(No Model.) 3 Sheets—Sheet 1.

J. G. COCHRANE.

DISH CLEANER.

No. 512,683. Patented Jan. 16, 1894.

Fig 2a.

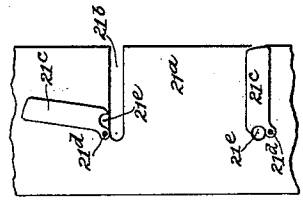


Fig 2.

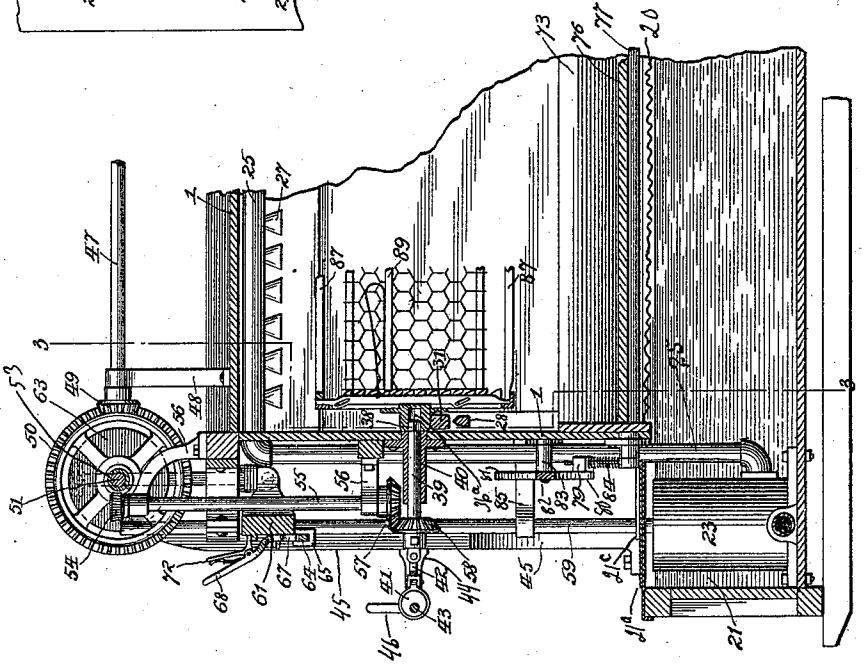
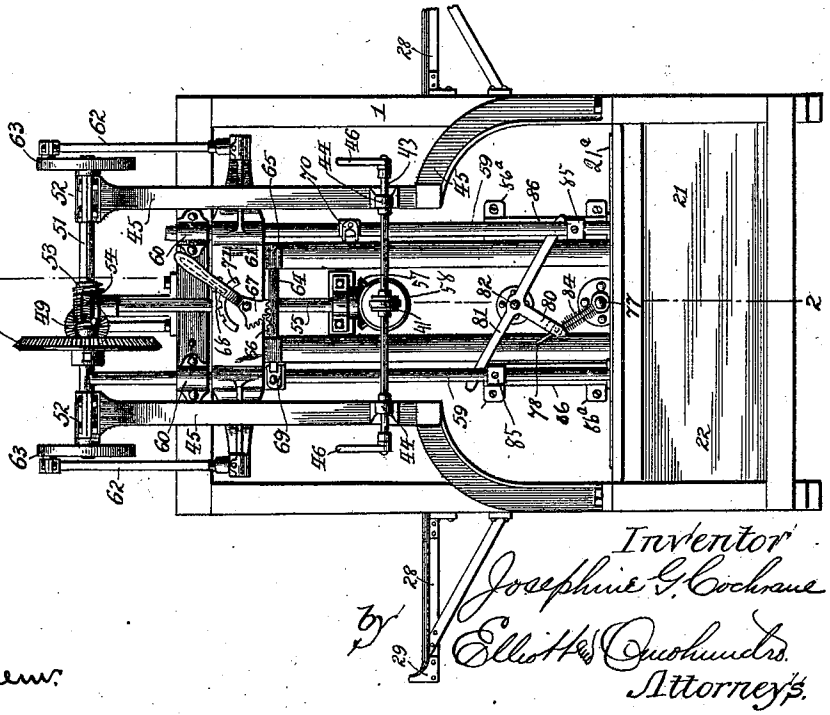


Fig 1.



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(No Model.) 3 Sheets—Sheet 2.

J. G. COCHRANE.

DISH CLEANER.

No. 512,683. Patented Jan. 16, 1894.

