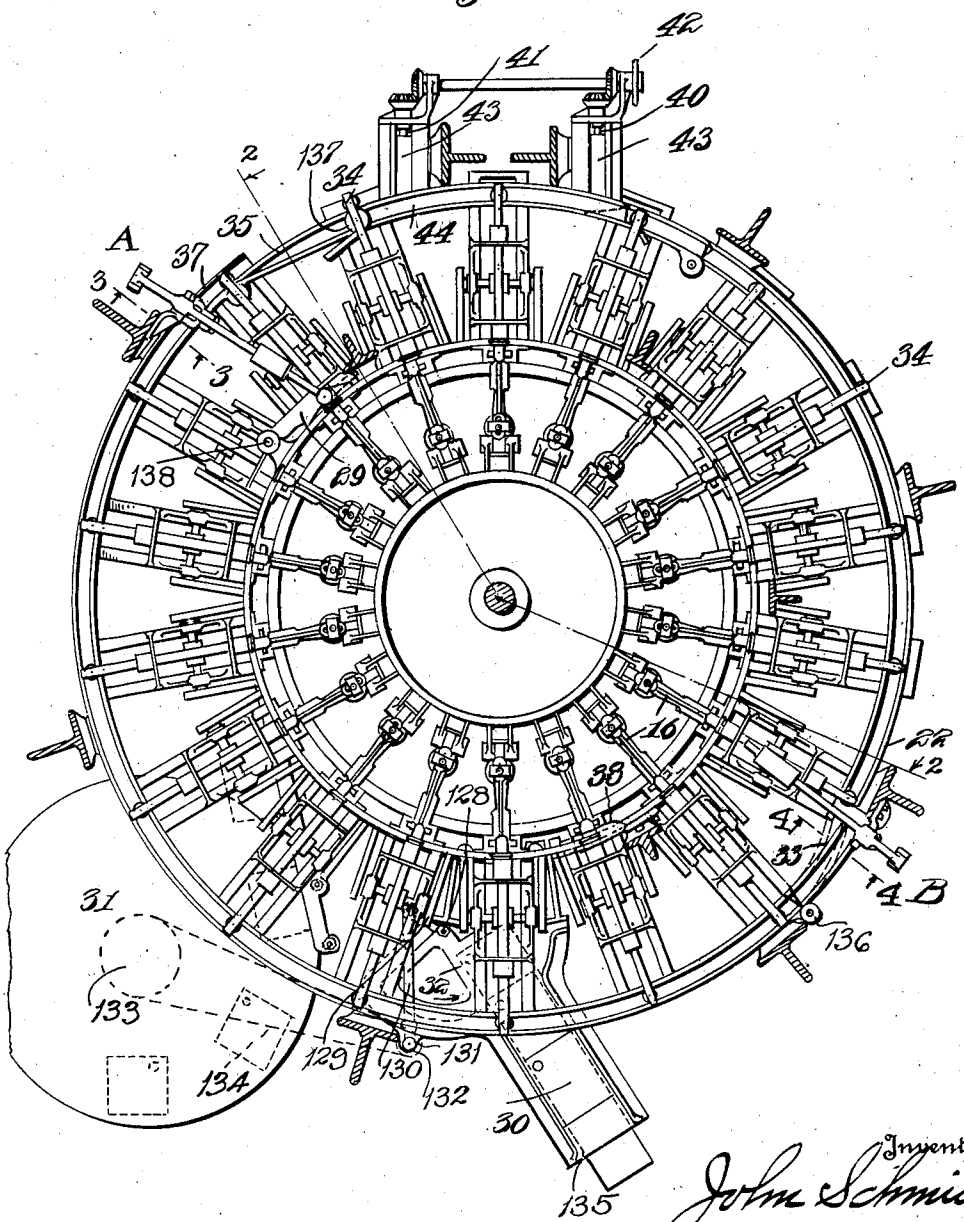
Feb. 26, 1935. J. SCHMIDT 1,992,329

FILLING MACHINE

Filed Sept. 22, 1931 3 Sheets-Sheet 1

Fig. 1.



