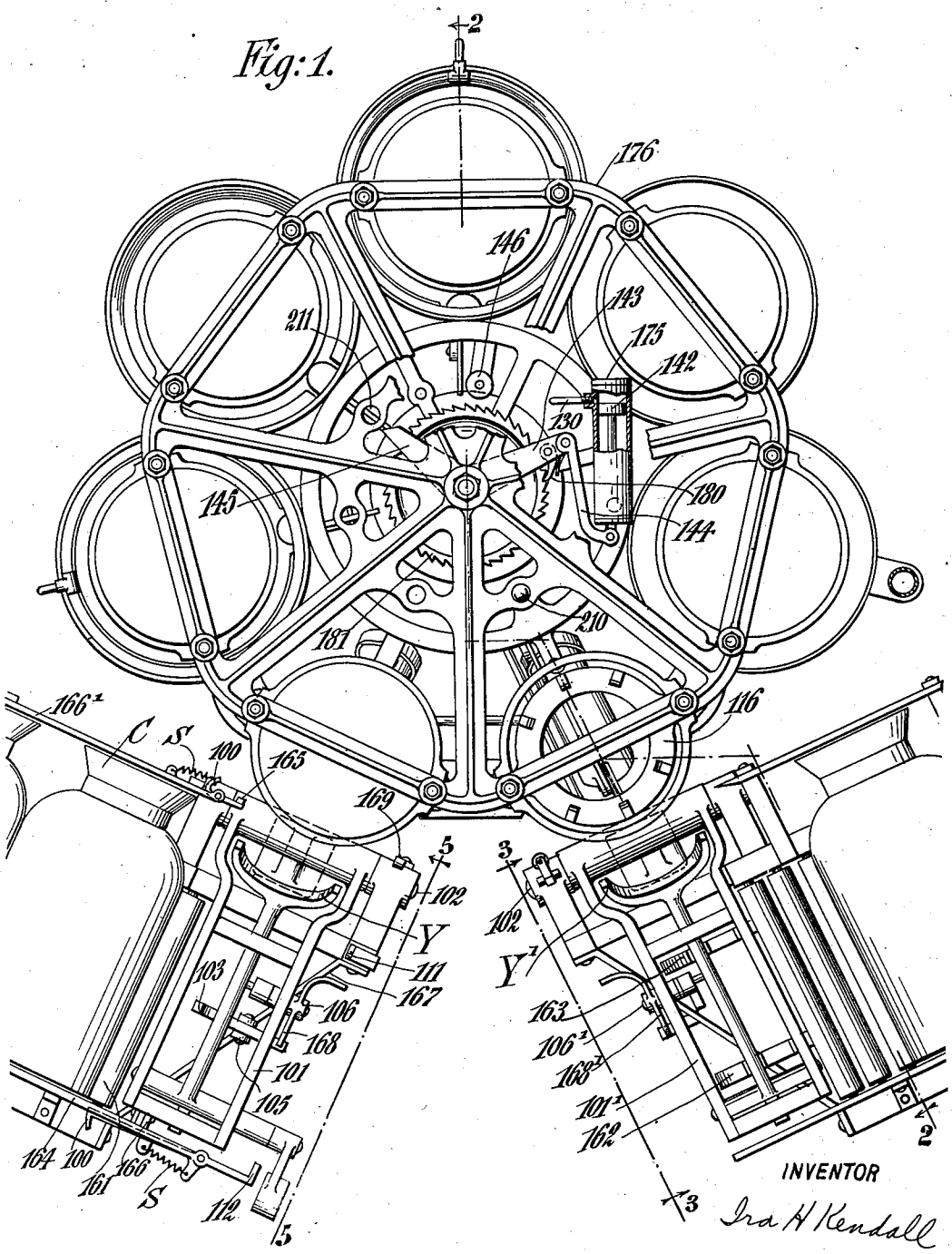
Oct. 4, 1927. 1,644,386

I. H. KENDALL

APPARATUS FOR WASHING RECEPTACLES

Original Filed April 11, 1922 7 Sheets-Sheet 1

Fig: 1.




INVENTOR

Ira H Kendall

BY Mock & Blum

ATTORNEYS.

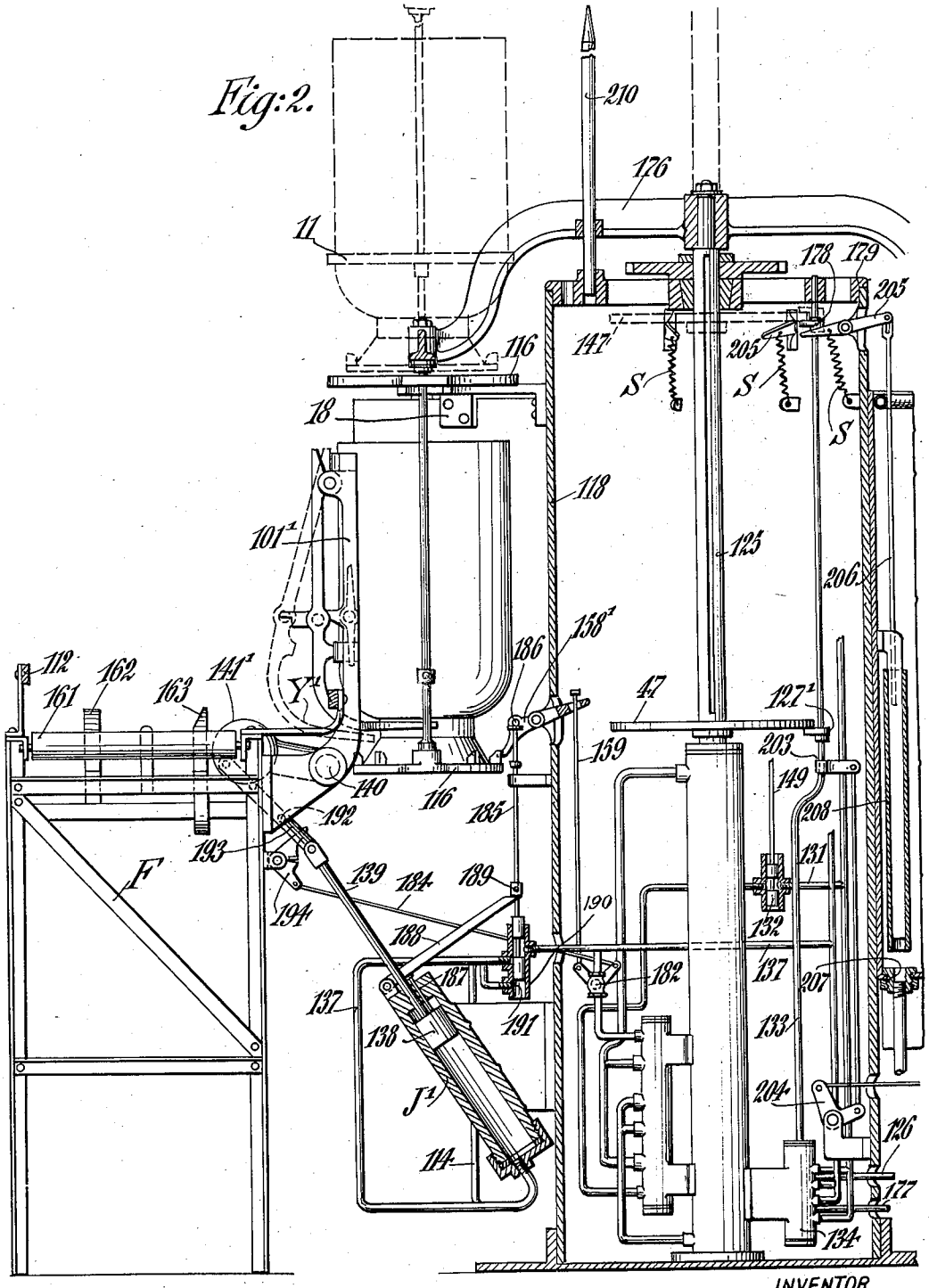
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I. H. KENDALL