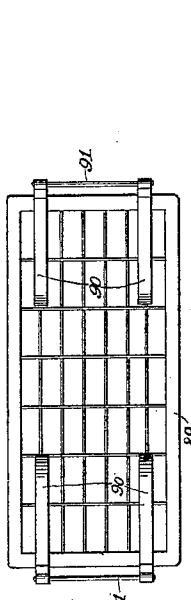

Fig. 1.

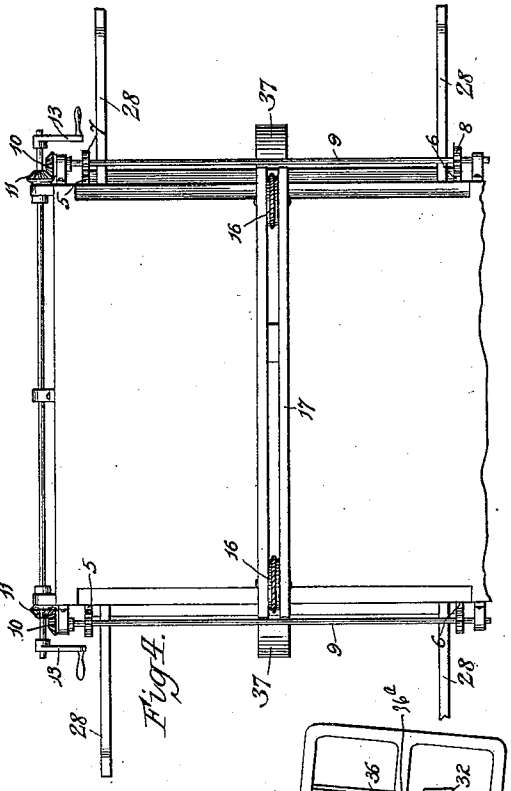

Fig. 4.

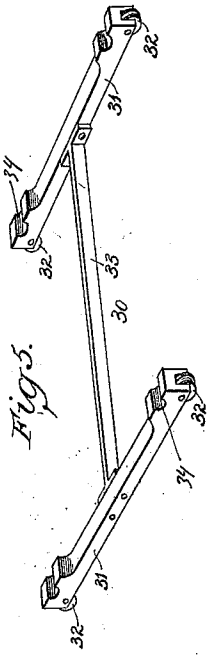

Fig. 5.

