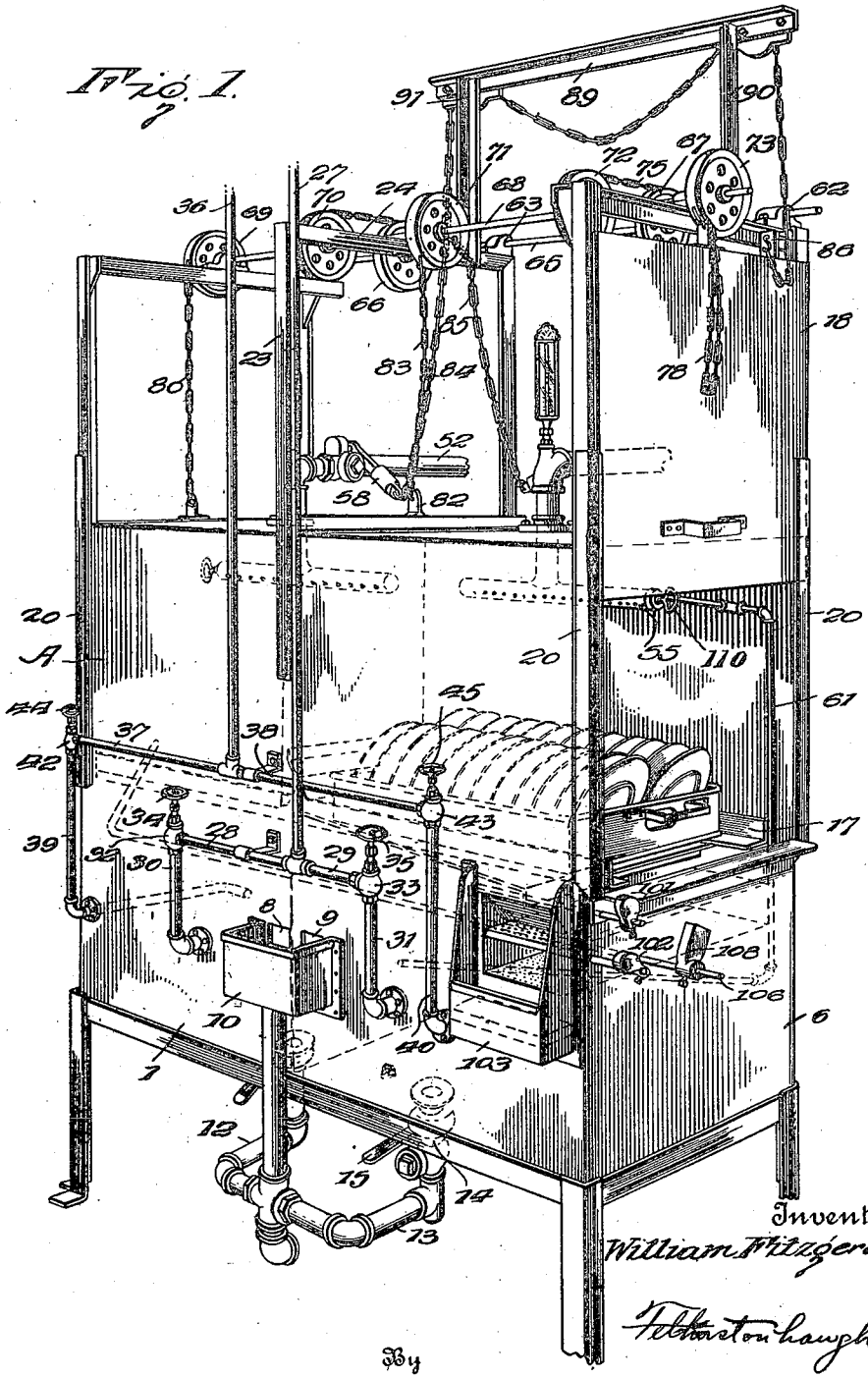
May 27, 1924. 1,495,473

W. FITZGERALD

DISHWASHING MACHINE

Filed Feb. 20, 1920 4 Sheets-Sheet 1

Fig. 1.




