

Jan. 10, 1933.

J. SCHMIDT

1,894,007

LIQUID FILLING MACHINE

Filed Sept. 24, 1926

3 Sheets-Sheet 1

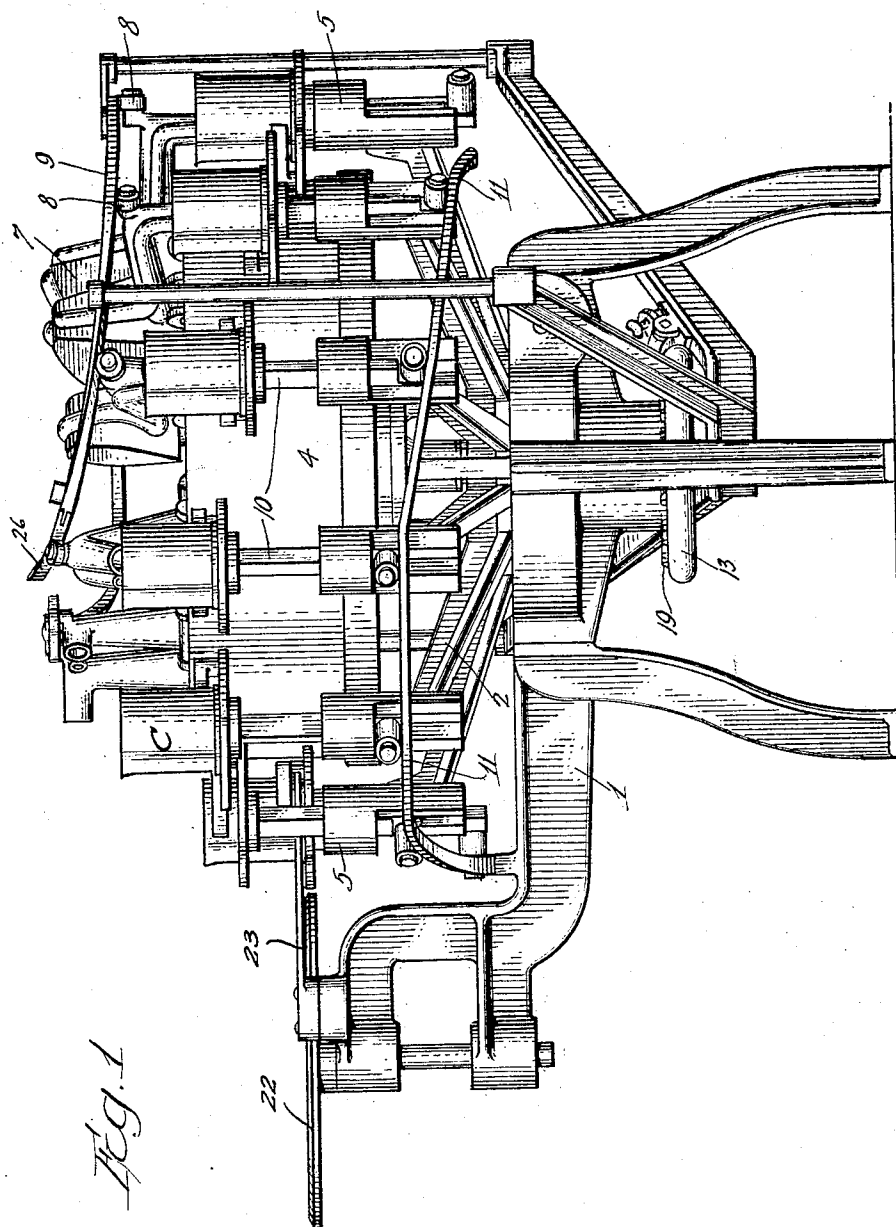


Fig. 1