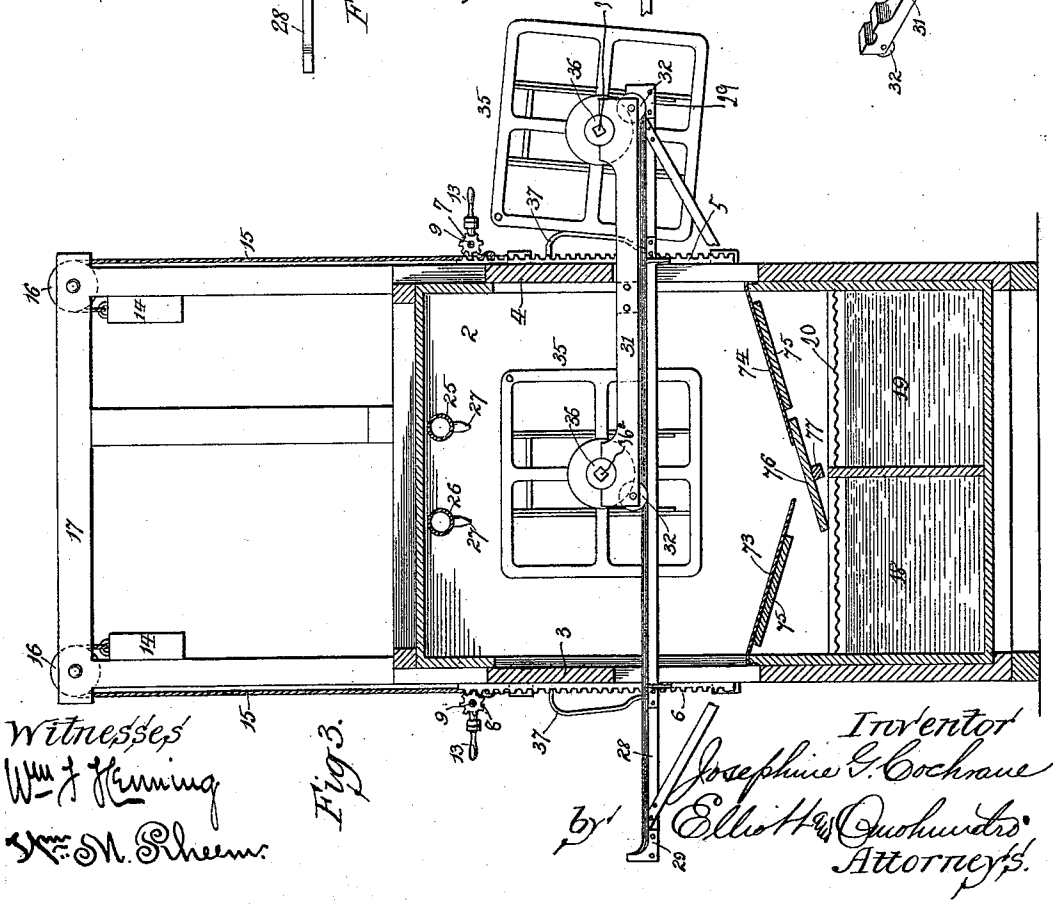

Fig. 3.

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(No Model.) 3 Sheets—Sheet 3.

J. G. COCHRANE.

DISH CLEANER.

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Fig. 6.

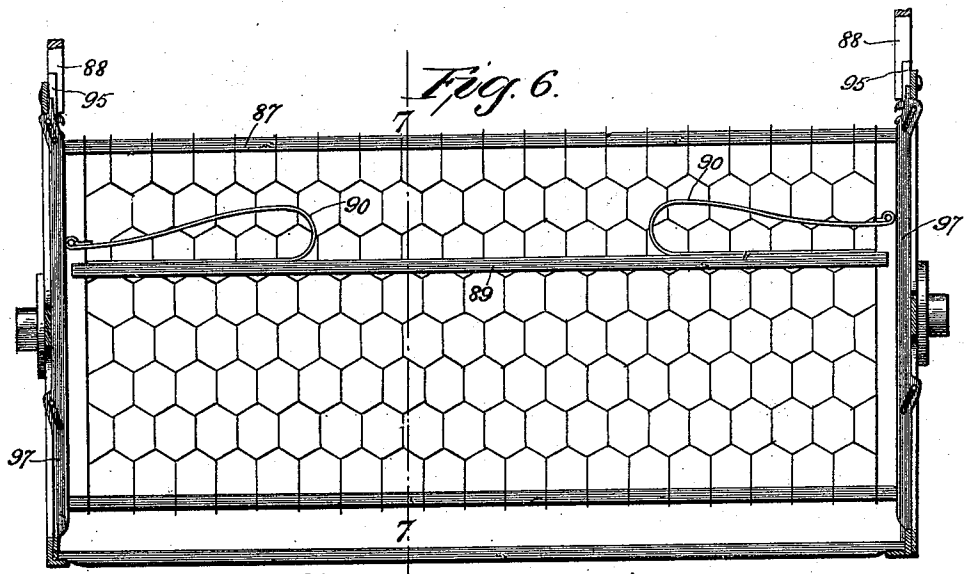


Fig. 7.

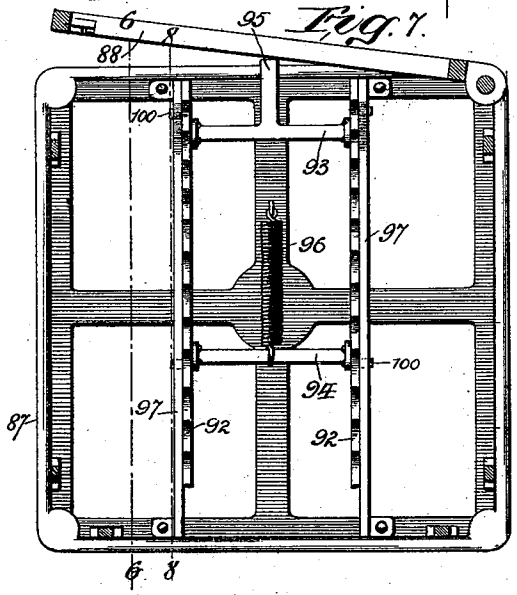


Fig. 8.

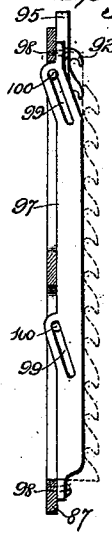


Fig. 9.

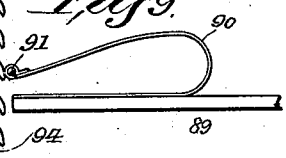
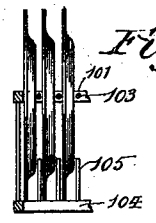


Fig. 13.



