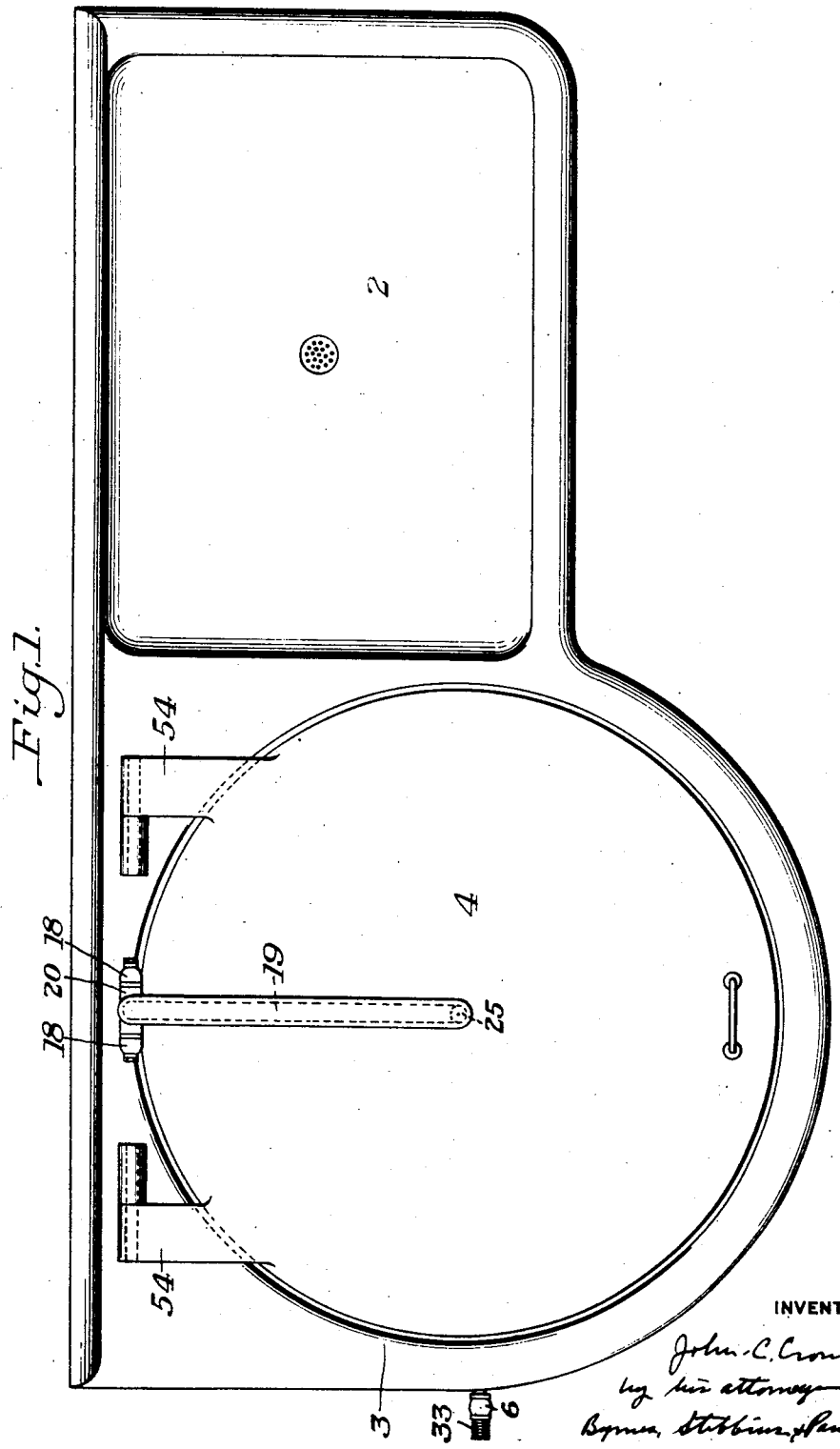
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APPARATUS FOR WASHING DISHES

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Fig. 1.



