L. A. BAKER.

CAN FILLING MACHINE.

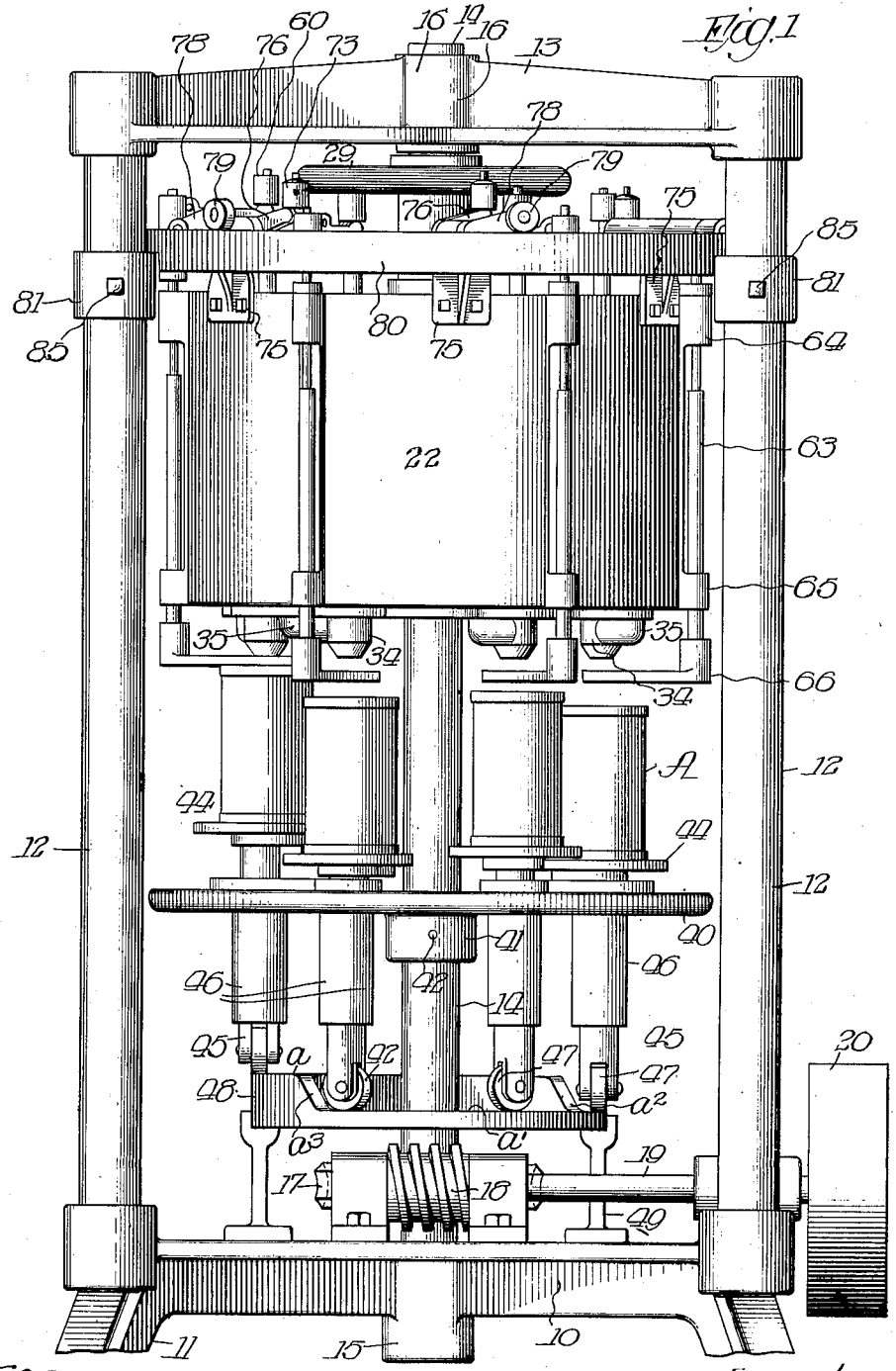
APPLICATION FILED JAN. 4, 1913.

