No. 713,842. Patented Nov. 18, 1902.

G. S. BLAKESLEE.

DISH WASHING MACHINE.

(Application filed Dec. 19, 1901.)

(No Model.) 6 Sheets—Sheet 1.

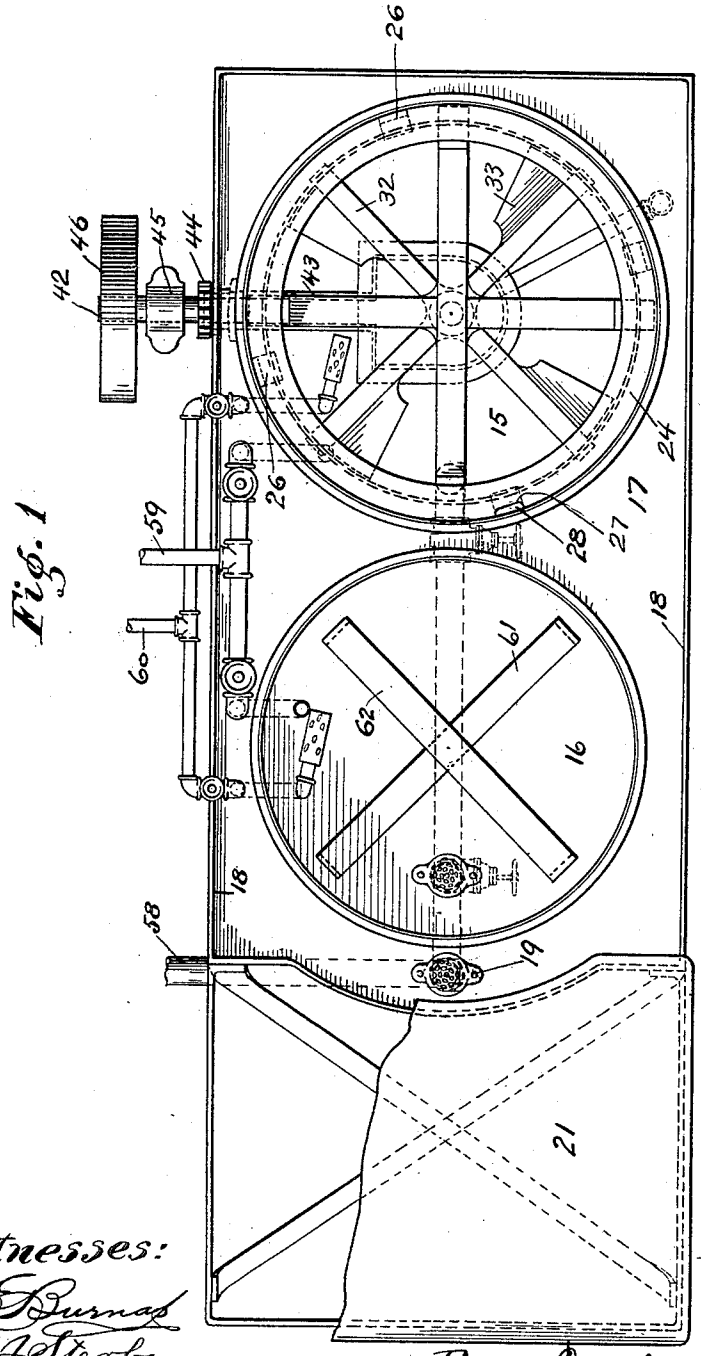


Fig. 1.

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(No Model.) 6 Sheets—Sheet 2.

