G. C. BARRON.

DISHWASHING MACHINE.

APPLICATION FILED DEC. 7, 1921.

1,438,680.

Patented Dec. 12, 1922.

3 SHEETS—SHEET 1.

Fig. 1.

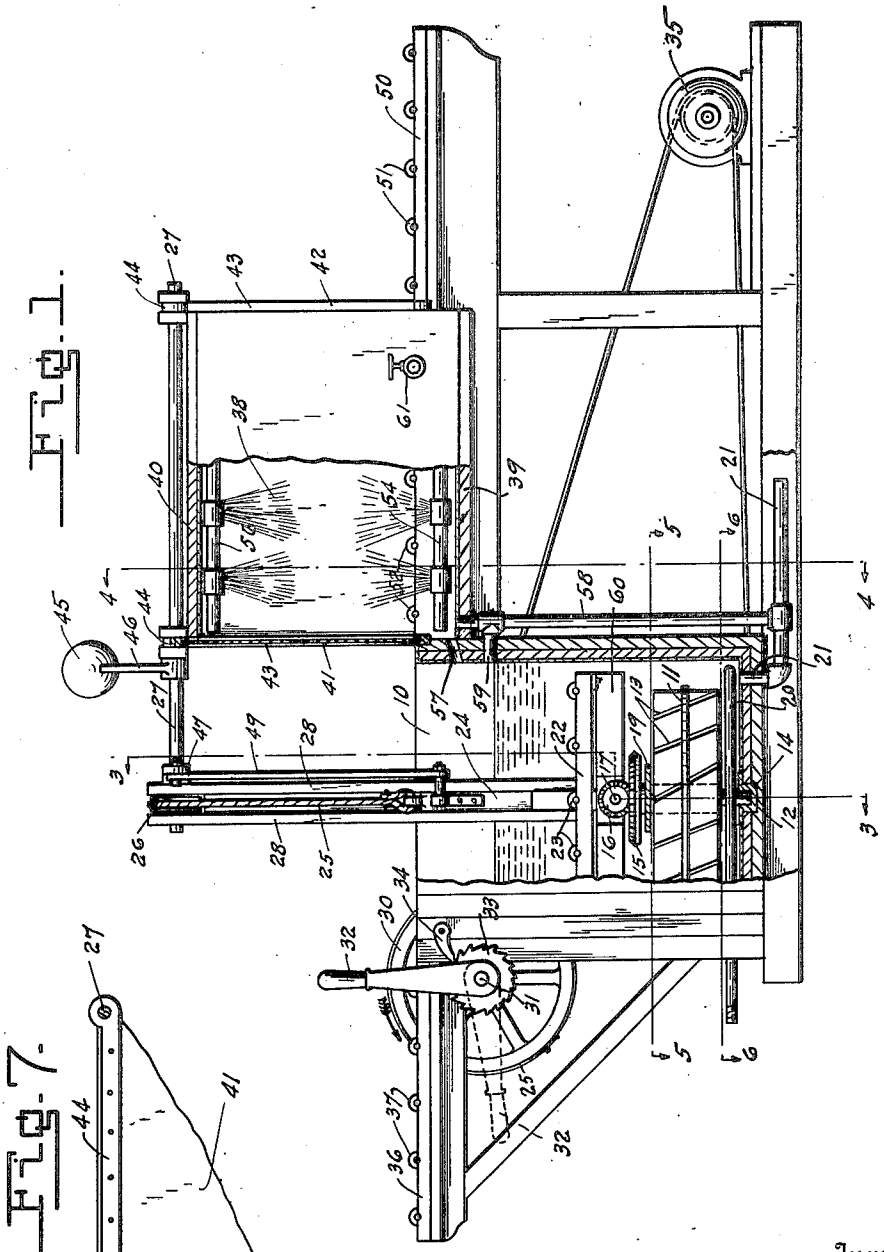
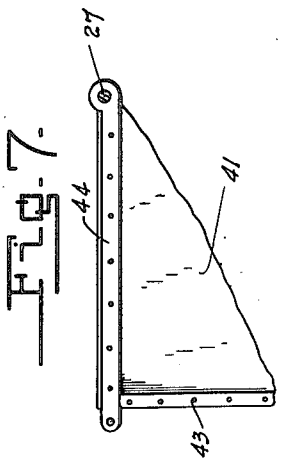


Fig. 7.