APPARATUS FOR WASHING RECEPTACLES

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Fig: 2.




INVENTOR
Ira H Kendall
BY Mocket & Flum ATTORNEYS.

Oct. 4, 1927. 1,644,386

I. H. KENDALL

APPARATUS FOR WASHING RECEPTACLE S

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*Fig:3.*

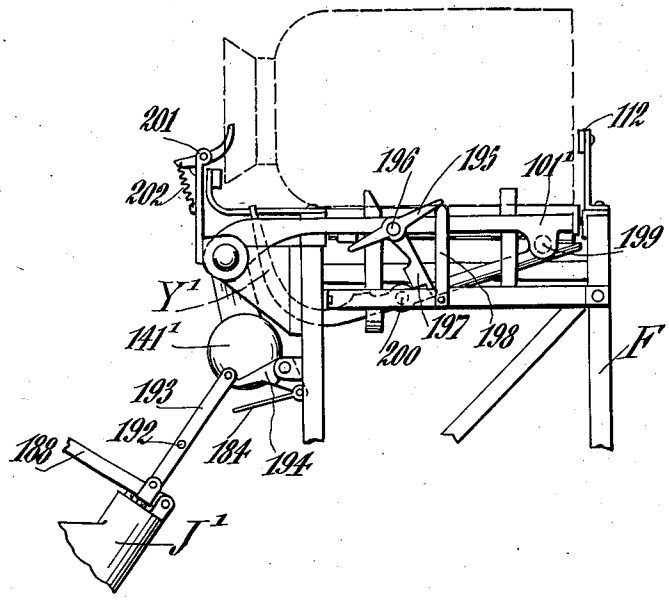
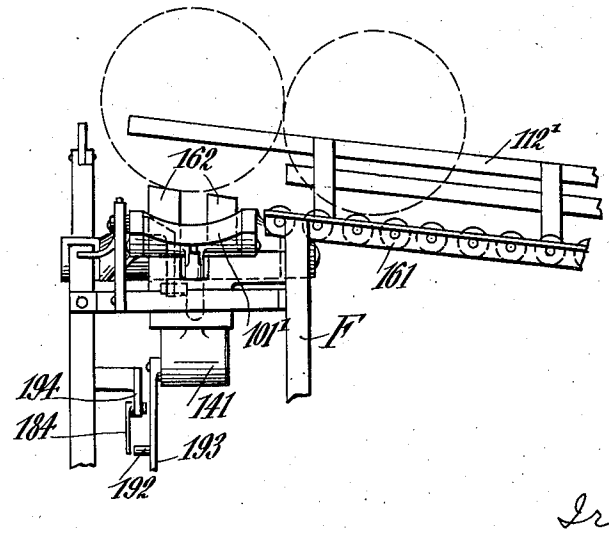



*Fig:4.*




INVENTOR

Ira H. Kendall

BY Mocket & Flum

ATTORNEYS.