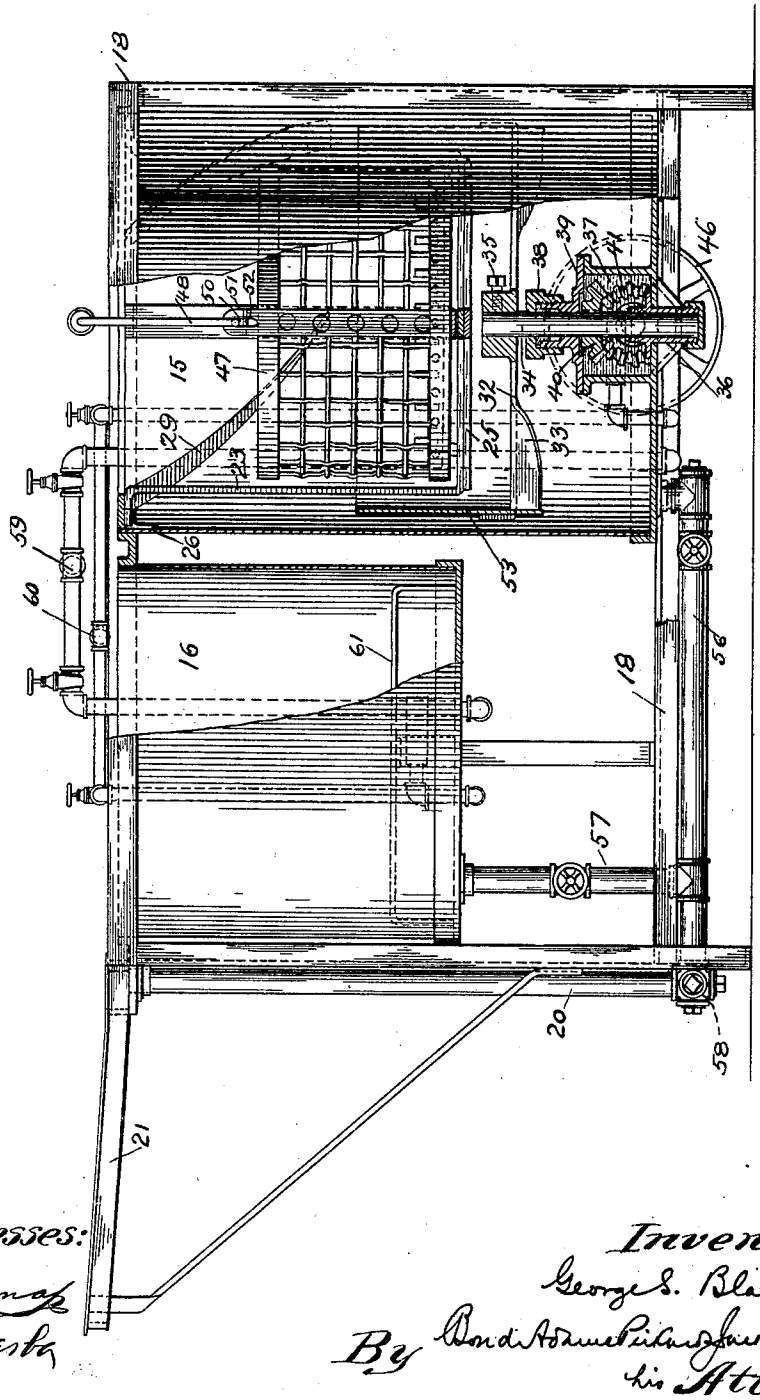


Fig. 2.