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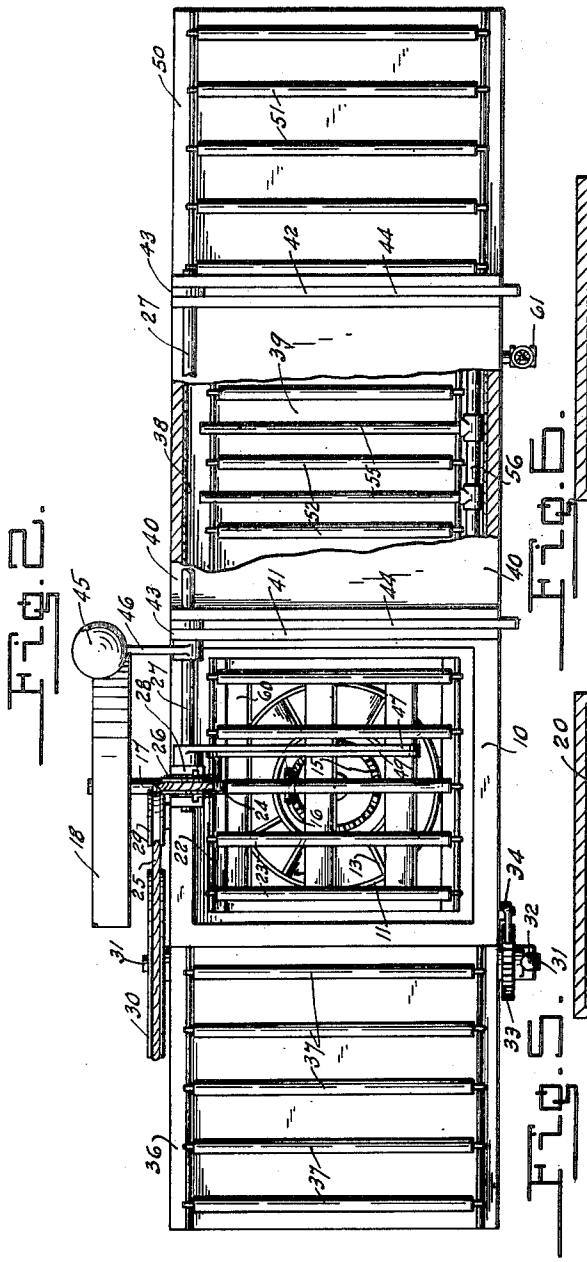

Fig. 2.

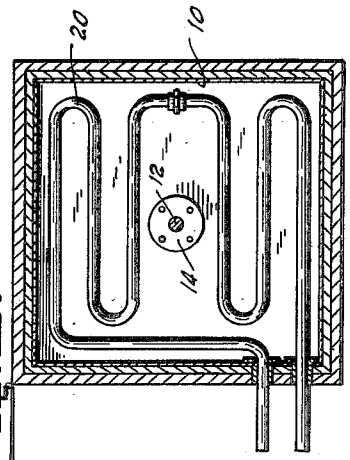

Fig. 6.

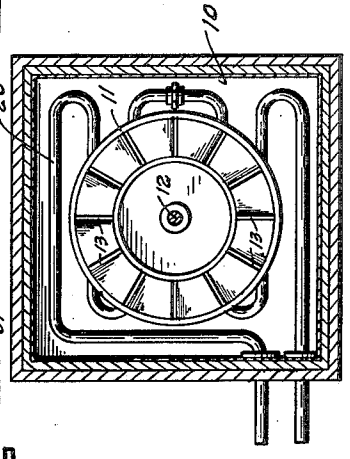

Fig. 5.

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3 SHEETS—SHEET 3.