1,105,173.

Patented July 28, 1914.

4 SHEETS—SHEET 1.

Fig. 1



Witnesses:

H. G. Barnett

G. C. Doole

Inventor

Lewis A. Baker

by William W. Hall, Atty.

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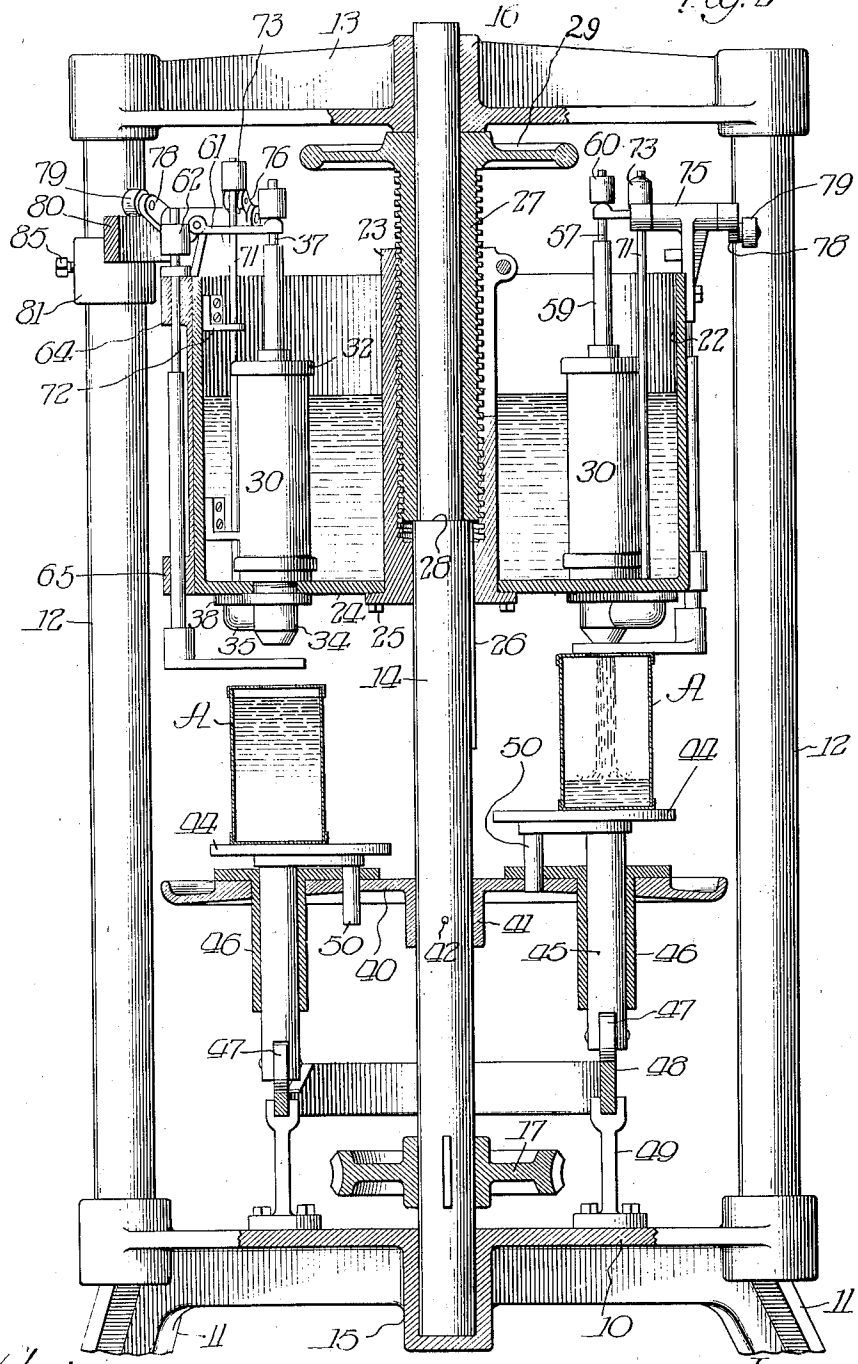
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4 SHEETS—SHEET 2.