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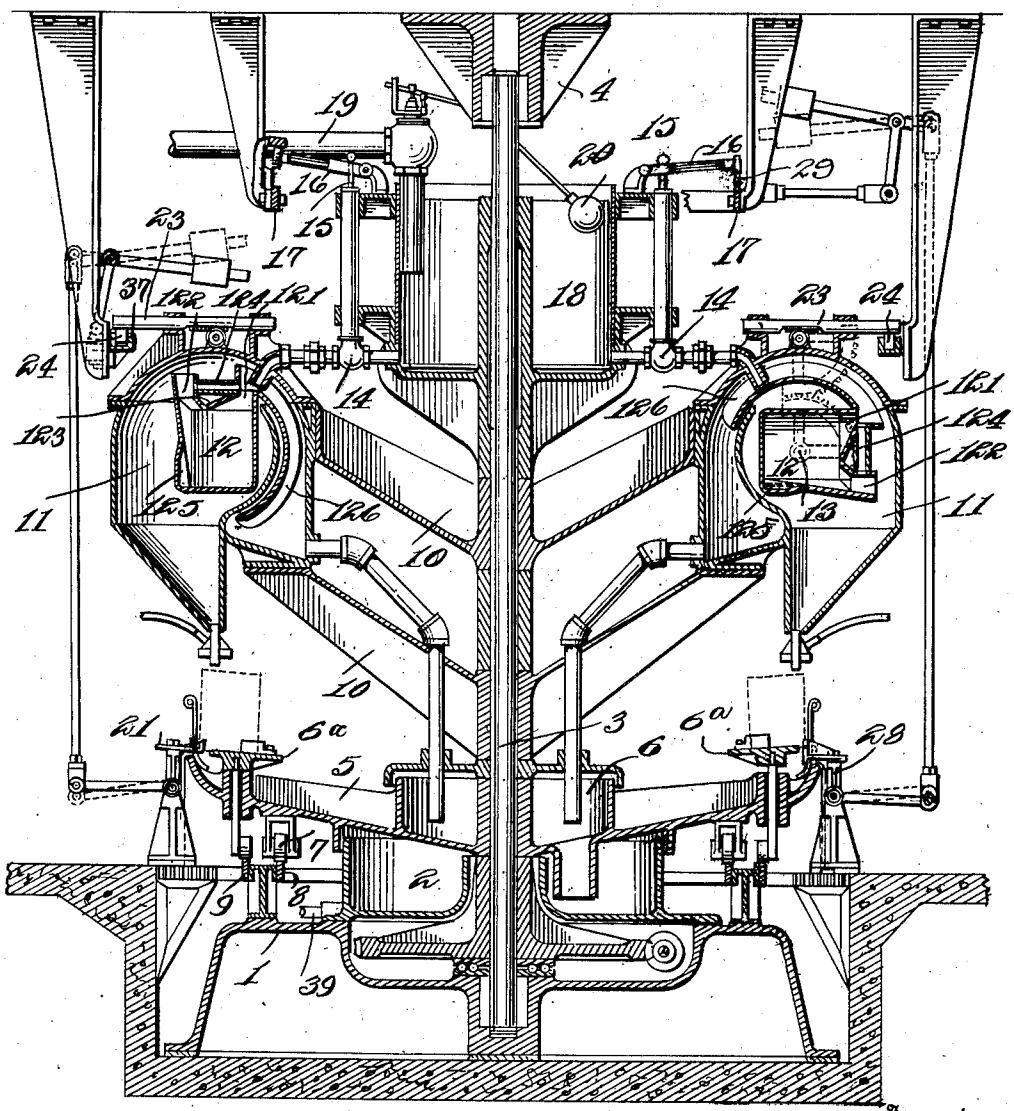
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FILLING MACHINE

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Fig. 2.



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FILLING MACHINE

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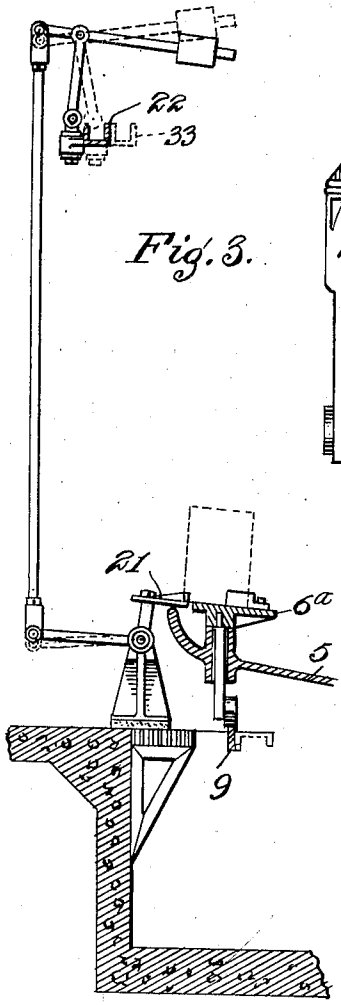


Fig. 3.

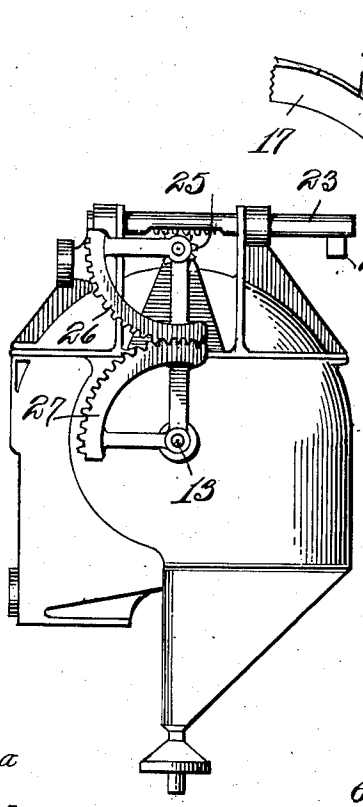


Fig. 5.

