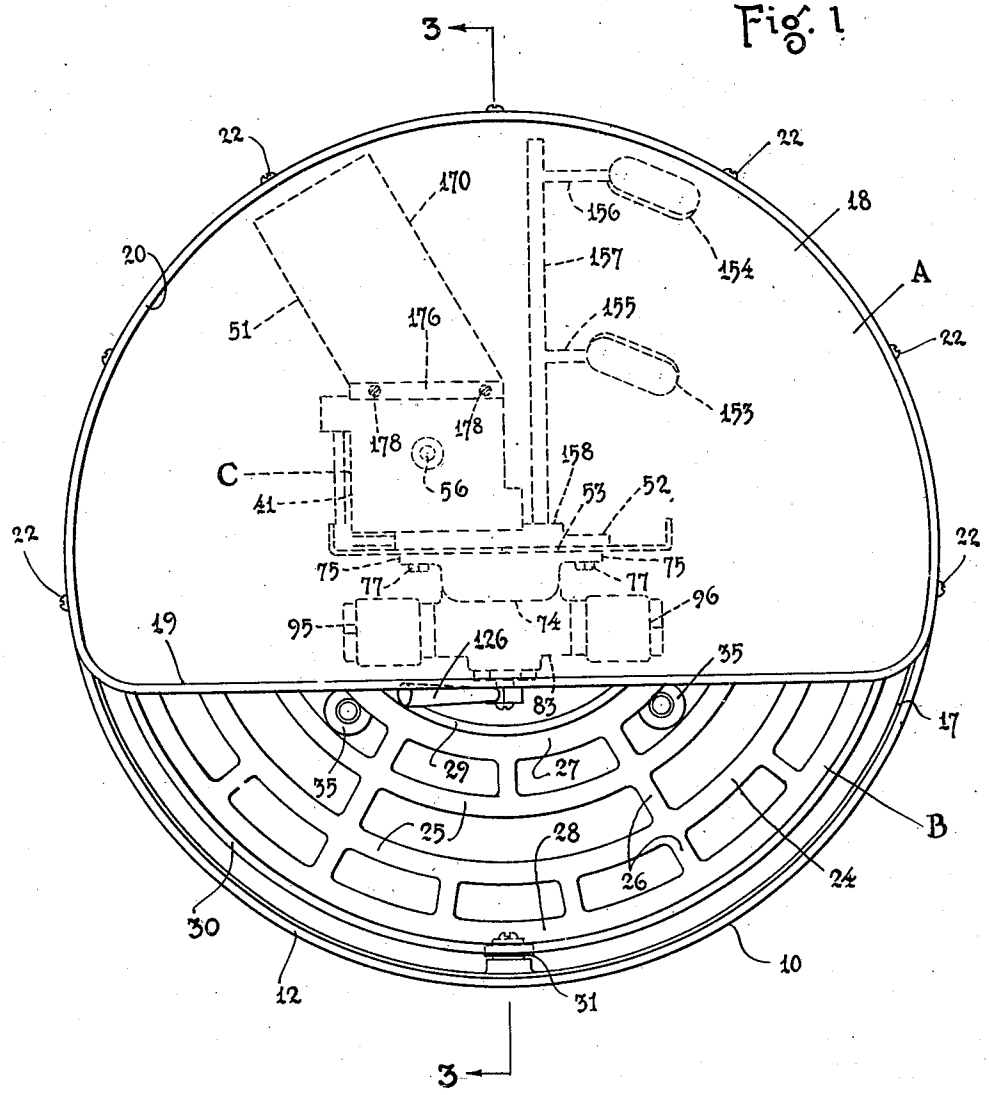
June 1, 1937. R. H. GREER, JR., ET AL 2,082,285

MACHINE FOR WASHING DRINKING VESSELS

Filed Oct. 27, 1933 4 Sheets-Sheet 1

Fig. 1



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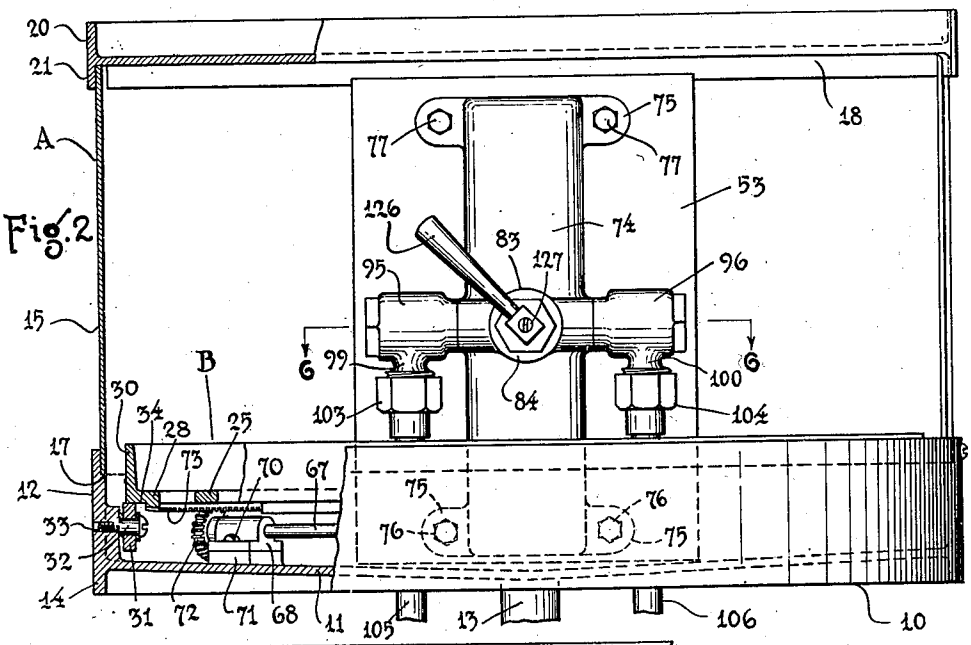
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MACHINE FOR WASHING DRINKING VESSELS