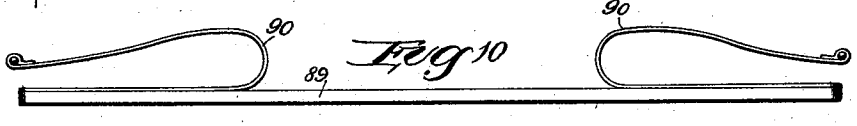
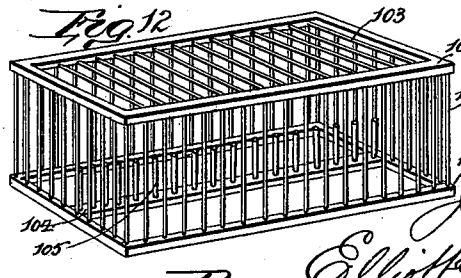


Fig. 10

Fig. 12.



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Inventor:
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UNITED STATES PATENT OFFICE.

JOSEPHINE G. COCHRANE, OF SHELBYVILLE, ILLINOIS.

DISH-CLEANER.

SPECIFICATION forming part of Letters Patent No. 512,683, dated January 16, 1894.

Application filed February 26, 1892. Serial No. 422,868. (No model.)

To all whom it may concern:

Be it known that I, JOSEPHINE G. COCHRANE, a citizen of the United States, residing at Shelbyville, in the county of Shelby and State of Illinois, have invented certain new and useful Improvements in Dish-Washing Machines, of which the following is a full, clear, and exact specification.

My invention relates to improvements in machines for washing dishes, in which a continuous stream or streams of either soap-suds or clear water is injected through a crate or reel holding racks or cages, containing dishes to be washed, while the crate or reel is rotated so as to bring as near as possible all surfaces or portions of the dishes under the action of the water; and my present invention is more particularly designed as an improvement upon machines of this character shown and described in United States Letters-Patent No. 355,139, granted to me December 28, 1886, and No. 391,782, granted to Jacob Kritch and myself jointly, October 30, 1888, and to which patents reference may be had for an understanding of any features not fully described herein.

One of the main objects of my present invention is to provide simple and effective means for giving the reel a continuous as contradistinguished from an intermittent rotation while subjected to the action of the water.

Another object is to provide the apparatus with a simple and automatic deflector for diverting the water as it runs from the crate or reel, into the proper compartment or chamber below, as in my aforesaid patents, and to do away with the depending arms heretofore used for supporting and shifting such deflector and at the same time to greatly reduce the deflector in width.

A further object of my invention is to provide the device with means for supporting two reels or crates at one time, so that one of the same may be on the inside of the washing chamber and the other on the outside in a position to be unloaded or refilled with articles to be washed.

A further object of my invention is to provide an improved crate or reel which will automatically lock or clamp the dishes therein when the cover of the reel or crate is closed down and automatically release the same when such cover is open.

A still further object, is to provide an improved form of basket or kit, which shall be capable of securely holding the dishes while in the reel, without damaging or marking the same, as has been the case heretofore when iron or metallic baskets or kits have been employed.

With these ends in view, my invention consists in certain features of novelty in the construction, combination and arrangement of parts hereinafter fully described, in connection with the accompanying drawings and more particularly pointed out in the claims.

In the said drawings, Figure 1 is a front elevation of my machine, the reels or crates being removed and the side doors and their lifting mechanism being omitted for the sake of clearness. Fig. 2, is a vertical longitudinal section thereof, taken on the line 2—2, Fig. 1. Fig. 2ª, is a detail plan view of the deck. Fig. 3, is a vertical transverse section taken on the line 3—3, Fig. 2, showing the reels or crates in end elevation. Fig. 4, is a plan view illustrating the mechanism for raising and lowering the doors of the washing chamber, the front portion of the machine being broken away. Fig. 5, is a perspective view of the reel supporting carriage, drawn to a smaller scale. Fig. 6, is a vertical longitudinal section of the dish reel or crate taken on the line 6—6, Fig. 7. Fig. 7, is a vertical transverse section of the same, taken on the line 7—7, Fig. 6. Fig. 8, is a detail view of the locking and releasing mechanism of the crate or reel, hereinafter described, the section being taken on the line 8—8, Fig. 7. Fig. 9, is a detail view of the sliding locking rack and the end of the follower, for holding the dishes in the crate or reel, showing a spring dog on such follower about to engage the teeth of the rack. Fig. 10, is a detail view of the follower in side elevation. Fig. 11, is a plan view of the same. Fig. 12, is a perspective view of the dish basket or kit, and Fig. 13, is a sectional view of the same, showing the manner of holding the dishes therein.