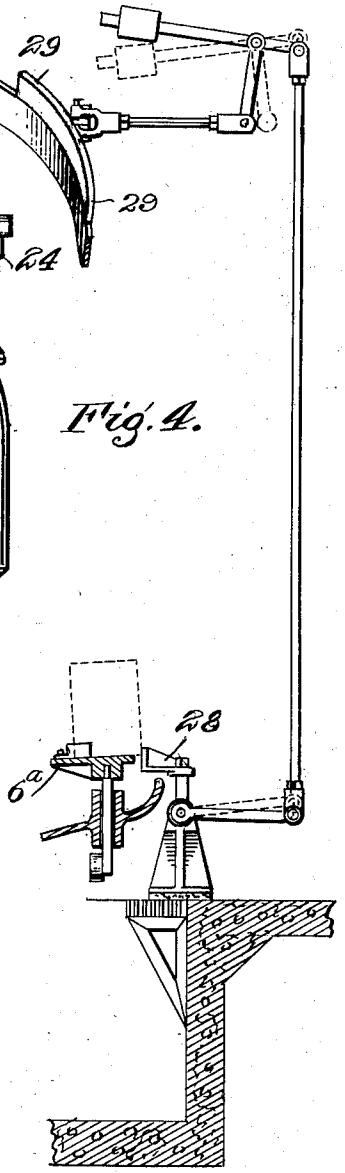


Fig. 4.

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UNITED STATES PATENT OFFICE

1,992,329

FILLING MACHINE

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Application September 22, 1931, Serial No. 564,441

23 Claims. (Cl. 226—97)

This invention relates to a machine for filling liquids into containers and is particularly adapted to the filling of gasolene or other volatile or non-volatile liquids, into the commercial five gallon can.

In most previous machines for filling liquids into containers of this type it has been the general practice to weigh the charge of liquid going into each container, and where machines of high capacity were employed this necessitated a number of weighing devices equal to the number of filling stations on the machine, and it further required an individual adjustment of each weighing device at each filling station in order to have each container receive the correct charge of liquid, which has proven to be very difficult task and keep all of the filling stations adjusted to deliver like quantities throughout a day run, or in fact for any relative period of operation.

Another difficulty with prior machines has been to keep the numerous valves necessary to the operation of the filling devices, from leaking and wasting large amounts of liquid which has been a monetary loss as well as a dangerous condition of operation.

Through extensive experiments and development work I have succeeded in evolving an apparatus for handling and filling liquids such as the commercial gasolene, into five gallon containers in a manner that has eliminated the majority of the valves heretofore necessary; has taken care of leaky valves, if they occur, in a manner to save every bit of the leaking material and carry it back to the main supply; as well as taking care of the usual drip from closing valves and directing it back to the main supply.

I have provided means for preventing a measuring chamber from being tipped to discharge its contents if a can is not present, and to prevent the opening of the valve to that measuring chamber if it has not been discharged so that this particular chamber will not be tipped to discharge its charge nor will it receive more liquid until a container is present to receive the charge.

I have also provided measuring chambers that are pivoted to discharge their contents; that have a well for a small surplus of liquid so that the measured charge delivered to the containers may be varied by slimply controlling the tipping of the measuring chambers; that have an area of reduced surface when the chamber approaches the complete fill so that the measured charge is very accurate compared to former devices, and there is also a tail extension on each measuring chamber to catch the drip from the valve at the closing thereof or from a leaky valve.

I have also provided a casing to surround the measuring chambers so that all fumes from the gasolene will be trapped and led back to the main gasolene supply and thus kept out of the room and thus reduce to some extent the natural fire hazard in handling this type of liquid.

It is therefore a principal object of the invention to provide a machine for filling liquids into positioned containers by means of tilting measuring devices that carry a measured charge greater than the charge delivered to the containers.

It is also an object of the invention to provide a machine for filling volatile liquids into positioned containers by means of tiltable measuring chambers that are enclosed in a substantially tight casing with the only opening being the discharge nozzle to the container.

It is also an object of the invention to provide a machine for filling volatile liquids into positioned containers wherein means are provided for preventing the tipping of a measuring chamber if a container is not positioned thereunder and with other means for preventing the delivery of more liquid to that measuring chamber until its charge has been delivered to a container.

