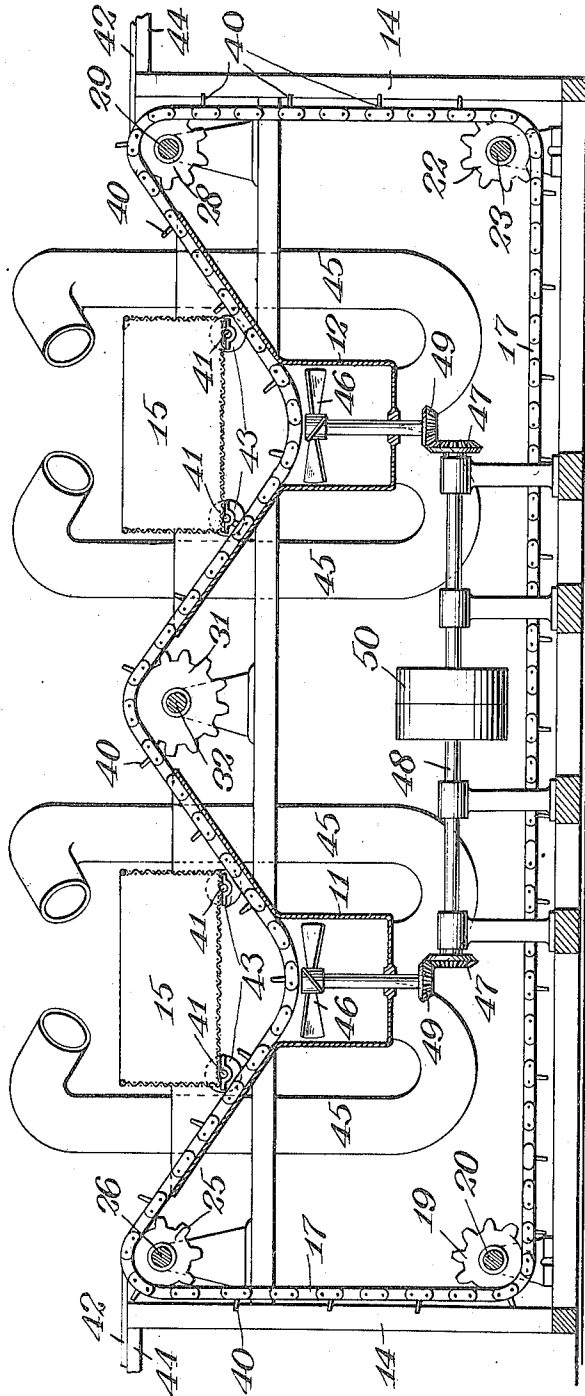


1,207,720.

Patented Dec. 12, 1916.
 4 SHEETS—SHEET 1.

Fig. 1.