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Fig. 3

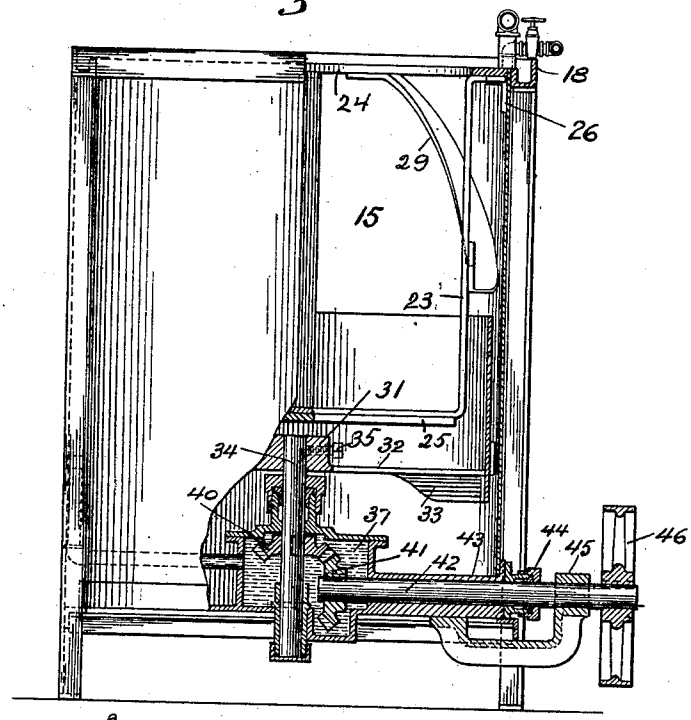


Fig. 5

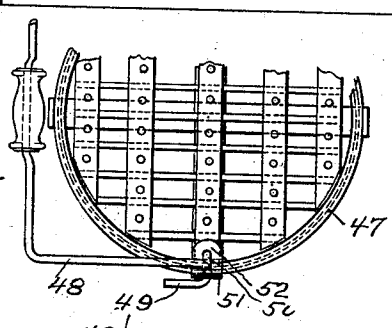


Fig. 6

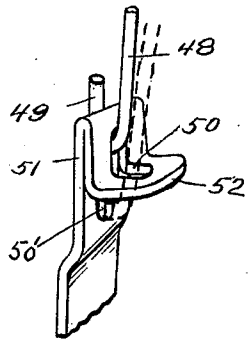
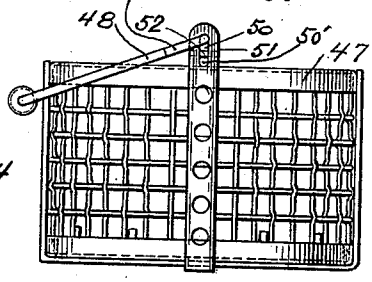


Fig. 4



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(No Model.) 6 Sheets—Sheet 4.

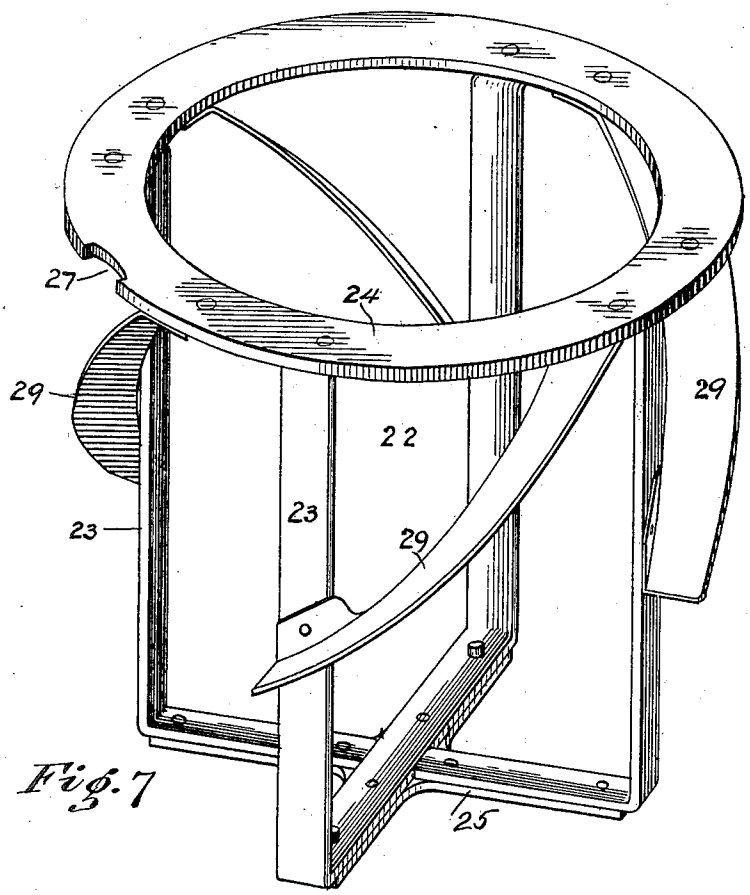


Fig. 7

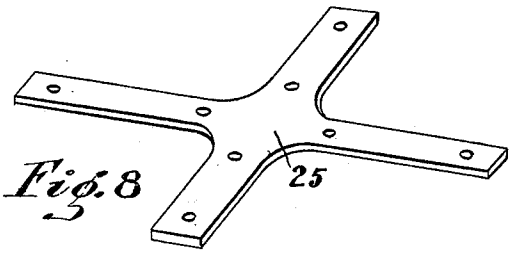


Fig. 8

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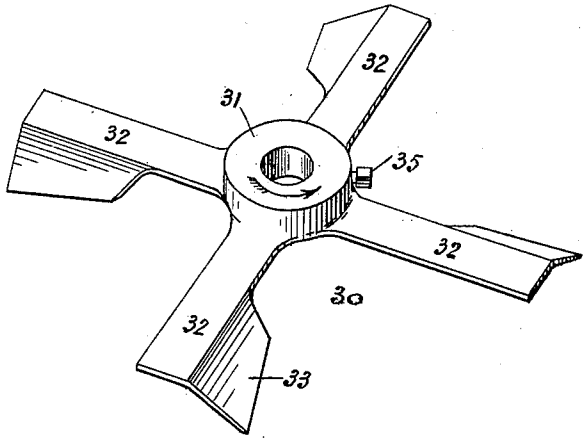
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DISH WASHING MACHINE.