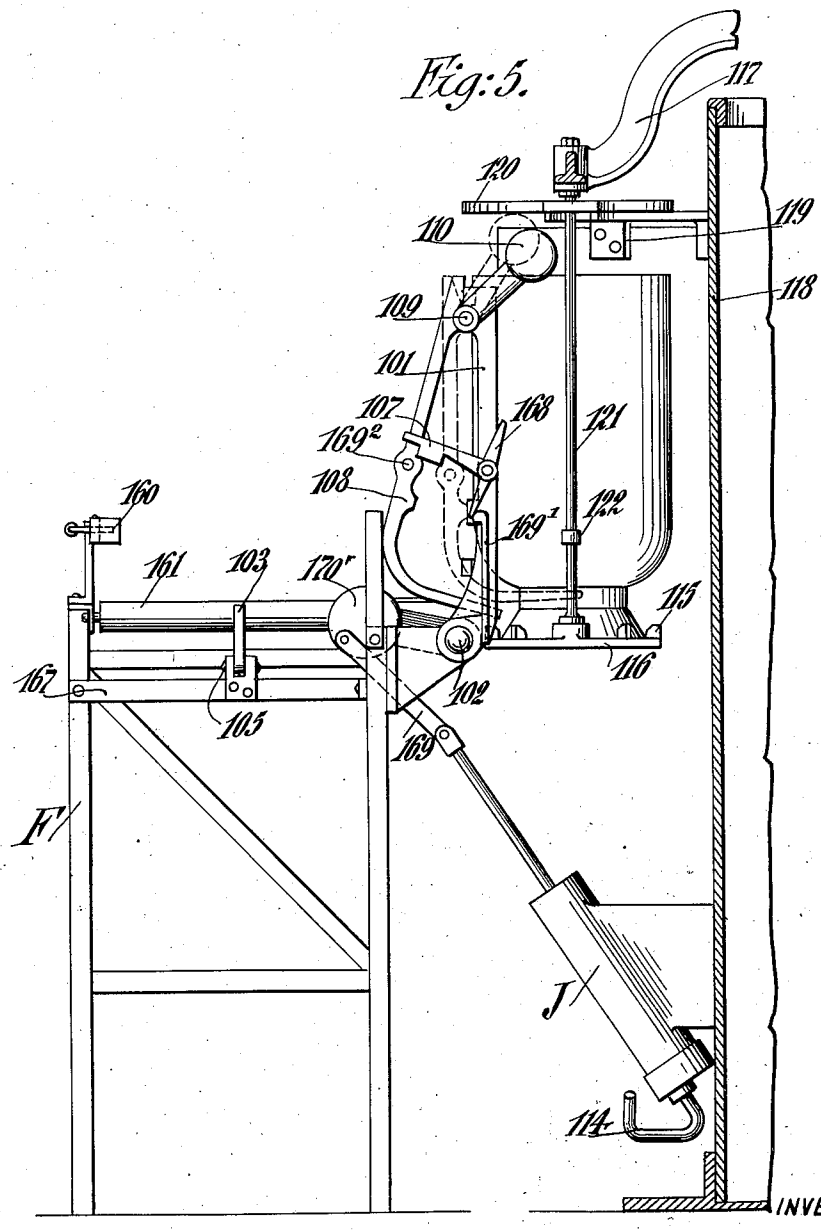
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I. H. KENDALL

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Fig. 5.




INVENTOR

Ira H. Kendall

BY Mock & Blum

ATTORNEYS.

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Fig:6.

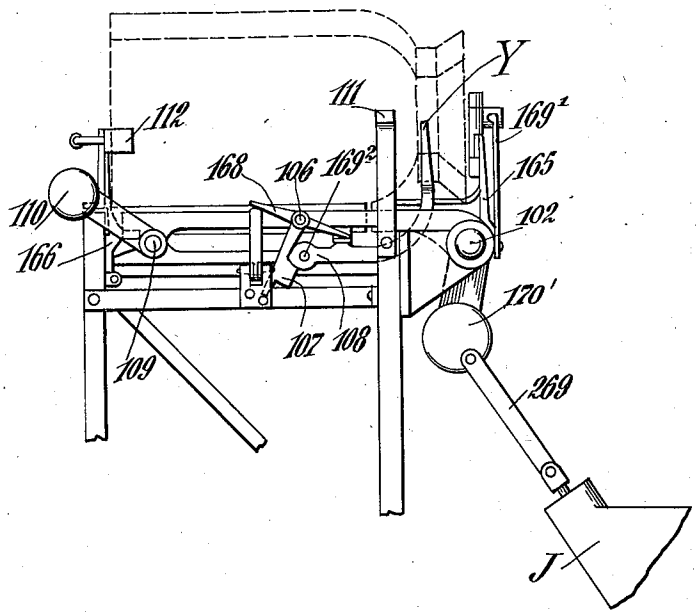



Fig:7.

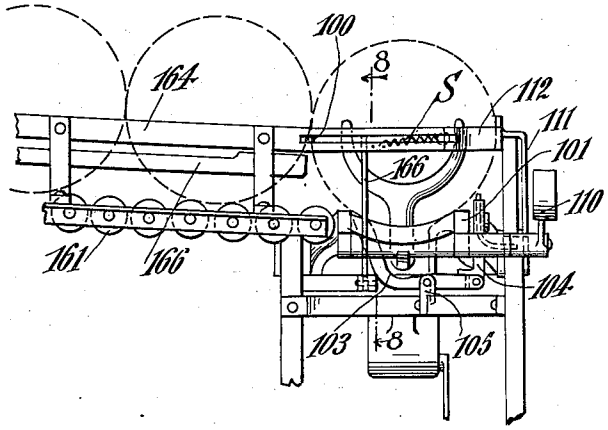
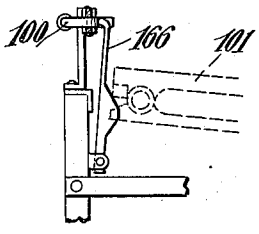



Fig:8.




INVENTOR

Ira H. Kendall

BY Mock & Blum

ATTORNEYS.

