March 24, 1925. 1,530,516

A. K. RARIG

CONTAINER FEED VALVE

Filed April 19, 1924 2 Sheets-Sheet 1

Fig. 1.

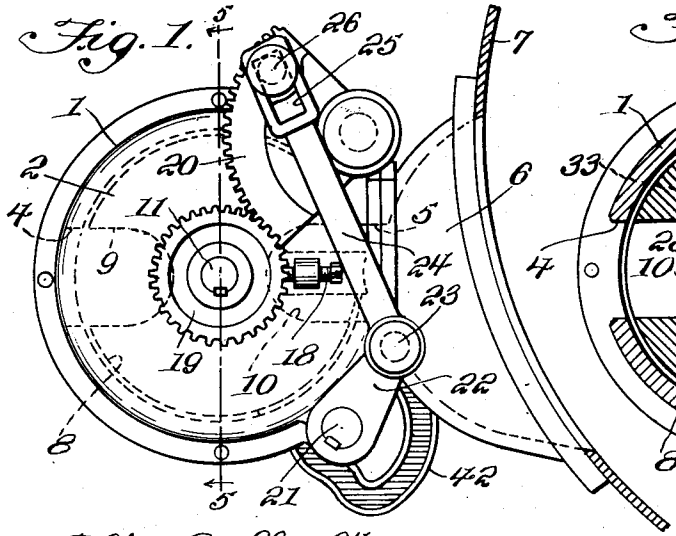


Fig. 3.

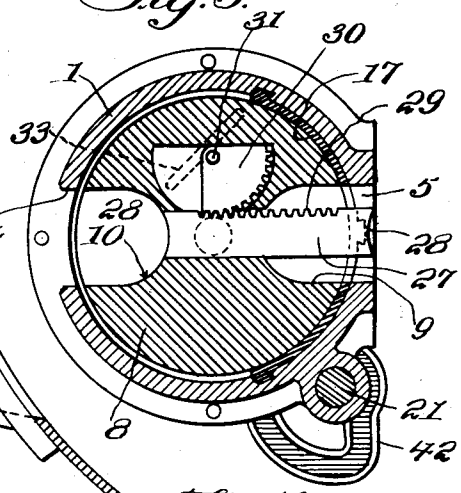


Fig. 2.

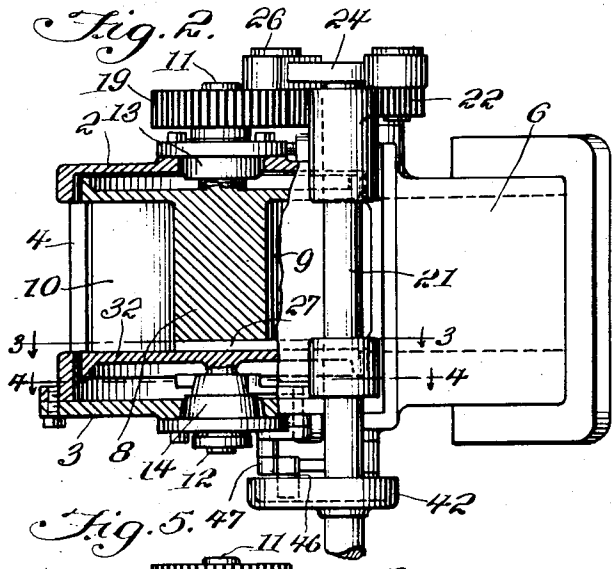


Fig. 4.

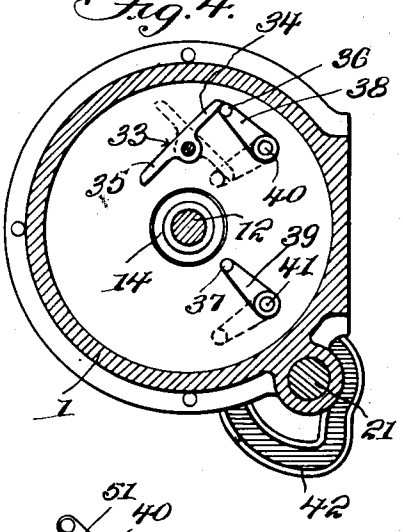


Fig. 5.