Fig. 2



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4 SHEETS—SHEET 3.

Fig. 3

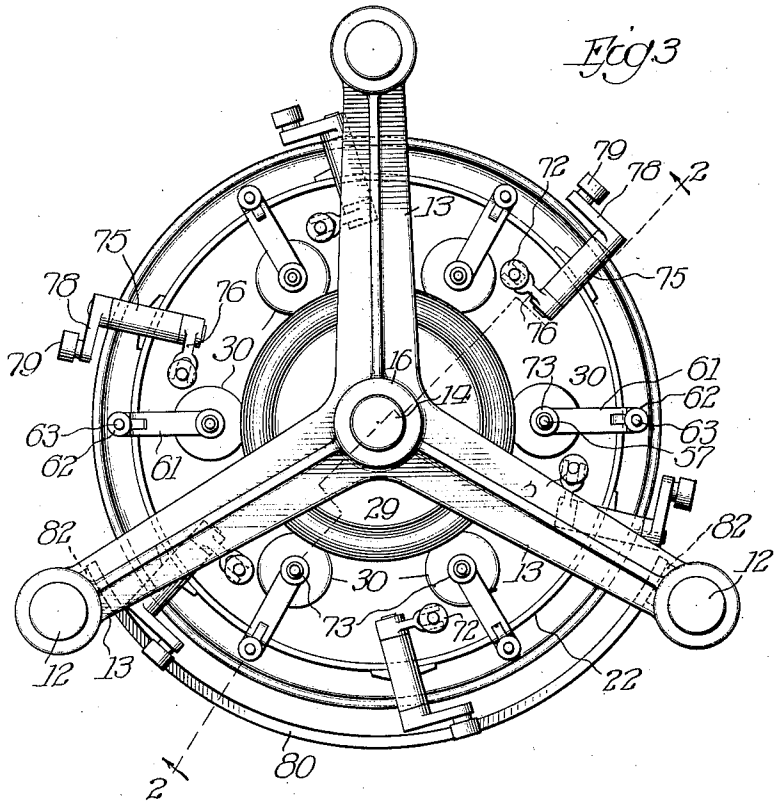
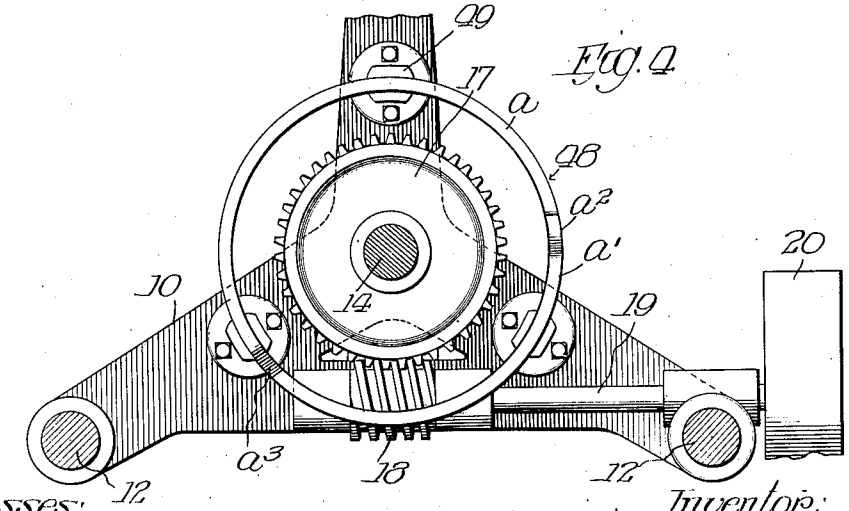


Fig. 4



Witnesses:

S. E. Barrett

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4 SHEETS—SHEET 4.