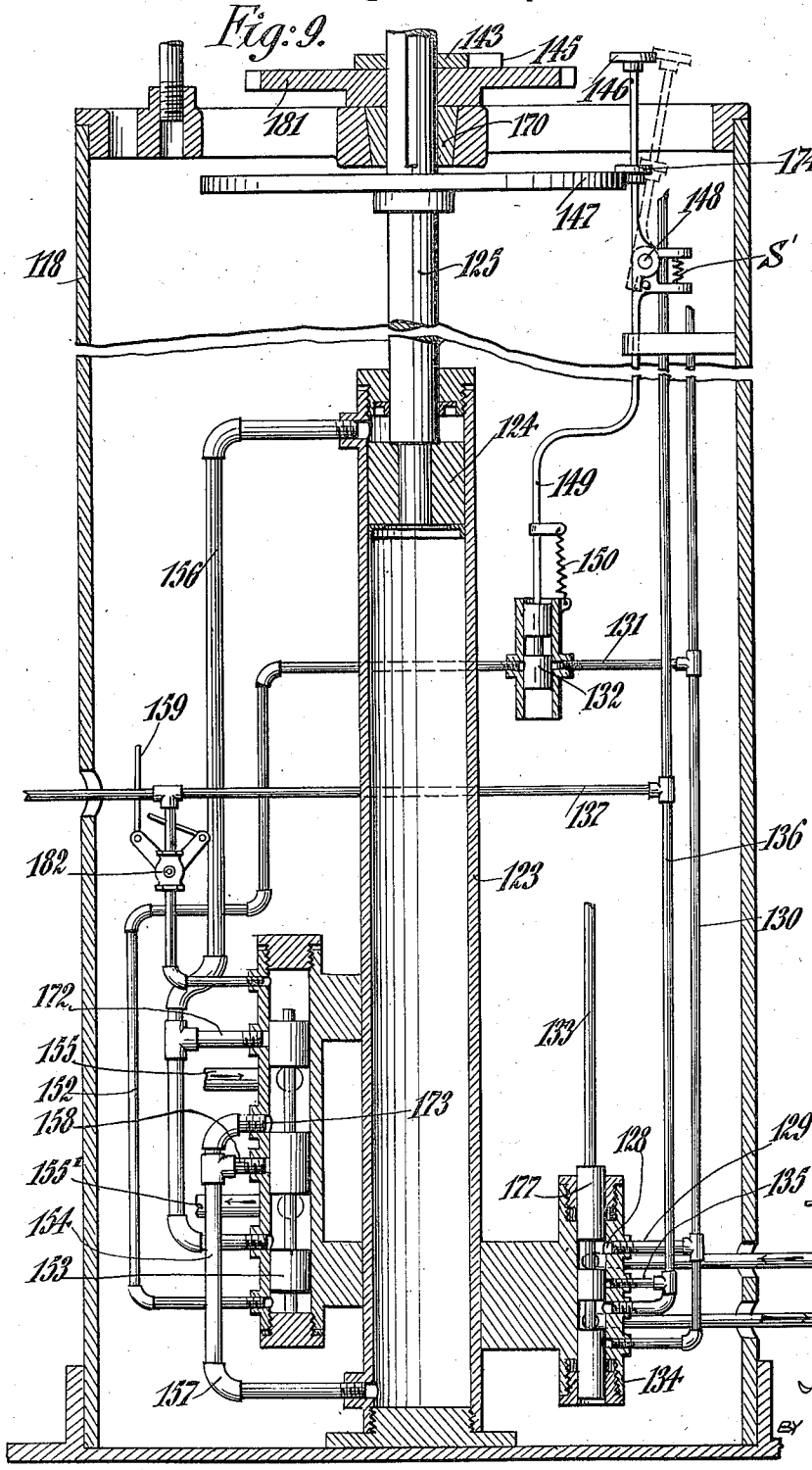
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Fig. 9.




INVENTOR

Ira H. Kendall

Mock & Blum

ATTORNEYS.

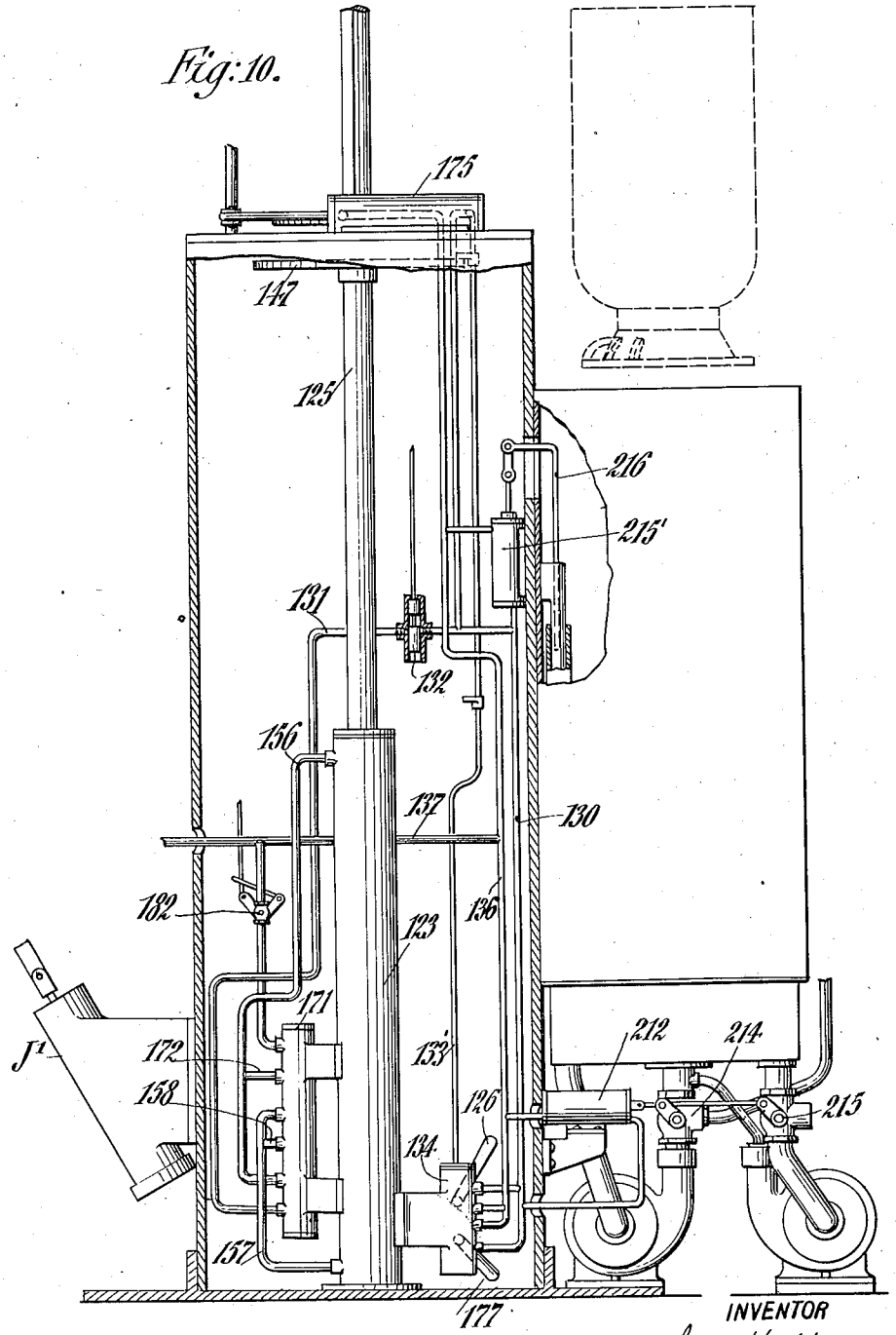
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I. H. KENDALL

APPARATUS FOR WASHING RECEPTACLES

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Fig. 10.