WITNESSES
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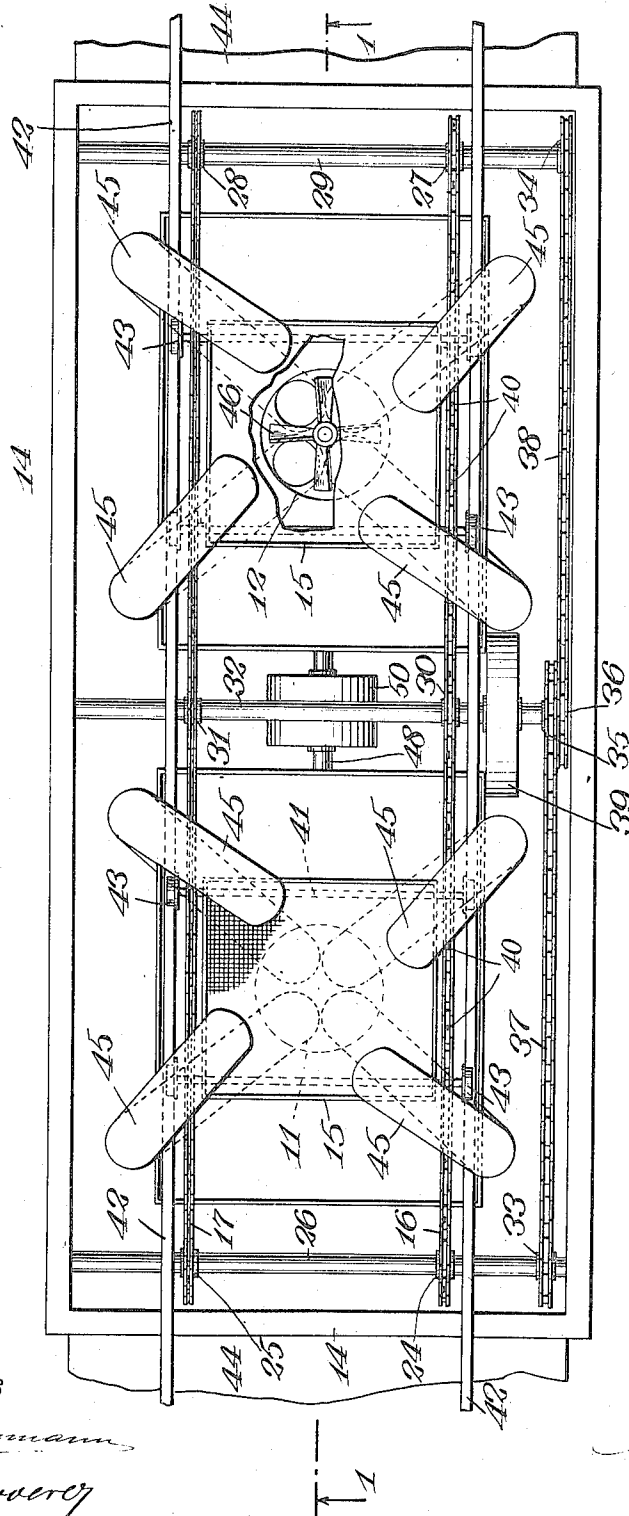
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WASHING MACHINE.
APPLICATION FILED MAR. 26, 1913.

1,207,720.

Patented Dec. 12, 1916.
4 SHEETS—SHEET 2.

Fig. 2.



WITNESSES

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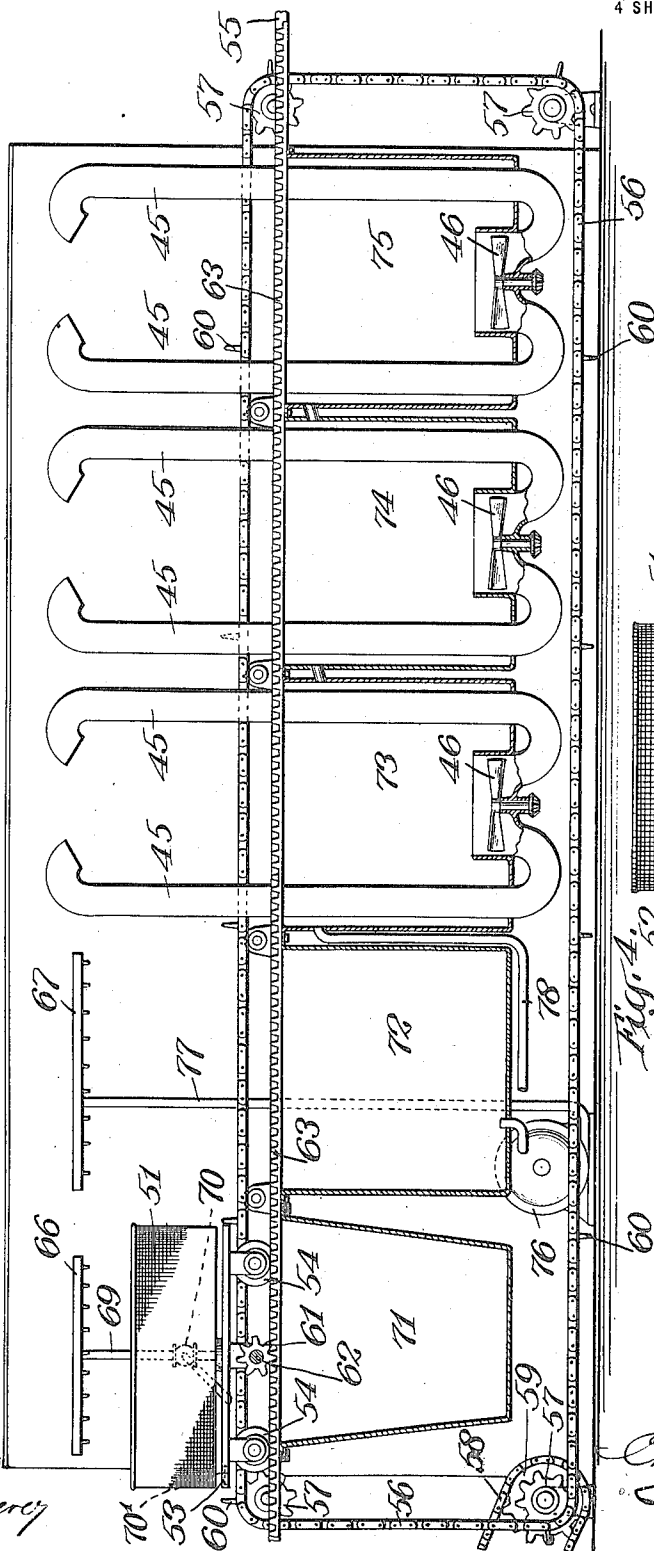
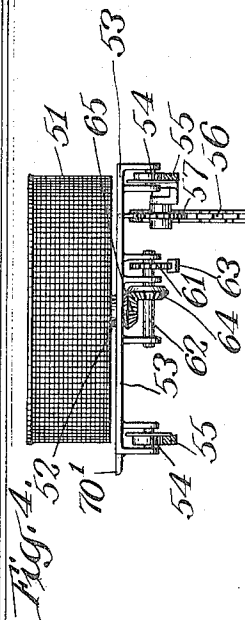
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1,207,720.