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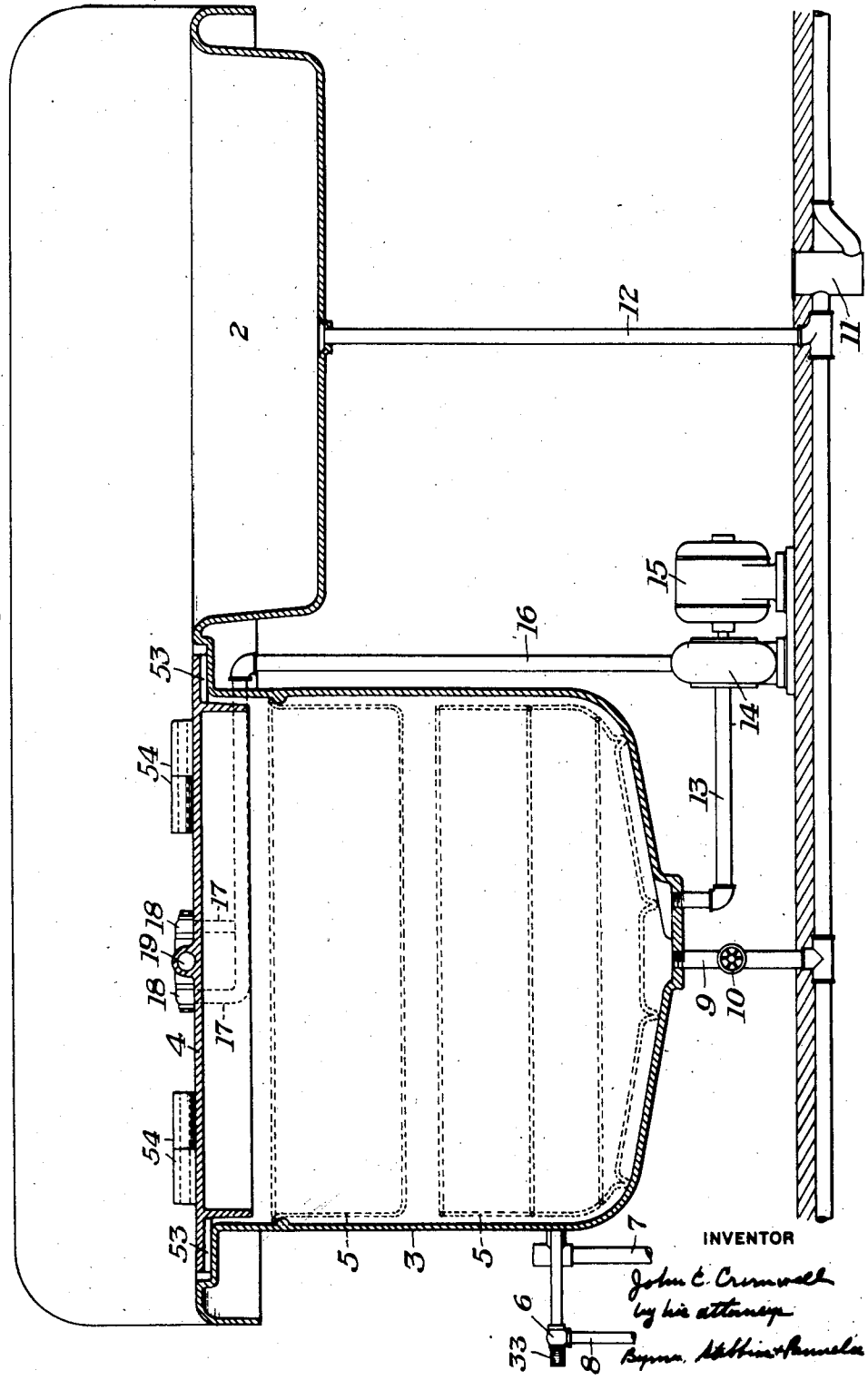
Byrnes, Stebbins & Rumble

Aug. 20, 1929. J. C. CROMWELL 1,724,910

APPARATUS FOR WASHING DISHES

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Fig. 2.



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Fig.3.