INVENTOR

Ira H. Kendall

BY Mock & Blum

ATTORNEYS.

Patented Oct. 4, 1927. 1,644,386

# UNITED STATES PATENT OFFICE.

IRA H. KENDALL, OF POTSDAM, NEW YORK.

## APPARATUS FOR WASHING RECEPTACLES.

Original application filed April 11, 1922, Serial No. 551,570. Divided and this application filed August 21, 1925. Serial No. 51,632.

My invention relates to a new and improved machine or apparatus for washing milk cans or other receptacles.

This application is a division of my previously filed application Serial No. 551,570 on April 11, 1922.

One object of my invention is to devise an automatic apparatus of this character which shall be completely operative by means of hydraulic power.

Other objects of my invention will be set forth in the following description and drawings which illustrate a preferred embodiment thereof, it being understood that the above general statement of the objects of my invention is intended to generally illustrate the same and not to limit it in any manner.

Figure 1 is a top plan view of an automatic machine.

Figure 2 is a section on the line 2—2 of Figure 1.

Figure 3 is a view on the line 3—3 of Figure 1 and shows the apparatus for removing a can from the turntable.

Figure 4 is a side elevation of the right hand side of Figure 3.

Figure 5 is a view on the line 5—5 of Figure 1 and shows the apparatus for placing a can on the turntable.

Figure 6 shows the device of Figure 5 in its horizontal position.

Figure 7 is a side elevation of the left of Figure 6.

Figure 8 is a section on the line 8—8 of Figure 7.

Figure 9 is a section through the main lifting jack.

Figure 10 shows another embodiment having a different control apparatus.

The cans C are placed upon a chute mounted upon a frame F. This chute is provided with rollers 161 and it also has side guides 166′ and 164. The cans are prevented from moving out of the chute by two pawls 100 which are normally caused to project inwardly in the path of the cans by means of springs S. When the cans roll off the chute they roll upon the cradle 101 pivoted upon the shaft 102. When the cradle is in the horizontal position shown in Figure 1, for example, the projection 165 on the cradle pushes one of the pawls 100 to the inoperative position. At the other end thereof, the cradle contacts with the lever 166 and forces it away from the position shown in Figure 8 so that it moves the other pawl 100 to the unlocking position. Hence when the cradle is in the horizontal position, one of the cans rolls upon the said cradle 101 and is stopped by the projection 111 of the cradle and the hook end 112 of the guide 164. When the can rolls upon the cradle 101, it depresses the lever 103 shown in Figure 1, pivoted at 105 below the body of the cradle, the said pivot 105 being however, connected to the frame member 167 which remains stationary.

As clearly shown in Figures 1 and 6, the revolution of the lever 103 around its pivot 105 causes the revolution of the lever 168 which is pivoted at 106 to the cradle and has the latch 107 rigidly secured thereto. In the view shown in Figure 6, this revolution of lever 168 causes the latch 107 to revolve clockwise. When the latch 107 thus revolves, the hook 108 which forms part of the yoke Y is released so that the said yoke Y is then free to revolve around the pivot 109 which is secured to the cradle. The yoke Y has the weight 110 secured thereto and this tends to revolve the yoke Y around the pivot 109 in the counterclockwise direction when the parts are in the position shown in Figure 6. As will be later more fully explained, the yoke Y is originally in the inoperative position, and when it is released from latch 107, the weight 110 causes the yoke Y to revolve to the operative position shown in Fig. 6.

The next operation is to revolve the cradle around the pivot 102 secured to the frame so as to bring the parts from the position shown in Figure 6 to the position shown in Figure 5. This is done by the jack J shown in Figure 5 having a piston therein of the ordinary type and this piston is pushed upwardly so as to revolve the cradle by means of the link 169 which is pivotally secured to the cradle at the weight 170′, as clearly shown in Figures 5 and 6. This weight 170′ tends to revolve the cradle back into its horizontal position when the hydraulic pressure in J has been released. When the cradle has been brought into position, the weight 110 revolves the yoke Y around its pivot 109 in the clockwise direction so that the said yoke is released from the can which is allowed to descend upon the carrier 116 secured to the rods 121.

When the cradle is rocked into vertical position the lever 168 contacts with the stop

169′ secured to the stationary frame of the machine so that the said latch 107 is revolved in the clockwise direction in the view shown in Figure 5. This releases the hook 108 so that the weight 110 is free to revolve the yoke from the dotted line or holding position shown in Figure 5, to the full line or release position shown in Figure 5. This leaves the can to be held between the beveled fingers 115 of the carrier 116 secured to the rods 121 having the collars 122. When the cradle is originally revolved by the jack J the can is firmly placed upon the carrier 116 so that the weight of the can is now no longer borne by the yoke Y which is therefore free to move away from the can.

When the yoke Y moves into the full line position shown in Figure 5, it tends to remain in this position during the first period of the backward revolution of the cradle so that the latch 107 is free to drop and engage the pin 169² upon the said hook 108. This locks yoke Y in its inoperative position until the can which rolls upon the cradle again revolves the lever 168 when it is moved back to horizontal position when the weight 110 moves the yoke Y back into its operative and holding position.

The hydraulic control mechanism to automatically raise and lower the cradle is shown in detail in Figure 9. The jack 123 has a piston 124 upon which the shaft 125 is mounted. The shaft 125 has the control disc 147 secured thereto. The shaft 125 moves up and down through the bearing 170. The cylinder of the jack 123, which is mounted within the tubular frame 118, has a pipe 156 communicating with a suitable port at the upper end thereof. The bottom of the pipe 156 communicates by means of a suitable port with a casing 171 of the control valve 153. This valve 153 is composed of three superposed and spaced piston parts separated by intermediate portions of smaller diameter. The pipe 156 also communicates with the upper end of the valve casing by means of the cross pipe 172. The pipe 155 is connected to any suitable source of water under pressure and this communicates with the valve casing 171 by means of a suitable port as shown. The pipe 155′ which is the outlet or drain pipe for the valve casing 171 is connected to any suitable outflow tank or the like, preferably to the fresh water tank of the washing system for the cans.