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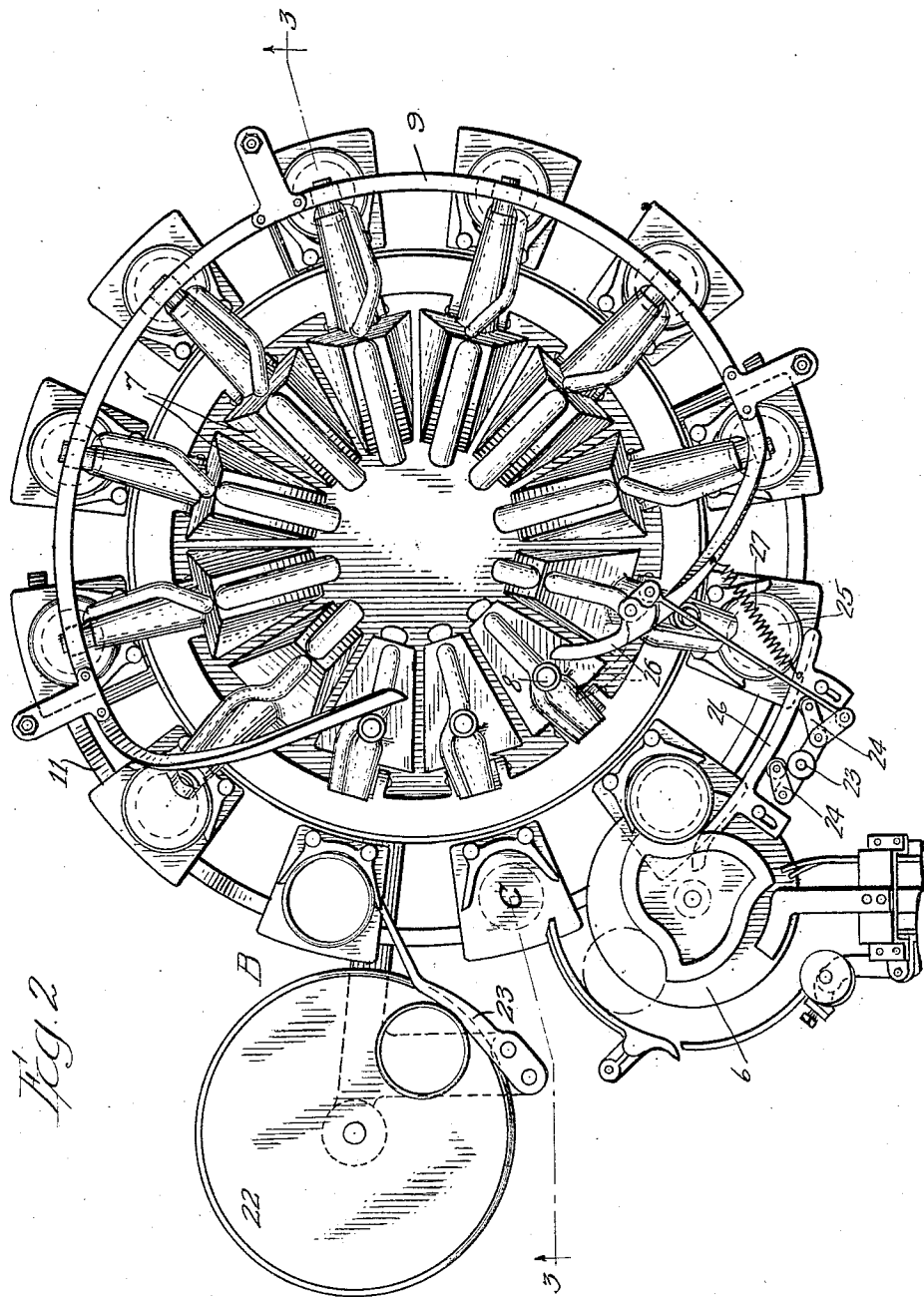
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3 Sheets-Sheet 2



