

April 26, 1927.

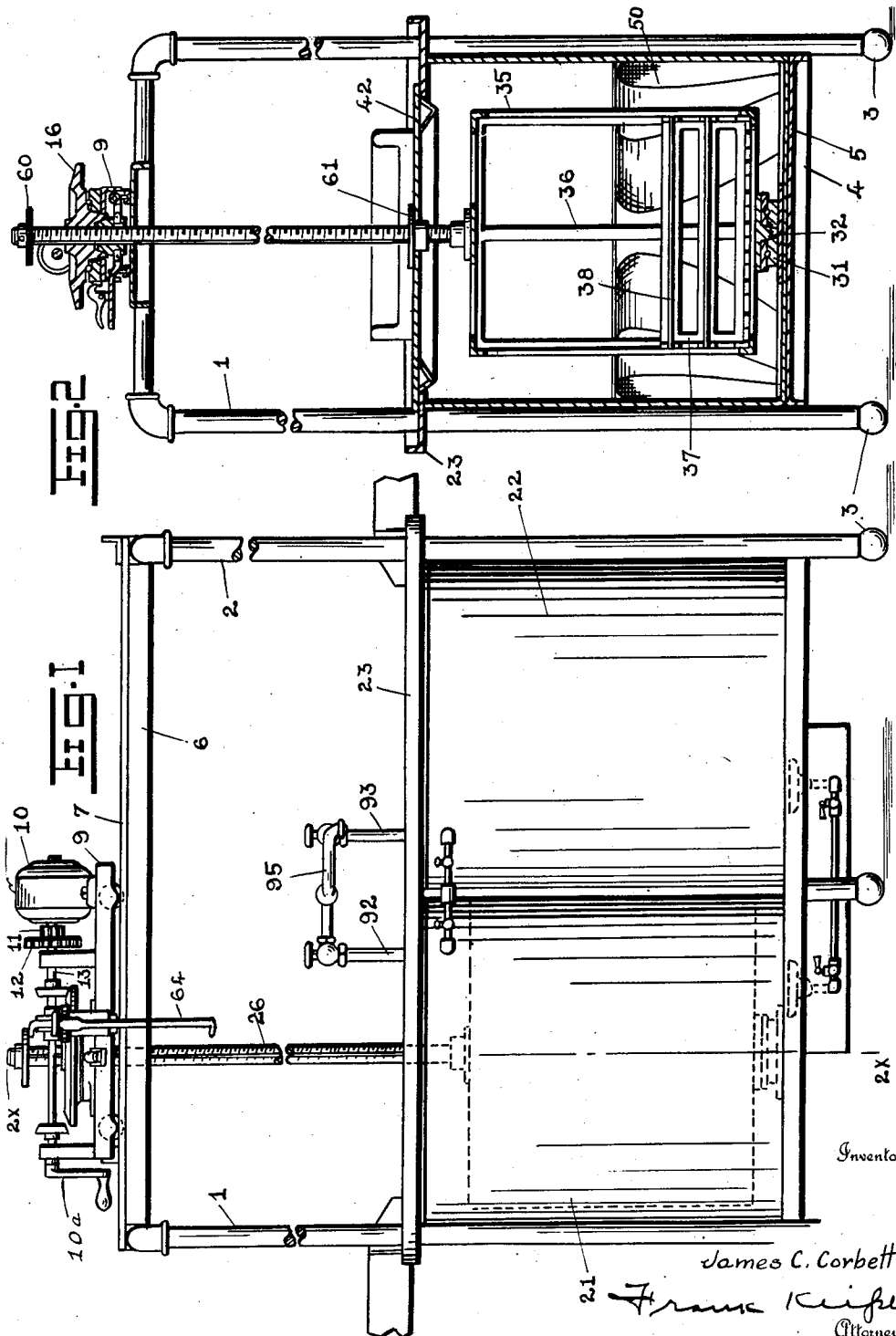
J. C. CORBETT

1,626,022

MACHINE FOR WASHING, RINSING, AND DRYING DISHES

Filed Nov. 7, 1925

3 Sheets-Sheet 1



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3 Sheets-Sheet 2

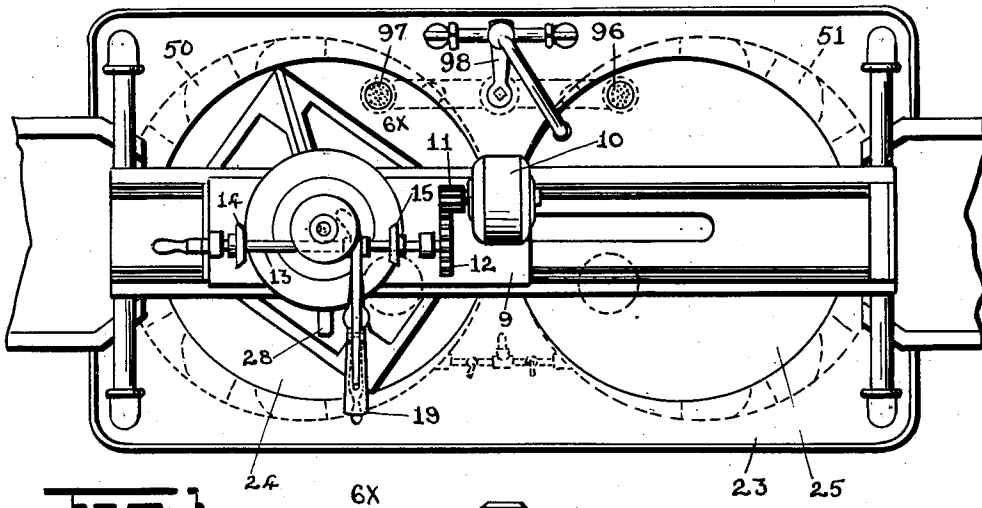


FIG. 1

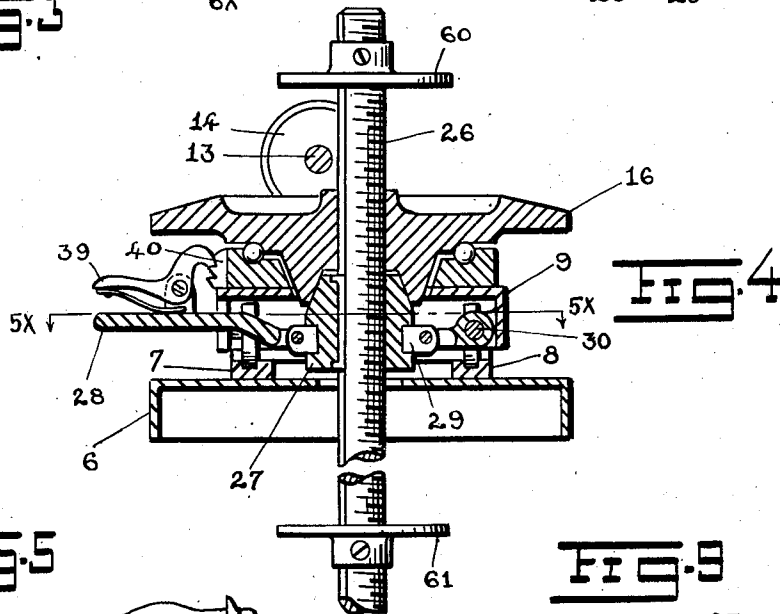


FIG. 4

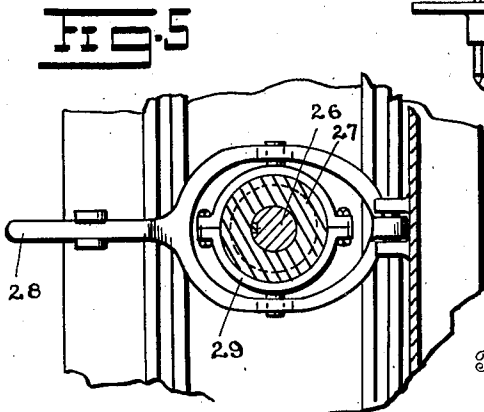


FIG. 5

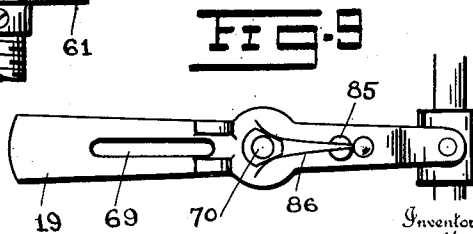


FIG. 6

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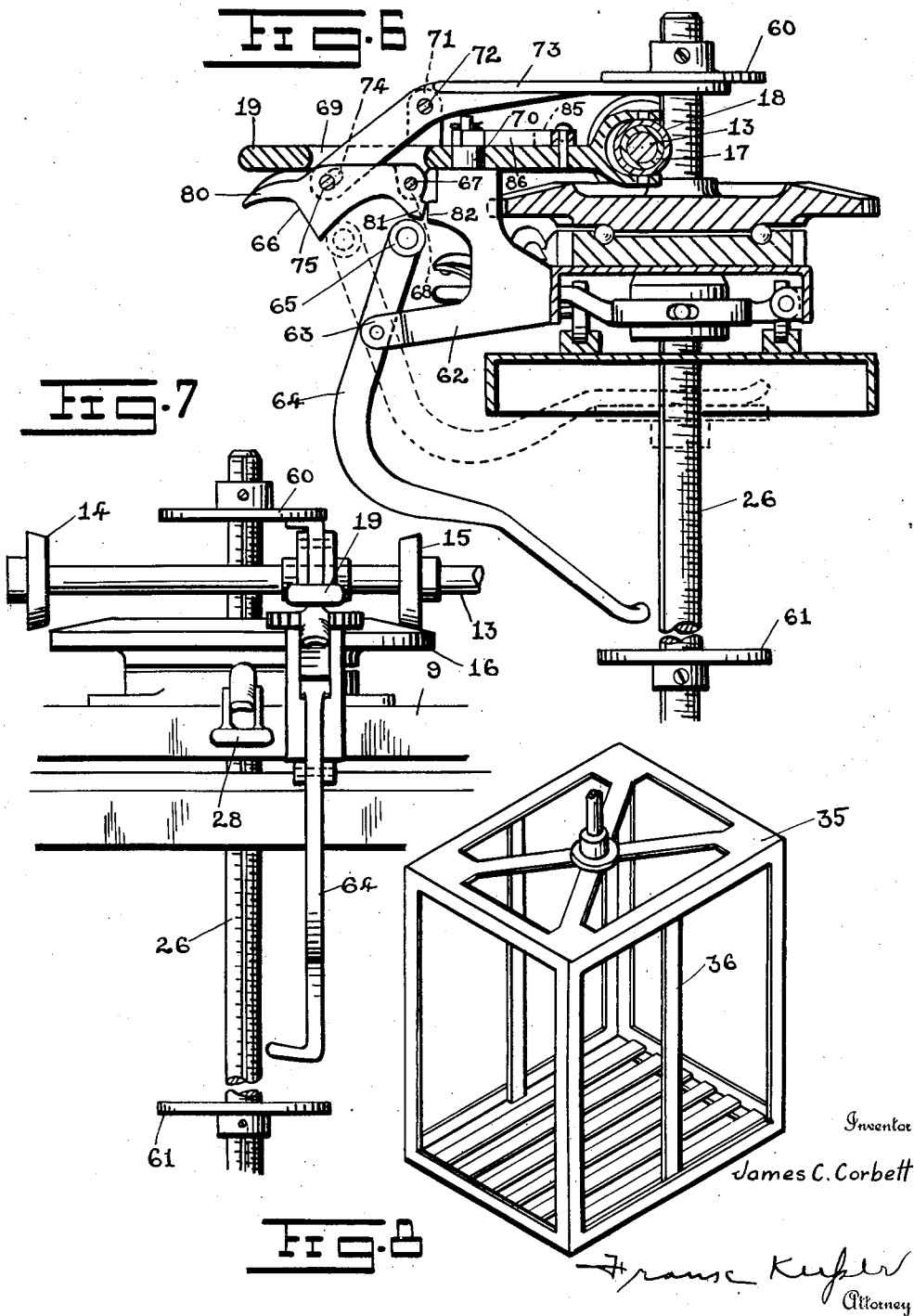
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MACHINE FOR WASHING, RINSING, AND DRYING DISHES

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3 Sheets-Sheet 3



UNITED STATES PATENT OFFICE.

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MACHINE FOR WASHING, RINSING, AND DRYING DISHES.

Application filed November 7, 1925. Serial No. 87,877.

The object of this invention is to provide a new and improved machine for washing and rinsing and drying dishes. Another object of the invention is to simplify the matter of handling the dishes and transferring them from one tank to another and in immersing the dishes in the first place and finally placing them on the drain board.

This and other objects of the invention will be fully illustrated in the drawings, described in the specification and pointed out in the claim at the end thereof.

In the drawings:

Figure 1 is the side elevation of my improved dish washing machine.