The bottom of the jack 123 communicates by a suitable port with the elbow pipe 157 and the top of this pipe communicates with the valve casing by means of the port 173. Said pipe 157 is also connected with valve casing 171 by cross pipe 158. The bottom of the valve casing also communicates by means of a suitable port with a pipe 152 which is controlled by means of an intermediate piston valve 132 which is acted upon by means of the tension spring 150, connected to the valve rod 149 of the said valve 132.

As clearly shown in Figure 9, the curved valve rod 149 has an extension 146 pivotally secured thereto at 148 and an intermediate collar 174 can contact with the control disc 147. The extension 146 is normally held in the vertical position so that the collar 174 can engage with disc 147, by means of the compression spring S′, and a pin is provided as shown in Figure 9 so as to prevent the said extension 146 from being revolved from the vertical position in the counter-clockwise direction. The casing of the valve 132 is connected by means of a suitable port to the pipe 131 and this is connected to the vertical pipe 130. The pipe 130 is connected at the upper end thereof to the jack 175 shown in Figure 1 and which has therein the piston 142, the movement of which intermittently revolves the turntable 176 as will be more fully explained hereafter. The bottom of the pipe 130 communicates by means of a suitable port with the bottom of a valve casing 134 which has therein a valve 177 provided with three piston-like parts.

The pipe 126 controlled by an ordinary hand valve 127 is connected to any suitable source of water under pressure and an outlet pipe 177′ is provided for the said valve casing 134 and the said oulet pipe 177′ is preferably connected to a fresh water tank for the washing system.

A vertical pipe 136 connected to a cross pipe 137 terminates in two branches 135 which are connected to the valve casing 134 by means of suitable ports and the pipe 137 is connected as shown in Figure 2 directly to the jack J′ which serves to remove the washed cans from the turntable and to place them upon the outlet chute which will be later more fully described. The pipe 114 branches off from the upper part of the pipe 137 shown in Figure 2 and this is connected to the jack J clearly shown in Figure 5, which actuates the cradle for lifting the cans from the inlet chute and for placing them upon the carriers of the turntable 176. When the machine is about to be operated the valve 127 is closed and the turntable is in its upper position with the piston 124 in the position shown in Figure 9.

When the piston 124 is in its top position, the valves 177 and 153 are in the position shown in Figure 9 which shows what may be called the initial or starting position of the machine.

When the valve 127 is opened and a corresponding valve which is not shown in the drawings is opened in the pipe 155, the water entering through pipe 155 cannot pass into the pipe 172, but it can pass through the pipe 157 below the piston 124. Hence,

if for any reason the piston 124 is not in its uppermost position, it will be rapidly forced to this uppermost position. If for any reason the said piston 124 is not in the position shown in Figure 9, then by opening the valve of pipe 155 first, it will be moved to this top position. The drain water passes out through pipe 156 to the bottom thereof and out through pipe 155′.

The water entering through the pipe 126 enters the valve casing 134. As clearly shown in Figure 2, the valve rod 133 is provided with an intermediate collar 127′ and a top collar 178 and the control disc 147 engages this collar 178 and moves rod 133 to the position shown in Figure 9 when the piston 124 is moved to its top position. A guide member 179 is provided at the top of the tubular frame 118 and this guides the movement of the curved sliding valve rod 133. If the piston 124 has been moved to its top position and the valve 127 is then opened, the water entering through the pipe 126 passes out through the pipe 129 into the pipe 130 and upwardly to the jack 175 and pushes the piston 142 outwardly. This piston 142 is connected by means of the link 144 to the lever 143 pivoted at the center of the mechanism and this lever 143 has the ordinary spring pressed pawl 180 which cooperates with the ordinary ratchet disc 181 connected to the turntable shown in Figure 9, for example, in the ordinary manner.

The lever 143 has an arm 145 clearly shown in Figures 1 and 9 and the revolution of the lever 143 causes the arm 145 to move the extension 146 of the lever 149 away from the control disc 147 and into the dotted line position shown in Figure 9, overcoming the force of the compression spring S′. The tension spring 150 immediately lowers the valve rod 149 so that the collar 174 cannot re-engage the control disc 147. The valve 132 shown in Figure 9 is thus depressed and the water can enter the cross pipe 131 and the pipe 152 and can therefore enter the bottom of the valve casing 171 below the bottom piston part of the valve 153. The valve 153 is thereupon pushed upwardly until the top of its rod contacts with the top of the casing 171. It is understood that the drawings are largely diagrammatic and that any suitable cushioning means could be used for preventing the said valves or any other valves from being moved too violently. This upward movement of the valve 153 opens the ports of pipes 172 and 158 and closes the bottom port of pipe 156. Hence the water under pressure can now flow into the pipe 156 and upwardly therein above the piston 124 and cause the turntable to be lowered while any water below the said piston 124 can flow out through pipe 157 and into the valve casing through the port of pipe 158 and then out through pipe 155′.

When the turntable has descended to the bottom of its path, the control disc 147 strikes the collar 127′ as shown in its lower position in Figure 2 and this causes the valve rod 133 to be depressed until the top piston port of valve 177 closes the port of upper branch of the pipe 130 while the intermediate piston port of valve 177 opens the port of upper cross branch 135 and closes the port of lower cross branch 135 and at the same time the bottom piston port of the said valve opens the port of the lower branch of the pipe 130.

As is clearly shown in Figure 2, when the turntable is depressed one of the carriers 116 contacts with and revolves a lever 158′ in the counterclockwise direction and this raises the rod 159 of the valve in the casing 182 so as to close the said valve which hitherto has remained open. The water under pressure which is now free to enter the pipe 136 passes through the pipe 137 and then to the jacks J and J′ because the revolution of the lever 158′ has depressed the valve rod 185.

When the turntable descends with its carriers 116, one of these carriers 116 revolves the lever 158′ in the counterclockwise direction until the said carrier 116 passes beyond the said lever 158′ leaving the said lever 158′ free to revolve in the reverse or clockwise direction. The lever 158′ is so weighted that its left end tends to project within the path of movement of carrier 116.