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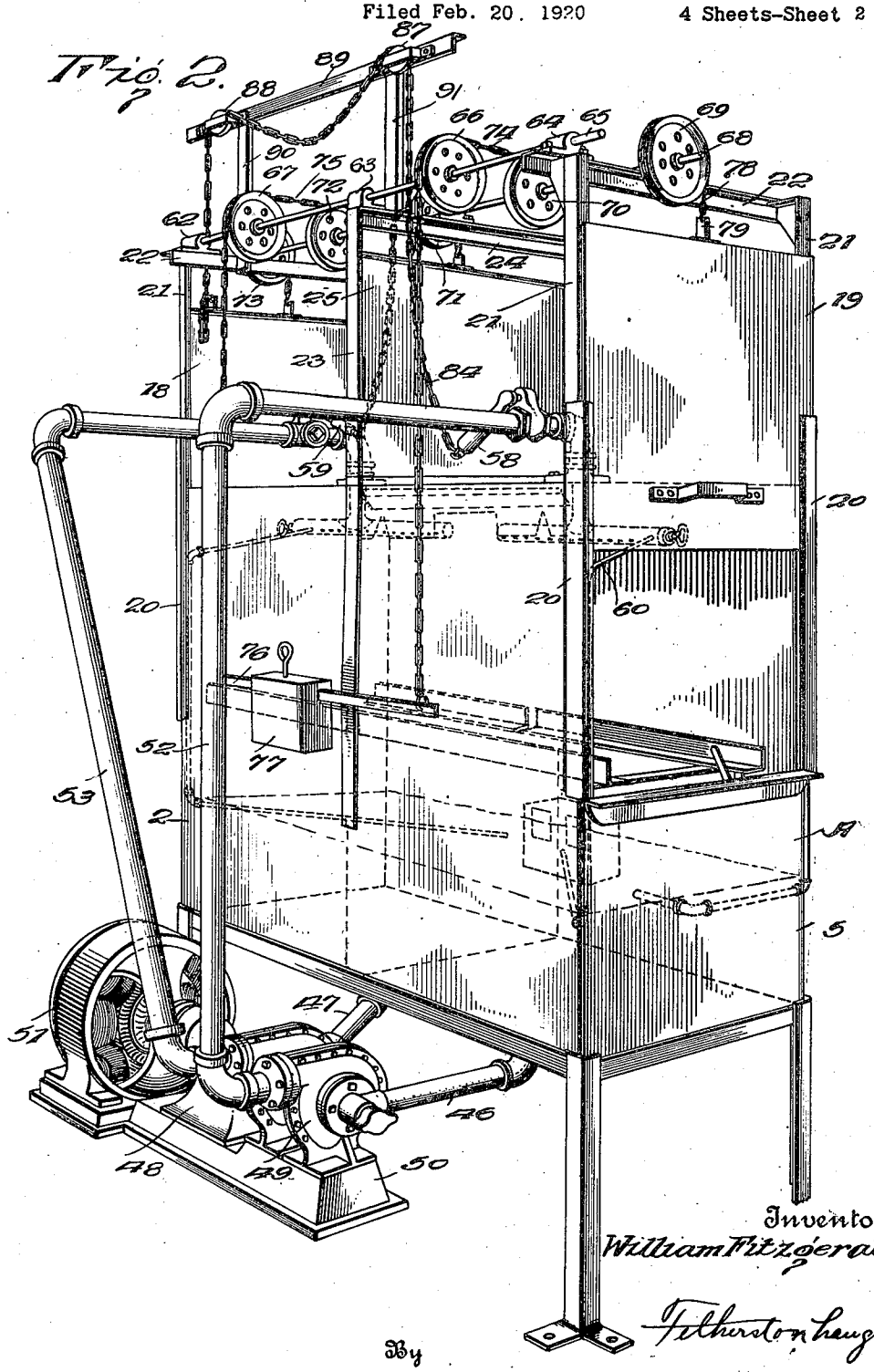
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Filed Feb. 20, 1920 4 Sheets-Sheet 2




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DISHWASHING MACHINE

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Fig. 3.