Figure 2 is a vertical section taken on the line 2*, 2* in Figure 1.

Figure 3 is a top plan view of the machine with the round cover plate omitted.

Figure 4 is an enlarged detail view of the clutch and operating mechanism shown at the top of Figure 2.

Figure 5 is a horizontal section on the line 5*, 5* in Figure 4.

Figure 6 shows a vertical sectional view of the gearing clutch mechanism, the parts being shown on a large scale.

Figure 7 is a front elevation of the parts shown in Fig. 6 viewed from the front of Figure 3 and from the left of Figure 6.

Figure 8 is a perspective view of the cage that is immersed in and raised from the tank.

Figure 9 is a top plan view of the lever used for shifting the friction pinions.

In the drawings like reference numerals indicate like parts.

In the drawings 1 and 2 indicate the upright frames which are formed of pieces of pipe cut of suitable length and threaded at the ends and connected at the upper corners with elbows. The bottom of the frame is supported by the ball feet 3, 3. Connecting the two members of the upright frame is a tie rod 4 which passes through the two members, one of these tie rods being provided at each end of the machine frame. Resting on these tie rods is the sheet iron base plate 5.

At the top of these uprights are connected by a frame work 6 which supports the tracks 7 and 8 on which runs a carriage 9. On this carriage is carried an electric motor 10 which drives a pinion 11 which meshes with a large reduction gear 12 that is keyed to the shaft 13. On this shaft is carried the

small friction cone pinions 14 and 15 which engage with a large cone gear 16. The pinions 14 and 15 are keyed on a shaft 13 with which they are moved back and forth together with the shaft 13. On the sleeve 17 is carried a collar 18 which is pivotally mounted between the bifurcated ends of the lever 19 pivoted on the post 70. By the movement of this lever 19 either the pinion 14 or 15 can be brought into contact with the gear 16. This lever is provided with a dog 66 that has a tooth 81 thereon that engages with the ratchet face 82 by which it is held at either end of its movement. Further reference will be made to this later on. As the pinions 14 and 15 always revolve in the same direction, but engage on opposite sides with the gear 16, they can be used to cause the gear to revolve first in one direction and then in the other. It will be seen that the pinion 11 is an elongated pinion and as the shaft 13 is moved back and forth with the cones 14 and 15, the gear 12 will move therewith and be maintained in driven engagement with the pinion 11. On the bottom plate 5 are placed the two cylindrical tanks 21 and 22 in which the water is contained. One of these tanks is used for washing the dishes and the other tank is used for rinsing the dishes. The tanks can be used alternately for each purpose and this use will result in the saving of the hot water used. On these tanks rest the intermediate plate 23 which is perforated with four small round openings through which the upright members of the upright frames 1 and 2 pass. These openings are surrounded with flanges or collars that keep any overflow water from passing through and dripping or running down the upright. The intermediate plate is is cut away with two large round holes 24 and 25. These openings are smaller than and eccentric to the circumference of the tanks so as to cover the baffles which are mounted stationary in each tank, which baffles will presently be described. The circular openings are concentric with the cage that rotates alternately in each tank and the shaft by which it is driven.

The large cone gear 16 drives a threaded shaft 26 through a clutch member 27. As shown in Figure 4, the cone 16 is recessed on the under side, and with this recess engages the male member 27 of the cone which is lifted into engagement therewith by the lever 28 which engages with a collar 29 in

which the cone member is free to rotate. The lever 28 is pivoted at 30 on the carriage 9. When the clutch member 27 is open the shaft 26 does not turn. As this shaft makes threaded engagement with the cone 16 the rotation of the cone 16 when the shaft does not turn causes the shaft 26 to lift, and brings up with it the cage 35 which is on the bottom of the shaft. When the cone 16 is turned in the reverse direction and the shaft 26 is held stationary, the cage is lowered into the tank. As the cage is either raised or lowered it is sufficient that the operator merely puts her hand on the cage to keep it from turning, and the threaded engagement above described will either raise or lower it, while it is held against rotation. When the cage reaches the bottom, it rests on the ball bearings 31, one of which is provided for each of the bottoms of the tanks 21 and 22. On the bottom of the cage is provided a male cone 32 that engages with a corresponding female cone in the ball bearing on which the basket turns on which the cage turns after it has been lowered. By this it is centered on the bearing that supports it.