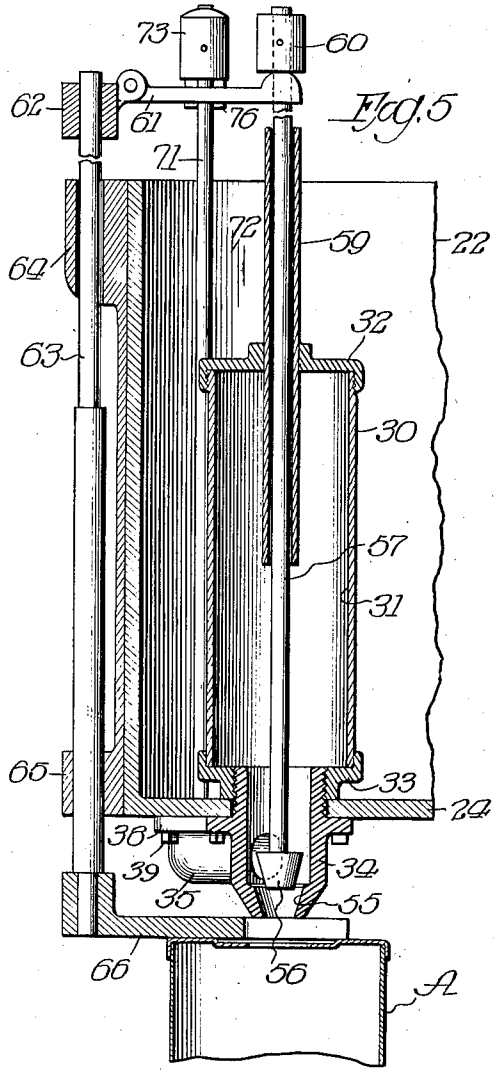


Fig. 5

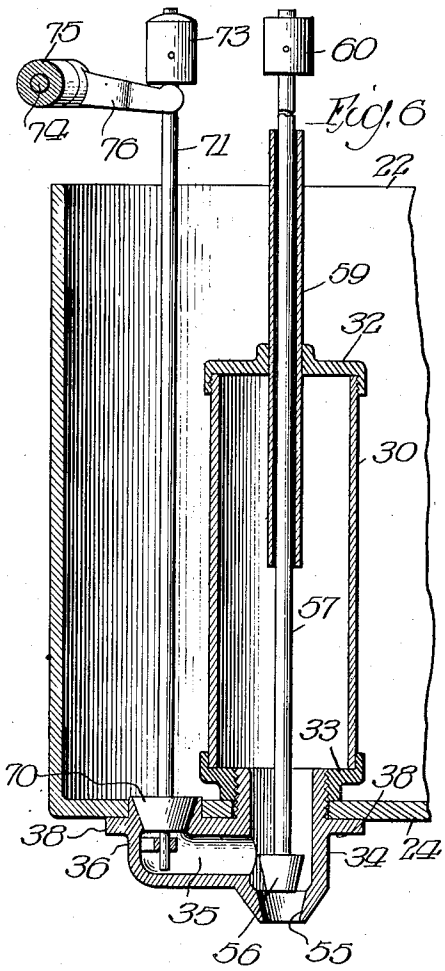


Fig. 6

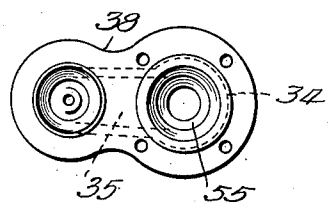
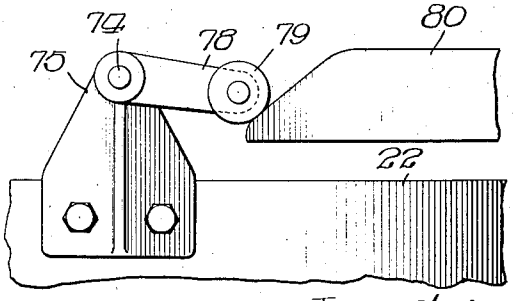


Fig. 8.