It is also an object of the invention to provide a machine for filling volatile liquids into positioned containers wherein the measuring chamber delivering the charge may be controlled in its tipping to deliver more or less of its charge according to the temperature of the liquid being handled.

It is also an object of the invention to provide a filling machine for delivering measured charges of a liquid to positioned containers wherein the opening of the valves delivering liquid to the measuring chambers are controlled by the presence of a container for each measuring chamber.

It is also an object of the invention to provide a filling machine for delivering measured charges of a liquid to positioned containers wherein the delivery of the liquid from the measuring chambers to the containers is controlled by the presence of a container.

It is also an object of the invention to provide a machine for filling volatile liquids into positioned containers wherein a supply tank is positioned in the top of the machine so that supply will flow by gravity to the measuring chambers and with an overflow tank below the supply tank for accumulating the overflow liquid and with means for then returning the overflow liquid

to the main supply, all of the said operations being conducted in substantially closed spaces.

With such objects in view as well as other objects and advantages which may be inherent in the invention, consisting in the parts and combinations hereinafter set forth and claimed, it is understood that the several necessary elements parts and combinations constituting the same may be varied in their proportions, placement and general arrangement without departing from the scope and nature of the invention, and in order to make the invention more easily understood there are shown in the accompanying drawings means and mechanism for placing the same in concrete form, without limiting the improvements in their applications to the particular construction chosen to illustrate the invention.

The drawings herewith are not necessarily drawn to scale neither do they necessarily represent to best engineering practices in the construction of machinery of this type, and some parts may be more or less exaggerated in their proportions and placement to better illustrate the operative principles involved.

Fig. 1 is a plan of an apparatus embodying the invention but with much of the under structure left out so as not to confuse the top mechanism which it is desired to show clearly in this view.

Fig. 2 is a sectional elevation on substantially the irregular line 2—2 of Fig. 1, and in this view much of the mechanism back of the parts in section have been omitted to prevent obscuring the principal parts desired to be clearly shown.

Fig. 3 is a detached detail of one of the control mechanisms wherein the presence of a container controls the tilting of a measuring chamber to discharge its contents.

Fig. 4 is a detached detail of the control mechanism that controls the opening of the valves to admit liquid to the measuring chambers.

Fig. 5 is a detached detail of one of the devices for tilting the filled measuring chambers.

The means and mechanism embodying this invention consists of a base member 1, set in a concrete foundation below the floor level. Secured directly on this base member is the overflow tank 2. Extending up from the base member is a central drive shaft 3 extending to the top of the room and having its upper end secured in a suitable bearing member 4. Positioned directly over the overflow tank 2 and centrally maintained by the shaft 3 is a turret member 5, which carries around its center a drain tank 6 and around its periphery a series of container supports 6a. Aside from its support on the shaft 3, the turret member 5 is also supported by the rollers 7 riding on the circular cams 8. The container supports 6a are controlled in their vertical movements by the circular cam 9.

Located directly over the turret member 5 is another turret member 10 maintained concentric by the shaft 3 and carrying around its periphery a series of casings 11 in which is mounted a series of tiltable measuring chambers 12. Each measuring chamber is pivoted near its center as at 13. Each measuring chamber 12 is of a peculiar shape to enable the handling of the liquid in the most efficient manner. The top of the chamber 12 is covered except for two comparatively small openings 121 and 122. The opening 121 is for filling the liquid into the chamber and the opening 122 is for discharging the liquid from the chamber. The top covering of the chamber has a concaved or depressed center as at 123 which is just below the full level of the liquid when the chamber is filled and tends to restrict the surface area of the liquid in the chamber and give a quick and sharp overflow when filling. An air vent is connected between the ports 121 and 122 as at 124, so that when the measuring chamber is tilted the pouring nozzle will be properly vented. There is a depression in one side of each measuring chamber as at 125 which acts as a surplus reservoir and provides excess liquid if it is found necessary to tilt the measuring chambers slightly to increase the charge delivered to the containers. Each measuring chamber carries a tail extension 126 which has continual flow contact with the casing 11 so that any drip from the valves will be directed to the casing. The drip flowing from the tail extension 126 down through the pipe line 127 to the tanks 6 and 2 from where it is pumped back to the main supply as has been mentioned. Each measuring chamber is supplied with liquid by means of the valves 14 and the cam controlled valve stems 15, each of which is provided with the arms 16 with rollers on the ends riding on the circular cam 17. Arranged centrally in the top of the apparatus is a general supply tank 18 receiving supply of liquid from the pipe line 19 controlled by the float valve 20.