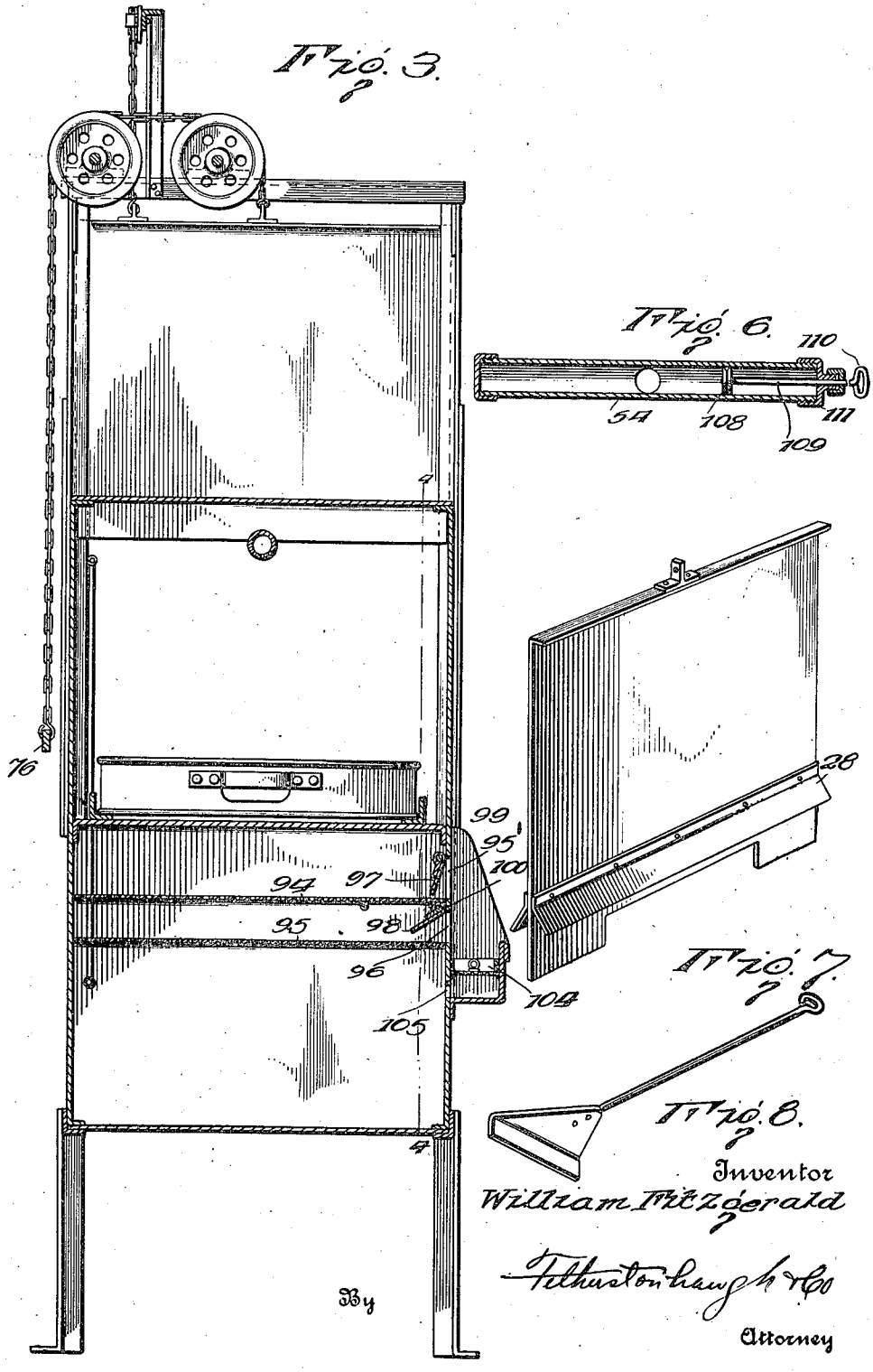



Fig. 6.







Fig. 7.



Fig. 8.

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May 27, 1924. 1,495,473

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DISHWASHING MACHINE

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Fig. 4.