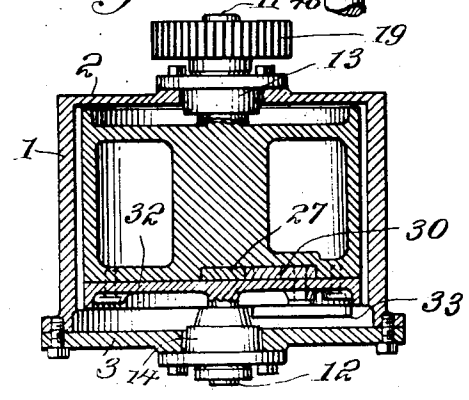
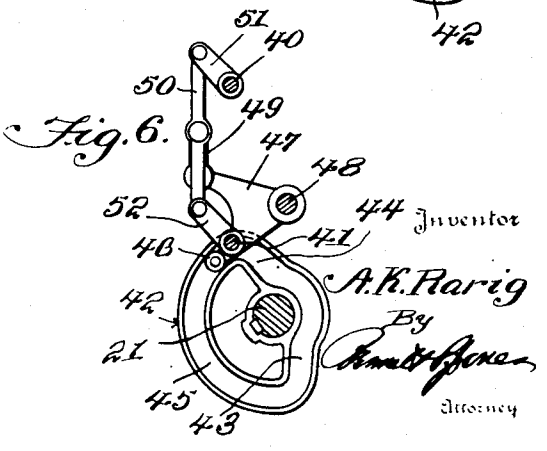


Fig. 6.



Inventor

A. K. Rarig

By

Attorney

March 24, 1925. 1,530,516

A. K. RARIG

CONTAINER FEED VALVE

Filed April 19, 1924 2 Sheets-Sheet 2

Fig. 10.

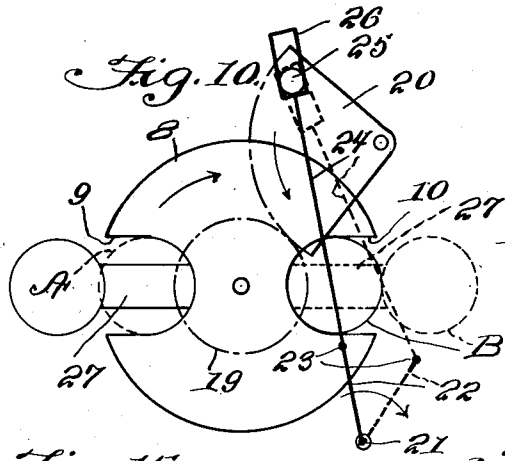


Fig. 13.

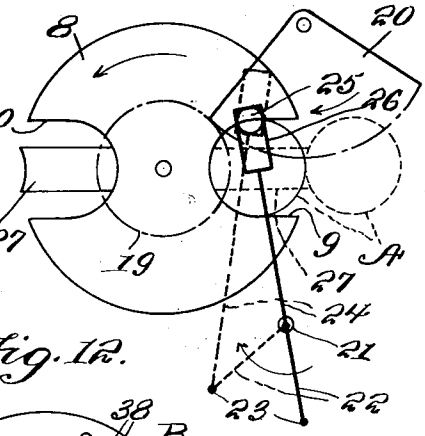


Fig. 15.

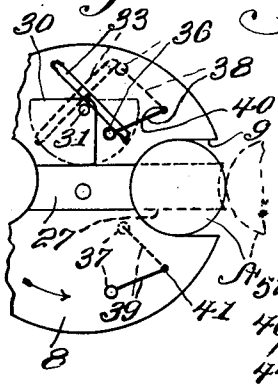


Fig. 14.

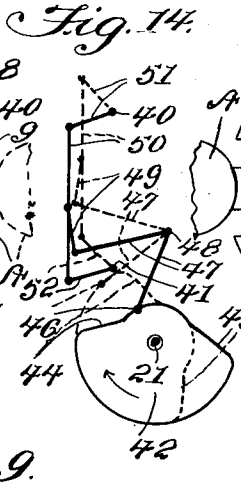


Fig. 12.

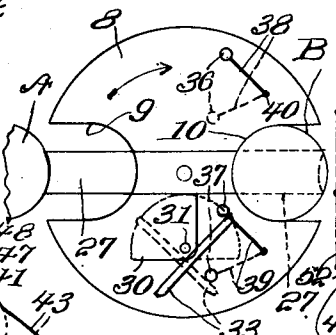


Fig. 11.