Arranged at the left of Fig. 2 will be seen the control mechanism for taking care of the tilting of the measuring chambers through the presence of a container. A sweep arm 21 is moved by a container which, through the links and rods shown connect with a short section 33 of the cam track 22 and move it so that when the rack bars 23 with the cam rollers 24 reach the point where the measuring chambers should be tilted to deliver their charge to a positioned container, the chamber will be tilted and placed in the position shown at the right of Fig. 2 where the charge has been delivered to the container and a little puddle of liquid remains in the pocket 125. The tilting of each measuring chamber is accomplished by means of the rack bar 23, Fig. 5, moving over the pinion 25 which in turn operates the gear quadrants 26 and 27 and through the pivot 13 turns the chamber as seen in Fig. 2.

On the right of Fig. 2 will be seen the mechanism that controls the opening of the valves for the delivery of liquid to the containers. If a container is present the sweep arm 28 will be moved by the container and through the links and rods shown the cam track 17, or rather a short section of it, will be moved to present an elevated section 29 over which the rollers on the ends of the arms 16 will ride and thereby lift the valve arms 16, the valve stems 15 and permit liquid to flow into the measuring chamber, if no container is present no liquid is released, and likewise if no container is present when it comes time to tilt the measuring chambers the tilting will be prevented.

Fig. 1 shows a feed chute 30 for delivering containers to the machine and a discharge disk 31 for taking the filled containers away from the machine.

Operation

The operation of the machine would be substantially as follows if built according to the drawings but may operate somewhat differently if built according to any permissible variations from that shown.

The first act in the operation of the machine would be to fill each measuring chamber with liquid. This is accomplished by simply holding the lever 28 outward as it would be held if cans

were present on the lifting plates 6a. As the machine rotates then each measuring chamber 12 will receive a charge of liquid, but none will be discharged because no containers being present the mechanism controlling the tilting of the measuring chambers will be inactive and the machine would continue to rotate with the filled chambers. At this time cans may be admitted to the machine from the feed chute 30 where they will be properly placed by the rocker which successively engages the foremost can and places it in proper position on the advancing lift plate 6a, the arcuate portion of the rocker 32 blocking further advance of the remaining cans until its return to the beginning of the feeding stroke.

The rocker 32 is pivoted at 128, the pivot shaft having a fixed arm 129 connected to a link 130 which in turn is connected to the crank arm 131 which is rotated by a sprocket 132 that may be driven in timed relation with the approach of the lifts 6a from any suitable means and may be driven from the shaft on which the disk 31 is mounted by means of a sprocket 133 and chain 134. The continuous rotation of the crank arm 131 acting to rock the member 32 back and forth and at each movement placing a can on the lift 6a and through its arcuate face 135 which rides in front of the advancing cans in the chute 30 holds them from further advance until the rocker is fully retracted when the column of cans will move up until a can rests in the pocket of the rocker 32 when it will be positioned on a lift 6a at the next rocking movement of 32. The crank arm 131 will make one complete revolution to one eighteenth revolution of the turret carrying the lifts 6a, since there are eighteen lifts of the machine. This will feed a can each time a lift reaches feeding position.

As the cans advance into their circuit they will first engage the control lever 21 at position "B" Fig. 1 which will operate the rods and levers as in Fig. 3 and move the rack bar 23 causing a tilting of the chamber 12 to discharge its contents into the positioned can. The movement of the rack bar is accomplished by the swinging of the cam switch 33 Fig. 1, and Fig. 3 as shown in dotted lines. When it happens that a can is not positioned on one of the stations this switch 33 is not moved but remains in the position of the full lines which causes the cam roller 24 to ride on the outside of the cam as shown at 34. By an examination of the plan of this cam in Fig. 1 it will be seen that it is not concentric its entire way around the circle but that a portion of it is on a larger circle than the other portion.

The position of the measuring chamber 12 at the left of Fig. 2 is not technically correct. In order to show the tilting mechanism of Fig. 3 in this view and at the same time show the measuring chamber 12 in an upright or filling position the chamber 12 is shown in its position just approaching the switch 33, it being understood that the chamber 12 is upright from station "A" to station "B" while moving in a counter clockwise direction. Likewise on the right of Fig. 2 the parts are not in the technically correct positions. At station "A" the switch 28 acts to move the cam member 29 onto the top side of the cam 17 so as to raise the lever 16 and thereby open the valve 14 to admit gasolene to the chamber 12. In order to show the chamber 12 in a tilted position as at the right of Fig. 2 it would not be proper to also show the cam member 29 as in the position of Fig. 4 because then gasolene would flow before the chamber 12 was tilted upright to receive it. The member 29 is therefore shown just back of the arm 16 which will be moved to open the valve as soon as the chamber 12 is tilted to the upright position.

After tipping, the containers remain in a tipped or discharging position for almost half the circle of travel, or until they reach the switch 35 when the travel of the cam roller 24 will move from the switch 35 and pass into the cam track 37 thereby moving the rack bar to position the chambers 12 upright to receive a new charge of liquid. The presence of the container acting to operate the rack bar at this station, through having positioned the roller in or outside of the cam track.