Filed Oct. 27, 1933 4 Sheets-Sheet 2

Fig. 2



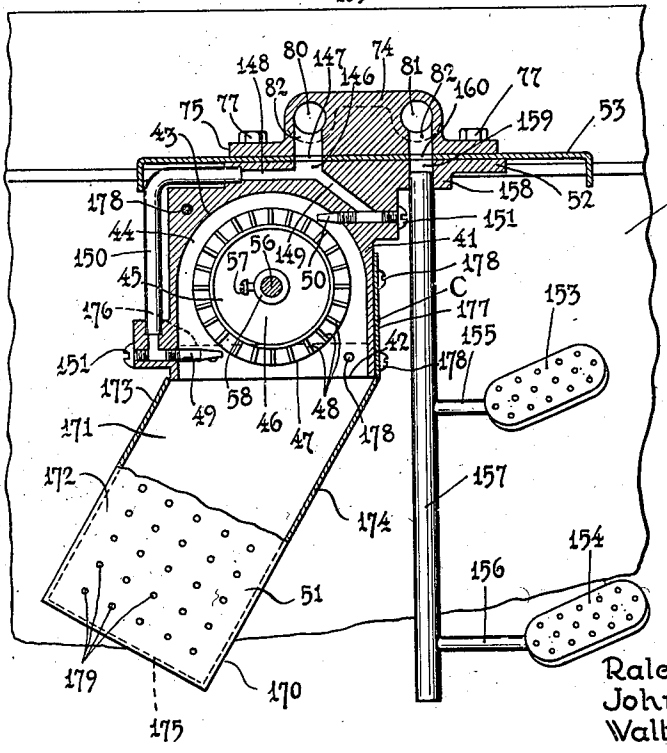


Fig. 5

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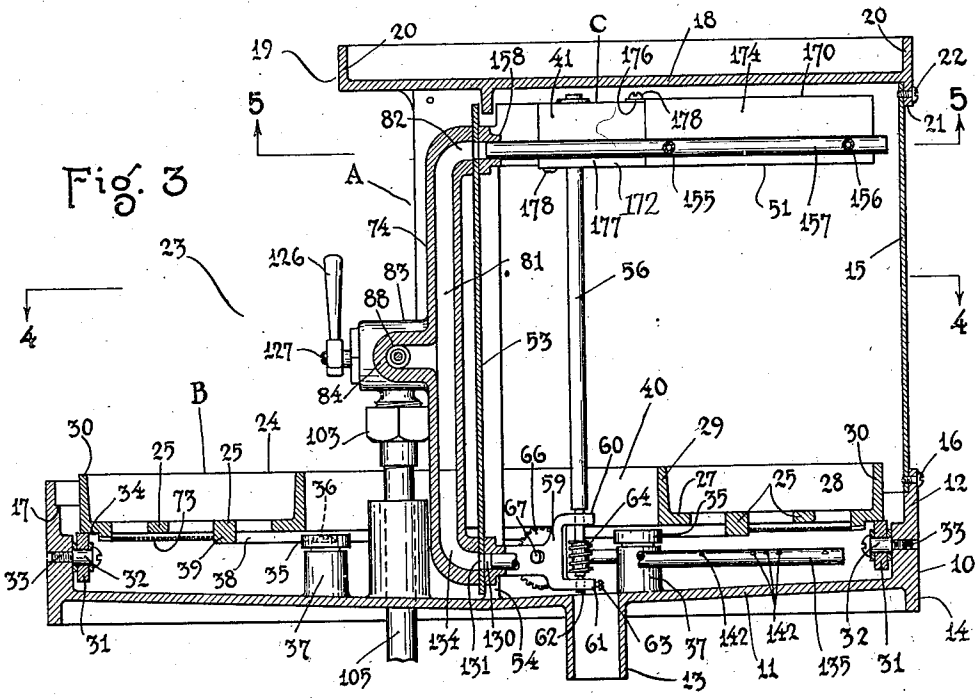
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MACHINE FOR WASHING DRINKING VESSELS