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3 Sheets-Sheet 3

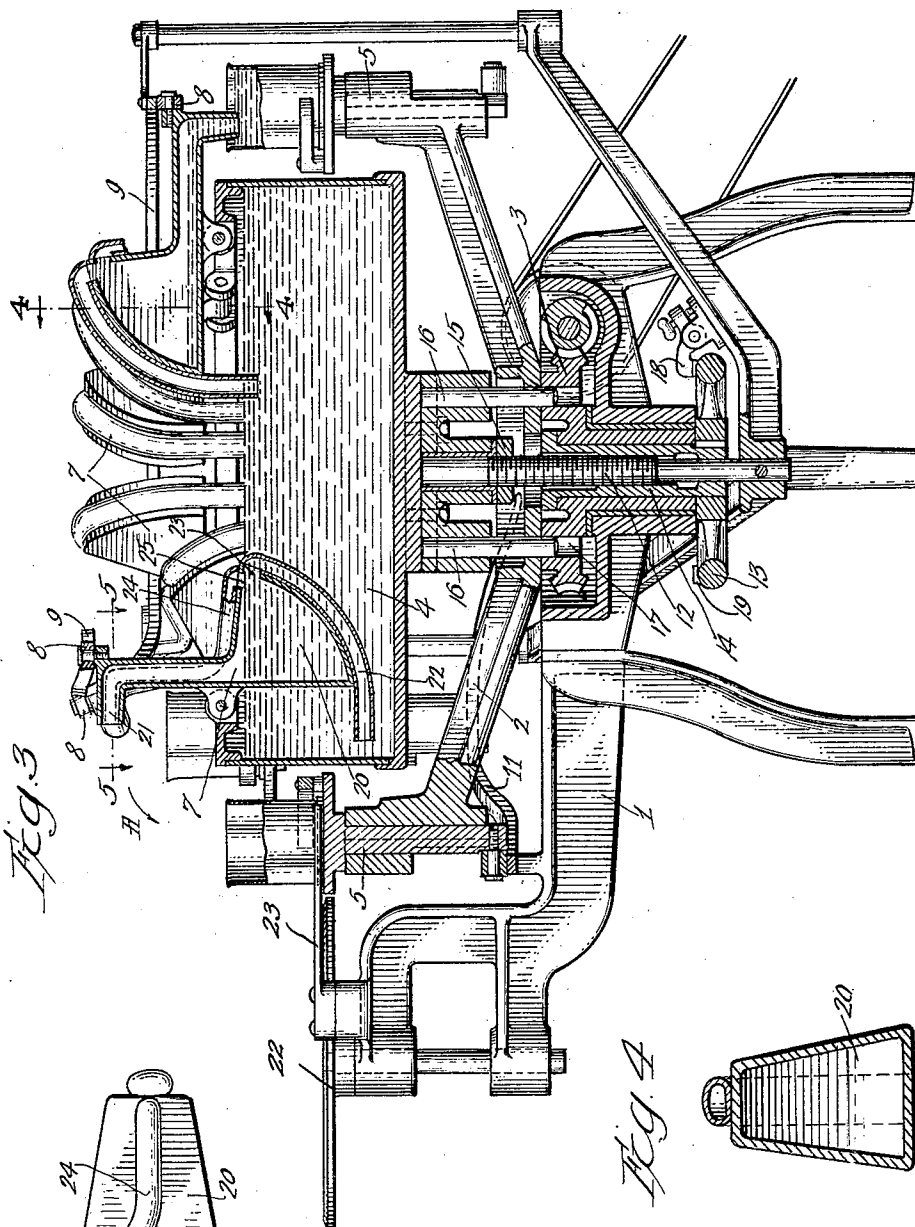


Fig. 3

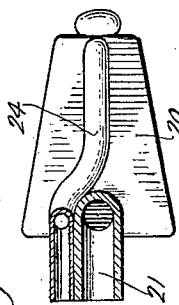
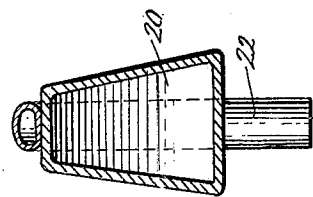


Fig. 5

Fig. 4



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UNITED STATES PATENT OFFICE

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LIQUID FILLING MACHINE

Application filed September 24, 1926. Serial No. 137,521.

This invention relates to an improved method and apparatus for filling liquids and syrups and the like into containers and is especially applicable to such use in canning and food preserving factories.

The present type of apparatus used for this purpose is more or less unsatisfactory, depending somewhat on the particular kind of material being handled, and hot liquids or syrups are especially difficult to handle without loss and more or less musing of the machinery and containers through the escape of the hot liquid during the filling operation.