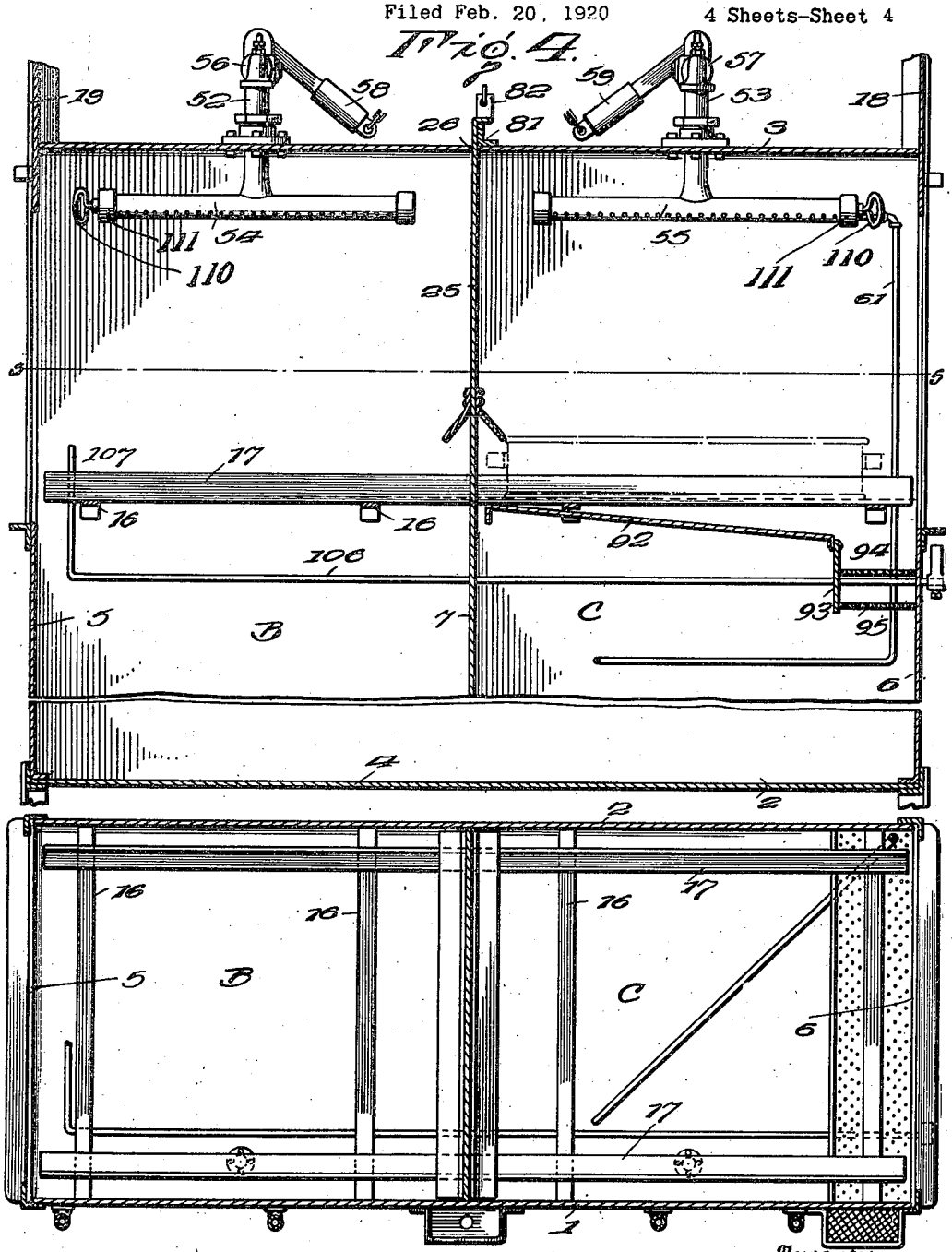



Fig. 5.

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# UNITED STATES PATENT OFFICE.

WILLIAM FITZGERALD, OF MEMPHIS, TENNESSEE.

## DISHWASHING MACHINE.

Application filed February 20, 1920. Serial No. 360,081.

*To all whom it may concern:*

Be it known that I, WILLIAM FITZGERALD, a citizen of the United States, and resident of Memphis, in the county of Shelby and State of Tennessee, have invented certain new and useful Improvements in Dishwashing Machines, of which the following is a specification.

This invention relates to improvements in washing machines; being particularly directed to washing machines of the type more especially adapted for the washing of dishes and other tableware.

In order that a clearer understanding may be obtained of the particular improvements with which my invention is chiefly concerned, I would state here that there has been proposed a type of dish washing machine which provides separate tanks, which I will hereafter term the washing and rinsing tanks, for containing respectively, a washing fluid and a rinsing fluid; together with a chamber supported above the tanks to receive the dishes to be washed and a pair of spraying devices located in the top of the chamber and adapted to direct a shower or spray of fluid down upon the dishes. Each of the said spraying devices receives fluid from one of the tanks and is arranged to discharge into its tank only, the fluid being drawn from the tank by suitable pumping mechanism and supplied to the spraying device under pressure.

A defect noted in connection with this type of apparatus is that all refuse in the form of solid particles entrained by the cleaning fluid in its passage over the dishes is not thoroughly removed from such fluid prior to the return thereof to the main body of fluid in the washing tank. To accomplish this, it has been proposed to place a screen in the washing tank above the body of fluid therein, but this arrangement has not proven efficient, for the reason that the cleaning fluid after passing over the dishes from the spraying device falls vertically upon the screen with sufficient force to disintegrate the solid particles of refuse retained on the screen with the result that such particles are ultimately forced through the screen and into the body of washing fluid, creating an unsanitary condition.

With the foregoing in mind, the primary object of my invention is to provide a generally improved dish washing machine of the above type which will not only eliminate the defects pointed out, but will also provide additional advantageous features.

Other and more specific objects of the invention are to provide in a dish washing machine of the type described, 1st means to prevent co-mingling of the washing and rinsing fluids during the operation of the machine, 2nd, means for removing all refuse in the form of solid particles entrained by the washing fluid in its passage over the dishes prior to the return of such fluid to the main body of washing fluid in the washing tank; and disposing such refuse in an accessible portion of the machine to permit the ready removal of the same, 3rd to remove all scum and grease floating on the surface of the fluids in the washing and rinsing tanks by forcibly directing a stream of fluid across the surface of each of the first-mentioned fluids and in the direction of a suitable overflow outlet, 4th separate supply, temperature regulating and drainage means for each tank, and 5th, closure means for the dish receiving chamber and means controlled by the movement of such closure means for turning on or shutting off the spraying devices.

An additional object of the invention may be said to reside in the provision, construction, arrangement and assemblage of the parts hereinafter specifically described, whereby the machine as a whole is adapted to more efficiently perform the functions required of it.