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Fig. 3



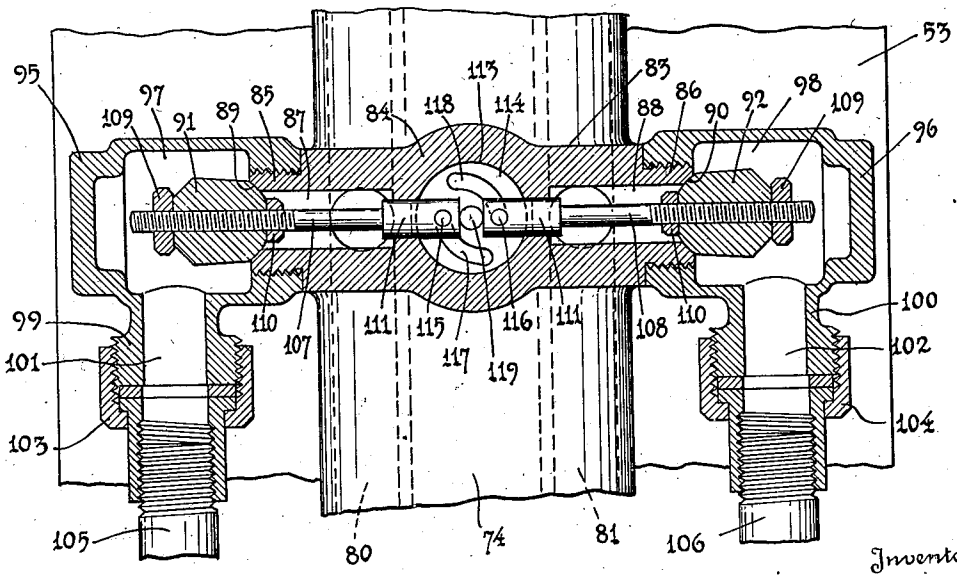


Fig. 7

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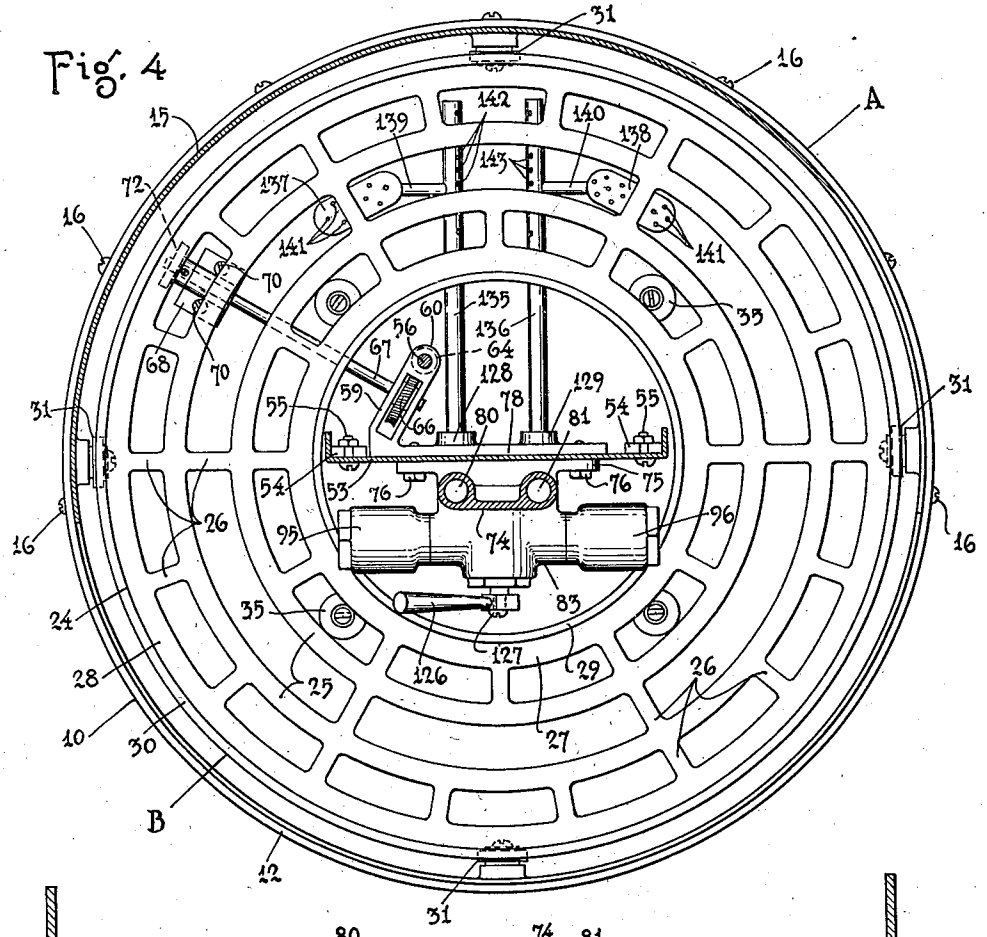
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MACHINE FOR WASHING DRINKING VESSELS