Referring particularly to the filling of liquids of all kinds into the ordinary type of open end sanitary can I will enumerate the difficulties usually encountered. Sanitary cans are shipped to the canning factories in bulk car load shipment and in this method of transportation and handling the flanges around the open ends of the cans become more or less bent and mutilated with the result that they do not present a smooth unbroken surface by means of which a liquid tight seal may be made with the filling apparatus. The filling apparatus in the canning factory usually comprises a tank connected with a series of filling devices constituting a rubber sealing disk that covers the open end of the sanitary can to prevent escape of liquid during the filling thereof. Whenever a can with bent flange is filled through the employment of apparatus using a rubber sealing disk over the top of the can, more or less of the filling liquid escapes through the breaks in the seal caused by the small indentations or bends in the flanges, which represents a distinct loss of material and results in messing up the machinery with a sticky syrup which sometimes is so detrimental to efficient operation that apparatus must be cleaned before continuing. It is also very difficult to maintain the rubber sealing disks against the corrosive action of very hot liquids and the frequent changing of disks causing unnecessary delays results in more loss to the canner. Another loss to the canner results from the necessity of changing the rubber disks whenever a different size can is to be filled. These sealing disks are made

to fit the various size cans and of course when the size cans is changed the disks on the filling machine must be changed to suit. During this changing operation the machines are idle. Aside from the rubber disks and their attendant disadvantages the ordinary type of filling machine has other inherent disadvantages. Working in connection with the sealing disks are plungers and cylinders of various sorts and shapes through which the filling liquids are handled. The fitting and maintenance and upkeep of these parts require more or less attention from skilled attendants during operation of the filling apparatus as well as a high grade of construction ability in the making of the apparatus, all of which adds to the cost of construction and operation.

In the development of my improved filling method and apparatus I have entirely eliminated all sealing valves, plungers, cylinders and other closely fitting parts and devices that have contributed to the difficulties enumerated and have provided a universal filling machine that is adapted to fill any size or shape of container with any condition of opening, that needs no fitting or adjustment when sizes or kinds of containers are changed and handles any and all kinds of liquids or syrups without clogging or musing up any of the filling apparatus and will provide any height of fill in the container by a simple adjustment of the position of the container relative to the filling nozzle, provision has also been made to prevent the operation of the filling device when no can is presented.

My improved method and apparatus for the purpose specified consists in a centrally located tank for containing a suitable supply of liquid or syrup. The filling devices comprise a series of pivotally arranged filling nozzles and charge containers which alternately dip into the supply tank and tilt over the mouths of the containers to be filled, during which movement the liquid or syrup flows through the open nozzle into the can or other vessel until the level of liquid in the can reaches the mouth of the filling nozzle when an air vent in the filling device is closed and the flow of liquid through the nozzle is auto-

matically stopped through the air lock principle.

5 It is therefore a principle object of my invention to provide a liquid filling machine and method where all sealing devices over the mouth of the container being filled are eliminated.

10 It is also an object of my invention to provide means for filling liquids into containers wherein the position of the container relative to the filling apparatus determines the amount of liquid entering the container.

15 It is also an object of my invention to provide a filling apparatus having means for preventing the flow of filling material when no container is presented to the filling apparatus.

20 It is also an object of my invention to provide a filling apparatus having means for controlling the amount of material filled into a container through employment of the air lock principle.

25 It is also an object of my invention to provide a filling apparatus that is adapted to fill containers of different size without the necessity of changing filling nozzles or any adjustments in the filling apparatus except the position of the container relative to the filling nozzle.

30 It is also an object of my invention to provide a machine for filling liquids wherein a series of filling devices are arranged in turret form so that containers may be moved in succession in operative relation with said filling devices and each in turn receive a measured quantity of material.

35 It is also an object of my invention to provide a liquid filling apparatus wherein there will be no loss of material due to inefficient filling means and wherein there are no moving parts for directly causing a flow of material into the positioned containers.

40 With such objects in view as well as other advantages inherent in the invention, the novel structural peculiarities, novel organization of elements and the separate and collective operations involved in the carrying out of the recited objects, which will be made the subject matter of claims hereto appended. I wish to point out that the same may be varied in their proportion, placement, general arrangement and operative relation without departing from the nature and scope of my invention.

55 In carrying out the objects of my invention in a concrete form or machine, other objects, advantages and improvements have been evolved, and in order to make the invention more clearly understood there are shown in the accompanying drawings means and mechanism embodying the preferred structural arrangement, and the preferred disposition of the different parts and combinations, in which I have simply shown one way of applying the creative part or concept of the invention

which may be applied to other structures and some of the parts or combinations of parts may be used without the others in different types of such machines without departure from the purview of my invention and I regard myself as entitled to such variations from the shown and described devices as fall within the scope and meaning of the claims hereto appended.