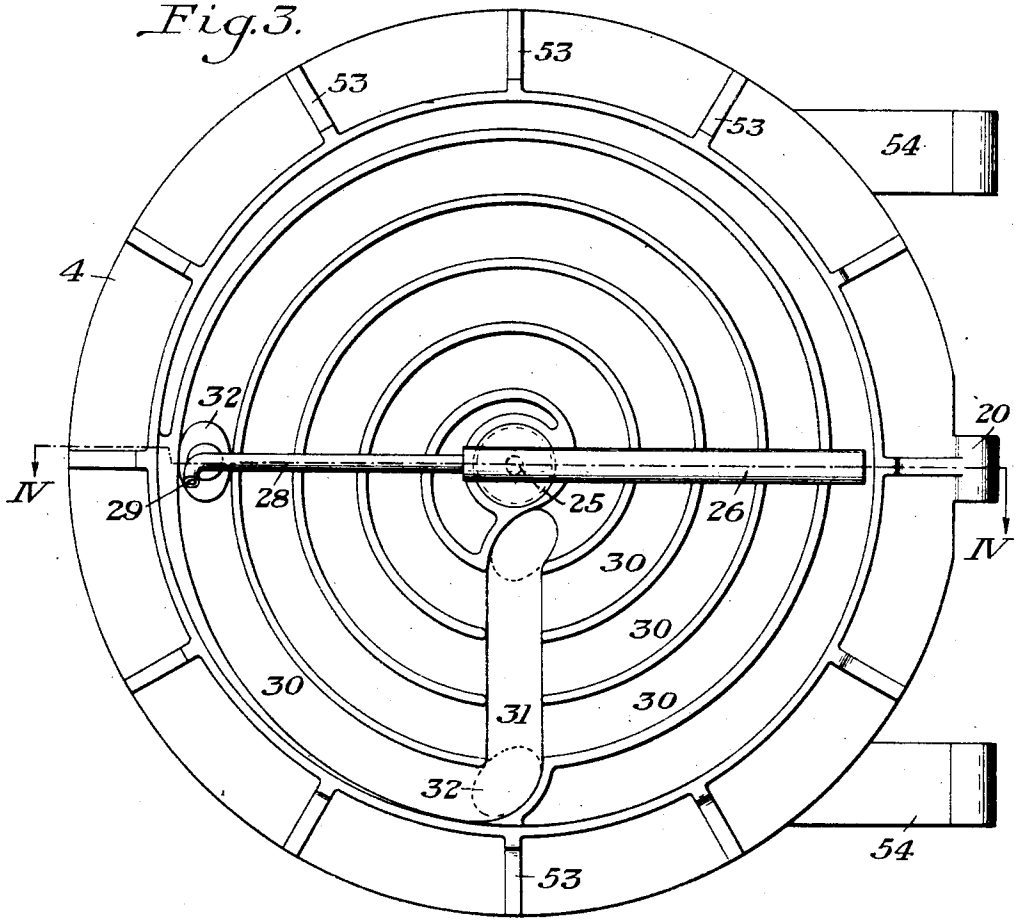


Fig.4.

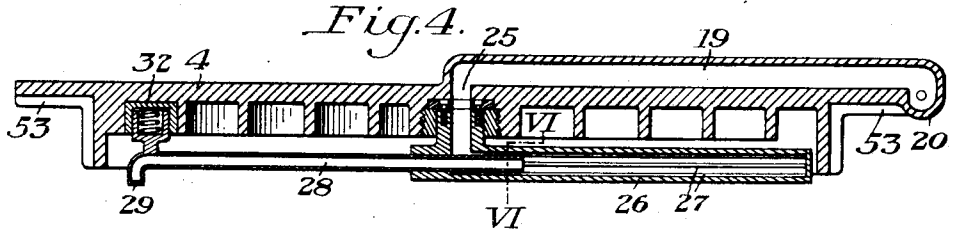
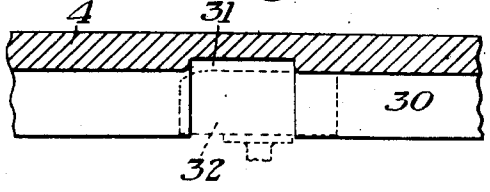


Fig.5.



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Fig. 6.

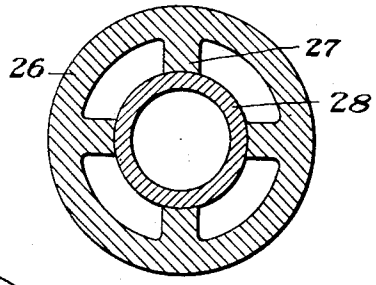


Fig. 7.