Just as soon as the containers have been righted for receiving a new charge the presence of the filled can on the lift 6a acts to operate the fill control mechanism operated by the lever 28 which will lift the valve arm 16, open the valve 15 and permit liquid to flow into the chamber 12 during its travel from position A to position B, where it will again be tipped and discharged if a container is present. The cam switch 33 is pivoted at 136 and is operated by the mechanism at the left of Fig. 2 and that shown in Fig. 3. The switch member 35 is pivoted at 137 and is free to be moved by the rollers passing. If the rollers 24 are moving in the cam groove 44 as they approach the switch 35 it will be opened from the position shown in Fig. 1 and remain open so long as rollers 24 are moving in cam 44, but when a roller like 34 moving outside the cam 44 approaches the switch 35 will be moved to the position of Fig. 1 so the roller 34 can pass into the cam groove 37.

The cam member 29 is pivoted at 138 Fig. 1 and is held in the position of Fig. 4 on top of the cam 17 so long as cans are regularly supplied to the machine but when a can is missed then this cam member 29 is positioned away from the cam 17 and rests as shown by dotted lines in Fig. 1 which will permit the arm 16 to pass this point without being lifted so that no gasolene will be supplied to this chamber 12 which is already full.

This cycle of operation continues as long as cans are delivered to the machine. The absence of a can or cans will immediately suspend operation of the tilting of the filled chambers and operation of the filling valves so there is no spilling of liquid at any time.

The change in the cam contour of the cam track 17 to effect the opening of the valves 14 to admit liquid to the measuring chambers is accomplished as follows.

Each time a can passes it contacts with the lever 28 which in turn through the levers and rods shown actuates the cam switch 29 which is moved over the cam 17, then as the rollers on the arms 16 approach they ride over the switch 29 and are thereby elevated which opens the valves 14. The friction of the valve stems 15 in the stuffing box is sufficient to hold the valves open until they are closed by a fixed bracket 38 under which they ride which moves them down to the closed positions.

The whole turret assembly is rotated by means of the worm and worm wheel shown under the tank 2. The liquid accumulated in the tank 2 is carried away through the pipe 39 to a circulating pump for reuse.

I will now describe the manner in which the fill of the containers may be varied to suit changes in temperature or other prevailing conditions that

may require more or less liquid to be delivered to each container.

The surplus puddle of liquid retained in each of the measuring chambers indicated at 125 has been referred to as remaining in each chamber after the container has received its predetermined charge of liquid. This excess of liquid is delivered to each measuring chamber each time it is filled, or rather we might better say this small surplus remains in each chamber as it is refilled to serve as a supply when it is desired to deliver an excess of liquid to each container to take care of differences in temperature during a days run, or to receive an excess of liquid retained by the measuring chamber if a less amount is delivered to each container.

In this machine one outside adjustment of the cam track controlling the tipping of the measuring chambers 12 serves to control an additional or a less tipping of each chamber as it passes through the adjusted section. This mechanism is illustrated at the top of Fig. 1. 40 and 41 represent adjusting screws operated by the hand wheel 42 and bevel gears shown. The screws 40 and 41 have no axial movement but move the long sleeves 43 which are fastened to the short section of cam track 44 thus moving the section of cam track 44 radially one way or the other to regulate the fill of liquid passing into each container.

In the construction and original adjustment of the measuring chambers 12 they are all adjusted to give exactly the same quantity of fill to each container, within a very small fraction of an ounce, so that by adjusting the short section of cam track just described each chamber is tilted in exactly the same manner and thereby the charge going into each container to suit operating conditions is controlled.

What I claim as new and desire to secure by Letters Patent is:

1. An apparatus for filling liquid into positioned containers by means of tiltable measuring chambers comprising a series of pivotally mounted measuring chambers, means for positioning empty containers in fillable relation with said chambers, means controlled by the presence of the containers for admitting liquid to said measuring chambers, means controlled by the containers for tilting said chambers to discharge into said containers, with adjusting means for controlling the tilt of said chambers.

2. An apparatus for filling liquid into positioned containers by means of tiltable measuring chambers comprising a series of pivotally mounted measuring chambers, a series of casings enclosing said chambers except for a small discharge opening, means for positioning empty containers in fillable relation with said measuring chambers, means controlled by the presence of containers for admitting liquid to said chambers, means controlled by the presence of containers for controlling the tilting of said chambers to discharge into said containers with means for delivering and discharging containers from said apparatus.

3. An apparatus for filling liquid into positioned containers by means of tiltable measuring chambers comprising a series of pivotally mounted measuring chambers, a series of casings surrounding said chambers, drip means associated with said chambers to direct surplus liquid away therefrom, means for positioning empty containers in fillable relation with said measuring chambers, means controlled by the presence of containers for admitting liquid to said chambers, means controlled by the presence of containers for controlling the tilting of said chambers with means for delivering and discharging containers to and from said apparatus.