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Fig. 4



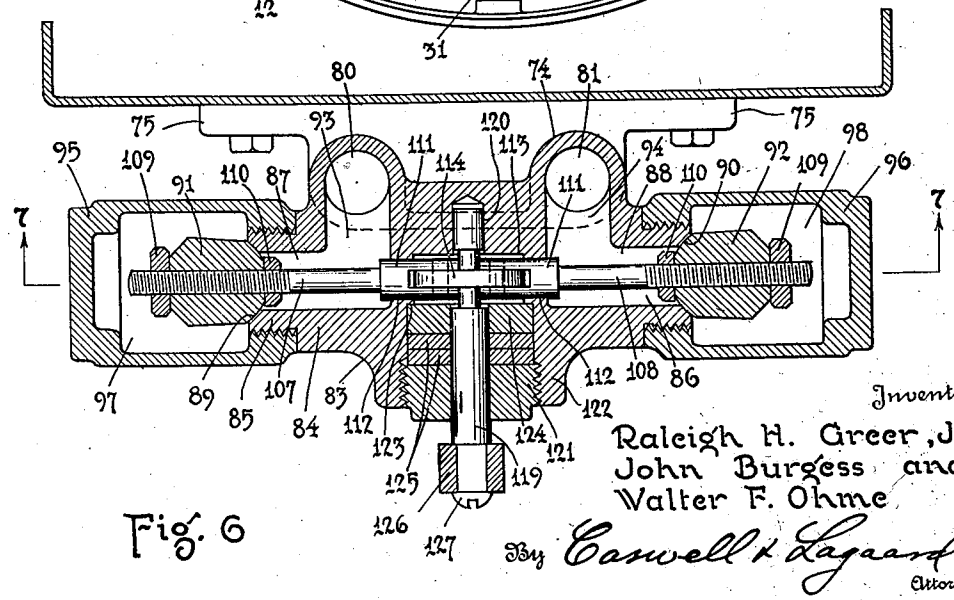


Fig. 6

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UNITED STATES PATENT OFFICE

2,082,285

MACHINE FOR WASHING DRINKING VESSELS

Raleigh H. Greer, Jr., John Burgess and Walter F. Ohme, Minneapolis, Minn., assignors of one-sixth to said Greer, one-third to said Ohme, one-sixth to Walter J. McComb and one-third to Albert J. Stafne, all of Minneapolis, Minn.

Application October 27, 1933, Serial No. 695,464

2 Claims. (Cl. 141—3)

Our invention relates to machines for washing drinking vessels and particularly to machines for washing drinking glasses.

An object of the invention resides in providing a machine in which the glasses may be washed by means of sprays and without manual manipulation.

Another object of the invention resides in providing a revoluble rack for supporting the glasses and in further providing fixed sprays past which the rack rotates and by means of which the glasses are washed.

An object of the invention resides in providing both hot and cold water sprays whereby the glasses are first washed in hot water and thereafter washed in cold water.

A feature of the invention resides in providing intermediate the hot and cold water sprays, means for gradually reducing the temperature of the glass to prevent cracking of the same due to the application of cold water thereto.

An object of the invention resides in providing a housing and in disposing said rack partly within and partly without said housing to give access to the same for the purpose of placing the glasses thereon and removing the glasses from the rack.

Another object of the invention resides in providing a tray and in rotatably supporting said revoluble rack on the tray.

An object of the invention resides in arranging the sprays both above and below the rack for the purpose of washing the glasses both upon the interior and exterior thereof.

A still further object of the invention resides in providing the machine with a wall extending upwardly from the tray and constructed with an opening, the rack being disposed partly within said wall and partly without, whereby access to the same may be had for the purpose of placing the glasses thereon and removing the same from said rack.

An object of the invention resides in constructing the revoluble rack with an opening in the center and in providing a support extending through said opening for supporting the sprays.

A feature of the invention resides in providing conduits for the sprays, said conduits extending through the opening in the rack.

An object of the invention resides in providing a water motor for rotating the rack and in utilizing the discharge from said water motor for cooling and washing the glasses.

A feature of the invention resides in constructing said water motor with a vertical shaft, said shaft extending through said opening and below the rack and in further providing transmission means driven by said shaft for rotating said revoluble rack.

Another object of the invention resides in the specific mechanism for operating the rack.

A feature of the invention resides in running said shaft through the opening in the rack.

A still further object of the invention resides in providing two conduits, one for cold water and one for hot water, each of said conduits having a valve and in further providing means for simultaneously operating said valves.

Other objects of the invention reside in the novel combination and arrangement of parts and in the details of construction hereinafter illustrated and/or described.

In the drawings:

Fig. 1 is a plan view of a machine for washing drinking vessels illustrating an embodiment of our invention.