Referring now to the drawings:

Figure 1 is a perspective view of the machine with one of the end closures in raised position.

Fig. 2 is a view similar to Fig. 1, but taken from an opposite direction.

Fig. 3 is a vertical transverse sectional view.

Fig. 4 is a vertical longitudinal sectional view, taken on the line 4—4 of Fig. 3.

Fig. 5 is a horizontal longitudinal sectional view taken on the line 5—5 of Fig. 4.

Fig. 6 is a view illustrating the application of a cleaning device for one of the sprayers.

Fig. 7 is a perspective view of the partition plate, and

Fig. 8 is a perspective view of an implement to be used in connection with my machine.

Proceeding now to a detailed description of the preferred embodiment which I have elected to disclose in this application, the letter A designates the enclosing case, which in the present instance, is shown as somewhat elongated in form and consists of side walls 1 and 2, a top wall 3, a bottom wall 4, and end walls 5 and 6, the latter walls rising from the bottom wall and terminating a substantial distance short of the top wall, thus leaving the upper half of the case open at the ends. The lower half of the case is divided intermediate of its length by a transverse partition 7 forming on opposite sides of the partition the tanks or reservoirs B and C for containing respectively a rinsing fluid and a washing fluid. The said compartments B and C are provided with the individual overflow openings 8 and 9, which are located close together on opposite sides of the partition 7, so as to discharge into a common overflow casing 10, suitably secured to the outside of the case and over the said openings. The casing 10 is open at the top so that the overflow is visible to the operator at all times and from the bottom wall of this casing extends a drain pipe 11. Branch pipes 12 and 13 extend from the pipe 11 to the bottom of the tanks or reservoirs B and C, and each of the said branches 12 and 13 is provided with a gate valve 14 having an operating handle or lever 15.

Spaced transversely extending supporting members 16 are secured within the case as shown to advantage in Figs. 4 and 5, and upon these members are supported the track members 17, which extend inwardly in pairs from opposite ends of the tank and terminate on opposite sides of the partition 7. The space within the case above the track members 17 constitutes the dish receiving chamber, the open ends of which are adapted to be closed by the vertically sliding doors 18 and 19. These doors 18 and 19 operate in suitable guides 20 arranged as shown. In the present instance each guide 20 is in the form of an L-shaped angle bar arranged with the portion of the bar forming the shorter arm of the L secured to a side of the case and the portion of the bar forming the longer arm of the L spaced from an adjacent end of the case to provide an intervening guide space receiving an edge of one of the end closures, as shown to advantage in Figs. 4 and 5. The upper ends of the angle bars or guides 20 project a slight distance above the top of the case and are assisted in guiding the end closures in their travel above the case by the supplementary angle bars 21 rising in pairs from the top of the casing adjacent each end of the latter and arranged as shown. The upper ends of each pair of bars 21 are connected by horizontally disposed angle bar 22. Between the bars 21 there is arranged an additional pair of bars 23 having the lower portion thereof suitably connected to the case and the upper ends thereof connected by a horizontal bar 24 corresponding to the bars 22 and disposed in alinement therewith. These bars 23 serve to guide the upward movement of a partition 25 sliding vertically in a central transversely extending slot or opening 26 formed in the top wall of the case. This partition, in lowered position is adapted to divide the dish chamber into two separate compartments in which the washing and the rinsing of the dishes are successively carried out as hereafter described. Adjacent the lower end of the partition deflectors 28 are secured to opposite sides of the partition and, in the present instance, such deflectors are shown as inclining downwardly and outwardly from the partition for engagement with an end of the dish tray when the latter is arranged in one of the compartments.

The water for the tanks or reservoirs B and C is supplied by a pipe 27 provided at the discharge end thereof with a suitable T coupling from which lead the oppositely directed branches 28 and 29. The branches 28 and 29 are connected with the vertical branches 30 and 31 through the medium of valve casings 32 and 33, housing therein suitable valves having the operating handles 34 and 35. The branch 30 leads to the tank B and the branch 31 to the tank C. In order that the temperature of the water in each tank may be independently regulated I also provide a steam supply pipe 36 provided at the discharge end thereof with a suitable T coupling from which lead oppositely directed branches 37 and 38 connected in a suitable manner with vertical branches 39 and 40 through the medium of valve casings 42 and 43 housing therein suitable valves having operating handles 44 and 45. The vertical branch 39 is conducted into the tank B as shown by dotted lines in Fig. 1, and the vertical branch 40 is conducted in a similar manner into the tank C.

