsing water therein, a self-closing valve associated with each conductor, a cam shaft, a cam thereon for each valve, a lever for each valve operable to open its valve and movable by its cam, means to turn said shaft including a bucket wheel, and connections from each of said conductors to supply a part of the washing and rinsing water to said wheel.

6. In a washing machine, a washing compartment, a conductor to deliver washing water therein, a second conductor to deliver rinsing water therein, a self-closing valve associated with each conductor, a cam shaft, a cam thereon for each valve, a lever for each valve operable to open its valve and movable by its cam, means to turn said shaft including a bucket wheel, connections from each of said conductors to supply a part of the washing and rinsing water to said wheel, manually operable means to turn said shaft sufficiently so that one of said cams opens its valve to admit water to said wheel, the other cam arranged to open its valve substantially at the time of closing of the first valve, so that the supply to said wheel is uninterrupted.

7. In a washing machine, a washing compartment in which water is maintained at a substantially constant level, a plurality of spray pipes in said compartment, a pipe con-

necting said spray pipes with the water in said compartment and with a supply of rinsing water, and means for alternately drawing washing water from the compartment and forcing it in one direction through the connecting pipe to the spray pipes and for forcing rinsing water in the opposite direction through the connecting pipe to the spray pipes.

8. In a washing machine, a washing compartment in which water is maintained at a substantially constant level, a plurality of sprinklers in said compartment, a supply pipe connecting said sprinklers with the water in said compartment and with the supply pipe through which water may flow in one direction from the supply pipe and in the opposite direction from said compartment, and means including an injector whereby the water from the supply pipe may be utilized for forcing water from the compartment through the connecting pipe to the sprinklers, and means for controlling the flow in each direction through said connecting pipe.

9. In a washing machine, a casing affording a washing compartment adapted to contain a body of water maintained at substantially a predetermined level, a dispensing means operable to deliver measured quantities of soap or the like into the casing and into said water, means to circulate such water, a controlling valve and manually operable means to open it, timing mechanism operable to close said valve after a predetermined interval, and means controlled by the timing mechanism to successively operate said dispensing means.

10. In a washing machine, a casing affording a washing compartment adapted to contain a body of water maintained at substantially a predetermined level, a dispensing means operable to deliver measured quantities of soap or the like into the casing and into said water, means to circulate such water, a controlling valve and manually operable means to open it, means to deliver rinsing water into the casing including a controlling valve, timing mechanism operable to close the first-named valve after a predetermined interval, and to later open and close the second-named valve, and means controlled by the timing mechanism to successively operate said dispensing means substantially at the time of closing of the second-named valve.

11. In a washing machine, a washing compartment, delivery pipes leading thereto, a control valve in each of said pipes, a common source of water supply for said pipes, manually operable means for opening one of said valves, and means actuated by the flow of water for closing said valve and for opening and closing the other valve.

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