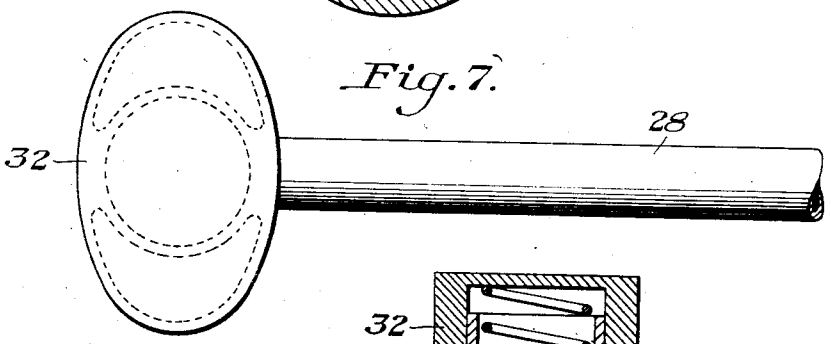


Fig. 8.

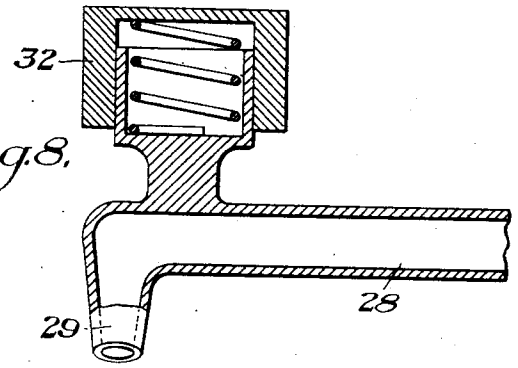
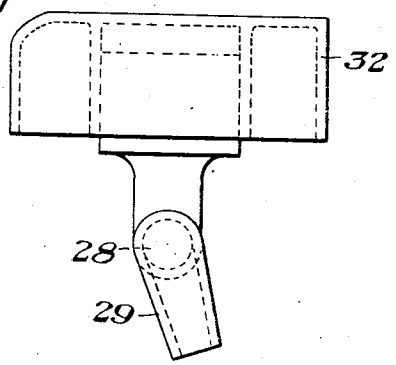


Fig. 9.



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Fig. 10.

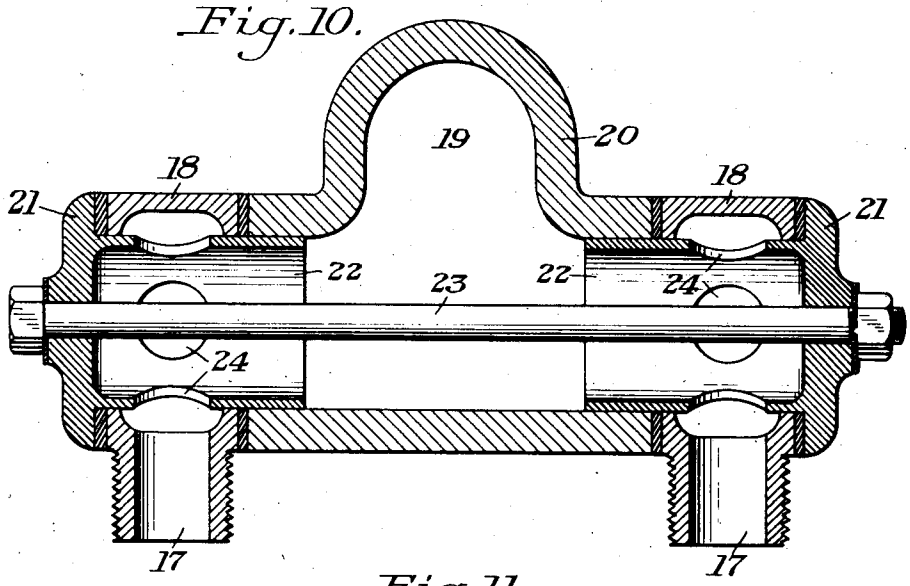
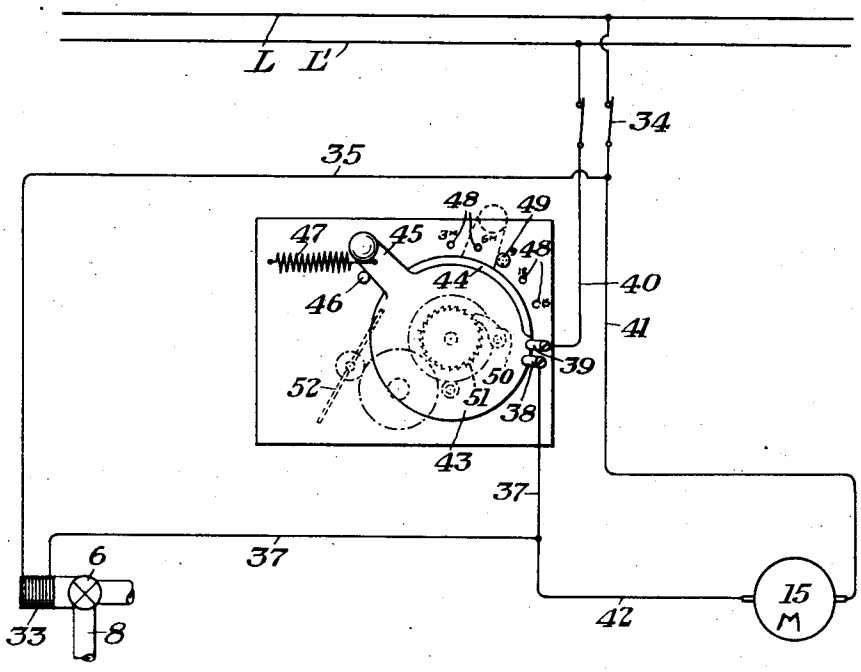