Fig 7



Witnesses:

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UNITED STATES PATENT OFFICE.

LEWIS A. BAKER, OF ELGIN, ILLINOIS.

CAN-FILLING MACHINE.

1,105,173. Specification of Letters Patent. Patented July 28, 1914.

Application filed January 4, 1913. Serial No. 740,151.

To all whom it may concern:

Be it known that I, LEWIS A. BAKER, a citizen of the United States, and a resident of Elgin, in the county of Kane and State of Illinois, have invented certain new and useful Improvements in Can-Filling Machines; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the characters of reference marked thereon, which form a part of this specification.

This invention relates to improvements in machines for filling cans or other receptacles with liquid or semi-liquid material, and refers more specifically to that type of machines wherein the receptacles are filled from a plurality of measuring chambers which supply liquid from a central tank.

Among the objects of the invention is to improve and simplify machines of this character and reduce the cost thereof.

A further object of the invention is to improve and simplify the construction of the valves which control the flow of material from the central reservoir to the measuring chambers and from the measuring chambers to the receptacles below.

The invention consists in the matters hereinafter set forth and more particularly pointed out in the appended claims.

In the drawings:—Figure 1 is a side elevation of a filling machine embodying my invention. Fig. 2 is a section thereof taken on the line 2—2 of Fig. 3. Fig. 3 is a top plan view of the machine. Fig. 4 is a horizontal section showing in top plan the cam for lifting the receptacles into their filling positions and for opening the measuring chamber discharge valves. Fig. 5 is a vertical section taken through one of the measuring chambers and its associated valve mechanism. Fig. 6 is a section taken through said parts in a different plane, with parts omitted. Fig. 7 is a detail of the cam and coöperating mechanism for operating the inlet valve to the measuring chamber. Fig. 8 is a top plan view of a fitting in which is formed the measuring chamber inlet and outlet passages.

For the sake of clearness of illustration the mechanism for feeding the cans to and discharging them from the machine has been omitted.

The frame of the machine consists of a base portion 10 supported on legs 11, vertical posts 12, 12 which rise from the base portion and a top member 13. Said posts may and preferably will be made of piping. As herein shown there are three posts 12 arranged in triangular relation and the top member 13 and base each have three arms which are provided at their ends with sockets to receive the ends of the posts.

14 designates a central vertical shaft that is rotatively mounted at its lower end in a step bearing 15 formed in the base 10 and at its upper end in a bearing 16 carried by the upper frame member 13. Said shaft is rotated through the medium of a worm wheel 17 and a worm 18 that is fixed to a short horizontal shaft 19 which extends to the side of the base and is provided with a driving pulley 20.

22 designates an open topped tank or reservoir which is supported on the shaft 14 to rotate therewith. As herein shown said tank is provided with a central vertical shell 23 which extends through the bottom wall 24 of the tank and is flanged at its lower end and is secured to the bottom wall by the bolts 25. The said shell is locked to the shaft by means of a spline 26 which permits the tank to be raised and lowered relatively to the shaft. The means herein shown for so raising and lowering the tank consists of a screw-threaded sleeve 27 which loosely surrounds the shaft 15 and turns thereon and is provided with an exterior screw-thread to engage an interior screw-thread in the shell 23. Said sleeve 27 engages at its lower ends a shoulder 28 on the shaft 14 and it is provided at its upper end with a hand wheel 29 which bears against the central portion of the upper frame member 13. The sleeve is thus held from endwise movement between the shoulder and the frame so that when it is turned the tank is either raised or lowered on the shaft, depending upon the direction of rotation of the adjusting sleeve.