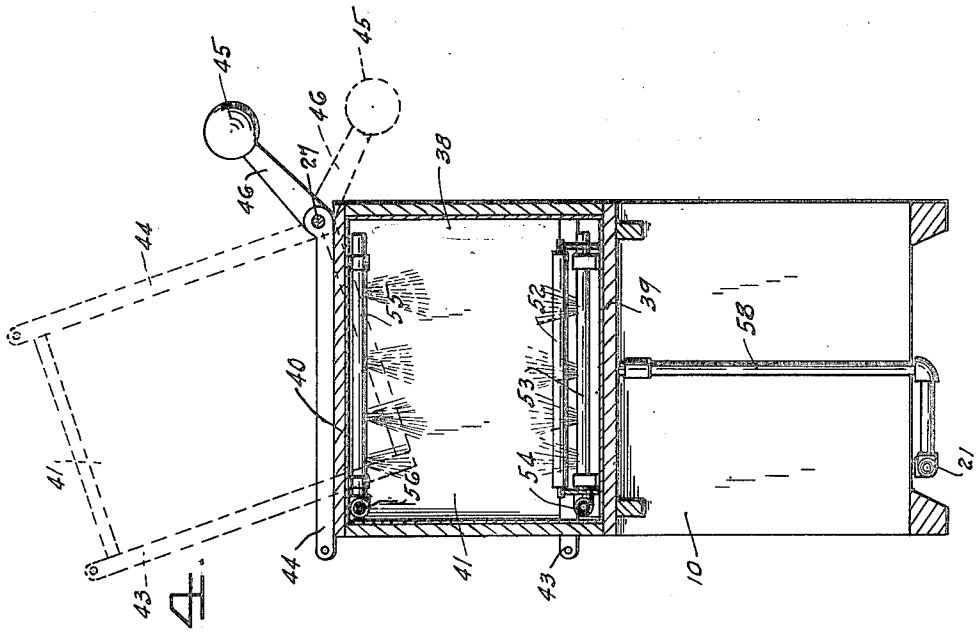

Fig. 4.

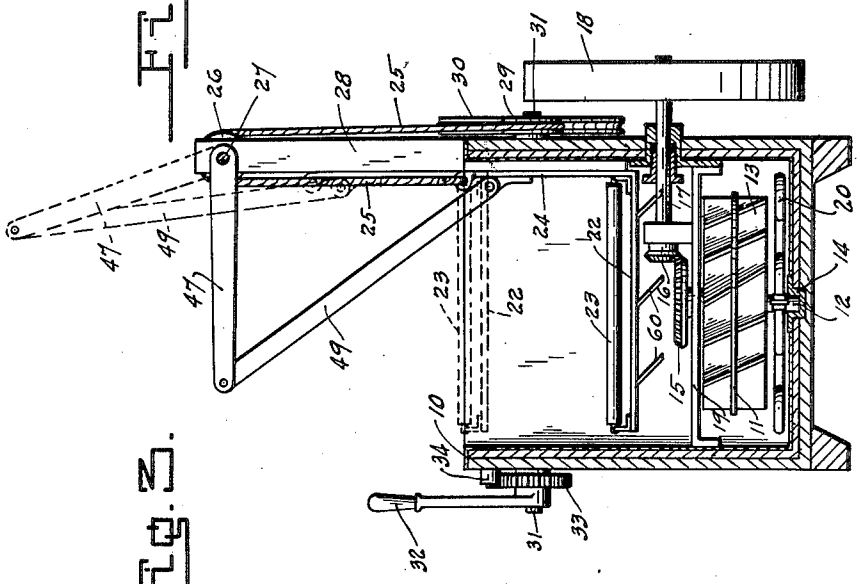

Fig. 5.

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UNITED STATES PATENT OFFICE.

GROVER C. BARRON, OF GAINESVILLE, GEORGIA.

DISHWASHING MACHINE.

Application filed December 7, 1921. Serial No. 520,592.

To all whom it may concern:

Be it known that I, GROVER C. BARRON, a citizen of the United States, residing at Gainesville, in the county of Hall and State of Georgia, have invented certain new and useful Improvements in Dishwashing Machines, of which the following is a specification, reference being had to the accompanying drawings.

This invention relates to dish washing machines, and particularly to washing machines of that character wherein the dishes are disposed within a washing tank and the water within the tank is violently agitated so as to wash the grease and dirt from the dishes, the dishes being afterwards rinsed and dried.

One of the objects of this invention is the provision of a dish washing machine of this character having an agitating tank and a spraying chamber, a set of dishes which have previously been washed being sprayed and rinsed in the rinsing chamber while another set of dishes is being washed.

Another object of the invention is to provide a washing machine of this character with a washing tank into which the dishes are lowered by means of an elevator and from which they may be raised by means of the elevator, the lower portion of this washing tank being provided with means for violently agitating the water and the elevator being of an openwork construction so that the currents of water may swirl around and between the dishes so as to thoroughly wash them.

Still another object is to provide a construction of this character wherein a feeding table having rollers is provided at the upper edge of the tank and a receiving table having rollers is provided at the upper edge of the tank opposite the feeding table so that as the elevator is raised a batch of dishes disposed within wire trays may be shifted from the elevator onto the last named table and a fresh batch of dishes unwashed may be shifted from the feeding table onto the elevator.