Fig. 11.



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Patented Aug. 20, 1929. 1,724,910

UNITED STATES PATENT OFFICE.

JOHN C. CROMWELL, OF COLUMBUS, OHIO, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE TESTITE COMPANY, A CORPORATION.

APPARATUS FOR WASHING DISHES.

Application filed November 20, 1922, Serial No. 602,065. Renewed January 15, 1929.

The present invention relates to an apparatus for washing dishes and more particularly to an apparatus adapted to efficiently and automatically perform this operation.

In the accompanying drawings there is shown for purposes of illustration only, a preferred embodiment of the present invention, it being understood that the drawings do not define the limits of my invention and that changes may be made in the construction and operation disclosed without departing from the spirit of the invention or scope of my broader claims.

In the drawings—

Figure 1 is a top plan view of a combined sink and dish washer;

Figure 2 is a vertical sectional view through the construction illustrated in Figure 1;

Figure 3 is a bottom plan view of the cover for the dish washer;

Figure 4 is a sectional view on the line IV—IV of Figure 3;

Figure 5 is a detail view illustrating a portion of the cover construction;

Figure 6 is a detail sectional view on an enlarged scale on the line VI—VI of Figure 4;

Figures 7, 8 and 9 are detail views of the spray nozzle;

Figure 10 is a detail view of the hinge construction for the cover; and

Figure 11 is a diagrammatic view illustrating one method of controlling the washing operation.

In the illustrated embodiment of the present invention there is shown a combined structure comprising a sink 2 and a dish washing machine having a main body 3 and a cover 4. The top of the cover 4 may be so disposed as to constitute a drain board for the sink in the usual manner, although this is not essential.

The container 3 is adapted to have baskets 5 of any preferred construction placed therein to hold the dishes to be washed in proper position. After the dishes have been placed in position, the valve 6 is opened to permit a body of water to enter the container and fill the same to the level of the overflow 7. The valve 6 may be operatively connected in any desired manner to a supply pipe 8 for supplying the hot water to the apparatus. Leading preferably from the lowest point of the container 3 is a drain pipe 9 having a controlling valve 10. The drain pipe may conveniently be connected to discharge into the trap 11 which receives the drain from the sink 2 through the pipe 12. This makes it unnecessary to duplicate the plumbing fixtures and provides a comparatively inexpensive installation occupying a minimum of space.