30, 30 designates a plurality of measuring chambers, six being herein shown. They are arranged in a circular, angularly spaced series within the tank, as shown most clearly in Fig. 3. The detail of said measuring chambers is best shown in Figs. 5 and 6. Each chamber comprises a hollow body or tube section 31 provided at its upper end with a centrally apertured cap 32 and at its lower end with an internally screw-threaded reducer sleeve 33 which receives an externally screw-threaded outlet nipple 34

through which material is directed to a can below. Opening into said outlet nipple is a hollow branch 35 that leads from the tank 22 so as to deliver material from the tank to the measuring chamber. Said branch is made integral with the nipple 34 and is provided with an upturned portion 36 that extends through the lower wall 24 of the tank, and opens into the tank flush with the level of the upper face of said wall. The said nipple 34 and branch 35 being thus made of a single piece is of considerable practical importance in the manufacture of the machine, inasmuch as it greatly simplifies the connection between the tank and the charge measuring chambers, and also enables the parts to be very simply attached to the tank and the charge measuring chambers. For the purpose of such attachment the fitting, embracing the nipple 34 and branch 35, is provided with flanges or lugs 38 which fit against the lower side of the bottom wall of the tank and screws 39 extend through said lugs and into the tank bottom to fasten them in place. When thus constructed, the fittings constitute means to hold the measuring chambers rigidly to the tank structure. This construction also enables the chambers to be readily removed from and assembled in the tank, thus providing a device which is easily cleaned and repaired.

40 designates a carrier plate beneath the tank which is sleeved at 41 to embrace the shaft 14, and may be fitted to the shaft in any suitable manner, as by the pin 42, whereby the carrier plate rotates with the shaft and tank. 44, 44 designate a plurality of gage plates upon which the receptacles A to be filled are delivered. Said gage plates are mounted on the upper ends of vertically movable lift rods 45 which extend downwardly through guide sleeves 46 that depend from the carrier plate, and said lift rods are provided at their lower ends with bearing rollers 47 which ride on the upper edge of an annular cam ring 48 that is supported from the base through the medium of the standards 49. The said lift rods are provided at their upper ends with lateral extensions having vertical guide lugs 50 which engage suitable openings in the carrier plate to hold the gage plates in position. Preferably, the rim of the carrier plate is turned upwardly, as shown in Fig. 2, to constitute a pan to receive material which may find its way thereto from the measuring chambers.

The filling nipple of each measuring chamber is provided at its lower end with a conical valve seat 55 (Figs. 5 and 6) which is engaged by a conical valve piece 56 carried by the lower end of a rod 57 which extends upwardly through the cap 32 of the measuring chamber for connection at its upper end with mechanism to actuate the valve. Surrounding said valve stem and extending also through the cap 32 is a vent tube 59 which extends at its lower end a distance into the measuring chamber and at its upper end above the maximum liquid level in the tank. Said vent tube fits tightly in the aperture of the cap through which it passes so as to be held normally in place, but is adapted to be slipped endwise therethrough to vary the extent of its penetration into the measuring chamber and thereby adjust the capacity of the measuring chamber to suit different sized receptacles to be filled therefrom. In practice, the vent tube may be provided with an exterior graduated scale to be read from the upper edge of the cap piece 32 to facilitate the adjustment of the tube. The said valve stem and valve are adapted to be lifted at appropriate times in the rotation of the tank and the series of measuring chambers so as to permit the material, which has been supplied to the chambers, to flow therefrom into the receptacles beneath. The means herein shown for thus actuating the outlet or discharge valves are made as follows: Each of said valve stems is provided at its upper end with a head 60 to form a downwardly facing shoulder on the stem. 61 designates an arm that bears at its inner end against the under side of the head 60 and is carried at its outer end by a collar 62 which is fixed to the upper end of a vertically movable lift bar 63 that is guided in suitable bearings 64, 65 carried by the wall of the tank. The said lift bar is provided at its lower end with an inwardly directed member 66 which extends inwardly beneath the adjacent outlet nipple 34, and may be forked at its inner end so as to clear said nipple. The said member 66 and the lift bar are raised by engagement therewith of the upper ends of the receptacles A when the latter are raised into their filling positions, as clearly shown in Figs. 2 and 5. The said receptacles are thus raised into their filling positions at appropriate periods in the rotation of the carrier plate 40 by means of the cam 48 and are lowered away from the nipples in another part of the rotative movement of the carrier.