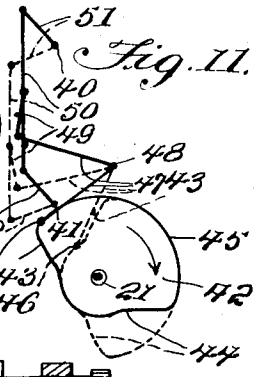


Fig. 7.

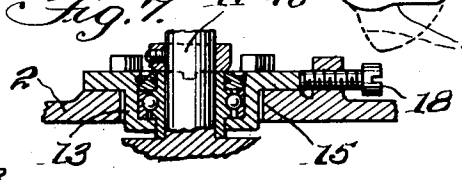


Fig. 9.

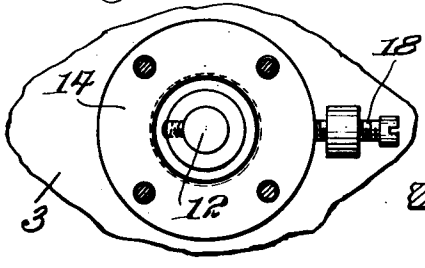
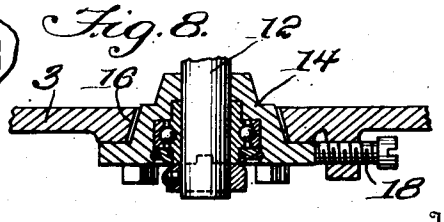


Fig. 8.



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Patented Mar. 24, 1925. 1,530,516

UNITED STATES PATENT OFFICE.

ALEXANDER K. RARIG, OF SAN FRANCISCO, CALIFORNIA.

CONTAINER FEED VALVE.

Application filed April 19, 1924. Serial No. 707,758.

To all whom it may concern:

Be it known that I, ALEXANDER K. RARIG, a citizen of the United States, residing at San Francisco, in the county of San Francisco and State of California, have invented new and useful Improvements in Container Feed Valves, of which the following is a specification.

This invention relates to can feed valves for canning machines, and particularly to feed valves of that type designed for introducing cans or other containers into and discharging them from a processing chamber, such as a steam pressure cooking chamber or vacuumizing chamber, in which the inlet and outlet of the chamber should be kept sealed against the loss of steam or ingress of air during the passage of the cans therethrough.

One object of my invention is to provide a feed valve, i. e., a combined feeder and valve, that can be operated at a high rate of speed without jamming the cans or otherwise injuring them or marring their surfaces.

Another object of the invention is to provide an oscillatory valve of 180° movement type which on each half oscillation will effect the delivery of a can or container.

Still another object of the invention is to provide operating means of simple, reliable and efficient character for actuating the valve and can ejecting means associated therewith at properly timed periods.

With these and other objects in view, the invention consists of the features of construction, combination and arrangement of parts, hereinafter fully described and claimed, reference being had to the accompanying drawings, in which:

Figure 1 is a top plan view of a can feed valve embodying my invention.

Figure 2 is a view, partly in side elevation and partly in longitudinal section of the same.

Figure 3 is a horizontal section on line 3—3 of Figure 2.

Figure 4 is a horizontal section on line 4—4 of Figure 2.

Figure 5 is a transverse section on line 5—5 of Figure 1.

Figure 6 is a view of the ejector actuating cam and parts operated thereby.

Figure 7 is a detail section through the upper head of the valve casing, showing the upper drum bearing.

Figure 8 is a similar view through the lower head of the valve casing, showing the lower drum bearing.

Figure 9 is a bottom plan view of the parts shown in Figure 8.

Figure 10 is a diagrammatic view illustrating the operation of the drum actuating means on one-half oscillation of the drum.

Figure 11 is a companion view to Figure 10 illustrating the action of the throw cranks of the ejector actuating means on the same half oscillation of the drum.

Figure 12 is a diagrammatic view illustrating the action of the throw cranks and gear segment in the motion of the working parts shown in Figure 11.

Figures 13, 14 and 15 are views similar to Figures 10, 11 and 12, illustrating the actions of the drum actuating means, throw crank actuating means, throw cranks and gear segment on the remaining half revolution of the drum.