(Application filed Dec. 19, 1901.)

(No Model.) 6 Sheets—Sheet 5.

Fig. 9.



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(Application filed Dec. 19, 1901.)

(No Model.) 6 Sheets—Sheet 6.

Fig. 10

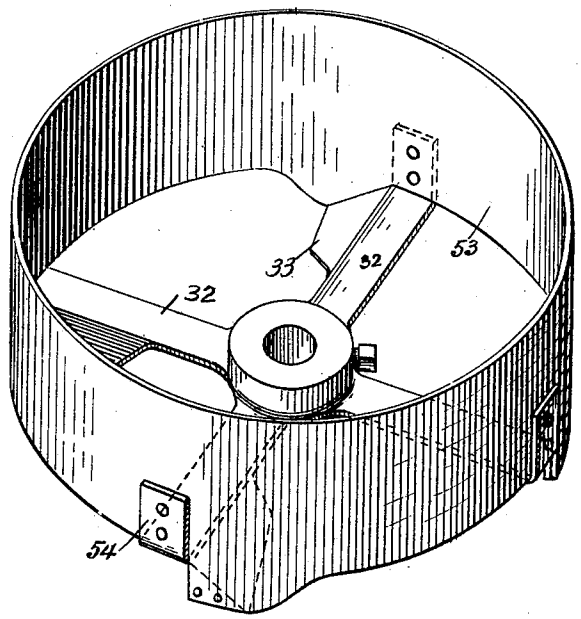
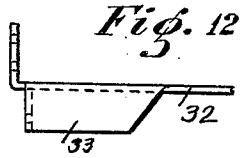


Fig. 12



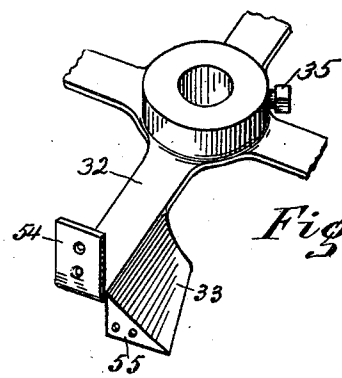


Fig. 11

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UNITED STATES PATENT OFFICE.

GEORGE S. BLAKESLEE, OF CHICAGO, ILLINOIS.

DISH-WASHING MACHINE.

SPECIFICATION forming part of Letters Patent No. 713,842, dated November 18, 1902.

Application filed December 19, 1901. Serial No. 86,537. (No model.)

To all whom it may concern:

Be it known that I, GEORGE S. BLAKESLEE, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Dish-Washing Machines, of which the following is a specification, reference being had to the accompanying drawings.

My invention relates to washing-machines, and has particularly to do with machines designed for washing dishes. It has for its object to provide an improved machine by which dishes may be thoroughly and expeditiously washed while they remain stationary or comparatively so.

Heretofore dish-washing machines have been produced designed to wash the dishes without their being rotated or otherwise moved while in the wash-water; but such machines, so far as I am aware, have not been satisfactory or successful, because they have not been so designed as to provide for the thorough scouring of the dishes. By my invention, however, I provide for forcing the wash-water up through the mass of dishes and at the same time for directing it down upon them, producing very violent agitation of the water in the tank, and insuring the thorough scouring of all the dishes under treatment.

A further object of my invention is to provide certain improvements in the agitating devices, in the means for directing the wash-water down upon and through the dishes, in the dish-holding basket, and in various other parts of the apparatus, all of which are fully hereinafter described.

That which I regard as new will be set forth in the claims.