As shown in Fig. 4, the part a of the cam 48 is the high portion thereof, and the part a' the low portion of the cam, and the parts a^2, a^3 are the rising and lowering portions of the cam. The said valves 56 are raised at a time when the rollers 47 of the lift bars are traveling over the high portions of the cam 48. The lifting arms 61 are preferably hinged to the heads 62 to permit them to swing backwardly and to thereby enable the stem 57 and valve 56 to be freely removed. The inlet branch passage 35 for each measuring chamber, through which material is directed thereto from the tank, is controlled by a conical valve 70 which fits a conical

valve seat in the upturned end 36 of the said branch passage. Said valve 70 is carried by the lower end of a valve stem 71 which rises upwardly through the tank. The said stem 71 is provided at its upper end with a head 73 adapted for engagement by suitable valve actuating mechanism. The valve actuating mechanism herein shown is made as follows: 74 designates a short horizontal rock shaft arranged adjacent to each measuring chamber and radially to the center of the tank. The rock shaft is mounted in a bearing 75 that is attached to the wall of the tank. Each rock shaft is provided at its inner end with a crank arm 76 which is bifurcated to engage under the head 73 on the valve stem. Each rock shaft is also provided at its outer end with a crank arm 78 arranged radially outside of the wall of the tank, and said latter crank arm is provided with a bearing roller 79 that is adapted to engage a curved cam bar 80 which is arranged radially exterior to the tank wall and is concentric to the axis of rotation of the tank. The said cam bar is carried by the frame, as by means of the sleeves 81 which surround the posts 12 and have inward projections 82, indicated in dotted lines in Fig. 3, to which the cam bar is attached. The said sleeves 81 may be attached to the posts 12 by set screws 85, thereby permitting the cam bar to be raised and lowered to correspond to the vertical adjustment of the tank.

From a comparison of Figs. 3 and 4, it will be noted that the cam bar 80 is arranged above the depressed portion a' of the lower cam ring 48. With this arrangement, it will be noted that the filling valves 70 for the measuring chambers are closed during the time the discharge valves 56 are opened, and vice versa. The low portion a' of the cam ring 48 is located at that part of the machine at which the receptacles A are delivered to and taken from the machine. As soon as a receptacle A is delivered to the machine it is raised by the coöperation of the cam 48 and rising bar 45 into its filling position and thereby opens the discharge valve 56 so that the material may be discharged from the measuring chamber to the receptacle. The period of filling the receptacle is more than one-half of the rotation of the machine. The inlet valves 70 are raised and the material delivered from the tank to the measuring chambers during the time the filled receptacles are being removed from the machine and others delivered thereto, the period being somewhat less than one-half of the rotation of the machine.

The quantity of material delivered to the measuring chambers is determined by the adjustment of the vent tube 59, inasmuch as the material will not rise higher in said chambers than the level of the lower ends of the vent tubes. As before stated, this quantity may be varied by adjusting the vent tubes vertically in the chambers. By reason of the annular space between the vent tubes and the inclosed valve stems 57, air is admitted therethrough to vent the chambers when the discharge valves are opened.

I claim as my invention:

1. A can filling machine, comprising in combination, a tank provided in its bottom wall with an opening, a measuring chamber in line with said opening, a gravity discharge nipple fixed to the bottom of the tank and extending upwardly through said opening, to which the lower end of the chamber is detachably fixed, a branch passage connected to the nipple below the tank and leading upwardly through the tank bottom and in open communication with the tank, and valves for controlling said nipple and branch passage.