The cage 35 is made up as an open frame work of angle iron as indicated in Figures 2, 3 and 8. The middle of the long sides as shown in Figures 3 and 8 are reinforced by an upright bar 36 also shown in Figure 2. The narrow ends are left open and into either end can be inserted the basket or crate 37 which is shown in Figure 2. This crate is a skeleton frame of wood which is divided off by the horizontal bars 38, 38 shown in Figure 2 so that a series of pockets are formed therein in which the dishes will stand upright. Each of these pockets is filled with dishes and the crate is set loosely in the cage, it being held therein by the flanges of the angle irons which extend all the way around the bottom of the cage.

When the cage is at the top, the basket or crate will be placed therein filled with dishes and then the lever 19 will be moved to drive the cone 16 to lower the shaft 26 and the cage 35, until the cage rests on the ball bearing on the bottom of the machine. Then the lever 28 will be moved to move the male cone 27 into engagement with the cone 16. This will cause the shaft 26 to turn and will cause the cage and its basket to rotate in the water of the tank. The lever 28 is held up to hold the cone 27 in driving position by the engagement of the pawl 39 with the ratchet 40. The cage will be rotated for about thirty seconds in one direction and then the lever 19 will be thrown to cause the cage to rotate in the other direction for an equal length of time after which the lever 19 will be put on neutral and the lever 39 again will be moved to disengage the clutch member 27 after which the

lever 19 is moved to turn the cone 16 to raise the shaft 26 and the cage 35. When the cage has been elevated the carriage 9 will be moved to suspend the cage over the rinsing tank upon which the cage will be lowered into the water and will be caused to rotate first in one direction and then in the other to secure the rinsing of the dishes after which it will again be raised so that the basket can be removed and placed on the drain board. Another basket can then be put into the cage and put through the two tanks in the same manner to both wash and rinse the dishes. In each of the tanks is provided a series of stationary baffles as indicated at 50 and 51. These baffles are wide on one side of the tank and taper to nothing on the other side of the tank so as to leave a circular opening that is clear of the baffles and eccentric to the tank. The baffles are thus given a curved wedge shape and are arranged to slope alternately up and down as shown in Figures 2 and 3. In the circular opening inside of the baffles the rectangular baskets can be rotated back and forth. The baffles are arranged to swirl the water up on one side and down on the other thus establishing currents in the water that will cause the water to flow up through the dishes in one part of the tank and down through the dishes in another part of the tank. Centered on the shaft 26 is the cover plate 42 that covers the opening in the plate 23 while the cage is in the tank. This plate is raised and lowered with the cage.

As above described, the rotation of the cone gear 16 independent of the shaft 26 may be controlled manually, but in such case the shaft 26 will continue its travel endwise until the cone 16 stops rotating or until the clutch member 27 is thrown into engagement with the cone 16 so as to compel the shaft to rotate therewith. If the clutch remains open and the pinion 14 or 15 remain in engagement with the gear 16, the shaft will continue to move downward until the cage rests on the bearing at the bottom after which the shaft will either continue its downward course or will raise the carriage off the track, and on the upward movement of the shaft the cage will continue to move up until it makes contact with the frame work at the top of the machine after which the pull would continue to be exerted by the shaft and the machine would then quickly jam. In order to avoid the possibility of a failure of the operator to move the clutch lever 28 or the reverse lever 19 at the right time, I have provided an automatic control device that will release the lever 19 and allow it to move to neutral position at either end of the movement of the shaft, thus stopping the rotation of the gear 16 and the endwise movement of the shaft 26. This mechanism I will now describe:

Fasten to the shaft 26 is provided the disk plate 60 at the top of the shaft and the disk plate 61 which is fastened to the shaft near its lower end and a little above the cage.

Fastened to the carriage 9 is the bracket 62 which has an arm 63 thereon on which is pivotally mounted the lever 64. This lever 64 when the cage is at the bottom of the machine swings by gravity to the position shown in full lines in Figure 6. The disk plate 61 when in its lowermost position will be a considerable distance below the end of the lever 64 when the lever is in full line position. This is indicated by the shaft 26 being shown broken above the disk plate 61. As the shaft and cage start up no effect will be produced on the lever 64 until the disk 61 approaches the upper end of its movement. It will then engage the lower end of the lever 64 as shown in Figure 6 and move it to the dotted line position shown in that figure, which indicates the upper end of the movement of the disk and the lever. The upper end of the lever 64 is provided with an anti-friction roller 65 that engages with a dog 66 which is pivoted on a pin at 67 and is provided with a cam surface on its lower edge. The pin 67 is supported by two lugs 68 which are provided on either side of a slot 69 in the lever 19. This lever 19 is pivoted on a post 70 provided on the bracket 62. Extending upwardly from the lever 19 is a pair of lugs 71 provided with a pin 72 on which is pivoted a lever 73 which extends down through the slot 69 and has a slot 74 in the lower end thereof which engages with the pin 75 carried in the dog 66.