In the drawings, Figure 1 is a plan view, part of the drip-tray being broken away. Fig. 2 is a side elevation, some parts being in section. Fig. 3 is an end elevation, some parts being in section. Fig. 4 is an elevation of the dish-holding basket. Fig. 5 is a partial plan view thereof. Fig. 6 is a perspective detail showing the devices for holding the bail of the dish-holding basket in its upright position. Fig. 7 is a perspective view illustrating the deflectors and the frame in which they are carried. Fig. 8 is a perspective view showing the reinforcing-frame at the bottom of the deflector-frame. Fig. 9 is a perspective view showing the agitator in its simplest form. Fig. 10 is a perspective view showing the most improved form of agitator. Fig. 11 is a perspective view showing a part of the agitator illustrated in Fig. 10, and Fig. 12 is an elevation of the same.

As best shown in Figs. 1 and 2, the machine comprises two tanks—to wit, the washing-tank 15 and the rinsing-tank 16. Said tanks are supported in a suitable frame formed, preferably, of angle-irons, as shown in Fig. 2. Said frame may be of any suitable construction to support the parts of the machine. As shown in Fig. 2, the upper edges of the tanks 15 16 are coincident with the top of the frame of the machine, and a plate or tray 17 is provided, which extends around the tanks and receives the water splashed from the tanks or dripping from the baskets as they are removed from the tanks. A flange 18 extends around the tray 17, as shown in Figs. 1 and 3, to confine the water and conduct it to a drain 19, which communicates with a waste-pipe 20, as shown in Fig. 1.

21 indicates a drip arranged at the end of the frame nearest the rinsing-tank 16 and adapted to conduct the drippings to the tray 17, as shown in Fig. 1.

22 indicates a basket-suspending frame, which is itself adapted to be suspended in the washing-tank 15, which frame serves not only to support the dish-holding basket when it is in the tank, but also carries the deflectors by which the wash-water is directed upon and against the dishes. Said frame 22 is best constructed of two U-shaped bars 23, placed at right angles to each other and rigidly secured together, said U-shaped bars being connected at their upper ends by a ring 24, as best shown in Fig. 7. A reinforcing-plate 25 is provided, which is secured to the lower portions of the bars 23, as best shown in Figs. 7 and 8. If desired, instead of using two U-shaped bars 23 the number may be varied; but I have found that the best results are secured by using the two bars arranged as described.

The external diameter of the ring 24 is equal to the internal diameter of the tank 15, so that said ring is adapted to fit snugly in the upper portion of said tank, where it is supported by brackets 26, secured to the inner surface of

the tank, as best shown in Figs. 1, 2, and 3. The frame 22 is thus suspended in the tank. To prevent the frame from rotating in the tank, the ring 24 is provided with a notch 27, adapted to receive a lug 28, projecting inwardly from the surface of the tank 15, as best shown in Fig. 1. The bars 23 are long enough so that the bottom of the frame 22 lies, preferably, below the center of the washing-tank 15, as best shown in Fig. 2, the object being to carry the dish-holding basket low enough so that the wash-water may properly be directed down upon the dishes without danger of its splashing out of the tank.

29 indicates the deflectors, which, as shown in Fig. 7, are carried by the frame 22. As shown, the lower ends of said deflectors are secured to the bars 23 and their upper ends to the ring 24, the deflectors being held in an inclined position. The best results are secured by curving the deflectors 29 slightly, so that they are somewhat spiral in outline, as shown in Fig. 7. The width of the deflectors is such that when they are secured in place their outer edges will be substantially in the plane of the periphery of the ring 24, so that when the frame 22 is fitted in place in the tank 15 the deflectors 29 lie substantially in contact with the inner surface of the tank 15.

30 indicates the agitator, the simplest form of which is best shown in Fig. 9. It consists of a hub 31, having radial arms 32, which carry deflectors 33 at their forward sides, extending from their outer ends inward about half the length of the arms 32. The deflectors 33 extend downward and forward from the arms 32, so that as the agitator rotates in the direction indicated by the arrow in Fig. 9 the deflectors will direct the water up and also give the body of water a whirling motion. Owing to the fact that the deflectors 33 extend a considerable distance inward from the outer ends of the arms 32, the upward movement of the water is not limited to the outer portion of the tank, but the water near the center is also directed upward, causing violent ebullition near the center of the tank. The water near the walls of the tank, however, rises to the highest point, owing to its more rapid movement.