In the drawings, wherein like signs of reference indicate like parts throughout the several views, 1 is a frame or casing provided

with a washing chamber 2 having open sides, which are closed preferably by vertically sliding doors 3—4, respectively, which may have any suitable means for elevating them. The means shown for accomplishing this and which I prefer to use, consist of two racks, 5—6, arranged in a vertical position at or near the end of each of the doors, which are engaged respectively by pinions 7—8, secured to horizontal shafts 9, one at each side of the machine and preferably at the upper edge or corner of the frame, 1. Each of these shafts 9, is provided with a beveled pinion 10, which are respectively engaged by similar pinions 11, secured to a crank shaft 12 journaled at the back of the machine and being provided at each end with a crank or handle 13, by means of which a rotary movement may be imparted to the shafts 9, which will consequently impart the desired movement to the doors, 3—4; thus causing both doors to be elevated or lowered simultaneously. Each door, if desired, may be provided with a counter balance 14, attached thereto by means of a suitable cord 15 working over pulleys 16 mounted in a cross bar 17 above the machine.

As in my aforesaid patents, situated below the washing chamber 2 and extending longitudinally thereof, are two independent water chambers 18—19, covered by a suitable sieve or screen 20 and being for the reception of clear or rinsing water and soap-suds, respectively, or any other cleansing solutions. These chambers 18—19, project forward beyond the casing 1, into pump chambers 21—22 respectively, in which are respectively situated the pumps 23—24, as in my aforesaid patents, and from these pumps extend the eduction pipes 25—26 respectively, which, however, unlike my aforesaid invention, are provided throughout their horizontal portions, which extend through the washing chamber 2 over the reel, with a series of flattened or fan shaped nozzles 27. These nozzles 27 are so arranged that their longest diameters will be lengthwise of the crate or reel, so as to direct a continuous sheet of water upon the reel from end to end thereof and thus subject the entire surface of the articles to be cleansed to the action of the water.

Arranged at each end of the washing chamber 2, transversely thereof, is a track or way 28, which extends slightly beyond the frame 1 on both sides, as more clearly shown in Fig. 3, and is provided at each of its extremities with any suitable stop, such as upturned or curved portion 29. Mounted upon these tracks or ways, is the reel carriage 30, each of whose side pieces 31 is provided at each end with any suitable anti-friction device, such for instance, as a grooved roller 32, which rollers rest upon the tracks 28 and thus support and guide the carriage as it is shifted from one side of the machine to the other, the side portions 31 of the carriage being tied together by a suitable brace-bar 33.

At each end of each of the side portions 31, is formed an open journal bearing 34, in either pair of which one of the reels 35 having journals 36 may be mounted. In practice, however, it is desirable and advantageous to mount one of the reels in each end of the carriage, as shown in Fig. 3, so that one reel may be on the inside of the chamber 2 subjecting its contents to the action of the spray pipes, while the other may be on the outside in a position to be emptied and refilled, if desired. Another important advantage in this construction and manner of use, is that each of the doors may be provided with a blade or other suitable spring 37, one of which, when the doors are closed down in the position shown in Fig. 3, will engage or press against the side of the crate on the outside and thus not only hold such crate firmly in position, right side up, but subserves the further useful function of maintaining the journal 36 of the reel in axial alignment with a clutch 38, by means of which the reel is rotated. One of the springs 37 is secured at its upper end to each of the doors at about midway of the length of the door and has its lower end resting freely against the outer side of the door, so that when the door is lowered as shown in Fig. 3, the spring will crowd between the side of the outer reel and the door and prevent such reel from turning, while at the same time, the carriage 30, upon which the reels are mounted, will be secured against inward movement and the inner reel consequently held in its proper position.

The journal 36 at one end of the reel is preferably provided with a cavity 36^a prismatic in form, so as to be capable of receiving a square or prismatic clutch 38 formed on the inner end of the reciprocating shaft or stem 39, suitably mounted with capability of rotation, in a sleeve or journal bearing 40, secured to the end of the frame 1. The outer end of the shaft 39 may be provided with any suitable mechanism for imparting an endwise movement thereto, so as to engage and disengage the clutch 38 with the socket in the journal 36, but I prefer to employ an eccentric 41, whose strap is connected to the end of the shaft 39 by means of a link 42, and whose shaft 43 is mounted in suitable bearings 44 formed on or secured to the uprights or stanchions 45, and provided at its extremity with suitable operating handles or cranks, 46.