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4 SHEETS—SHEET 3.

Fig. 3.



WITNESSES

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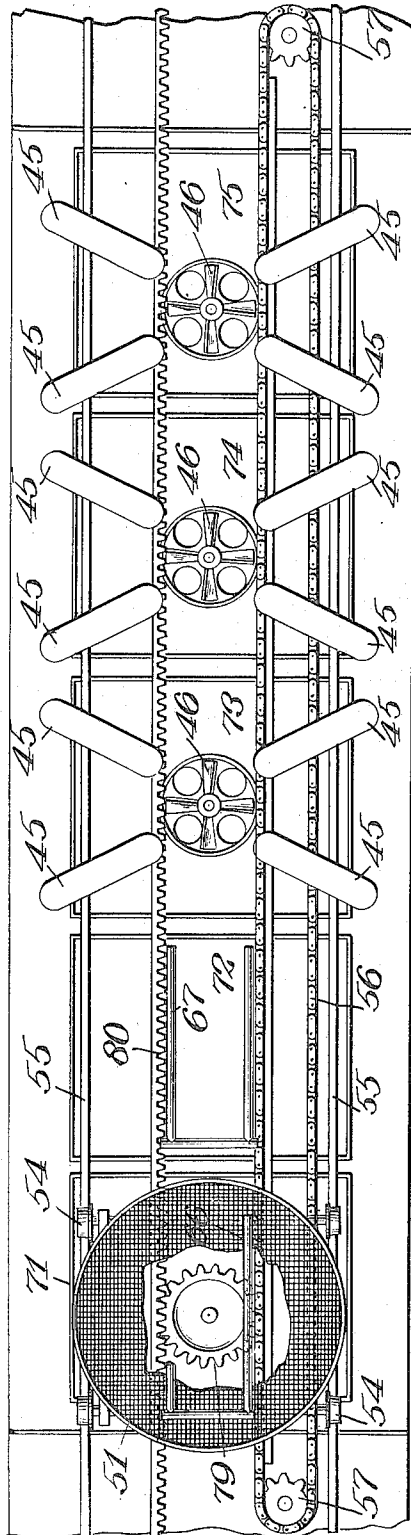
C. H. J. DILG.
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1,207,720.

Patented Dec. 12, 1916.

4 SHEETS—SHEET 4.

Fig. 5.



WITNESSES

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UNITED STATES PATENT OFFICE.

CHARLES H. J. DILG, OF NEW YORK, N. Y.

WASHING-MACHINE.

1,207,720.

Specification of Letters Patent.

Patented Dec. 12, 1916.

Application filed March 26, 1913. Serial No. 757,043.

To all whom it may concern:

Be it known that I, CHARLES H. J. DILG, a citizen of the United States, residing in the borough of the Bronx, city of New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Washing-Machines, of which the following is a specification, reference being had therein to the accompanying drawings, forming part thereof.