In the practical embodiment of my invention as herein disclosed, I provide a feed valve comprising a circular casing 1 having an integral top head 2 and a detachable bottom head 3, the latter being secured in position by any suitable type of fastening means. This casing is formed in two of its diametrically opposed side walls with openings 4 and 5 of a size for the passage of a can or container of any intended diameter or diameters. Either one of these openings may be employed as an inlet and the other as an outlet, accordingly as the valve is intended for use as an injector valve or discharge valve. In the present instance the valve is shown as constructed for use as an injector valve, being provided for such purpose with a neck 6 forming a passage communicating with the opening 5, and which neck is designed in practice to be hermetically secured to the wall of a chamber 7, fragmentarily shown, having an inlet opening through which the cans are introduced into such chamber. This chamber may be a steam heated cooking chamber or a vacuumizing chamber, and the neck 6 may receive one end of a conveyor or other intermediate transfer device for conveying the cans from the outlet of the injector valve to a cooking drum or seaming machine with-

in the chamber. By simply reversing the working position of the valve, however, or disposing the neck 6 for communication with the inlet 4, the device may be employed as an ejector valve for discharging the cans or containers from the outlet of the chamber, without in any manner varying the construction or operation of the working parts of the valve device. It is therefore to be understood that the subject-matter of the appended claims covers a valve device designed for either injecting or ejecting purposes and for use with steam cooking, vacuumizing or other like chambers which are to be supplied with articles to be treated and in which the inlet or exit passages of the chamber, or both, are to be kept sealed against the ingress or egress of air, steam or other fluids while the cans are being fed thereinto and therefrom.

Disposed within the casing 1 is an oscillatory drum 8, having an oscillatory motion in an arc of 180°, and provided at diametrically opposite sides thereof with peripheral can receiving seats, pockets or recesses 9 and 10, each having a bottom can supporting wall and which are alternately movable by the oscillations of the drum into and out of register with the opening 4 and 5. The drum is provided at top and bottom with stub shafts 11 and 12 journaled in anti-friction bearings 13 and 14, which are loosely fitted for adjustment in openings 15 and 16 in the heads 2 and 3 of the casing 1. Set in the walls of the casing 1 adjacent to the outlet 5 is a wear liner 17 of Babbitt metal or other suitable comparatively soft metal, against which the adjacent side of the drum 8 bears. In the use of the valve in connection with a vacuumizing chamber, the suction pull due to the vacuum in that chamber draws the drum tightly against the liner 17, so as to seal the opening 5 against the ingress of air, whereby a high degree of vacuum in the vacuumizing chamber may be obtained. Set screws 18 mounted upon the heads 2 and 3 are provided for engagement with the bearings 13 and 14 for adjusting the same in the openings 15 and 16 to regulate the pressure of the drum under the suction pull against the wear liner 17, whereby any undue binding action may be prevented and a tight sealing action at the same time maintained.

Fixed to the stub shaft 11 is a gear 19 with which meshes a gear segment 20 suitably mounted upon the top of the casing 1 and which is alternately movable in opposite directions to communicate oscillatory motion through the gear 19 to the drum 20, whereby the drum will first be turned in one direction from, for example, the position shown in Figure 3, to reverse the position of the pockets 9 and 10 and cause them to respectively register with the outlet 5 and inlet 4, and then to shift the drum back again to the position shown in Figure 3 in which the pocket 9 communicates with the inlet 4 and the pocket 10 with the outlet 5. In the position shown in Figure 3, the pocket 10 is shown as disposed to receive a can or container introduced through the inlet 4 and adapted through a half oscillation of the drum 8 to be brought to register with the outlet 5 for the discharge of the can or container through said outlet, in which operation the pocket 9, which as shown in Figure 3 registers with the outlet 3, is moved into registry with the inlet 4 to receive a can, the respective pockets on the subsequent or remaining half oscillation of the drum being shifted back again to the position shown in Figure 3.