Fig. 2 is a front elevational view of the structure shown in Fig. 1 with portions thereof broken away to illustrate the internal construction of the machine.

Fig. 3 is an elevational sectional view taken on line 3—3 of Fig. 1.

Fig. 4 is a plan sectional view taken on line 4—4 of Fig. 3.

Fig. 5 is an inverted sectional view taken on line 5—5 of Fig. 3.

Fig. 6 is a fragmentary plan sectional view taken on line 6—6 of Fig. 2.

Fig. 7 is an elevational sectional view taken on line 7—7 of Fig. 6.

Our invention comprises a housing which we have indicated in its entirety by the reference character A, and in which the operating mechanism of the invention is installed. The operating mechanism of the invention comprises a revoluble rack B which is driven through a water motor C. A series of sprays to be later described in detail, spray hot and cold water upon the glasses carried by the rack as the rack is rotated past said sprays. These various parts will now be described in detail.

The housing A consists of a tray 10 circular in form which is constructed with a bottom 11 having a rim 12 extending upwardly therefrom. The bottom 11 is preferably sloping toward the center of the tray where a drain 13 is provided by means of which the water discharged into the housing may be removed from the device. At the outer margin of the bottom 11 is provided a ledge 14 which elevates the bottom 11

above the surface on which the machine rests. This ledge may, if desired, be formed in continuation of the rim 12 of the said tray. The tray 10 may be constructed as a casting or the same may be spun or constructed in any other suitable manner. The housing A further comprises a circular wall 15 which is semi-circular in extent and is secured to the rim 12 of tray 10 and extends upwardly therefrom. This wall is preferably attached to the said rim through small bolts 16 which pass through suitable openings in both the said rim and wall. A shoulder 17 formed on the rim 12 serves as a seat on which the wall 15 may rest. Upon the upper end of the wall 15 is provided a cover or closure 18 which is circular at the rearward portion thereof and which is cut away at the forward portion as indicated at 19 to extend across the ends of the wall 15. This closure is provided with a flange 20 which extends upwardly therefrom and which provides a shelf where washed glasses may be placed until desired for use. The flange 20 extends downwardly below the closure 18 as indicated at 21 to form a lip by means of which the closure may be secured to the wall 15. This is accomplished through bolts 22 which pass jointly through said wall and lip the same as bolts 16. By means of the particular construction described, the housing A is provided at the front thereof with an opening 23 through which access may be had to the interior of the housing and to the glasses placed upon the rack B mounted therein.

The rack B consists of a toroidal shaped member 24 which is constructed with a number of circularly disposed concentrically arranged rings 25. These rings are connected together through radially extending bars 26 to form a reticulate supporting structure on which the glasses or other dishes to be washed may be placed. The inner and outer rings 27 and 28 of the rack B are provided with upwardly extending flanges 29 and 30 by means of which the glasses placed upon the rack are properly positioned and held from engagement with the sides of the housing as the rack is moved. The rings 25, 27 and 28 and the bars 26 all lie in a common horizontal plane so as to form a suitable support for the glasses.

The rack B is rotatably supported on a number of horizontal rollers 31 which are journaled on stub shafts 32 formed with threaded shanks 33 screwed into the rim 12 of the tray 10. These rollers engage the underside of a circular track 34 formed on the underside of the outer ring 28 of the rack B. The rollers 31 as noted, support the rack in proper position and guide the same for rotation about a vertical axis. To restrain axial movement of the rack B a number of vertically disposed rollers 35 are employed which like the rollers 31 are journaled on stub shafts 36 secured to bosses 37 formed on the bottom 11 of tray 10. These rollers engage the inner surface 38 of a circular annulus 39 formed on one of the circular rings 25 of the rack proper. Rollers 35 hold the rack from horizontal movement and cause the same to rotate about a center situated at the middle of the said rack. The central portion of the rack within flange 29 is provided with an opening 40 through which the supporting mechanism for the various sprays of the invention and the water motor C are carried. These parts will be subsequently described in detail.

The water motor C is illustrated in detail in Fig. 5 and consists of a case 41 substantially rectangular in form. This case is constructed with a chamber 42 within the same, said case being open at one end designated by the reference numeral 42 and also at the bottom of the same. The chamber 44 is circular at its inner end 43 and is rectangular where the same opens through the wall of the case as designated at 42. Rotatably mounted within the chamber 44 is a rotor 45. This rotor is provided with a hub portion 46 having a rim portion 47 secured thereto. On the rim portion 47 are provided a number of blades 48 which are disposed substantially radially and which issue outwardly from the rim portion 47. Two water nozzles 49 and 50 are mounted in the case 41 and serve to direct water tangentially to the blades 41 causing the rotor 45 to rotate when sufficient water pressure is procured. The rim portion 47 serves as a fly wheel which is highly advantageous in the operation of the motor. The case 41 is closed at the lower end thereof through a plate 172 which forms part of a spray 51 to be presently described and which is attached to said case through the attaching means for the spray proper. The open end 42 of the case 41 brings the chamber 44 into communication with the spray 51 which is arranged to extend over the rack B.