47 is the main driving shaft, mounted preferably on the top of the casing or frame 1, longitudinally thereof, in any suitable bearing 48, and being driven by an engine or any other suitable motor or power. The end of this shaft 47 is provided with a beveled pinion 49, which engages with a beveled gear wheel 50 mounted upon and secured to a cross shaft 51, which has its bearings 52 in the upper ends of the standards or stanchions 45, as more clearly shown in Fig. 1. This shaft 51, is also provided with a worm 53, which engages with the worm wheel 54 se-

cured to the end of the vertical or upright shaft 55, mounted in suitable bearings 56, secured to the frame 1; and at the lower end of, or other convenient point on this shaft 55, is secured a beveled pinion 57, which is so arranged as to be engaged by a similar pinion 58, secured to the shaft 39, when such shaft is pushed inward toward the reel, as before described; but, of course, any of the other well known mechanical expedients for establishing a connection between the shafts 55 and 39 might be employed without departing from the spirit of my invention.

The pump piston rods 59, are provided at their upper ends with any suitable guides 60, and arranged to slide upon but otherwise disconnected with these piston rods, is a cross-head 61, whose extreme ends are shown as turned backward slightly, so as not to interfere with the standards 45, and are suitably connected by means of pitmen or connecting rods 62 with wrist pins of the crank disks 63, which latter are secured to the extremities of the shaft 51, and thus cause the cross-head 61 to reciprocate up and down on the piston rods 59 during such time as the shaft 51 may be in operation.

Inasmuch as it is desirable that but one pump should be operated at a time, and that both should be inactive while the doors of the chamber 2 are open for removing or replacing the reels, it is necessary to provide the cross-head with some means for detachably connecting it with either or disconnecting from both of the piston rods. The means shown and which I prefer to employ, consist of a bolt 64, mounted in suitable boxes or guides 65, secured to or formed upon the cross head 61 and provided at or near its mid-length with a rack or series of teeth 66, which are engaged by a segment rack 67, pivoted to the cross-head and having a suitable operating handle 68; and on the piston rods are secured respectively notches or keepers 69—70, into either of which the bolt 64 may be projected, by means of the lever 68, and thus cause the operation of the pump on that side until such bolt is shifted to the neutral or central position, so as to be out of engagement with both keepers, or into engagement with the opposite keeper.

For locking the bolt in the desired position, the cross head may be provided with a locking rack 71 having suitable notches, as shown in Fig. 1, in which notches engages a suitable locking dog 72 pivoted to the back of the lever 68; or any other preferred means may be employed.

Arranged just above the screen 20 in the chamber 2, is a suitable, divided, horizontal partition, which preferably consists of two removable inwardly inclined slides 73—74, adapted to be inserted through the door ways of the chamber 2 and to rest upon guides or any other suitable supports 75, such slides terminating at their inner ends under the axis of the inner crate or reel, and at a short distance from each other, so as to permit the water flowing from either of the pipes 25—26, to run off into the chambers 18—19 below. In order, however, that the water injected through one of the pipes 25—26 may be kept separate from that which is injected through the other of such pipes, and may be caught in one of the chambers 18—19 only, I arrange immediately under the inner ends of the slides 73—74, a tilting deflector 76, which is mounted upon a horizontal shaft 77 in such a position as to overlap the under side of either of the slides 73—74 when tilted in an inclined position, as more clearly illustrated in Fig. 3. Thus, it will be seen that the water discharged by either of the pipes 25—26 will be compelled to run off into but one of the chambers 18—19. The outer end of this shaft 77 is provided with a crank arm 78, which passes through a swiveled lug 79 on the end of a depending arm 80, secured to or formed on a rocking lever 81, which latter is pivoted at 82 on the support 83. The crank arm 78 has sleeved upon it between the shaft 77 and the lug 79, a suitable spring 84, which, it will be seen, when the lever 81 is oscillated sufficiently far to cause its arm 80 to pass the perpendicular, will throw such arm to the extremity of its movement on one side, and consequently, hold the deflector 76 in its tilted position.