A further object of the invention is to dispose said receiving table within a rinsing chamber having spray pipes, the ends of the rinsing chamber being provided with doors, the construction being such that as the elevator is lowered into the washing tank the doors of the rinsing chamber will be closed and as the elevator is lifted the doors of the rinsing chamber will be opened, thereby permitting the removal of the batch of dishes within the rinsing chamber and the sliding of the trays of dishes on the elevator into the rinsing chamber, there being a final receiving table at the end of the rinsing chamber opposite the tank onto which the trays of dishes are shifted from the table in the rinsing chamber.

Other objects have to do with the means whereby the doors are raised and lowered in consonance with the raising and lowering of the elevator with the details of construction appertaining thereto and to the means whereby water is carried from the rinsing chamber to the washing tank and whereby the water is agitated and kept hot in the washing tank, etc.

My invention is illustrated in the accompanying drawings, wherein:—

Figure 1 is a side elevation of a dish washing machine constructed in accordance with my invention, the front walls being partly broken away;

Figure 2 is a top plan view of the construction shown in Figure 1;

Figure 3 is a section on the line 3—3 of Figure 1;

Figure 4 is a section on the line 4—4 of Figure 1, showing in dotted lines the doors raised;

Figure 5 is a section on the line 5—5 of Figure 1;

Figure 6 is a section on the line 6—6 of Figure 1;

Figure 7 is a fragmentary face view of one of the doors for the rinsing chamber.

Referring to the drawings, it will be seen that my washing machine includes a washing tank 10 which is shown as made of wooden slats and lined with zinc or any other suitable material of this character. Disposed in the bottom of this washing tank is a rotatable agitator 11 mounted upon a vertical shaft 12 and having radially disposed, inclined blades 13. I do not wish to be limited to the particular manner of constructing the agitator, as this may be varied in many ways. The lower end of the shaft 12 is mounted in a stepped bearing 14, and the upper end of this shaft carries the beveled gear wheel 15 which meshes with the beveled pinion 16 mounted upon a radial shaft 17 extending out through the side wall of the tank and through a suitable stuffing box and carrying the driving pulley

18. It will be obvious that the shaft 17 will rotate the shaft 12 and thereby the agitator, the agitator being so constructed as to cause the great agitation of the water within the tank and the constant flow of water upward in the tank and back to the agitator. The upper end of the shaft 12 is shown as supported upon a transverse bearing 19. Steam heating coils 20 extend into the tank and are connected to a suitable source of steam, whereby the water within the tank may be kept at the proper temperature. A drain pipe 21 is provided which opens into the bottom of the tank. Water is supplied to the tank from the rinsing chamber, as will be later described.

Disposed within the tank, which is illustrated as rectangular in plan, is an elevator platform 22 which is of open construction and simply formed of an open frame, this frame supporting the transversely extending rollers 23. The elevator platform is supported by a vertically extending supporting bar 24 which at its upper end is connected to a cable 25 passing over a sheave 26 mounted upon a shaft 27, in turn mounted in suitable uprights 28. One of the uprights 28 is formed with a vertical groove and the vertically extending member 24 which carries the elevator is formed with a tongue engaging in said groove so that this member 28 constitutes a guide for the elevator. The cable 25 after it passes over the pulley or sheave 26 extends downward and passes beneath an idler pulley 29 and then passes over a drum 30 or pulley mounted upon a shaft 31, upon which shaft is mounted the handle 32. This drum 30 is relatively large in comparison with the pulley 26.

Mounted upon the shaft 31 is a ratchet wheel 33 with which coacts a pawl 34. It will be obvious now that a rotation of the drum in the direction of the arrow in Figure 1 under the action of the handle will cause the winding up of the cable and the lifting of the elevator, but the downward movement of the elevator will be prevented by the pawl 34. When it is desired to permit the descent of the elevator, the pawl 34 is detached from its engagement with the ratchet wheel and the handle moved reversely or in a clockwise direction, thus slackening the cable and permitting the descent of the elevator. The downward movement of the elevator is checked before the elevator strikes the pinion 16 by reason of the closing of the doors of the rinsing chamber, as will be later described. The belt pulley 18 may be driven from an electric motor 35 or in any other suitable manner.

Level with the top of the tank 10 there is disposed a feed table 36 supported in any suitable manner and carrying the transverse rollers 37 so that dishes placed in wire trays may be disposed upon this feed table, and when the elevator rises to the level of the feed table and the washed dishes are removed, a new batch of dishes may be shifted from the feed table onto the rollers of the elevator.