Journaled upon one side of the casing 1 is a drive shaft 21 designed in practice to receive continuous rotary motion in one direction from any suitable source of power. Fixed to the upper end of this shaft is a crank arm 22 carrying a wrist pin 23 to which is pivotally coupled one end of a connecting rod 24. The opposite end of this rod is provided with a slotted portion 25 slidably and pivotally engaging a wrist pin or stub 26 fixed upon the gear segment 20. On one half revolution of the shaft 21 the connecting rod 24 is moved in one direction to shift the gear segment 20 in one direction, and on the remaining half revolution of the shaft 21 the connecting rod 24 is moved in the reverse direction to shift the gear segment 20 in the opposite direction to that in which has been previously moved, between which reverse movements of the rod 24 and segment 20 the slotted end 25 of the rod travels idly along the wrist pin 26 without imparting motion thereto. In such idle motions of the rod 24, occurring on each half revolution of the shaft in the shifting of the rod from the end of one working action across its dead center position to the beginning of its next working action, the drum 8 remains at rest for an interval sufficient for the reception of a can into its pocket which is in receiving position and the ejection of a can from its pocket which is in discharge position.

A reciprocating double ejector 27 is provided for alternately ejecting the cans or containers from the pockets 9 and 10. This ejector comprises a bar having opposite end can engaging surfaces 28, said bar being slidably mounted in a guideway extending across the drum between the inner ends of the pockets 9 and 10 for reverse shifting and can ejecting motions on successive half oscillations of the drum. This ejector bar is provided on one side with rack teeth 29 meshing with a gear segment 30 carried by a shaft 31 journaled on the drum, said segment being alternately movable

in opposite directions for communicating the shifting motions to the ejector bar. The segment 30 fits within a recess in the bottom of the drum and is held in position by a detachable head 32, secured to the drum body by any suitable type of fastening means, and which head carries the lower stub shaft 12. The shaft 31 extends downward through this head 32 into the space between it and the casing head 3 and has fixed to its lower end an actuating lever 33 provided with oppositely extending arms 34 and 35.

The arms 34 and 35 are adapted for co-operation respectively with engaging pins 36 and 37 upon crank throw arms 38 and 39 fixed to shafts 40 and 41 journaled in and extending downwardly through the head 3 of the casing, the throw arms 38 and 39 being disposed in the space between the heads 3 and 32 for rocking movements between inactive and active positions to respectively engage the lever arms 34 and 35 and thereby transmitting reverse swinging movements to the segment 30. The arms 38 and 39 normally lie when inactive radially to the axis of the drum 8, as indicated by the dotted line position of the arm 38 and the full line position of the arm 39 in Figure 3, and said arms are movable outwardly on their working motions to the full line position of the arm 38 and dotted line position of the arm 39 shown in Figure 3, which also shows in full and dotted lines the working movements of the lever 33 in the working movements of said arms 38 and 39.

The mechanism for operating the throw arms 38 and 39 comprises a cam 42 fixed to the shaft 21 for continuous rotary motion in one direction. This cam is provided with a groove having two working portions 43 and 44 and an idle portion 45. A roller 46 is provided to travel in the cam groove, and this roller is mounted at one side of the base of a triangular rocker arm 47, pivoted at its vertex, as indicated at 48, to the underside of the head 3, and coupled at the opposite side of its base by a link 49 to a connecting rod 50 connected at its ends by cranks 51 and 52 respectively to the lower ends of the shafts 40 and 41 of the throw arms 38 and 39. The rocker arm 47 is alternately movable in opposite directions by the cam portions 43 and 44 to alternately shift the throw arms 38 and 39 back and forth on their working and return motions, the successive actuations of the throw arms 38 and 39 occurring during the time periods when the drum 8 is at rest between periods of half oscillation, the roller 46 travelling idly in the cam groove portion 45 after each movement of the throw arms 38 and 39 and during the period when the drum 8 is making a half oscillation. Provision is thus made for the shifting of the ejector 27 in a proper direction to discharge a can from the drum pocket which is in discharge position, at the time when the drum is at rest and the other pocket is in receiving position.