For the purpose of supporting the water motor C the same is constructed with flanges 52 which issue outwardly from the case 41 of said motor and which are bolted to a vertical support 53 through machine screws 77. The support 53 consists of a channel member arranged in upright position and extending through the opening 40 in the rack B. This channel member is bolted to ears 54 which are cast on the bottom 11 of tray 10 and which extend upwardly therefrom. For this purpose bolts 55 are employed which pass through the said ears and said channel member.

The rotor 45 of the water motor C is mounted upon a vertically extending shaft 56 which is journaled at its upper end in case 41. The rotor 45 is held attached to the shaft 56 through set screws 57 screwed into a hub 58 formed on said rotor. Shaft 56 extends downwardly through the opening 40 in the rack 29 and is journaled at its lower end in a forked supporting bracket 59 best shown in Fig. 3. This bracket is constructed with a flange 78 which overlies the rear surface of the upright support 53, which flange is bolted thereto through machine screws 76. The bracket 59 carries two spaced arms 60 and 61, the said shaft being journaled in a drilled hole formed in the arm 60. An end thrust bearing 62 for engagement with the lower end of the shaft 56 is mounted in the arm 61 and is held in place therein through a set screw 63. On the shaft 56 between the two arms 60 and 61 is mounted a worm 64 which is keyed or pinned to the said shaft in the customary manner. This worm meshes with a worm wheel 66 also carried by the supporting bracket 59. The worm wheel 66 is mounted on a shaft 67 which is journaled in suitable drilled holes in the bracket 59. The shaft 67 extends radially with respect to the axis of the rack B and is journaled at its outer end in a bearing 68. Bearing 68 is attached to a suitable boss 71 which is formed on the bottom 11, the said bearing being secured thereto through screws 70. At the end of the shaft 67 is provided a bevel pinion 72 which meshes with a bevel gear 73 cast on the underside of the ring 28 of rack B and in proximity to the track 34.

The weight of the rack causes the teeth of the gears 73 and the pinion 72 to mesh with one another whereby a drive is effected between the said shaft 67 and the rack proper.

For the purpose of conducting water to the various sprays of the invention a duct structure 74 is employed which is provided with lugs 75 issuing outwardly from the sides of the same. The screws 76 and 77 previously referred to at the lower and upper ends of the device pass through the said lugs and the upright support 63. The screws 77 as previously stated are threaded into the case 41 of water motor C while the screws 76 are threaded into the flange 78 of the bracket 59. The duct structure 74 is constructed with two water passageways 80 and 81 which extend throughout the length of the same and which are formed at their upper and lower ends with openings 82 and 134 leading through the rear wall of the said duct structure. At the center of the duct structure is a valve mechanism 83 by means of which cold and hot water may be led to the ducts 80 and 81.

The valve structure 83 is shown in detail in Figs. 6 and 7 and comprises a case 84 cast integral with the duct structure 74. The case 84 is constructed with two oppositely directed transversely extending threaded bosses 85 and 86 which are formed with bores 87 and 88. At the ends of these bores are provided valve seats 89 and 90. Suitable valve heads 91 and 92 are employed which are of the Fuller ball type and are adapted to engage said seats and to close communication with the bores 87 and 88. The bores 87 and 88 communicate through angular passageways 93 and 94 with the passageways 80 and 81 in the duct structure 74.

Attached to the bosses 85 and 86 of the valve structure 83 are two caps 95 and 96 which are threaded to screw upon the threaded ends thereof. These caps are constructed with chambers 97 and 98 within the same which when the valve heads 91 and 92 are opened are brought into communication with the bores 87 and 88. The two caps 95 and 96 terminate in threaded necks 99 and 100 which are constructed with passageways 101 and 102 communicating with the chambers 97 and 98. By means of suitable pipe fittings 103 and 104 sections of pipe 105 and 106 may be attached to the caps 95 and 96 and brought in communication with the chambers 97 and 98 thereof and water conducted into the two passageways 80 and 81 of duct structure 74. The pipe 105 is connected to a source of cold water while the pipe 106 is connected to a source of hot water.