2. A can filling machine comprising, in combination, a tank provided in its bottom wall with an opening, a measuring chamber, a gravity discharge nipple therefor extending through the said opening and screw-threaded to the lower end of the chamber and flanged to bear against the lower side of the tank bottom, screws extending through the flanges and into the tank bottom, an integral hollow branch connected to said nipple below the tank and having an upturned end which extends through the bottom of the tank, and valves for controlling said nipple and branch.

3. The combination with a tank, provided in its bottom with an opening, of a chamber having a screw-thread at its bottom, a screw-threaded, flanged nipple extending through said opening and engaging the screw-thread of the chamber, and a hollow branch connected below said bottom to said nipple and extending through the tank bottom.

4. The combination with the supply tank of a filling machine and a measuring chamber, of a one-piece gravity discharge nipple and a filling branch therefor connected to the tank and to said chamber, a valve at the discharge end of the filling nipple and a valve at the receiving end of the filling branch.

5. The combination with the supply tank of a filling machine and a measuring chamber, of a one-piece gravity discharge nipple and filling branch connected to the tank and chamber, screw-threaded means on the chamber and nipple constructed to fix the chamber to the tank bottom, the filling branch being in open communication with the tank and connected to the nipple below the level of the bottom wall, and valves controlling said nipple and branch.

6. A one-piece discharge nipple and filling attachment for the measuring chambers of filling machines having means to detach-

ably fix it to the chamber, the nipple comprising a vertical tubular member having an internal valve seat at its lower end, and the filling attachment comprising a lateral hollow branch having an upturned end to extend through the bottom wall of the supply tank or reservoir and provided with an internal valve seat.

7. A one-piece gravity discharge nipple and filling attachment for the measuring chambers of filling machines, the nipple having a screw-thread and a flange, and the filling attachment comprising a laterally disposed hollow branch having an upturned receiving end to enter an opening in the bottom of the tank, said nipple and branch being formed to provide internal valve seats.

8. In a can filling machine, a tank, a series of measuring chambers, provided with gravity discharge nipples communicating with the bottoms of the chambers, filling branch passages connected to the nipples below the tank bottom and leading upwardly through the tank bottom and in communication with the interior of the tank and valves for controlling the nipples and branch passages.

9. A can filling machine comprising a frame consisting of upright posts and top and bottom frame members, a central shaft rotatively mounted in said frame members, a tank and can carrying mechanism carried by and rotative with the shaft, measuring chambers, valves for controlling the flow of liquid to and valves for discharging the liquid from said chambers, and actuating mechanism for the former valves comprising a cam bar radially exterior to the tank, with means for supporting and vertically adjusting said cam bar on said posts.

10. In a can filling machine, the combination with a tank, a measuring chamber having a valve controlled outlet and provided with an inlet passage and a valve controlling the inlet passage provided with a stem which extends upwardly through and beyond the tank, of means for operating said valve comprising a rock shaft which is mounted in a bearing carried by the tank, a crank thereon engaging said valve stem and a second crank on said rock shaft adapted for engagement by an actuating device.

11. In a can filling machine, the combination with a rotative tank and measuring chambers therein, of valve means for controlling the inlet of material to and its discharge from the chambers, with means for presenting the cans to and withdrawing them from the discharge ends of said chambers, the chamber-inlet valve means comprising lift valves, rock shafts mounted on the tank, crank arms at their inner ends for connection with the chamber inlet valves, other crank arms at their outer ends and a fixed cam member adapted to engage said latter crank arms.

In testimony, that I claim the foregoing as my invention I affix my signature in the presence of two witnesses, this 21st day of December, A. D. 1912.

LEWIS A. BAKER.

Witnesses:
W. L. HALL,
G. E. DOWLE.