The working operation of the parts will be readily understood by reference to the diagrams, Figures 10 to 15, inclusive. Figure 10 shows the drum and drum operating means substantially as shown in Figure 1 with the exception that the crank 24 and rod 22 appear in full lines in one of their dead center positions between intervals of operation and in dotted lines the arrangement of the parts when about to reverse the movement of the drum. Figure 10 also shows the ejector in the reverse position to that shown in Figure 3 and with a can A positioned to enter the pocket 9 and a can B about to be ejected from pocket 10. Figures 11 and 12 show the corresponding full and dotted line positions of the ejector operating means. In the travel of the crank 24 and rod 22 from the full line to the dotted line positions in Figure 10 the stud 26 makes its idle travel from the inner to the outer end of the slot, during which the drum 8 remains stationary and the parts 24—26 are brought to the position shown in Figure 1. During this idle period of the drum the roller 46 passes from the inactive groove portion 45 of the cam to the working groove portion 43 thereof, thereby shifting the throw crank actuating mechanism, as shown in Figures 11 and 12, from the full line position to the dotted line position, whereby the throw crank 38 is retracted and the throw crank 39 projected, the latter acting on the lever arm 35 to move the lever 33 to shift the gear segment 30 so as to shift the ejector 27 to the dotted line position in Figure 12, thereby forcing the can B from pocket 10 and leaving pocket 9 free for the feed of the can A thereinto, which can is entered before the drum begins its reverse motion. The drum shifting mechanism now begins its drum reversing action, the crank 22 and rod 24 operating to shift segment 20 from the position shown in Figure 1 to the reverse position shown in Figure 13, as a result of which the drum 8 will be turned to the position shown in Figures 13 and 15, so as to bring the previously emptied pocket 10 into receiving position and the loaded pocket 9 into discharge position. In such operation the crank 22 and rod 24 move from the working position shown in Figure 1 to the reverse dead center position shown in full lines in Figure 13, during which it shifts the drum, and then over to the reverse starting position shown in dotted lines in Figure 13, during which the drum is again idle and the slotted end 25 of the rod 24 travels idly over the stud 26 until the position of these parts shown in Figure 1 is again reached, whereby the

drum operating devices are set for a repetition of the first-half oscillation of the drum previously described. While the drum is idle in the motion of the parts 24—26 just described, during the drum turning action of which the roller 46 is travelling in the cam groove portion 45, such roller 46 is engaged by the working portion 44 of the cam groove, as shown in Figure 14, thereby shifting the throw crank actuating means so as to retract the throw crank 39 and project the throw crank 38, the latter acting on arm 34 of lever 33 to shift the gear segment 30, thus operating ejector 27 to discharge can B from pocket 9 and leave pocket 10 vacant for the admission of a can thereto. The parts are then set for a repetition of the first-half oscillation of the drum as hereinbefore described.

From the foregoing description, taken in connection with the drawings, the construction and operation of my improved feed valve will be readily understood and it will be seen that a valve of this character is provided which will feed a can in an expeditious manner and without injury thereto, while at the same time securely sealing the outlet of the valve against the passage of fluids. Also it will be seen that a valve of simple construction is provided, embodying a comparatively small number of working parts of a kind which will not easily get out of order, and which valve is of such a structure as to permit of easy and convenient assemblage, disassemblage and repairs or replacements of its parts.

It is to be understood that wherever the word "can" or "container" is used in the specification and appended claims, such terms are designed to refer to cans proper, jars, cartons, or other receptacles commonly used in the packaging of coffee, milk, fruits, vegetables, meats, sea-foods, and all other foodstuffs, goods or commodities packed in receptacles for preservation. By the use of the term "feed", I mean a valve designed for either feeding containers into a chamber or feeding them therefrom, the valve embodying my invention being equally well adapted for use as an introducing valve or discharge valve.

Having thus fully described my invention, I claim:—

1. A feeder valve comprising, in combination, a casing having diametrically disposed inlet and outlet openings, an oscillatory valve in said casing provided at diametrically opposite sides with peripheral holding pockets, and means for oscillating said valve for alternately bringing the respective pockets into registry with the inlet and outlet openings, said valve having a sealing engagement with the walls of the casing in the region of at least one of said openings.

2. A feeder valve comprising, in combination, a casing having diametrically disposed inlet and outlet openings, an oscillatory valve in said casing provided at diametrically opposite sides with container receiving pockets for cooperation with said openings, an ejector common to both pockets for displacing containers therefrom, and means for oscillating the valve and actuating said ejector.

3. A feeder valve comprising, in combination, a casing having diametrically disposed inlet and outlet openings, an oscillatory valve in said casing mounted to revolve upon a vertical axis and provided with diametrically disposed peripheral container receiving pockets, each having a can supporting bottom wall, means for alternately moving the valve in opposite directions with intermediate periods of rest, ejecting means for discharging containers from the pockets, and means for operating the ejecting means during the periods of rest of the valve.