The dog 66 is provided with a handle 80 which the operator can grasp with the same hand that grips the handle of the lever 19. The lever 19 is used to shift the cone pinions 14 and 15. The dog 66 has a tooth 81 thereon that engages with the ratchet face 82 in either of the extreme positions of the lever 19 so as to hold the pinion 14 or 15 in engagement with the cone gear 16. The lifting of the dog 66 either manually or by the swinging of the lever 64 releases the dog from engagement with the ratchet face so that the lever 19 can drift toward neutral position, carrying the active pinion 14 or 15 away from the cone 16, thus stopping the drive thereof.

When the lever 64 is swung from the full line position to the dotted position shown in Figure 6 the dog 66 is raised to the position shown in Figure 6 and the left hand end of the lever 73 is raised and the right hand end is drawn down. In such case the disk 60 will be elevated to the top of its movement and will stand way above the right hand end of the lever 73. When the shaft 26 descends and gets near the lower end of its movement the disk 60 will engage with the right hand end of the lever 73 and move it down raising the left hand end of the lever. This will lift the left hand end of the dog 66 and draw the tooth 81 away from the ratchet face 82. In like manner when the shaft 26 lifts the disk 61 will engage the lever 64 which in turn will lift the dog 66 and draw the tooth 81 away from the ratchet 82. In either case the cone pinion 14 or 15 will not thereafter be held positively in engagement with the gear 16 but will drift away therefrom upon which the gear 16 will cease to be driven and will cease to raise or lower the shaft 26. To facilitate the drifting movement of the lever 19 to the neutral position I provide as follows: A split pin 85 is provided on the lever 19 in which is held a split spring 86, the free ends of which engage the cams or bevels formed on the top of the post 70. The post 70 is rigid with the bracket 62 and when the lever 19 is moved from neutral position in either direction the one end of the split spring 86 bears heavier on one of these beveled surfaces than the other end of the split spring bears on the other beveled surface. This split spring therefore tends to return the handle 19 to neutral position and quickens the movement of it as soon as the tooth 81 on the dog 66 is released from the ratchet face 82. In this way the gear 16 is brought to rest and thereafter the cone clutch member 27 is moved into engagement therewith if the shaft 26 is at the bottom of its movement, to rotate the crate. After the crate has been rotated sufficiently in both directions then the clutch 27 is opened upon which the shaft 26 and crate is raised until its upward movement is stopped by the releasing of the lever 19 as above described. The carriage is first positioned over the tank for washing the dishes, and the cage is lowered and rotated, and after the washing has been completed and the cage is raised, the carriage is moved along the tracks to position the cage over the other tank and the operation is then repeated in that tank.

Below the tanks are provided the gas burners 90 and 91 by which the water in the tank is kept hot. 92 indicates the cold water pipe and 93 the hot water pipe and 95 indicates a swinging faucet by which the water can be put into either tank. 96 and 97 indicate drains for the tank which are regulated by a valve, the handle of which is indicated at 98 in Figure 3. The valve can be put into position to drain either of the tanks separately.

If for any reason the motor 10 should fail to operate, the machine may be operated manually for which purpose a crank 10^A may be fastened to the outer end of the shaft 13 as illustrated in Figures 1 and 3.

I claim:

In a dish washing machine, the combination of a pair of tanks placed side by side, an overhead track supported over said pair of tanks, a carriage adapted to move back and forth on said track, a cage adapted to hold dishes to be washed, a threaded shaft suspended from said carriage and connected to said cage to either turn or raise and lower said cage on the rotation thereof, a gear mounted on said carriage and threaded on said shaft, a clutch splined on

said shaft below said gear, and means for either holding said clutch in frictional contact with said gear to rotate therewith and rotate said shaft with said cage, or holding it out of engagement with said gear to allow said shaft and cage to remain stationary so as to raise or lower said shaft on the rotation of said gear. 15

In testimony whereof I affix my signature.

JAMES C. CORBETT.