Also connected with the bottom of the container 3 is a circulating connection 13 leading to the inlet of a pump 14 adapted to be driven by a motor 15. The outlet from the pump has a connection 16 which extends upwardly of the container 3 and then laterally to a position in back of the same. This pipe may then be branched in any desired manner to provide branch connections 17, see Figure 10, for supplying cleaning water to the interior of the stationary bearing portions 18 of the hinge connection for the cover 4. The cover in turn may be provided with a radially extending passage 19 communicating with the central bearing portion 20 of the hinge and adapted to rotatably engage the relatively stationary bearing portions 18. The parts may be held in assembled position by providing caps 21 having sleeves 22 extending inwardly through the portions 18 and engaging the portion 20. The caps in turn may be clamped in position by a bolt 23 and may be formed with a series of openings 24 for admitting the cleaning liquid from the branches 17 into the passage 19.

At its inner end the passage 19 communicates with a vertically extending opening 25 formed in the cover and adapted to supply the water being circulated to a tube 26 secured in any desired manner to the under side of the cover. As shown in Figure 6 this tube may be formed with a series of guide flanges 27 adapted to engage the inner tube 28 which communicates with the nozzle 29. The tube 28 extends through one end of the tube 26 and is telescopically mounted with respect to said last mentioned tube. The cover 4 is formed on its under side with a spirally extending groove 30 and with a radially extending groove 31. As shown in Figure 5, the groove 31, which may be termed a cross groove, is preferably slightly deeper than the groove 30. Carried by the tube and nozzle structure 28 and 29 is a

spring pressed head 32, as shown in detail in Figures 7, 8 and 9, the head being of oblong or oval construction. This head is adapted to enter the grooves 30 and 31 and travel around first in the spiral groove until it reaches the innermost portion thereof, after which it will engage the cross groove 31 and move to its starting position. This spiral motion of the nozzle may be secured by constructing the same to operate on the reaction principle, the nozzle projecting at an angle for this purpose. The movement radially through the cross groove 31 will obviously be secured due to the pressure of the water within the tube 26 tending to move the tube 28 outwardly with respect thereto. By making the cross groove 31 of greater depth than the spiral groove 30, it will be apparent that a smooth passage for the outward movement of the head 32 is provided. Also, by forming the head so that it has a greater dimension in one direction than the other, it will be apparent that during its radial travel through the cross groove the reaction tendency of the nozzle 29 will not force it into the spiral groove until the extreme outer portion of the groove is reached.

It is desirable in an apparatus of this character to provide means for controlling the entire operation automatically. I have found that this may be expeditiously accomplished by constructing the valve 6 so as to be electrically or manually operated, the electric operation being under the control of a solenoid 33. Referring more particularly to Figure 11 there is shown a pair of feed wires L and L' adapted to supply current to the entire apparatus through a main controlling switch 34. One side of this switch has a connection 35 to one end of the solenoid winding and the other end of the solenoid winding is connected by a wire 37 with the contact 38. The contact 38 is in spaced relationship to a second contact 39 which is in turn connected by a wire 40 to the opposite side of the switch 34. This switch 34 also has one connection 41 to one of the brushes of the motor 15, while the other brush of the motor is connected by wire 42 and wire 37 with the contact 38.

With the construction described, it will be apparent that in order to energize the solenoid 33 and the motor 15, it is necessary to bridge the contacts 38 and 39. This is preferably accomplished by a time operating switch which may comprise a rotating member 43 carrying a conducting plate 44 around a portion of its periphery. The member 43 is provided with an operating handle 45 by means of which it can be rotated away from the fixed stop 46 and against the action of a tension spring 47. This member is adapted to be moved to any one of a plurality of different positions depending upon the length of time during which it is desired to continue the washing operation. For this purpose there may be provided a series of contacts 48 which may be in the form of openings adapted to receive a stop pin 49. Each of the contacts 48 may be designated as indicated to show a period of operation of three minutes, six minutes, etc. If it is desired to keep the apparatus in operation for nine minutes, the stop 49 will be placed in the position indicated and the member 43 rotated until the handle 45 engages the stop. This will bring the conductor 44 into such position as to bridge the contacts 38 and 39, thereby closing the circuit to the solenoid and the motor. Movement in this direction may be comparatively unrestricted by providing the member 43 with a pawl 50 which cooperates with a ratchet 51. When the member 43 is rotated in a clockwise direction the pawl rides freely over the ratchet teeth. When the handle 45 is released, however, the return movement of the member 43 under the influence of the spring 47 is restricted by the engagement of the pawl with one of the ratchet teeth. This ratchet may be operatively connected in any desired manner to a suitable governor whereby the speed of rotation of the member 43 in a counter-clockwise direction will be controlled. This governor may conveniently be in the form of a flutter valve 52.