The agitator 30 is mounted upon the upper end of a shaft 34, carried in the bottom of the tank 15, as best shown in Fig. 2, a set-screw 35 being provided for securing the agitator to said shaft. The lower end of the shaft 34 fits in a suitable socket 36 in the bottom of the tank 15, the upper portion thereof passing through a lubricator-box 37 and thence through a stuffing-box 38, carried by the cover 39 of the lubricator-box, as shown in Fig. 2. The bearings above and below the lubricator-box 37 serve to hold the shaft 34 firmly in its upright position.

40 indicates a beveled pinion which is mounted upon and keyed to the shaft 34 within the lubricator-box 37.

41 indicates a beveled pinion which is also mounted in the lubricator-box and meshes with the pinion 40. The pinion 41 is mounted on a shaft 42, which extends through a sleeve 43 in the bottom of the tank 15 into the lubricator-box 37, passing through a stuffing-box 44 in the side of the tank 15, its upper end being fitted in a bearing 45, as shown in Fig. 3.

46 indicates a pulley mounted on the shaft 42 for rotating said shaft and through it the shaft 34. Instead of a pulley 46 a crank may be attached to the shaft 42 for rotating it, so that the agitator 30 may be rotated by hand. By mounting the pinions 40 41 and the shaft 34 in the lubricator-box they are not only protected from dust, but are also continually lubricated, as the lubricator-box, being filled with oil or other suitable lubricator, keeps them always in a perfect state of lubrication. It also deadens the noise of operation, so that the machine makes no disturbance when operating. The shaft 34 is made as short as possible, so that the agitator 30 will be carried as near as possible to the bottom of the tank, and the lower portion of the suspending-frame 22 is arranged to lie immediately over and adjacent to the agitator.

47 indicates the dish-holding basket, which is of wire mesh or other open-work construction and is adapted to hold the dishes to be washed. Said basket is slightly less in diameter than the suspending-frame 22, into which it is adapted to fit, resting on the bottom thereof, as shown in Fig. 2. The bottom of the basket 47 is of open-work construction, as well as the sides, so that the wash-water may rise freely through it. 48 indicates a bail by which the basket is carried. Said bail is provided with upturned ends 49, adapted to hook through slots 50 50′ in lugs 51, rising from opposite sides of the basket. (See Figs. 4, 5, and 6.) As shown in Fig. 6, the end of each lug is bent back upon itself and then substantially at right angles, the slot 50 extending through the vertical portion of the lug and also into the horizontal portion 52 thereof. As shown in Fig. 4, the slot 50′ also extends below the horizontal portion 52, so that, as indicated by dotted lines in Fig. 6, the lower end of the bail may be moved down in the slot 50′ until it lies in the slot 50 in the horizontal portion 52 of the lug. The bail will thereby be held in a vertical position by the horizontal portion 52 of the lug. By raising the bail, however, until it lies in the upper portion of the slot it will be free to rock. The object of this construction is to hold the bail in an upright position when the basket is in the tank, thereby preventing it from being immersed in the water.

The operation of my improved apparatus as thus far described is as follows: The tank 15 is partly filled with hot soapsuds, and the basket, filled with dishes, is then placed in the frame 22, resting on the bottom thereof. The shaft 42 is then set in motion, rotating the agitator 30 in the direction indicated by

the arrow in Fig. 9. The water near the center of the tank, as well as that near the circumference thereof, is thereby thrown up with considerable force, that nearer the circumference rising until it strikes the under surfaces of the deflectors 29, which direct it downward upon the dishes in the basket. At the same time the water near the center of the tank is thrown up directly through the bottom of the basket, meeting the water falling from above, so that a very pronounced agitation of all the wash-water is effected. This agitation is most violent through the space occupied by the dish-holding basket, so that the water is forced through the dishes, which are thereby thoroughly scoured and cleansed. The best results are secured by extending the deflectors 29 down a considerable distance below the upper edge of the dish-holding basket, as shown in Fig. 2, so that part of the water is directed into the basket laterally through the periphery thereof. The ring 24 in addition to supporting the deflectors and the basket serves also to prevent the water from being thrown out of the tank, since any water which passes the deflectors 29 strikes the under surface of the ring 24 and is directed back into the tank.

In Fig. 10 I have shown a more improved form of agitator, which is substantially the same as the agitator 30, but in addition is provided with a closed-sided cylindrical portion 53, secured to the ends of the arms 32, said arms being provided with lugs 54 for that purpose, as shown in Figs. 11 and 12. The deflectors 33 are also provided with lugs 55 for further securing the cylinder 53. As shown in Fig. 2, the cylindrical portion 53 extends up between the bars 23 and the tank and serves to increase the agitation of the water and to direct it more forcibly against the deflectors 29. It also aids in directing the wash-water thrown down by the deflectors 29 against the dishes in the basket.