Intake pipes 46 and 47 conduct fluid from the tanks B and C to suitable pumps 48 and 49. In the present instance these pumps are shown as mounted on a common base 50 and driven from the shaft of an electric motor 51. The discharge from the pumps is conducted by pipes 52 and 53, which extend upwardly along one side of the case and then horizontally over the top of the case; the discharge ends of said pipes being connected in a suitable manner through the top of the case with the horizontal spraying pipes or devices 54 and 55 located in the top of the dish receiving chamber and adjacent opposite ends of said chamber. Above the top wall of the case the pipes 52 and 53 are provided with suitable valves 56 and 57 having weighted levers or handles 58 and 59 normally tending to gravitate to a valve

closing position, as more clearly shown in Fig. 4.

From the spraying pipes or devices 54 and 55 pipes 60 and 61 lead downwardly into the tanks B and C and have their lower ends directed horizontally in the direction of the overflow outlets 8 and 9. The lower horizontal portions of the said pipes 60 and 61 are located a definite distance below the level of the fluid in the tanks B and C and the purpose of these pipes is to direct a stream of fluid under pressure across the surface of the body of fluids in the said tanks and out through the openings 8 and 9 with the result that the scum and grease floating on the surface of said fluids will pass out through the said openings also.

Adjacent one end the bars 22 and 24 support thereon suitable alined bearings 62, 63 and 64 through which extends a revoluble shaft 65 mounting sheaves 66 and 67 adapted to revolve therewith. Intermediate their ends the bars 22 and 24 support in a similar manner a second revoluble shaft 68 on which are fixed the sheaves 69, 70, 71, 72 and 73; the sheaves 70 and 72 being disposed opposite the sheaves 66 and 67 on the shafts 65. Chains 74 and 75 are connected at one end to the sheaves 70 and 72 and are then passed over the sheaves 66 and 67 to extend downwardly along one side of the machine. The opposite ends of these chains are connected to the ends of a bar 76 having thereon an adjustable weight 77. One end of a chain 78 is secured to the sheaves 73 and the opposite end of this chain is suitably secured to the end closure 18, as for instance by being engaged with a lug 79 on the upper end of the said closure. A chain 80 is connected in a similar manner to the closure 19 and the sheave 69. As more clearly shown in Fig. 4, the upper end of the partition 25 is bent at right angles to engage an angle bar 81 extending transversely across the top of the case. The bent end of the partition is provided with an upwardly extending lug 82 to which is attached one end of a chain 83, the other end of the chain being attached to the sheave 71. Chains 84 and 85 connect at one end to the weighted levers 58 and 59, the latter chain being a relatively short chain having its opposite end connected to the chain 84 above the horizontal bar 24, as shown to advantage in Fig. 1. The chain 84 has its opposite end secured to a lug 86 on the upper end of the closure 18, the intermediate portion of the chain being trained over the pulleys 87 and 88 carried by a horizontal bar 89 disposed on the upper ends of vertical bars 90 and 91 rising respectively from one of the bars 22 and the bar 23.

By referring to Fig. 2 it should now be evident that when the doors 18 and 19 and the partition 25 are in elevated position the chains 78, 80 and 83 will be wound on the sheaves 73, 69 and 71 respectively while the chains 74 and 75 will be unwound from the sheaves 70 and 72 whereby the counter-weight 77 will be in its lowermost position. Assuming now that the door 18 is moved downwardly, it will be evident that through the medium of the chain 78 and the sheave 73 the shaft 68 and the remaining sheaves mounted thereon will be rotated in a direction to unwind the chains connected to the closure 19 and the partition 25 thereby permitting such closure and partition to descend simultaneously with the door 18. At the same time, it will be evident that the sheaves 70 and 71 are being rotated in a direction to wind the chains 74 and 75, thereby raising the counter-weight 77. When the closure 18 is again moved upwardly in order to gain access to the dish receiving chamber, it will be seen that the counter-weight 77 in descending tends to positively rotate the shaft 68 in the reverse direction, thus winding the chains 78, 80 and 83 on their respective sheaves and causing the door 19 and partition 25 to ascend with the door 18. It will also be evident that, during the downward movement of the closure 18, the chains 84 and 85 will be moved in a direction to raise the weighted levers 58 and 59, thus opening the valves controlling the passage of the fluid to the spraying devices 54 and 55. On the upward movement of the closure 18, the chains 84 and 85 relax sufficiently to permit the weighted levers 58 and 59 to gravitate to a valve closing position.