4. A feed valve comprising, in combination, a casing having diametrically disposed inlet and outlet openings, an oscillatory valve in said casing provided with diametrically disposed pockets for cooperation with said openings, an ejector common to both pockets and movable in opposite directions for alternately displacing containers from said pockets, means for imparting successive half oscillations to the valve with intervals of rest between them, and means for actuating the ejector during the intervals of rest of the valve.

5. A feed valve comprising, in combination, a casing having inlet and discharge openings arranged at an angle of 180° to each other, a valve in said casing mounted to oscillate upon a vertical axis and having peripheral pockets each provided with a can supporting bottom wall, said valve being oscillatable through an arc of 180° to alternately bring the pocket into registry with the inlet and outlet openings, means for imparting successive half oscillations to said valve at periodic intervals, and means for ejecting containers successively from the pockets at periodic intervals between intervals of movement of the valve.

6. A feed valve comprising, in combination, a casing having diametrically disposed openings, an oscillatory valve in said casing provided with diametrically disposed container holding pockets for cooperation with said openings, means for periodically imparting half oscillations to the valve, a container ejector common to both pockets and movable axially between and through the same, and means for periodically actuating the ejector in opposite directions between intervals of operation of the valve.

7. A feed valve comprising, in combination, a casing having diametrically disposed inlet and outlet openings, an oscillatory

valve in said casing having diametrically disposed container receiving pockets for cooperation with said openings, gearing comprising a gear and gear segment for actuating the valve, and crank operated means for actuating said gearing having a lost motion connection therewith for moving idly between intervals of operation of the gearing.

8. A feed valve comprising, in combination, a casing having diametrically disposed inlet and outlet openings, an oscillatory valve in said casing provided with diametrically disposed container holding pockets for cooperation with said openings, a gear connected with said valve, a gear segment meshing with said gear and provided with a crank pin, a driven shaft, a crank arm connected with said shaft, and a connecting rod coupled to the crank arm and having a slotted end engaging the wrist pin of the gear segment.

9. A feed valve comprising, in combination, a casing having diametrically disposed inlet and outlet openings, an oscillatory valve therein provided with diametrically disposed container holding pockets for cooperation with said openings, means for imparting periodic half oscillations to the valve, an ejector movable between and longitudinally of the pockets for alternately displacing containers therefrom, an oscillatory element for oscillating said ejector, and means for operating the oscillatory element between periods of operation of the valve.

10. A feed valve comprising, in combination, a casing having diametrically disposed inlet and outlet openings, an oscillatory valve in said casing provided with diametrically disposed container holding pockets for cooperation with said openings, means for imparting periodic half oscillations to the valve, ejecting means common to the pockets for discharging containers therefrom, and means for periodically operating said ejecting means for alternately discharging containers from the pockets at proper time periods.

11. A feed valve comprising, in combination, a casing having diametrically disposed inlet and outlet openings, an oscillatory valve provided with diametrically disposed pockets for cooperation with said openings, means for imparting periodic half oscillations to the valve, an ejector for alternately discharging containers from the pockets, gearing for reciprocating said ejector, and cam operated mechanism for actuating said gearing.

12. A feed valve comprising, in combination, a casing having inlet and outlet openings, an oscillatory valve in said casing having a sealing engagement with the walls of the casing in the region of one of said openings and provided with container holding means and operative to shift containers between the inlet and outlet, means for oscillating said valve, and means operative therewith for shifting containers therefrom through the outlet.

13. A feed valve comprising, in combination, a casing having an inlet and an outlet, and an oscillatory feed valve in said casing oscillatable on a vertical axis and provided with peripheral can receiving seats, and means for operating said valve for shifting containers between the inlet and outlet.

14. A feed valve comprising, in combination, a casing having an inlet and an outlet, an oscillatory feed valve provided with peripheral can receiving seats and oscillatable on a vertical axis in said casing for shifting the containers between the inlet and outlet, an ejector for discharging containers from said seats through the outlet, and means for operating the valve and ejector at proper time periods.

In testimony whereof I affix my signature.

ALEXANDER K. RARIG.