In order that the pumps themselves may automatically tilt the deflector 76 to the proper position for casting the water into the proper one of the chambers 18—19, I provide each of the piston rods with rearwardly projecting arms 85, rigidly secured thereto in any suitable manner and projecting under the ends of the lever 81, so that when either of the piston rods is operated, the lever 81 will be oscillated upon its pivot, if at the beginning of the operation of such piston rod the end of the lever 81 on that side is in its lower position. These arms 85 may be guided at their rear ends by any suitable guides or ways 86, consisting for instance, of ordinary channel irons secured by ears 86^a to the end of the casing 1 for preventing the rotation of the piston rods, and thus at the same time avoiding the possibility of the keepers or notches 69 shifting out of position by the rotation of the piston rods; and such arms 85 are arranged at such positions with relation to the lever 81, that the lever will be tilted or thrown upward at one end at the first upward stroke of the piston and will remain in this position until the other pump is started.

In order that access may be had to the interiors of the pumps and the chambers in which they are situated, for cleaning the same, I have provided the upper ends or sides of these chambers 21—22, with a removable deck or cover 21^a which is provided in its inner end or edge with two slots 21^b for the passage of the piston rods when the deck is being slipped into place. These slots 21^b are provided with doors 21^c, pivoted to the deck at 21^d so as to

swing to and from said slots; and the ends of these doors are provided with semicircular notches 21ᵉ for partially encompassing the piston rods.

The reel preferably consists of a rectangular frame 87 provided with a suitable hinged lid 88, and such reel is adapted to receive any suitable basket, such as that shown in Fig. 12, for containing the dishes to be cleansed. The basket is held in position in the bottom of the reel so as to avoid breakage or rattling of the dishes while the machine is in operation, by means of the follower 89, whose ends are provided with spring dogs 90 connected together at their outer ends by a cross-bar 91, which is adapted to engage with the toothed locking bars or racks 92, two of which being preferably arranged at each end of the reel. Each pair of these racks 92 are provided with a connecting cross bar 93, at or near their upper ends and with a similar bar 94 near their lower ends, and the bar 93 is preferably provided with an upwardly projecting post or lug 95, which is arranged to be impinged by the lid 88 when the latter is closed, thus forcing the racks 92 downward against the action of a spring 96, secured to the bar 94 and to the end of the reel, and thereby projecting the teeth of the racks 92 beyond fixed plain-edged guard bars 97 arranged parallel with each of the racks 92, and causing such teeth to engage over the cross bars 91 of the spring dogs 90 and lock the follower in position.

The plain edged bars 97 are secured at 98 at both ends, to the frame of the crate or reel, and are provided with inclined slots 99 in which work suitable pins or lugs 100, formed on or secured to each of the racks 92, thus causing such racks, when forced downward by the action of the lid, to ride inward in the manner described, for engaging the spring dogs 90, and to ride outward under the influence of the spring 90 when the lid is opened, and thus withdraw the teeth beyond the plain edged bars 97 and permit the ready withdrawal of the follower. The lid, of course, may be provided with any suitable catch or latch for holding it closed. The ends of the spring dogs thus constituted by the springs 90 and cross bars 91, are capable of perpendicular movement independently of the follower, and hence the follower will be held upon the dishes by a yielding pressure which will avoid damage to frail articles.

Great difficulty has heretofore been experienced with iron or metallic baskets for holding dishes, owing to the fact that even when such baskets are enameled, the enameling soon wears off and leaves the exposed metal to mark and mar the dishes. In order to avoid this objection, I have constructed a basket of wood, which, while sufficiently strong and rigid to hold the dishes firmly in position, not only prevents the marking thereof, but avoids chipping fine china and the rattling thereof while in the machine.

The form of basket which I have found to be most efficient for holding flat ware, consists of two rectangular frames, 101—102, forming the top and bottom respectively, which may be connected together by slats or strips 103, composed of wood, rattan or bamboo. The frame 102, is provided with a central piece 104, through the middle of which are planted a number of short pins or posts, 105, between which and the horizontal ribs 103, the flat articles may be situated, as more clearly shown in Fig. 13.

Having thus described my invention, what I claim as new therein, and desire to secure by Letters Patent, is—

1. In a dish washing machine, the combination with the chambers for the rinsing and washing solutions and the pumps communicating with said chambers respectively and having piston rods, of a cross-head, means for reciprocating said cross-head, and a shiftable bolt on said cross-head, adapted to be connected with either of said piston rods, substantially as set forth.

2. In a dish washing machine, the combination with the washing chamber, the chambers 18—19 for the washing and rinsing solutions and the pumps communicating with said chambers 18—19 respectively and adapted to discharge into the washing chamber and having piston rods provided with notches or keepers, of a cross-head having means for reciprocating it, and a shiftable bolt on said cross-head for engaging either of said keepers and being adapted to be disengaged from both of said keepers at once, substantially as set forth.