Above the level of the body of fluid in the tank C I mount an inclined splash plate 92 as shown to advantage in Fig. 4. This plate extends the full width of the tank and inclines downwardly from a point at or adjacent to the upper end of the partition 7 and has its lower end secured to the upper edge of a vertically disposed plate 93 extending transversely across the tank C in spaced parallelism with the end wall 6 of the case and forming in conjunction with the said end wall 6 and with the side walls of the case what may be termed a filtering chamber open at the top and bottom and discharging into the tank C. Superimposed screens 94 and 95 extend the full width of the tank C and are suitably supported in the filtering chamber between the plate 93 and the wall 6 and preferably, the openings in the lower screen are smaller than the openings in the upper screen, so that such particles of refuse as may pass through the openings in the upper screen will be caught and retained by the lower screen. The front wall 1 of the case is provided with openings 95′ and 96 communicating with the filtering chamber above and below the upper screen 94 and controlled by the inwardly opening doors 97 and 98. These doors 97 and 98 are fixed at their upper edges to suitably supported

rotatable shafts 99 and 100. These shafts are extended at one end through the adjacent wall 6 of the case and have mounted on the extended ends thereof adjustable counter-weights 101 and 102. By adjusting these counter-weights in an obvious manner, the doors 97 and 98 may be retained in open or closed position.

On the front wall I of the case a receptacle 103 is secured into which the refuse accumulated on the screens 94 and 95 may be raked as by means of an implement such as I have shown in Fig. 8. In this receptacle and above the bottom thereof there is located a screen 104 shown to advantage in Fig. 3, through which screen such fluid as may be deposited in the receptacle with the refuse from the screens 94 and 95, will pass into the bottom of the receptacle and return to the main body of fluid in the tank C through the opening 105 provided for this purpose. Preferably the screen 104 is removable from the receptacle.

To prevent the dish tray from being accidently pushed out of the machine when passing the said tray to a position beneath the rinsing sprayer, I provide a suitable form of stop consisting of a rod 106, extended through the wall 6 and the partition 7 of the case and having its inner end bent at right angles as indicated at 107. The outer end of this rod has an adjustable counterweight 108 mounted thereon which corresponds to the counter-weights 101 and 102 previously referred to and by means of which the angled end of the rod may be disposed vertically to engage the tray to limit movement of the tray in one direction or disposed horizontally to prevent such engagement.

In describing the complete operation of the machine, it will be assumed that the drain gate valves 14 are closed and the doors 18 and 19 and the partition 25 in their elevated positions. With the parts referred to arranged as stated, the water supply valves are opened through the medium of the handles 34 and 35, to admit water into the tanks B and C, and are permitted to remain open until there is an overflow into the casing 10, at which time the valve handles are operated to partially close the valves. The temperature of the water in one or in both of the tanks may now be regulated by manipulating the handles 44 and 45 controlling the steam valves. The dish tray containing the dishes to be washed is now placed upon the track members 17 and moved to a position directly beneath the washing sprayer 55. The electric motor operating the pumps is now started in the usual manner and the door 18 pulled downwardly to close the end of the dish receiving chamber. This downward movement of the door 18 will cause the door 19 and the partition 25 to descend simultaneously therewith as previously explained and will also open the valves controlling the passage of fluid from the pumps 48 and 49 to the spraying devices 54 and 55. In this manner, it will be seen that the dishes beneath the washing sprayer 55 will be subjected to a shower or spray of washing fluid which is directed from the sprayer in such manner and with sufficient force to thoroughly remove all refuse in the form of solid particles from the dishes. After its passage over the dishes the washing fluid together with the entrained refuse falls downwardly upon the splash plate 92, and is guided thereby into the filtering chamber provided by the plate 93 and screens 94 and 95. The fluid passes through the screens 94 and 95 in the said filtering chamber and returns to the main body of washing fluid in the tank C. The solid particles or refuse are caught by the screens 94 and 95 and the accumulated refuse may be readily removed from such screens through the doors 97 and 98 and deposited in the receptacle 103.

It will be noted here that the splash plate 92 receives the direct vertical impact of the fluid falling from the washing sprayer 55, with the result that the velocity of the flow of such fluid will be reduced before passing into the filtering chamber and upon the screens 94 and 95.

When the washing operation is completed the door 18 may be raised. The operator may then insert his arm into the dish receiving chamber to pass the dish tray to a position beneath the rinsing sprayer 54, without having his clothing saturated by the spray. The closures 18 and 19 and the partition 25 are now returned to lowered position, thus setting in operation the rinsing sprayer 54 the fluid from which removes all grease from the dishes and effects the final cleaning thereof, such grease as is removed being passed downwardly into the tank B. As previously explained, all grease and scum accumulated on the surface of the liquids or fluids in the tanks 5 and 6 will be forced outwardly through the overflow openings 8 and 9 through the medium of the pipes 60 and 61.

In Fig. 6 I have shown the application of a cleaning device to one of the sprayers whereby the latter may be readily cleaned. This cleaning device consists of a plunger head 108 of a size to be snugly received within the bore of the spraying device designated at 54, and to be reciprocated therein. The plunger head is provided with a suitable operating rod 109 equipped at its outer end with a handle 110. The rod portion 109 of the device is slidably mounted in a suitable manner through the center of a threaded cap 111 adapted to be engaged with an end of the spraying device as shown. It will

be understood that each of the spraying devices is provided with one of these cleaning devices as shown to advantage in Fig. 4.