When the lever 158′ has been revolved so that the pin 186 is at the bottom of its movement, then the rod 185 has been depressed so that the piston valve controlled thereby has opened the port of valve casing 190 shown on the lower left side of Figure 2 so that communication is established between the two branches of the pipe 137 and the two pistons 138 of the jacks J and J′ are thereupon moved outwardly so as to upwardly rock the two cradles 101 and 101′. Piston 138 of jack J′ comes into contact with supplemental control rod 187 and moves it outwardly so as to upwardly rock lever 188 which raises the valve rod 185 by means of the collar 189 and moves the rod 185 back until communication is cut off between the branches of pipe 137 by means of the valve in the casing 190. The lever 158′ then has its left end above the carrier 116 and between the beveled fingers on the said carrier. The rod 185 abuts a pin 186 on lever 158′ and jacks J and J′ have substantially the same control system. However, the yoke Y′ which is pivoted to cradle 101′ has no weight secured thereto.

When the piston valve in the casing 190 has thus been upwardly moved so as to open

the port 191, then the weights 170′ and 141′ rock the respective cradles back to their horizontal position because the water in jacks J and J′ is free to escape by any suitable pipe not shown in the drawings, preferably to a fresh water tank. When the cradle 101′ revolves back to its horizontal position, the pin 192 upon its link 193 contacts with the lever 194 so as to revolve it clockwise and pull upon the link 184 so as to again open the valve in casing 182. When the carrier 116 is raised, it revolves the lever 158′ so as to move it away from the stud at the top of rod 159, so that no effect is produced.

As shown in Figure 9, the water under pressure in pipe 137 is now free to pass through casing 182 and to enter the top port in valve casing 171, and move the valve 153 back to the position shown in Figure 9. The water under pressure in pipe 155 then enters casing 171, and passes out through port 173 and passes through 157 below the piston 124 so that the turntable again moves upwardly to contact with the collar 178 and raises the piston valve 177 to the position shown in Figure 9.

When the cradle 101′ takes off a can, the said can contacts with the projections 162 and 163 so as to free it from the cradle 101′ and allow it to roll down the outlet chute having the guards 112.

As shown in Figures 2–4, the cradle 101′ pivoted at 140 has the lever 195 pivoted thereto at 196 and provided with a latch 197. In the position shown in Figure 3, the lever 195 has been moved to the position indicated therein by the stationary projection 198. The weight of the yoke Y′ which is pivoted to the cradle 101′ at 199 causes it to fall into the dotted line position. As the cradle 101′ is raised, the end of the latch 197 engages the pin 200 because the weight of said latch swings it into position and the latch 197 holds the yoke Y′ relatively inclined to the cradle 101′. When, however, the cradle 101′ is almost vertical, the lever 195 secured to latch 197 and pivoted at 196 contacts with the pivoted lever 201 shown in Figure 3 and acted upon by the tension spring 202, and this causes the end of the latch 197 to release the pin 200 so that the yoke can rock into the vertical position shown in full lines in Figure 2 and engage a can. When the cradle 101′ drops back to its horizontal position, the lever 201 can rock sufficiently to pass out of the way.

The lever 194 really consists of two separately pivoted parts, the upper part of which shown in Figure 2 can revolve counterclockwise freely with respect to the lower part, but engages it as soon as it is rocked clockwise. As shown in Figure 6, the rod 269 connected to piston of jack J is connected to weight 170′ of cradle 101.

In the embodiment shown in Figure 10, the various valves, etc., are all controlled by pilot jacks, such as the jacks 175, 212, 215′, etc. The rod 133′ is equivalent to the rod 133 before described.

As clearly shown in Figure 2, the valve rod 133 is connected by means of the collar 203 to a link which operates the bell crank lever 204 which controls the valves in casings 214 and 215. These valves control the delivery of water for washing the cans.

The jack 175 shown in Figure 1 is connected at its outlet end, namely, at the end opposite the end shown adjacent to the piston shown in Figure 1, to the pipe 136.

Wherever I refer in the drawings or description or claims to any parts by numbers, it is to be understood that I do not wish to be limited to the specific form of said parts illustrated in the drawings or description.

I have shown a preferred embodiment of my invention but it is clear that numerous changes and omissions may be made without departing from the spirit thereof.

I claim:—

1. In a machine for handling milk cans and other receptacles, a turntable having carriers for said cans, holding means adapted to hold the can located adjacent the said turntable, said holding means being mounted upon movable supports, mechanism for moving said supports towards and away from the said carriers, and automatic means for causing the holding means on one of said supports to release a can when the can is in proper position on the adjacent carrier and for causing the holding means upon the other support to simultaneously grip and hold the can on the carrier adjacent thereto.

2. In a machine for handling milk cans and other receptacles, the combination of a turntable, means for revolving the said turntable, a cradle 101 pivoted adjacent the said turntable, a yoke Y pivotally secured to said cradle 101, means for actuating said cradle 101 towards and away from the said turntable, and means adapted to actuate said yoke Y so as to cause it to release a can when said yoke Y is substantially in the vertical position.

3. In a machine for handling milk cans and other receptacles, the combination of a turntable, means adapted to revolve the said turntable, a cradle 101′ pivoted adjacent the said turntable, a yoke Y′ pivotally secured to said cradle 101′, means adapted to actuate the said cradle towards and away from the said turntable, and means adapted to actuate said yoke Y′ to cause it to engage a can when it is in substantially the vertical position.

4. In a machine for handling milk cans and other receptacles, the cradle 101, the yoke Y connected thereto, means for revolv-

ing the said yoke Y when it is in substantially the vertical position to cause it to release a can, means for locking the said yoke Y into said inoperative and releasing position and means actuated by the weight of a can placed upon the said cradle for releasing the said yoke so that it can be revolved to its operative position relative to the cradle.