For operating the valve heads 91 and 92 the following construction is used. The two valve heads 91 and 92 are supported on valve stems 107 and 108, each of which has screwed upon it two nuts 109 and 110 between which the valve heads 91 and 92 are mounted. The free ends of the said valve stems which have been indicated at 111 in Fig. 6 are bifurcated as shown and are slidably mounted in transverse guideways 112 formed in the center portion of the case 83 and in alignment with the two bores 87 and 88. These two guideways extend into a central circular cavity 113 in case 83 in which is rotatably mounted a disk 114. The bifurcated ends of said valve stem straddle the said disk as shown in Fig. 6. Two pins 115 and 116 extend through the bifurcated ends of the said valves and also through two spiral slots 117 and 118 formed in the disk 114. When the disk 114 is rotated the said disk through the walls of the slot 117 and 118 move the valve stems 107 and 108 inwardly and outwardly serving to simultaneously operate both of the valve heads 91 and 92 causing the opening or closing of the two valves as desired. The disk 114 is attached to a spindle 119 which is journaled at one end in a socket 120 formed in the case 84 and at its other end in a bearing block 121 screwed into a threaded neck 122 formed on the case 84. The bearing block 121 serves to close the opening to the cavity 113 in which the disk 114 is mounted. Between the block 121 and a shoulder 123 formed in the case 84 and concentric with the cavity 113 is a metal washer 124 and two packing washers 125. When these washers are compressed through the turning of the bearing block 121 a tight joint is formed between the spindle 119 and the case proper, whereby leakage of water out of the case is prevented. A handle 126 attached to the end of the spindle 124 through a screw 127 permits of manipulating the valve.

The spray 51 previously referred to for spraying cold water upon the glasses carried on rack B is best shown in Fig. 5. This spray consists of a rectangular duct 170 formed with a top wall 171, bottom wall 172 and side and end walls 173, 174 and 175. The duct 170 is open at the end opposite the end 175 and is so situated with respect to the case 41 of motor C that said duct communicates with the chamber 44 through the open end 42 thereof. The bottom 172 of the duct 170 underlies the open lower portion of the case 41 so as to completely close the chamber 44 therein. Wall 174 and wall 171 are formed with flanges 176 and 177 which overlie portions of the case 41. By means of screws 178 threaded into the case 41 and passing through said flanges and the wall 172, the spray 51 is held attached to the case 41. In the bottom wall 172 of spray 51 is formed a number of openings 179 through which the water discharged from the motor and entering the duct 170 percolates down upon the glasses or other dishes carried by the rack.

In addition to the spray 51 for conducting cold water upon the glasses carried on the rack B other sprays are employed which are situated and connected to the duct structure 74 in the following manner: The flange 78 of bracket 59 is constructed with bosses 128 and 129 which are formed with bores 130 best shown in Fig. 3. These bores communicate with openings 131 in the support 53 which in turn communicate with the passageways 134 formed in the duct structure 74 and connected to the two passageways 80 and 81 of said duct structure. The two bosses 128 and 129 have attached to them two tubes 135 and 136 which extend horizontally from said bosses in a rearward direction and are situated below the rack B. The two tubes 135 and 136 are plugged at their ends. Two sprays 137 and 138 are employed which are connected to the two tubes 135 and 136 through branch tubes 139 and 140. The sprays 137 and 138 are provided with apertures 141 which are directed upwardly and by means of which the water entering the tubes 135 and 136 is sprayed upwardly to strike the glasses carried on the rack and to wash the same from beneath. The two tubes 135 and 136 are themselves constructed with apertures 142 and 143 which are arranged in an inclined manner so that the sprays of water coming from the two tubes strike one

another at the locality where the water comes in contact with the glasses carried by the rack. Through the agency of these combined sprays the hot and cold water is mixed producing temperate water which is sprayed upon the glasses from below whereby the temperature of the glasses is lowered before the cold water is discharged upon the same.

Water for operating the water motor C is procured from the cold water passageway 80 of duct structure 74. The case 41 of motor C is constructed with a passageway 146 which communicates with an opening 147 in the support 53. This opening is opposite the upper passageway 82 of the duct structure 74 which in turn communicates with the cold water passageway 80 of said duct structure. Within the case 41 are constructed two water passageways 148 and 149. These passageways both communicate with the passageway 146. Passageway 149 is in communication with the nozzle 50. A tube 150 is attached to the case 41 and brings the passageway 148 into communication with the nozzle 49. The various passageways in the case 41 are constructed by drilling and where drilling necessitates forming an opening through the case, said opening is closed through a screw 151. It will readily be comprehended that when water under pressure is introduced into the passageway 146 the same is discharged through the two nozzles 49 and 50 against the wheel 45 and said wheel caused to rotate. The cold water leaving the water motor is discharged through the spray 51 upon the glasses as the rack B travels beneath the said spray.

For washing the glasses, two hot water sprays 153 and 154 are employed which are similar to the sprays 137 and 138. These sprays are connected through branch tubes 155 and 156 with a tube 157 which in turn is secured to a boss 158 formed on the case 41. This boss is constructed with a passageway 159 which communicates with an opening 160 in the upright support 53. Opening 160 communicates with the passageway 82 leading to the hot water passageway 81 of the duct structure 74. By means of the two sprays 153 and 154 which are situated above the g'asses, hot water is directed downwardly upon the glasses and the washing and heating of the glasses from the exterior is accomplished.