While I have disclosed a preferred embodiment of my invention, I do not wish to be limited to the exact details of construction and arrangement shown and described as it is my intention to make such changes in the construction, arrangement and combination of parts as I may desire, providing that the same come within the scope of the appended claims and do not depart from the spirit of the invention.

What is claimed is:—

1. A washing machine comprising a fluid reservoir provided with an overflow outlet, a spraying device discharging into said reservoir, and means for conducting a portion of the fluid supplied to said spraying device across the body of fluid contained in the reservoir and in the direction of said overflow outlet.

2. A washing machine provided with a chamber to receive the articles to be washed, closure means for the chamber, means for passing a fluid over the articles to be washed, valve means controlling the passage of said fluid and normally tending to shut off the flow of the fluid, and flexible connecting means extending between said valve means and the closure means, whereby actuation of the valve means is controlled by movement of the closure means.

3. A washing machine comprising a chamber to receive the articles to be washed, a spraying device in said chamber, means for supplying fluid to said spraying devices, a counter-balanced valve controlling the passage of fluid to the spraying device and normally tending to a closed position, and a closure for the chamber connected to the counter-balanced valve in such manner that when the closure is in its closed position the valve will be opened and when the closure is in its open position the valve will be permitted to close.

4. A dish washing machine comprising a reservoir adapted to contain a fluid and provided with an overflow outlet, means for supporting dishes above said reservoir, a spraying device located above said dish supporting means and discharging into said reservoir, and a conduit depending from the spraying device into the reservoir and having the lower end thereof directed horizontally to extend a definite distance below the level of the fluid in the reservoir and in the direction of the overflow.

5. In a dish washing machine of the type comprising a reservoir for containing a fluid, and means for causing the fluid to be passed over the articles to be washed and returned to the reservoir, a plate mounted above the main body of fluid contained in said reservoir and inclining downwardly from a point immediately adjacent one side wall of said reservoir to a point spaced from the opposite side wall of the reservoir, a partition wall extending across the reservoir in spaced relation to the last-mentioned side wall thereof and disposed immediately adjacent the lower end of said inclined plate, filtering elements supported between said partition wall and the adjacent parallel side wall of the reservoir, said filtering elements being accessible through one wall of the reservoir.

6. A dish washing machine comprising a casing receiving the articles to be washed, a spraying device within said casing, a valve controlling the passage of fluid to said spraying device and provided with a weighted handle normally tending to close the valve, a movable closure for said casing, and a flexible connection extending between said closure and valve handle, whereby actuation of the valve is controlled by movement of the closure.

7. A dish washing machine, comprising a cleaning chamber, vertically slidable closures at the ends of said chamber, a partition in said chamber slidable through the top wall thereof, a pair of shafts rotatably mounted above the chamber, winding sheaves carried by one of said shafts, flexible elements connecting said closures and partition to certain of said sheaves, guide sheaves carried by said second shaft, flexible elements passing over said guide sheaves from certain other of said winding sheaves, a counter-balanced weight suspended by said last mentioned flexible elements, a pair of spraying devices located in said chamber on opposite sides of said partition, each of said spraying devices being equipped with a normally closed valve controlling the supply of fluid thereto and flexible connecting means extending between one of said closures and said valves, whereby the valves will be automatically opened upon movement of the closure members to closed position and will be permitted to close upon movement of the closure members to open position.

8. A dish washing machine comprising a cleaning chamber, vertically slidable closures at the ends of said chamber, a spraying device within the said chamber provided with a normally closed valve controlling the supply of fluid thereto, a rotatably mounted counterbalanced winding element supported above said chamber, flexible connections extending between said winding element and closures and a flexible element extending between one of said closures and the valve adapted to effect opening of the valve when the closure members are moved to closed position and to permit subsequent closing of the valve upon movement of the closures to open position.

9. A dish washing machine comprising a

casing having the lower half thereof divided by a partition to form separate fluid reservoirs, the upper half of the casing being open at the ends, vertically displaceable closures controlling the openings at the ends of the casing, a vertically displaceable partition mounted in the casing, adapted, in lowered position, to rest upon the upper edge of said first mentioned partition, spraying devices located in the top of said casing upon opposite sides of the displaceable partition, each of said spraying devices being provided with a normally closed valve controlling the supply of fluid thereto, means, controlled by manual movement of one of the closure members to raised or lowered position, for causing corresponding movement of the partition member and remaining closure member and means, controlled by the movement of said closure members, adapted to effect opening of the said valves when the closure members are moved to closed position and to permit the valves to close upon movement of the members to open position.

In witness whereof I have hereunto set my hand in the presence of two witnesses.

WILLIAM FITZGERALD.

Witnesses:
TOM NAYLOR,
CHARLES EARLE JOHNSON.