70 In referring to the accompanying drawings which will give a clearer understanding of the invention I wish to point out that the several views constituting the drawings are more or less diagrammatic in character; are not necessarily drawn to scale, nor do they necessarily represent the best or the preferred engineering practices in the construction of machines of this character, and that some of the parts may be shown exaggerated relative to other parts to more clearly disclose the structure and operation.

75 Figure 1 represents a side elevation of a machine embodying my invention. In this view certain parts lying in the immediate foreground of the machine have been omitted to more clearly show the operative parts controlling the movement of the can lifts, filling devices and attendant parts. The principle part omitted in this view is the feed-in device which is shown in elevation in Fig. 2 and indicated by the numeral 6. This omission permits an unobstructed view of the cam member for controlling the lift of the can supporting plungers.

80 Figure 2 is a plan of the machine of Fig. 1. This view has embodied the parts omitted from Fig. 1 and shows a very clear arrangement of the operative parts of the machine.

85 Fig. 3 is a vertical sectional elevation from the same position as Fig. 1 and taken on approximately the line 3—3 of Fig. 2. This view shows clearly the construction and arrangement of the filling devices and the means for regulating the amount of fill by adjusting the height of the apparatus constituting the supply tank and the filling nozzles relative to the positions of the containers. It also shows clearly the far side of the cam 11 for controlling the lift of the plungers and clearly shows an elevated portion back of the discharge point of the filled cans which elevated portion will be further referred to.

90 Fig. 4 is a sectional view of one of the filling devices taken on approximately line 4—4 of Fig. 3.

95 Fig. 5 is a sectional view of one of the filling devices taken on approximately line 5—5 of Fig. 3.

100 The numeral 1 represents generally the main frame work of the machine. 2 represents a spider type of turret mounted on the main frame 1 and adapted for rotative movement through the medium of the worm drive at 3. The liquid supply tank 4 is located coaxially with the spider turret 2 and

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rotated in time therewith. Around the periphery of the turret 2 are arranged in proper spaced relation a series of container supports 5, adapted to receive containers from a common source 6, consisting of a feeding disk and timing means for placing each container on a support 5 as it passes the feeding station. Fig. 2 shows the location of this feed-in device relative to the turret 2, and "C" represents the approximate position where the can is placed in control of the turret for further movement. The can marked "C" in Fig. 1 indicates substantially the same position.

Pivottally arranged around the inner periphery of the liquid supply tank 4 are a series of measuring and filling devices 7 of a peculiar shape which will be referred to later. These devices 7 are spaced to align with the containers on the turret 2. Adjacent the nozzle ends of the filling devices 7 are rollers 8 riding along the annular cam 9 which cam controls the movement of said filling devices in their operation of filling containers located on the turret 2. The containers are carried directly on a series of vertically movable plungers 10 controlled by the cam member 11, the purpose of control will be explained later.

The liquid supply tank 4 is mounted for vertical adjustment by means of the screw 12, hand wheel 13 and attendant parts. The worm wheel 3 is mounted for rotation in a suitable bearing in the main frame 1 as shown clearly in Fig. 3. A sleeve 14, fixedly secured to the handwheel 13 is threaded for a portion of its length and carries the adjusting screw 12, the upper end of said screw supporting the supply tank by means of the collar 15. Drive pins 16 secured to the hub under the supply tank extend through suitable holes in the spider 2 down into holes in the worm wheel as indicated at 17. This construction permits vertical adjustment of the tank 4 relative to the rest of the apparatus and gives a positive drive to the movable parts. The hand wheel 13 is locked against free rotation by means of the pawl 18, engaging lugs 19 around the periphery of said hand wheel.

I will now give a more detailed description of the filling devices as best shown in Fig. 3. The series of filling devices arranged around the periphery of the supply tank 4 comprise a measuring chamber 20 and a filling nozzle 21. The filling devices shown in section in Fig. 3 shows the positions of receiving a charge of liquid from the supply in the tank 4 and discharging the same into a container. The box like portion of the device receives liquid through the curved channel 22 and port 23, the liquid filling to the level of the tank 4. As the tank moves around through its path of travel the roller 8 on the nozzle end of the filling device rid-