My invention relates to washing and rinsing machines, and embodiments of my invention are particularly adapted for washing and rinsing dishes and other similar articles.

An object of my invention is to provide a machine which will be simple, reliable and effective in its operation, and which will be durable, and will be inexpensive to manufacture and to maintain.

Other objects and advantages of my invention will appear from the following description.

To these ends my invention comprehends various advantageous features of construction, and arrangements and combinations of parts, as will hereinafter more fully appear.

I shall now describe the embodiments of my invention illustrated in the accompanying drawings and shall thereafter point out my invention in claims.

Figure 1 is a central longitudinal sectional elevation of a machine embodying my invention, taken on line 1—1 of Fig. 2, looking up. Fig. 2 is a plan of the same. Fig. 3 is a view corresponding to Fig. 1, showing another embodiment of my invention. Fig. 4 is a detail in end elevation of the basket or carrier and driving parts therefor, as viewed from the left of Fig. 3. Fig. 5 is a plan of another embodiment of my invention.

In the embodiment of my invention illustrated in Figs. 1 and 2, two tanks 11 and 12 are employed, the former containing the washing or cleansing water and the latter the rinsing water. These tanks are suitably supported on the frame 14 of the machine. The tops of the tanks flare outwardly longitudinally of the machine, as shown, thereby providing inclined ways down which the baskets or carriers 15 for the dishes ride through the tanks. These baskets or carriers are preferably foraminous, as shown

in Fig. 1, although, for the sake of clearness, they appear as solid in Fig. 2, the parts underneath being shown in dotted lines, except where one of the carriers is partly broken away in this figure. To thus convey the carriers through the tanks, two endless carrier sprocket chains 16 and 17 are provided on opposite sides of the machine. To propel these sprocket chains, five pairs of sprocket wheels are provided, two sprocket wheels on the transverse shaft 20 (one of which, marked 19, is shown), and two sprocket wheels on the transverse shaft 23 (one of which, marked 22, is shown), guide the respective sprocket chains at the two lower corners of the machine; the sprocket wheels 24 and 25 on the transverse shaft 26 and the sprocket wheels 27 and 28 on the transverse shaft 29 guide them at the two upper corners of the machine; while two sprocket wheels 30 and 31 on the transverse shaft 32 at the top of the machine between the two tanks serve as a middle guide. The sprocket chains are of such length that they sag or are depressed at the top and follow the outline of the inclined ways, as shown, thereby running through the tanks.

To impart motion to the carrier sprocket chains 16 and 17, the two upper corner shafts 26 and 29 are provided on one end with sprocket wheels 33 and 34, respectively, while the middle shaft 32 is provided on its corresponding end with two sprocket wheels 35 and 36, the former being connected to the sprocket wheel 33 by an endless driving sprocket chain 37, and the latter being connected to the sprocket wheel 34 by an endless driving sprocket chain 38. The shaft 32 is driven in any suitable way, as by a belt connecting a pulley 39 on the shaft to any suitable source of power, and this shaft rotates the sprocket wheels 30 and 31, and, through the driving chains 37 and 38, rotates the shafts 26 and 29 and the sprocket wheels carried thereby, and the carrier chains 16 and 17 are thus driven. The sag or slack in the chains 16 and 17 is properly maintained by the sprocket wheels 33, 34, 35 and 36, and by the sprocket chains 37 and 38, which serve to maintain the sprocket wheels over which the chains 16 and 17 run on the shafts 26, 32 and 29, in the same rotative relation.

The carrier chains are provided at suitable

intervals with lugs or prongs 40, which are arranged to engage the axles 41 of the carriers 15, and through this connection the carriers are moved along with the carrier chains. To support the carriers 15 and facilitate their movement, tracks or rails 42 are laid along, one outside of each sprocket chain and conforming thereto, thereby forming guide rails on which the wheels 43 of the carriers run as the carriers are moved along by the sprocket chains. These tracks 42 run out a suitable distance upon platforms 44 at the ends of the machine.

It is now apparent that as the carrier 15 is placed upon the platform 44 at the receiving end of the machine and moved over until caught by the carrier chains 16 and 17, it will be automatically carried over the inclined ways through the tanks 11 and 12 and deposited on the platform at the other end of the machine, by means of the apparatus above described.