5. In a machine for handling milk cans and other receptacles, the cradle 101, the yoke Y pivoted thereto and having the weight 110 connected thereto, the said yoke Y having the hook 108 provided with a pin $169^2$ connected thereto, the latch 107 having two parts adapted to alternately engage the said hook 108 and the said pin $169^2$, the lever 168 pivoted to the cradle and connected to the latch 107, the stop 169′ connected to the frame of the machine and adapted to engage with and revolve the lever 168 when the yoke Y is in substantially vertical position and the lever 103 pivoted at 105 and adapted to be revolved by the weight of a can placed upon the cradle 101, the said lever 103 being adapted to engage with and turn the said lever 168.

6. In a machine for washing milk cans and other receptacles, a frame, a cradle pivotally connected to the said frame, means adapted to move the cradle from a horizontal position to a vertical position and also in the reverse direction, a yoke pivotally connected adjacent one end thereof to the said cradle so that said yoke tends to swing to the vertical position and to engage a can when the said cradle is in its vertical position, said yoke having a pin, a lever pivoted to said cradle and having a latch connected thereto so that said lever and said latch move in unison, said latch being adapted to engage said pin while said cradle is being moved from its horizontal position to its vertical position so as to maintain said yoke inclined with respect to said cradle, a stop connected to the frame of the machine and adapted to actuate the lever to cause said latch to release said pin when said cradle is in substantially the horizontal position.

7. In a machine for handling milk cans and other receptacles, the combination of a turntable 176, a shaft 125 having the carriers 116, said turntable 176 being mounted on said shaft 125, the hydraulic jack 123 having a piston 124 connected with said shaft 125 and adapted to raise and lower said shaft, means for revolving the said turntable and a jack adapted to operate said means, cradles adapted to place cans upon the said carriers and remove cans therefrom and jacks adapted to operate said cradles and pilot valves connected with all the said jacks and adapted to cause the piston 124 to be first moved to substantially the upper part of its said jack, to then cause the partial revolution of the said turntable, to then cause the said cradles and the parts connected thereto to be actuated so as to place a can upon one of the said carriers and remove a can from another of the said carriers and to then cause the said piston 124 to be lowered substantially to the bottom of the jack 123, and to be then raised to its upper position before mentioned.

8. In a machine for handling milk cans and other receptacles, a turntable 176, a shaft 125 upon which said turntable 176 is mounted, a ratchet 181 connected to said shaft 125, the lever 143 pivotally mounted upon said shaft 125 and having the pawl 180 adapted to engage the said ratchet 181, the jack 175 having a piston 142, the link 144 connecting said piston 142 to the said lever 143, the said lever 143 having the extension 145, means for admitting water under pressure to the said jack 175 so as to cause the said turntable 176 to be turned for a portion of a revolution, the cradles 101, and 101′, the jacks J and J′ having pistons respectively connected to said cradles and adapted to actuate them, the control means 146 adapted to be operated by the movement of the projection 145 to permit water under pressure to be admitted into the said jacks J and J′ to move the said cradles towards said turntable and control means operated by the pistons of the said hydraulic jacks J and J′ for shutting off their connection with the water under pressure when they have reached the end of their movement, and means for then causing the said cradles to move back to the said horizontal position.

9. In a machine for handling milk cans and other receptacles, a turntable 176, a shaft 125 upon which said turntable is mounted the ratchet 181 connected to said shaft, the lever 143 pivoted on said shaft 125 and having the pawl 180 adapted to engage the said ratchet 181, the jack 175 having a piston 142, the link 144 connecting said piston to the said lever 143, the said lever 143 having the extension 145, means for admitting water under pressure to the said jack 175 so as to cause the said turntable 176 to be turned for a portion of a revolution, the cradles 101 and 101′, the jacks J and J′ having pistons respectively connected to said cradles and adapted to actuate them, the control means 146 adapted to be operated by the movement of the projection 145 to permit water under pressure to be admitted into the said jacks J and J′ to move the said cradles towards the said turntable, and control means operated by the pistons of the said hydraulic jacks J and J′ for shutting off their connection with the water under pressure when they have reached the end of their movement, and means for then causing the said cradles to move back to the said horizontal position, and valve means adapt-

ed to be operated by the movement of the said cradles back to their horizontal position to cause the said turntable to be lowered.

10. In a machine for handling milk cans and other receptacles, the turntable 176 mounted upon the shaft 125, the jack 175 having a piston 142 and means whereby the movement of the piston 142 causes the intermittent partial revolution of the said turntable, the pilot valve 177, the inlet pipe 126 and the outlet pipe 177′ connected to the casing 134 of the said pilot valve 177, the pipes 130 and 136 communicating with the said casing 134 and with the said jack 175, the cross pipe 131 communicating with the casing 171 of the second pilot valve 153, separate pipe connections between the said casing 171 and the top and bottom main jack 123, said jack 123 having vertically movable piston 124 therein, said piston 124 being connected to the shaft 125 the movement of the said second pilot valve 153 being adapted to control the flow of liquid under pressure in said separate pipe connections and the movement of the said piston 124, a valve controlling the cross pipe 131, means adapted to open the said valve of the said pipe 131 only after the jack 175 is operated to turn the said turntable 176 whereby the said turntable is lowered only after it has been revolved, the jacks J and J′ adapted to move the cradles 101 and 101′, the cross pipe 137 connected to the said jacks J and J′ and controlled by a valve and casing 190 and means controlled by the movement of the said turntable for opening the said valve and the said pipe 190 only after the said turntable has substantially reached the end of its lowering movement, control means adapted to shut the valve in the said casing 190 and operated by the pistons in the said jacks J and J′, the valve in the casing 182 controlling the connection between the cross pipe 187 and the upper end of the casing 171 and means for actuating the said valve in the casing 182 when the said cradles are rocked back in their horizontal position.

11. In a machine for handling milk cans and other receptacles, the combination of a turntable 176, a shaft 125, said turntable 176 being mounted on said shaft 125 and having the carriers 116, a hydraulic jack 123 having a vertically movable piston 124 connected with the shaft 125 and adapted to raise and lower said shaft, means for turning said turntable operated by another hydraulic jack, and pilot valve means connected with said jacks and adapted to cause the piston 124 to be moved up and down and to cause said turntable to be turned between each complete stroke of said piston 124.

In testimony whereof I affix my signature.

IRA H. KENDALL.