3. In a dish washing machine, the combination with the chambers for the rinsing and washing solutions and the pumps communicating with said chambers respectively and having piston rods provided with notches or keepers, of a cross-head having means for reciprocating it, a shiftable bolt on said cross-head for engaging either of said keepers and being adapted to be disengaged from both of said keepers at once, and a locking dog for said bolt, substantially as set forth.

4. In a dish washing machine, the combination of a reel having its journal provided with a prismatic portion, a rotary longitudinally movable shaft having a prismatic end adapted to fit said prismatic portion of the reel journal, the cross shaft 51 a gear connection between said shafts, and an eccentric connected to said first shaft for moving it endwise substantially as set forth.

5. In a dish washing machine, the combination with the washing chamber having two chambers below it, of a tilting, as contra-distinguished from a swinging, deflector arranged in said washing chamber and projecting over both of said lower chambers, and means for forcing the water into said washing chamber having means for tilting said deflector, substantially as set forth.

6. In a dish washing machine, the combination with the washing chamber having a num-

ber of chambers situated below it, of a stationary tilting deflector arranged in said washing chamber, the pump piston rods, projections or arms on said rods and a lever for tilting said deflector, having its ends arranged permanently in the line of motion of said arms or projections, substantially as set forth.

7. In a dish washing machine, the combination with the washing chamber having a number of chambers situated below it, of a stationary tilting deflector arranged in said washing chamber, inclined slides or partitions arranged above said deflector, and means for tilting said deflector automatically by the motion of the pump pistons, substantially as set forth.

8. In a dish washing machine, the combination with the washing chamber having two chambers below it, and inclined slides or partitions arranged at both sides of the lower portion of said washing chamber, of a tilting deflector pivoted in said washing chamber and permanently projecting under the lower edges of both of said slides, and means for forcing the water into said washing chamber, having means for tilting said deflector, substantially as set forth.

9. In a dish washing machine, the combination with the washing chamber having two chambers below it, and inclined removable slides arranged on both sides thereof, of a tilting deflector pivoted in said washing chamber and projecting under the lower edges of both of said slides, and means for forcing the water into said washing chamber, having means for tilting said deflector, substantially as set forth.

10. In a dish washing machine, the combination with the pumps, a washing chamber adapted to receive a reel or crate, and two chambers below said washing chamber connected with the pumps respectively, of the shaft 77, arranged below the reel, a tilting deflector mounted on said shaft below the reel, a crank arm on said shaft, a rocking lever connected with said crank arm, means for oscillating said lever by the operation of the pumps and a spring for holding said deflector in its tilted position, substantially as set forth.

11. In a dish washing machine, the combination with the washing chamber, of sliding doors for closing the sides of said washing chamber, a track or way extending through said chamber, a carriage mounted upon said track and having two pairs of journal bearings for the reception of the journals of two reels at once, substantially as set forth.

12. In a dish washing machine, the combination with the washing chamber, of a track or way extending through said chamber, a carriage mounted upon said track and having two pairs of journal bearings for the reception of the journals of two reels at once, a clutch for operating the inner reel and a stop for holding the inner journal bearing in axial alignment with said clutch, substantially as set forth.

13. In a dish washing machine, the combination with the washing chamber having sliding doors, of a track or way extending through said chamber, a carriage mounted upon said track and having two pairs of journal bearings for the reception of the journals of two reels at once, a clutch for operating the inner reel and spring stops on said doors adapted to press against the outer reel when the doors are closed, substantially as set forth.

14. In a dish washing machine, the combination with the washing chamber and means for holding and washing the articles therein, of doors for closing the sides of said chamber, having racks, pinions engaging said racks, and a shaft for operating said pinions for opening said doors simultaneously, having a crank at both sides of the machine, substantially as set forth.

15. In a reel for the purpose herein described, having a lid, the combination of a follower having locking dogs thereon, toothed racks for engaging said dogs, plain edged bars for holding said dogs away from said toothed racks and means for automatically engaging and disengaging said racks with said dogs by the opening and closing of said lid, substantially as set forth.

16. In a dish washing machine, the combination with a crate or reel having toothed racks therein, of a follower adapted to fit in said crate or reel and spring dogs on said follower adapted to engage with said racks, said dogs being movable perpendicularly independently of the follower, whereby the follower will be yieldingly held, substantially as set forth.

17. In a dish washing machine, the combination with the washing chamber having open sides provided with doors, of a track extending through said chamber and protruding through both of its open sides, and a carriage mounted on said track and adapted to carry two reels at once, substantially as set forth.

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