ing along the cam 9 causes a tipping of the filling device in the direction of the arrow "A" of Fig. 3, bringing the mouth of the nozzle down into the open end of a container located on one of the plungers 5. The extreme filling position of the filling device is shown at the right of the view, Fig. 3, where the nozzle is located in the mouth of the open end can and the liquid has flowed from the measuring chamber 20 into the can, filling the can to the level of the nozzle opening, but retaining a portion of liquid in the measuring chamber, the quantity remaining being regulated by the height of the can relative to the mouth of the filling nozzle. It will be noted that the channel 22 carries an extension that never leaves the liquid in the tank, which acts as a seal for that end of the filling device. An air vent 24 lying along the side of the filling nozzle and terminating in the port 25 permits air to enter the chamber 20 as the liquid flows out of the nozzle into the container. Just as soon however, as the liquid level of the container reaches the end of the nozzle and closes the air vent opening in the vent 24 the liquid will stop flowing as increase to the quantity of liquid in the can but will continue to flow into the vent pipe 24 until it reaches the level of the remaining liquid in the chamber 20. This vent pipe nozzle is so small however, that the amount held therein if deposited in the can when raised would not make any appreciable difference. This is also true of the small amount of liquid in the discharge nozzle 21 that may flow into the can just as the nozzle rises away from the can in its final movement to the position at the left of Fig. 3. The liquid held in both the air vent pipe and discharge nozzles will probably remain therein when the nozzles are raised away from contact with the liquid in the container on account of the air lock principle involved in the conditions prevailing in the interior of the chamber 20. With both nozzles filled with liquid this liquid cannot flow or drop out of the nozzles because no air can enter the chamber 20. The sectional view at the right of Fig. 3 shows the air vent pipe broken away, but it is shown fully in the section at the left. By stopping the air from entering the chamber 20 the fill of the container is controlled by the air lock principle and the level of fill can be regulated by simply raising or lowering the supply tank carrying the filling devices, which will permit the nozzle 21 to enter more or less into the container. The measuring and filling chambers 7 are pivoted to the turret member as clearly shown in Fig. 3, this pivot permits the chambers to swing about the pivot as an axis and to thereby assume the positions indicated at the right and left sides of Fig. 3, one of which is for receiving a charge of liquid and the other for

discharging the liquid into a positioned container.

Operation

5 The operation of the device would follow the procedure to be now explained when assembled as shown but might vary somewhat therefrom with another arrangement or embodiment of the invention.

10 A continuous line of cans or other containers would be supplied through a suitable channel to the feeding and timing device 6 and placed successively on the face plates of the plungers 5 and properly aligned by suitable centering devices. At the point where

15 the cans are placed in position for filling the filling devices are in the position as shown at the left of Fig. 3, they have received a measured charge of liquid and will immediately

20 begin a movement on their pivots that will swing the nozzles down into the open ends of the containers. The containers are placed in position for filling at a higher plane than where they are discharged, Fig. 1 tending to

25 show this to a somewhat better advantage. This higher plane is desirable so that the nozzle 21 will enter the can practically as soon as it begins to tilt, so that it will be well into position as soon as the liquid begins to flow

30 into the container, then as the nozzle continues to tilt the container is gradually lowered by means of the cam 11 until the position is reached as at the right of Fig. 3. This prevents any tendency to slop or spill as the

35 liquid first enters the container, the flow of liquid is gradual and the fall of liquid from the nozzle to the bottom of the container is short, and therefore the loss from spillage is practically nil. After the containers have

40 received their predetermined charge of liquid the filling devices are gradually raised away from the open ends of the filled containers and brought to the charging position as at the left of Fig. 3 and the filled containers are dis-

45 charged on the ordinary disk as is shown in Fig. 2 at "B". The provision for preventing the discharge of liquid from the filling nozzles when no can is present to be filled, constitutes the mechanism clearly shown in Fig.

50 2. Just as the cans enter the machine they encounter a movable shoe 26, which is held in the position of Fig. 2 so long as the line of cans is unbroken. The bracket 23 is fixed in position and carries the rock levers 24, one of

55 which is connected to the connecting rod 25, which is in turn connected to the swinging arm 26 of the cam 9. The position of the parts as shown in Fig. 2 positions the finger end of the cam 9 to engage the rollers 8 of the

60 filling devices and thus tip them forward into the mouths of the containers. A tension spring 27 tends to hold the parts in operative relation. When the flow of cans ceases or a can is missed the spring 27 will place the parts

65 in the dotted positions, the finger 26 being

70 moved out of the path of the rollers 8 the filling devices will not be tilted until cans again appear in the line of travel. This operation takes place in the following manner. As the containers, filled with liquid, move around with the turret from the position at the right of Fig. 3, which is the lowest point in their downward movement during the filling operation, they remain in this position for a part of their travel until the rollers