Disposed to receive dishes from the tank 10 is a rinsing chamber 38. This chamber is closed at its lower end by a bottom 39 and is also closed at its upper end by a top 40 and is closed at its front and rear. This rinsing chamber is also zinc-lined and the exterior of the rinsing chamber is covered with a non-heat conducting material. The ends of the rinsing chamber are closed by doors 41 and 42. These doors are of sheet zinc or like material and may be made non-heat conducting if desired and carried by a frame 43. Each of these doors is carried by an arm 44 which is attached to the shaft 27 upon which the pulley 26 is mounted, it being remarked that this pulley 26 is loose upon the shaft and oscillates independently thereof. This shaft 27 carries a door counterweight 45 on an arm 46 which is fast to the shaft 27. This shaft also has extending from it the arm 47 which is disposed adjacent the upright 28, the outer extremity of this arm being connected by a link 49 to the elevator supporting rod or slide 24.

Thus it will be seen that when the elevator is raised the shaft 27 will be given a counterclockwise movement which will lift the arms 44 and the doors 41 and 42 will be raised from the position shown in full lines in Figure 4 to the dotted line position in Figure 4, and that when the elevator is lowered the doors will be lowered, closing the rinsing chamber. Beyond the door 42 there is provided a receiving table 50 carrying the transverse rollers 51, these rollers being disposed in alignment with the rollers 37.

Disposed within the rinsing chamber in line with the rollers 37 and 51 are the transverse rollers 52 which support the wire baskets full of dishes, and disposed below these rollers 52 are transversely extending spray pipes 53 which are connected to a header 54, in turn connected to any suitable source of hot water. Below the top 40 of the rinsing chamber are disposed the spray pipes 55 connected to a header 56 which is also connected to a source of hot water. Of course, the headers 54 and 56 will both be connected to the same source. Just above the bottom 39, the rinsing tank is connected to the tank 10 by means of a duct 57 so that the water from the rinsing chamber will run into the washing tank 10. A waste pipe 58 is connected to the bottom of the rinsing tank and extends downward to the drain pipe 21, and a branch pipe 59 is provided which extends into the tank 10 at the normal level of the water therein, this branch 59 constituting an overflow pipe. Preferably,

though not necessarily, the bottom of the skeletonic elevator 22 is formed with downwardly and laterally extending metal wings 60 which act to distribute the water and the washing compound in the washing vat or tank 10. It will be understood, of course, that the arms 44 are keyed to the shaft 27 so as to oscillate therewith.

It is to be understood that the feed pipe for the spray pipes 54 and 56 is provided with a suitable valve 61 whereby the water may be cut off from the spray pipes when desired or turned on.

In the operation of this device, after the tank 10 has been filled with hot water and washing compound, the elevator is raised and the dishes on the feed platform, which dishes are disposed in openwork wire containers or trays, are shifted onto the elevator. The elevator is then lowered and as the elevator is lowered the doors of the rinsing chamber are lowered. Water is then turned on and the spray from the rinsing chamber passes into the washing tank. After a suitable time, and when the dishes are washed, the elevator is raised and the batch of washed dishes are run onto the rollers in the rinsing tank, the raising of the elevator, of course, lifting the doors so as to permit the shifting of the dish baskets and a fresh basket of dishes is then shifted onto the elevator and the elevator lowered, lowering the doors of the rinsing tank and the dishes within the rinsing tank are rinsed while and at the same time as the dishes in the washing tank are being washed. When the elevator is again raised, the batch of dishes in the rinsing tank are shifted onto the receiving table while those on the elevator are shifted into the rinsing tank and a fresh batch is shifted onto the elevator. It is to be understood, however, that preferably after the rinsing operation a sufficient interval of time is allowed for the dishes within the rinsing tank to dry, this drying operation being accelerated by the heat within the rinsing tank, and the hot water in the spray pipes being stopped during this period. Of course, it is obvious that means may be provided for automatically stopping the flow of water in the rinsing tank when the elevator is raised and permitting the flow of water from the spray pipes when the elevator is lowered.

While I have illustrated a construction which I have found to be thoroughly practical in use, I do not wish to be limited thereto as it is obvious that many changes might be made in the details of this construction and in the arrangement of the various parts without departing from the spirit of the invention.

While under ordinary circumstances the hot water in the supply pipes for the rinsing chamber 38 will be sufficient to heat the rinsing chamber, it is obvious that heating coils may be disposed within the rinsing chamber so as to afford sufficient heat for drying operation after the sprays have been cut off.