The operation of our invention is as follows: The device is first mounted upon a suitable support such as a table or the like in a manner so that the head 14 rests upon the same. A suitable hole is drilled in the table to receive the drain 13 which is connected to a hose or other suitable conduit carrying the waste water to the sewer or wherever desired. The hot and cold water pipes 106 and 105 are connected to suitable sources of hot and cold water. When the operator desires to use the machine the handle 126 is turned to the right which causes the two valve stems 107 and 108 to move outwardly and the valve heads 91 and 92 to leave the seats 89 and 90 respectively. This brings cold and hot water respectively into the two passageways 80 and 81. The cold water travels from passageway 80 through openings 82 and 147 into passageway 146. From passageway 146 the water divides, part passing through passageway 149 to nozzle 50 and the remainder passing through passageway 148 and tube 150 to nozzle 49. The water leaving said nozzle enters rectangular duct 170 and is discharged downwardly from the spray 51 through the apertures 179 in the wall 172 of said duct. Cold water also passes from passageway 80 into tube 135 and is directed into branch tube 139. The cold water entering these two tubes is discharged upwardly from the apertures 142 in tube 135 and from the apertures 141 of spray nozzle 137. In like manner the hot water entering passageway 81 is led into tubes 136 and 157 and from these tubes into branch tubes 140, 155 and 156. From the tube 136 and branch tube 140 hot water is sprayed upwardly, the water being discharged through the apertures 143 in tube 136 and the apertures 141 in spray nozzle 138. Hot water is also sprayed downwardly from the tubes 155 and 156, the same being discharged from the apertures of the two spray nozzles 153 and 154. Cold water upon entering the nozzles 49 and 50 of water motor C causes the water motor to operate turning shaft 56 which in turn rotates shaft 67 through the worm 64 and worm wheel 66. This causes the rack B to be rotated through the action of the two gears 72 and 73. Through the reduction of gearing employed, the rack travels at a relatively low rate of speed. In explaining the operation of the invention, we have referred to the washing of glasses, though it can be understood that other dishes may also be washed. In use the glasses are inserted in the housing A through opening 23 and are placed upside down upon the rack B. Glasses so placed travel around toward the right and in a counter-clockwise direction as viewed in Fig. 4. As the glasses pass the spray 138 and the two sprays 153 and 154, hot water is sprayed both upon the exterior and the interior of the glasses, which thoroughly washes the same. As the glasses pass the sprays from the holes 142 and 143 of tubes 135 and 136, the hot and cold water leaving said tubes mixes, producing water more or less tepid which is discharged against the glasses. This somewhat reduces the temperature of the glasses and prevents cracking. As the glasses pass the spray 137 and the spray 51, cold water is discharged against the same which reduces the temperature of the glasses to a temperature more nearly equal to that of the beverage to be served in the glasses. When the glasses reach the front of the machine the same will have been washed with hot water and subsequently cooled and are ready to be again used. In the event that further washing is required, the glasses can be left on the rack and allowed to travel several times through the device. As soon as the glasses appear at the left hand side of the device, the same may be removed and other glasses placed upon the rack and washed. The washed glasses may be placed on the shelf 18 where the same are readily accessible for use. When the machine is to be shut off the handle 126 is turned to the left which closes both of the valves controlling the flow of hot and cold water. In this manner a single manipulation is all that is required to operate the device.

The advantages of our invention are manifest. The glasses can be washed without manual handling of the same. With our invention clean water is at all times used so that contamination of the glasses through washing with dirty water is entirely prevented. When the glasses come out of the washer the same are at a suitable temperature so that the glasses are ready for immediate use which eliminates raising the temperature of the beverage or the subsequent cooling of the glass. Due to the use of temperate water intermediate the hot and cold water sprays dan-

ger of breakage of the glasses is greatly reduced. Our invention is neat and compact and is highly efficient in operation requiring no electric current for operation and utilizing the power available from the water used for washing and for moving the glasses through the machine. The device is operated through a single lever which simultaneously turns on both the hot and cold water. By means of this construction, no adjustments or manipulation are necessary.

Changes in the specific form of our invention, as herein disclosed, may be made within the scope of what is claimed without departing from the spirit of our invention.

Having described our invention, what we claim as new and desire to protect by Letters Patent is:

1. In a machine for washing drinking vessels, a revoluble rack for dishes, a water motor for rotating said rack, said motor being disposed above said rack, said motor having a vertically disposed rotatable shaft extending through and below said rack, a worm on the lower end of said shaft, a rotatable shaft extending laterally from said first mentioned shaft below said rack, a worm wheel on one end of said second shaft meshing with said worm, a pinion on the other end of said second shaft and a gear on said rack for rotating the latter and driven by said pinion.

2. In a machine for washing drinking vessels, a tray, a circular rack unobstructed throughout the periphery thereof and mounted for rotation above said tray, said rack having an opening in the center thereof, a water motor for rotating said rack situated above said rack, the water leaving said motor discharging downwardly upon said rack, said motor having a vertically disposed shaft extending through the opening in said rack and below the same, transmission mechanism driven by said shaft and operating from below said rack to rotate the same, and a duct structure for delivering water to said motor, said duct structure extending through the opening in said rack.

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