With an apparatus constructed in accordance with my invention, it will be apparent that it is possible to effect a gradual changing of the body of the cleaning liquid due to the gradual overflow through the connection 7 and the gradual seepage through the drain 10. This insures the provision of clean liquid after the apparatus has been in operation for a predetermined period, this period being automatically regulated by the operator.

The cover 4 is preferably provided with a series of ribs or projections 53 which maintain the same in slightly spaced relationship, as indicated in Figure 2, with respect to the container 3. This permits the desired escape of the steam whereby when the operation of the motor 15 is stopped and the solenoid 33 is deenergized for permitting the valve 6 to close, the gradual drainage of the water through the valve 10 will leave the dishes both clean and dry.

It will be apparent that supplemental hinges 54 may be provided for supporting the cover to thereby relieve the circulating connections from any strain.

The advantages of the present invention arise from the provision of a dish washing apparatus which may be automatically controlled and in which the body of the cleaning liquid is gradually changed.

Further advantages arise from the provision of a nozzle which projects a stream of

cleaning water in a gradually changing path thereby subjecting all of the contents of the apparatus to the action of the stream.

I claim:

1. In a dish washing apparatus, a container, a movable nozzle for directing the stream of cleansing fluid against the dishes within the container, means for supplying said fluid to said nozzle, and means for guiding the nozzle to cause it to rotate in substantially a spiral path and then across the convolutes of said path from the end of one convolute to the beginning of another convolute.

2. In a dish washing apparatus, a container, a movable reaction nozzle for directing a stream of cleansing fluid against the dishes in the container, means for supplying fluid to said nozzle, means for supporting the nozzle, and means for guiding the nozzle to cause it to rotate in substantially a spiral path and then across the convolutes of said path from the end of the last convolute to the beginning of the first convolute.

3. In a dish washing apparatus, a container, a movable reaction nozzle for directing a stream of cleansing fluid against the dishes within the container, means for supplying fluid to said nozzle, telescopic means for supporting the nozzle, and means for guiding the nozzle to cause it to rotate in substantially a spiral path and then across the convolutes of said path from the end of one convolute to the beginning of another convolute.

4. In a dish washing apparatus, a container having a cover, a continuous cam in the cover comprising a plurality of spiral convolutes and a cross groove connecting the beginning of the outer convolute with the ending of the inner convolute, a nozzle of the reaction type mounted for rotation and reciprocation on the cover, and a guiding member connected to the nozzle and within the groove for reciprocating the nozzle.

5. A cover for a dish washing machine having a plurality of spiral grooves and a cross groove connecting the end of the inner convolute with the end of the outer convolute, a water supply pipe mounted in substantially the center of the cover, a nozzle of the reaction type at the end of a second pipe telescopically engaging the first pipe, a guiding member for the nozzle in the cam groove and a spring connection between the cover and the guiding member for maintaining the guiding member in the bottom of the cam groove.

6. In a dish washing apparatus, a container, a cover having a spiral groove formed thereon and having a cross groove intersecting said spiral groove connecting the ends of the inner and outer convolutes of the spiral groove, said grooves being of different depths, and means including a nozzle cooperating with said grooves for directing a stream of cleansing fluid into the body of the container, whereby said nozzle will travel around in a spiral manner and then across the convolutes of the spiral in a continuous manner, substantially as described.

7. In a dish washing apparatus, a container, a cover having a spiral groove formed thereon and having a return groove intersecting said spiral groove connecting the ends of the inner and outer convolutes of the spiral groove, and means including a nozzle cooperating with said grooves for directing a stream of cleansing fluid into the body of the container, whereby said nozzle will travel around in a spiral manner and then across the convolutes of the spiral in a continuous manner, substantially as described.

8. In a dish washing apparatus, a container, a cover having a spiral guide formed thereon and having a return guide intersecting said spiral guide connecting the ends of the inner and outer convolutions of the spiral guide, and means carrying a nozzle cooperating with said guides for directing a stream of cleansing fluid into the body of the container, substantially as described.

In testimony whereof I have hereunto set my hand.

JOHN C. CROMWELL.