After the dishes have been washed the basket, full of dishes, is placed in the rinsing-tank 16, which is filled with clean water, resting on supports 61 62, as shown in Figs. 1 and 2, and after being rinsed the dishes are removed and placed on the drip 21.

56 57 indicate waste-pipes which, together with the pipe 20, communicate with a pipe 58, adapted to conduct the waste water to the sewer. 59 60 indicate pipes adapted to conduct hot and cold water to the lower portions of the washing and rinsing tanks. All of said pipes are provided with the necessary valves for regulating the supply of water to the tanks or its discharge therefrom.

In practice hot water or steam, or both, are continually introduced into the rinsing-tank 16 while it is in use, so that said tank is constantly filled with clean rinsing-water, which overflows the upper edge of the tank and is discharged upon the tray 17, from which it passes through waste-pipe 20 to the sewer. As illustrated in Figs. 1 and 2, said waste-pipe 20 is not provided with any valves, so that the greasy water flowing from the rinsing-tank, together with such grease as it may accumulate from the tray 17, is carried off, and as it does not come in contact with any valve mechanism the grease does not clog the discharge, as it would otherwise be apt to do. Moreover, the tray 17 is kept clean by the overflow.

While my improved washing-machine is designed, primarily, for washing dishes, it may be used for washing other articles, and I wish it to be understood that my invention is not restricted in its use to washing dishes. Neither is my invention limited to the specific details of construction illustrated and described, except in so far as such details are specifically claimed.

That which I claim as my invention, and desire to secure by Letters Patent, is—

1. In a machine of the character described, the combination of a tank, a rotary agitator therein comprising a closed-sided cylinder open at its ends, and a stationary receptacle for the articles to be washed arranged within said agitator, substantially as described.

2. In a machine of the character described, the combination of a tank, a rotary agitator therein comprising a closed-sided cylinder open at its ends and having a deflector at its bottom, and a stationary receptacle for the articles to be washed arranged within said agitator, substantially as described.

3. In a machine of the character described, the combination of a tank, a rotary agitator therein carrying a deflector at its bottom, a suspended frame within said agitator carrying a deflector near the upper end of said tank, and a receptacle for the articles to be washed carried by said frame, substantially as described.

4. In a washing-machine, the combination of a tank, a rotary agitator therein consisting of a cylinder open at its ends, a receptacle for the articles to be washed arranged within said agitator, and a deflector carried at the bottom of said agitator, substantially as described.

5. In a washing-machine, the combination of a tank, a rotary agitator therein consisting of a cylinder open at its ends, deflectors at the upper portion of the tank over said agitator, and a stationary receptacle for the articles to be washed arranged within said agitator, substantially as described.

6. In a washing-machine, the combination of a tank, a suspending-frame within said tank, a rotary agitator between said suspending-frame and the side of the tank, a series of deflectors at the upper portion of the tank, and a receptacle for holding the articles to be washed, said receptacle being adapted to fit into said suspending-frame, substantially as described.

7. In a washing-machine, the combination of a tank, a rotary agitator therein consisting of a cylinder open at its ends, a stationary supporting-frame within said agitator, and a re-

movable dish-holding receptacle carried by said supporting-frame, substantially as described.

8. In a washing-machine, the combination of a tank, a rotary agitator therein consisting of a cylinder open at its ends, a stationary supporting-frame within said agitator having upward-extending or vertical portions adapted to be suspended in said tank, and a receptacle for the articles to be washed removably arranged within said supporting-frame, substantially as described.

9. In a washing-machine, the combination of a tank, a rotary agitator therein, a stationary supporting-frame within said agitator and suspended in the tank, deflectors carried by said supporting-frame near the upper portion of the tank, and a receptacle for articles to be washed supported by said supporting-frame, substantially as described.

10. In a washing-machine, the combination of a tank, a rotary shaft extending thereinto, an agitator detachably connected with said shaft and rotated thereby and comprising an open-ended cylinder carrying a deflector at its bottom, and a receptacle for the articles to be washed arranged within said agitator, substantially as described.