I claim:

1. In a dish washing machine, a washing tank having actuating mechanism, an elevator associated therewith, means for causing the downward movement of the elevator into the tank and its upward movement therefrom, a rinsing tank associated with the washing tank and having hot water sprayers, doors normally closing the ends of the rinsing tank, and means causing the opening of said doors when the elevator rises and the closing of the doors when the elevator lowers.

2. A dish washing machine including a dish washing tank, a feeding table located at the upper end of the tank and having rollers, a rinsing chamber associated with the washing tank and having transverse rollers on a level with the upper edge of the washing tank, sprayer pipes disposed within the rinsing tank and connected to a source of hot water, swingingly mounted doors normally closing the ends of the rinsing tank, a receiving platform having rollers disposed on a level with the rollers in the rinsing tank, a vertically movable elevator in the washing tank, manually operable means for raising or lowering the elevator, the elevator being operatively connected to said doors to cause the doors to open when the elevator raises and close when the elevator descends.

3. In a washing machine, a washing tank, agitating mechanism in the bottom of the tank, an openwork elevator moving vertically within the tank above the agitating mechanism, a slide connected to the elevator, guides within which the slide moves, a cable connected to the slide, a pulley over which the cable passes, a manually operable winding drum upon which the cable is wound, a ratchet wheel and pawl preventing reverse movement of the winding drum, and manually operable means for giving a step by step winding movement to the winding drum.

4. A dish washing machine including a washing tank, agitating mechanism in the lower portion of the tank, a vertically movable openwork elevator platform disposed within said tank and having transverse rollers, a slide supporting the platform, guides disposed at one side of the tank and within which said slide is movable, manually operable means for raising and lowering the slide, an elevator, a rinsing chamber associated with the upper end of the tank and having rollers disposed on a level with the upper end of the tank and closed at its bottom and top and front and rear, a shaft extending through the upper corner of the

rinsing chamber, doors mounted upon said shaft for oscillation thereon and normally closing the ends of the rinsing chamber, spray pipes mounted within the rinsing chamber, an arm extending from said shaft, and a link connection between said arm and the elevator, the shaft being rocked to elevate the doors upon an upward movement of the elevator and to lower the doors upon a downward movement of the elevator.

5. A dish washing machine including a washing tank, agitating mechanism in the lower portion of the tank, a vertically movable openwork elevator platform disposed within said tank and having transverse rollers, a slide supporting the platform, guides disposed at one side of the tank and within which said slide is movable, manually operable means for raising and lowering the slide, an elevator, a rinsing chamber associated with the upper end of the tank and having rollers disposed on a level with the upper end of the tank and closed at its bottom and top and front and rear, a shaft extending through the upper corner of the rinsing chamber, doors mounted upon said shaft for oscillation thereon and normally closing the ends of the rinsing chamber, spray pipes mounted within the rinsing chamber, an arm extending from said shaft, a link connection between said arm and the elevator, the shaft being rocked to elevate the doors upon an upward movement of the elevator and to lower the doors upon a downward movement of the elevator, drain pipes leading from the bottom of the tank and from the bottom of the rinsing chamber, and a port leading from the lower end of the rinsing chamber into the upper end of the washing tank.

6. A dish washing machine, a washing tank, a power operated agitator disposed in the bottom of the tank, an openwork elevator platform disposed within the tank above the agitator for vertical movement and having transversely extending rollers, guides extending upward from the tank, a slide operating in said guides and carrying a platform, a shaft extending through the upper ends of the guides, a sheave loosely mounted upon said shaft, a cable passing over the sheave, a winding drum around which said cable passes and having a handle whereby it may be oscillated, a feeding table disposed at the upper end of the tank and having rollers in line with the upper end of the tank, a rinsing chamber having its bottom disposed slightly below the upper end of the tank and communicating by a duct with said tank, the chamber being open at its opposite ends, doors for the ends of the tank mounted upon said shaft to oscillate therewith, a counter-weight for said doors mounted upon the shaft, an arm carried by said shaft, a link connection between the arm and the elevator, the upward movement of the elevator causing the oscillation of the shaft and the raising of the arm and doors and the downward movement of the elevator causing the closing of the doors, rollers disposed within the rinsing tank on a level with the rollers on the feed table, spray pipes disposed below said rollers, spray pipes disposed in the top of the rinsing tank, means for cutting off the supply of water to said spray pipes, a receiving table having rollers disposed on a level with the rollers in the rinsing chamber, and a drain pipe leading from the bottom of the rinsing chamber and communicating with the washing tank on a line with the normal water level therein.

In testimony whereof I hereunto affix my signature.

GROVER C. BARRON.