4. An apparatus for filling liquid into positioned containers by means of tiltable measuring chambers comprising a series of measuring chambers mounted on pivots, a series of casings enclosing said chambers, a turret for carrying said chambers through a circular path, means for rotating said turret, means for positioning empty containers on said turret in fillable relation with said chambers, means controlled by the presence of containers for admitting liquid to said containers from said chambers, means for controlling the discharge of liquid into said chambers operated by the presence of containers, and means for delivering empty containers to said container positioning means and means for removing filled containers from said apparatus.

5. An apparatus for filling positioned containers by means of movable measuring chambers comprising a turret, means for moving said turret, means for positioning empty containers on said turret, a series of measuring chambers on said turret, pivotal mountings for said chambers, combined linear and circularly moving means for tilting said chambers on their pivots to discharge in said containers, means for admitting liquid to said measuring chambers, means associated with said measuring chambers for directing surplus liquid away therefrom, means for accumulating surplus liquid and means for delivering and removing containers to and from said apparatus.

6. An apparatus for filling positioned containers by means of movable measuring chambers comprising a turret, means for moving said turret continuously, means for positioning containers on said turret, a series of pivotally mounted measuring chambers on said turret in fillable relation with the position containers, rack and pinion mechanism for moving said chambers on their pivots to discharge into said containers, the said rack and pinion mechanism being controlled in its movement by the presence of containers, means for admitting liquid to said chambers also controlled by the presence of containers.

7. An apparatus for filling containers comprising a series of measuring chambers, pivotal mountings for said chambers, combined reciprocating and rotary means for tilting said chambers on their pivots, means for admitting liquid to said chambers, a series of casings surrounding said chambers, adjusting means for controlling the tilt of said chambers, a surplus pocket in each of said chambers for carrying surplus liquid, means for positioning containers in fillable relation with said chambers, means associated with said chambers for directing drip from the filling nozzle away therefrom and means for conveying filled containers away from said apparatus.

8. An apparatus for filling containers comprising a series of measuring chambers, pivotal mountings for said chambers, combined reciprocating and rotary means for tilting said chambers on their pivots, valve means for admitting liquid to said chambers, adjusting means for controlling the tilt of said chambers, a pocket in each chamber for containing a quantity of surplus liquid, means associated with each chamber for directing drip from the filling nozzle away therefrom, in all positions of said chambers, means for positioning containers in fillable relation with said

chambers, and means for removing filled containers away from said apparatus.

9. An apparatus for filling liquid into containers comprising a series of measuring chambers, pivotal mountings for said chambers, combined reciprocatory and rotary means for tilting said chambers on their pivots to discharge into containers, cam means for operating said chamber tilting means, means for admitting liquid to said chambers, cam means for controlling the said liquid admitting means, switches associated with said cam means and means controlled by the presence of containers for operating said switches to thereby control the filling and tilting of said measuring chambers.

10. An apparatus for filling containers by means of tiltable measuring chambers, combined reciprocatory and rotary means for tilting said chambers, cam means for operating said tilting means, means for admitting liquid to said chambers, cam means for operating said liquid admitting means, switches associated with said cam means for effecting movement of said tilting means and said liquid admitting means, said switches being operated entirely by the presence of containers in fillable relation with said measuring chambers, means for positioning containers and means for removing filled containers.

11. An apparatus for filling liquid into containers comprising a series of tiltable measuring chambers, pivotal mountings for said chambers, combined reciprocatory and rotary means for tilting said chambers, valve means for admitting liquid to said chambers, cam means for effecting the tilting of said chambers, cam means for controlling the liquid admitting means, a switch in the cam means for controlling the tilting of said chambers, a switch overlying the cam means for controlling the liquid admitting means, said switches being controlled entirely by the presence of containers, means for positioning containers and means for removing the containers after filling.

12. An apparatus for filling containers comprising a turret assembly consisting of a liquid tank, a series of tiltable measuring chambers, a series of casings around said measuring chambers, a drip conveying means in each of said casings, a surplus liquid reservoir in each of said measuring chambers, an arcuate extension integral with said measuring chambers and in constant communication with said drip conveying means, a drip accumulating tank below said turrent assembly, means for directing liquid into said measuring chambers by gravity, means for tilting said chambers periodically into and out of discharge position, means for positioning containers in fillable relation with said measuring chambers and means for removing filled containers from said apparatus.