11. In a washing-machine, the combination of a tank, a rotary shaft extending thereinto, a rotary agitator connected to said shaft and comprising a closed-sided cylinder with open ends, a receptacle for holding the articles to be washed, a suspending-frame within said agitator having at its upper end an annular plate, and deflectors carried by said frame, substantially as described.

12. In a washing-machine, the combination of a tank, a rotary shaft extending thereinto, a rotary agitator detachably connected to said shaft and carrying a deflector at its bottom, a receptacle for the articles to be washed, a suspending-frame having an annular portion at its upper end, and deflectors carried by said frame, substantially as described.

13. In a washing-machine, the combination of a tank, means in said tank for throwing upward the water therein, an inclined deflector in said tank for intercepting the water and directing it downward, and a stationary receptacle adapted to fit into said tank for holding the articles to be washed, substantially as described.

14. In a washing-machine, the combination of a tank, a rotary agitator therein adapted to be rotated to throw the water upward, inclined means in said tank adjacent to the wall thereof for intercepting the water and directing it downward, and a stationary receptacle adapted to fit into said tank for holding the articles to be washed, substantially as described.

15. In a washing-machine, the combination of a tank, a rotary agitator therein adapted, when rotated, to throw the water upward, an inclined deflector in said tank adjacent to the wall thereof for intercepting the water and directing it downward, and a stationary receptacle adapted to fit into said tank for holding the articles to be washed, substantially as described.

16. In a washing-machine, the combination of a tank, a frame carried in said tank and adapted to support a dish-holding basket, deflectors carried by said frame adjacent to the wall of the tank, and a rotary agitator in said tank arranged to direct the water upward against said deflectors, substantially as described.

17. In a washing-machine, the combination of a tank, a rotary agitator therein having inclined deflectors adapted to direct the water upward, a receptacle for the articles to be washed arranged above said agitator, and an inclined deflector in said tank adjacent to the wall thereof, said deflector being arranged to intercept the water thrown up by the agitator and direct it downward into the receptacle for the articles to be washed, substantially as described.

18. In a washing-machine, the combination of a tank, a rotary agitator therein having inclined deflectors arranged to direct the water upward as the agitator rotates, a receptacle for the articles to be washed arranged above said agitator, and inclined deflectors arranged adjacent to the wall of the tank and extending from the upper portion thereof down into the tank for intercepting the water thrown up by said deflector and directing it into the receptacle for the articles to be washed, substantially as described.

19. In a washing-machine, the combination of a tank, a suspending-frame adapted to fit into said tank, said frame consisting of a ring having depending bars adapted to support the dish-holding receptacle, deflectors carried by said frame between said dish-holding receptacle and the wall of the tank, and a rotary agitator below said deflectors adapted to direct the water upward against said deflectors, substantially as described.

20. In a washing-machine, the combination of a tank, a suspending-frame adapted to fit into said tank, said frame consisting of a ring having depending bars adapted to support the dish-holding receptacle, inclined deflectors carried by said frame between said dish-holding receptacle and the wall of the tank, and a rotary agitator below said deflectors adapted to direct the water upward against said deflectors, substantially as described.

21. In a washing-machine, the combination of a tank adapted to contain wash-water, a receptacle for the articles to be washed, a rotary agitator in said tank, a vertical shaft on which said agitator is mounted, a water-tight lubricator-box into which said shaft extends, gearing in said box for rotating said shaft, and a shaft extending into said lubricator-box for driving said gearing, substantially as described.

22. In a washing-machine, the combination of a tank adapted to contain water, means for

conducting water into said tank, means surrounding and adjacent to the upper portion of said tank for receiving water therefrom, and an outlet-pipe for the discharge of water from said water-receiving means, substantially as described.

23. In a washing-machine, the combination of a tank, means for conducting water into the lower portion thereof, means surrounding and near the upper portion of said tank for receiving water flowing therefrom, and a waste-pipe connected with said water-receiving means, substantially as described.

24. In a washing-machine, the combination of a tank adapted to contain water, means for discharging water into the lower portion of said tank, a tray at the upper portion of said tank and adapted to receive water flowing from the tank, and an outlet-pipe communicating with said tray, substantially as described.

25. In a washing-machine, the combination of a washing-tank, a rinsing-tank, a tray surrounding said washing and rinsing tanks and arranged near the upper portion of said rinsing-tank, an outlet-pipe communicating with said tray, and means for supplying water to said rinsing-tank, substantially as described.

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