While moving the dishes through the tanks, I also subject them to the action of streams of water so directed as to set up rotary currents. The bottom of each tank communicates with four tubes or conduits 45, which terminate in depending mouths or spouts overhanging the tank and directed eccentrically upon the tank and at an angle to the radial planes containing the respective objective points, as shown, so as to produce a rotary motion to the water and thus produce an excellent cleansing effect. The water in the tank is continuously pumped up through these tubes by a suitable pump, such as a screw 46, the two screws being driven by bevel gears 47 on the ends of a longitudinally extending driving shaft 48, which bevel gears mesh with the respective bevel gears 49 on the screw shafts. Motion is imparted to the driving shaft 48, as by a belt suitably driven and running over a drive pulley 50 on the drive shaft 48. At the same time that the dishes are passing through the tanks of water, therefore, they are being subjected to these streams of water so directed as to set up rotary currents, and by the time they have passed through both sets of streams they are thoroughly cleansed and rinsed.

In the modified embodiment of my invention shown in Fig. 3, the carrier 51 for the dishes moves in a horizontal plane throughout its travel, and in addition to being subjected to the streams of water, the carrier is rotated upon its central vertical axis. In the process here employed, the dishes are first subjected to a blast of cleansing fluid, such as steam or hot air, to blow the particles from the dishes; then to a spray or number of fine streams of tepid water to wash off the particles which could not be blown off; then to streams of hot washing solution to cleanse the dishes; then to streams

of hot rinsing water; and preferably finally to streams of extremely hot clear water to facilitate drying. In this construction the foraminous basket or carrier 51 is mounted for rotation upon a central vertical axle 52 in a frame 53, the wheels 54 of which are arranged to run upon two side horizontal rails 55 extending the length of the frame of the machine. The endless sprocket chain 56 is guided upon four corner sprocket wheels 57, the one in the lower left hand corner being driven by a sprocket chain 58 and sprocket wheel 59 mounted on the shaft of the sprocket wheel 57. The lugs 60 on the sprocket chain strike a wear piece on the frame 53 of the carrier and so propel the carrier. At the same time, a pinion 61 on the transverse shaft 62 underneath the frame 53 of the carrier engages in a longitudinal rack 63, and so rotates the shaft 62 and the bevel gear 64 thereon, which meshes with and drives a bevel gear 65 on the axle 52 of the carrier, thereby continuously rotating the basket or carrier as it is propelled along the rails 55.

Overhanging the tracks 55 in succession are, first, two longitudinally extending spray pipes 66 (one of which is shown) for the stream or other cleansing fluid, then two similar spray pipes 67 (one of which is shown) for tepid water, and then three sets of four pipes or conduits 45 (two of each set being shown) provided with overhanging mouths or spouts similar to those of the pipes 45 of Figs. 1 and 2, arranged to discharge washing solution, rinsing water, and hot clear water, successively, upon the carrier as it passes underneath. These spouts are also arranged to discharge their streams upon the carrier in the same manner, as those previously described with reference to Figs. 1 and 2.

Steam or other vapor or fluid is fed to the spray pipes 66 through a conduit 69 leading from any suitable source, and on which is provided a spring valve 70 which is operated by a lug 71' on the frame 53 of the carrier as the carrier passes, thereby opening the valve and admitting steam just as the carrier passes underneath the pipes 66, the valve being self-closing after being released by the lug 71'. The particles are blown off the dishes into a removable can or receptacle 71 suitably supported on the frame of the machine, underneath the rails 55. Tanks 72, 73, 74 and 75 are provided for the tepid water, the washing solution, the rinsing water and the clear hot water, respectively. The tepid water is continuously fed from the tank 72 to the tepid water spray pipes 67 by a suitable pump, such as a rotary pump 76, through the pipe 77 communicating with the spray pipes 67. The water from the tanks 73, 74 and 75 is continuously fed to the respective set of pipes 45 by suitably driven

pumps, such as the screws 46, as in Figs. 1 and 2. These three tanks are arranged to overflow back from the tank 75 to the tank 74, and from the tank 74 to the tank 73, as shown, and thence to a discharge pipe 78 leading to any suitable place of deposit, such as a grease separator (not shown). Condensed steam may be supplied to the end tank 75 to keep this water near the boiling point, and since the water overflows back from this tank through the preceding tanks, it is apparent that the water will be progressively cooler in the preceding tanks. It will be manifest that, when the dishes have been subjected to all these successive treatments, being rotated all the time upon the central vertical axis of their carrier, even the dirtiest dishes will be thoroughly cleansed and rinsed from all sides and that they will soon dry. The drying may be facilitated after passing through the hot clear water by any well known drying process, such as a hot air chamber or blower (not shown).