13. An apparatus for filling positioned containers comprising a measuring chamber, a pivotal mounting for said chamber, a filling nozzle and a discharge nozzle in the top of said chamber, a drip member adjacent the filling nozzle, a chamber in which said drip member is in constant contact, a pocket in said measuring chamber to retain a surplus of liquid, adjustable means associated with said chamber to control the tilt thereof and draw on said surplus when desired, means for tilting said measuring chamber, means for admitting liquid to said measuring chamber, both said tilting and said liquid admitting means being controlled by the presence of containers, means for positioning containers in fillable relation with said measuring chamber and means for removing filled containers from said apparatus.

14. An apparatus for filling liquid into positioned containers, a measuring chamber, a pivotal mounting for said chamber, a casing surrounding said chamber, a nozzle for directing liquid from said chamber into a positioned container, in the lower part of said casing, a compartment associated with said casing for receiving drip and surplus liquid, an accumulating tank below said chamber, means for conveying surplus liquid from said compartment to said tank, means controllable by the presence of a container for tilting said measuring chamber, and means controllable by a container for admitting liquid to said measuring chamber and means for positioning and removing containers.

15. An apparatus for filling containers comprising a series of measuring chambers carrying a surplus of liquid, pivotal mounting for said chambers, cam means for controlling the normal tilting of said chambers, means for positioning containers under said chambers and maintaining them vertical to receive charges therefrom, a single means along the path of travel of said chambers for changing the amount of tilt initially given to all of said chambers to regulate the amount of liquid delivered to each container.

16. An apparatus for filling liquid into containers comprising a series of measuring chambers carrying a surplus of liquid and moving in succession past operating means, said operating means comprising a series of cam sections for effecting the tilting of said chambers, pivotal mountings for said chambers to permit tilting thereof, one of said cam sections having movement relative to the path of travel of said chambers to change the tilt of said chambers and thereby increase the amount of liquid delivered to each container by said chambers, by drawing additional liquid from said surplus with means for positioning containers to receive liquid from said chambers.

17. An apparatus for filling liquid into containers comprising a series of measuring chambers carrying a surplus of liquid, a pivotal mounting for said chambers, cam means for tilting said chambers, a single adjusting means for radially moving said cam means for changing the initial tilt of all of said chambers to thereby regulate the amount of liquid delivered from said chambers by drawing from or adding to said surplus, with means for positioning containers in substantially vertical positions to receive a charge of liquid from said tilted chambers.

18. An apparatus for filling liquid into containers comprising measuring chambers carrying a surplus of liquid and moving along a predetermined path, means for positioning containers in vertical positions relative to said chambers to receive charges of liquid therefrom, chamber tilting means along the path of travel of said chambers, and a single means for regulating the tilt of all of said chambers to change the amount of liquid delivered to said containers, by drawing from or adding to said surplus.

19. An apparatus for filling liquid into positioned containers by means of tiltable chambers comprising a series of pivotally mounted measuring chambers, a substantially closed casing surrounding each tiltable chamber, means for positioning empty containers in fillable relation with said tiltable chambers, means controlled by the presence of containers for admitting liquid to said measuring chambers, means con-

trolled by the containers for tilting said chambers to discharge into said containers, with a single means for controlling the tilt of all of said chambers.

20. An apparatus for filling liquid into positioned containers by means of tiltable measuring chambers comprising a series of pivotally mounted measuring chambers, a series of casings surrounding said chambers, each casing having a filling compartment and a drip compartment, filling nozzles entering said casings, drip catching members associated with said chambers and always having communication with said drip compartments to convey drip from said nozzles to said drip compartments, means for positioning empty containers in filling relation with said chambers and other means for conveying filled containers away from filling relation with said chambers.

21. An apparatus for filling liquid into positioned containers comprising a series of measuring chambers, pivotal mounting for said chambers, means to tilt said chambers, means for supplying liquid to said chambers, a filling nozzle on each of said chambers, means for venting said filling nozzles, drip catching means associated with said chambers and movable therewith but always in a fixed relation to said chamber filling nozzles, a casing surrounding each chamber and having a filling compartment and a drip compartment, the chamber moving only in the filling compartment but the drip catching means moving in both compartments, means for supplying containers in filling relation with said chambers and means for removing filled cans from said apparatus.

22. An apparatus for filling liquid into containers comprising a series of measuring chambers, pivotal mountings for said chambers, gear quadrants and rack bars for tilting said chambers on their pivots to discharge into containers, means for admitting liquid to said chambers, cam means for controlling the said liquid admitting means, switches associated with said cam means, and means controlled by the presence of containers for operating said switches to thereby control the filling and tilting of said measuring chambers.

23. An apparatus for filling liquid into positioned containers comprising the following operative devices, means for feeding containers one at a time into filling position, means along the path of each container and operative therefrom for admitting liquid thereto, means for measuring a charge of liquid, means operative by a container for controlling the depositing of a charge thereinto, means operative by a filled container for recharging said measuring chamber preparatory to filling a subsequent container, and means for removing the filled containers.

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