The embodiment of my invention illustrated in Fig. 5 differs from that shown in Figs. 3 and 4 only in the means for propelling and rotating the basket. The sprocket chain 56 runs in a horizontal plane over two sprocket wheels 57, one of which is driven in any suitable way. To rotate the carrier, a pinion 79 is arranged in a horizontal plane underneath the carrier bearing in the frame of the carrier, and meshes with a longitudinal rack 80 on one side and with the sprocket chain 56 on its other side. The movement of the sprocket chain, therefore, causes the pinion 79 to rotate because of its engagement with the rack 80, thereby rotating the basket or carrier and propelling it along the tracks. To vary the rate of rotation and the speed of the carrier, it is only necessary to change the size of the pinion 79 and to correspondingly adjust the track 80 and the chain 56.

Instead of the spouts, the tanks may all be provided with pipes like 67, and each set may be controlled with a valve operated by the car so that the streams of fluid descend while the car is passing and cease when it moves from underneath each successive set of openings.

It is obvious that various modifications may be made in the constructions shown in the drawings and above particularly described within the principle and scope of my invention.

I claim:

1. A dish-washing machine comprising a tank, a dish carrier, a track leading into and out of the tank, means for conveying the carrier along the track through the tank, a spout overhanging the tank and adapted to direct a stream of fluid eccentrically into the tank so as to produce a rotary motion

therein, and means for supplying water to the spout as the carrier passes through the tank.

2. A dish-washing machine comprising a tank, a carrier for the dishes, means for conveying the carrier through the tank, a spout overhanging the tank and adapted to direct a stream of fluid upon the dishes as they are conveyed through the tank, and means for rotating the carrier as it is conveyed through the tank.

3. A dish-washing machine comprising a carrier, a plurality of sets of water spouts, the spouts of each set being adapted to direct streams of water upon the carrier, means for supplying water to each set of spouts, means for conveying the carrier progressively through the range of each set of spouts where it is subjected to the combined action of the streams of each set, and means for rotating the carrier as it is conveyed through the tank.

4. A dish-washing machine comprising a carrier for the dishes, a plurality of tanks, means for conveying the carrier successively through the tanks, a spout overhanging each tank and adapted to direct a stream of fluid thereon as the dishes are conveyed there-through, and means for rotating the carrier as it is conveyed through the tanks.

5. A dish-washing machine comprising a carrier for the dishes, a plurality of tanks, a set of spouts for each tank arranged to direct streams of water eccentrically into the tank so as to produce a rotary motion therein, means for supplying water to each set of spouts, means for conveying the carrier through the tanks in the range of the successive sets of spouts, whereby it is subjected successively to the combined action of the streams from each set of spouts, and means for rotating the carrier as it is conveyed through the tanks.

6. A dish-washing machine comprising a tank, a track leading into and out of the tank, a stationary spout overhanging the tank and adapted to direct a stream of fluid thereupon, a valve for controlling the admission of fluid to the spout, a carrier for the dishes, means for conveying the carrier along the track through the tank, a tripping device on the carrier arranged to open the valve as the carrier moves within range of the spout, and means for rotating the carrier as it is conveyed along the track.

7. A dish-washing machine comprising a carrier for the dishes, a track for the carrier, a spout adapted to discharge a stream of fluid upon the carrier as it is moved along the track underneath the spout, and means to rotate the carrier as it is so moved.

8. A dish washing machine comprising a carrier for the dishes, a track for the carrier, means for discharging cleansing fluid upon the carrier as it is moved along the track,

and means for rotating the carrier as it is so moved.

9. A dish-washing machine comprising a tank, a carrier for the dishes, means for conveying the carrier through the tank, and
5 means for rotating the carrier as it is conveyed through the tank.

In testimony whereof, I have affixed my signature in the presence of two witnesses.

CHAS. H. J. DILG.

Witnesses:

G. BAMMANN,
JOHN SCHROOERER.