75 on the bottoms of the plungers begin to travel on the other end of the cam 11, which is seen at the top of Fig. 2. The shape of the cam 11 on the side of the machine where the filled containers are raised from their low position is in shape substantially like the shape clearly shown in Fig. 1. The drop curve in the cam that lowers the cans to the discharge position is clearly shown under the discharge point

80 in Fig. 3. The filling nozzles may begin to rise slightly ahead of the rise of the filled containers, but just as soon as the rollers on the lower ends of the plungers contact with the cam 11 at the top of Fig. 2 the containers will be elevated in unison with the rise of the

85 nozzles so that the open end of the can will follow the nozzle until it has tilted past the point where any liquid can run out and thus serve to catch any drip that may occur. Drip is not likely to occur because as has been mentioned, the conduit 22 always being immersed in liquid forms an air lock in the chamber 20, which with liquid in the end of the nozzle

90 21 and liquid in the end of the vent 25 all movement of liquid is locked until the nozzle 21 is tilted up far enough to permit the liquid to run from the nozzle and air vent down into the chamber 20.

Throughout this description I have referred to this invention as filling liquids such as soups and the like but I want to make it clear that the device is well adapted to the filling of liquids of all and any kinds into containers of any and all sorts. Cans that are previously filled with whole or parts of

105 fruits may have their syrups supplied with this device; all kinds of vegetables may have their brines supplied through this method of handling liquids; bottles and jars may be filled with liquids of various kinds, and

110 owing to the fact that no seal is required under any circumstances the open end of the container may be of any shape or configuration, all liquids will be handled without loss or spillage and the quantity supplied to each

115 container will be measured more accurately than by any other method known to me.

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

1. An apparatus for filling liquid into open ended unsealed cans comprising a rotatable turret including a supply tank, measuring compartments pivoted adjacent said supply tank, and adapted to receive charges of liquid therefrom by immersion therein, each measur-

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ing compartment having a discharge nozzle and an air lock extension that is in constant communication with said liquid in the tank, means for placing empty open top cans in alignment with the discharge nozzles of said measuring compartments to receive charges therefrom, means for tilting said compartments to discharge liquid into said cans, air vent means connecting with said compartments to permit air to enter therein when liquid flows therefrom into said cans, said vent means acting to check the flow of liquid by cutting off the air to said compartments when the rising liquid in the cans closes the said vent means, the tops of said cans remaining open to the atmosphere during filling.

2. An apparatus for filling liquid into open end unsealed cans comprising a rotatable turret including a supply tank for liquid, a series of measuring devices pivotally positioned around said turret and adapted to receive charges of liquid from said tank by immersion therein, each measuring device having a discharge nozzle and an air lock extension that is in constant contact with the liquid in said tank, means for placing empty cans into receiving position adjacent each measuring device, means for tilting said measuring devices to discharge liquid into said cans, means for moving said cans vertically as the discharge begins, other means for moving them along a fixed plane while starting the filling and additional means for moving them vertically as the filling ceases, an air line leading from the surface of the liquid in each can when filled to check the flow of liquid from the measuring device when closed by the liquid in the can, the tops of the cans remaining open to the atmosphere while being filled.

3. An apparatus for filling liquid into open end unsealed cans comprising a series of pivoted measuring devices, a tank for liquid from which each measuring device may receive a charge, each measuring device comprising a measuring chamber, a discharge nozzle and an air lock member and a vent pipe, means for positioning cans adjacent the discharge nozzle of said measuring device, means for tilting said measuring devices to discharge into the positioned cans while said air lock member remains in contact with the liquid in said tank and to bring said vent pipe into contact with the liquid in the can when it is filled to the desired level to thereby stop the flow of liquid into said can.

4. An apparatus for filling liquid into open end unsealed cans comprising a series of pivoted measuring devices, a tank for liquid from which each measuring device may receive a charge, each measuring device consisting of a discharge nozzle, an air lock member, a vent pipe and a measuring chamber, means for positioning cans adjacent the

said discharge nozzle of said measuring device, means for tilting the measuring device to bring the discharge nozzle into position over a can, means for moving the can vertically during the time the measuring device is tilting to discharge material, stopping the flow of liquid into the can through a closing of the vent pipe by the rising liquid in the can while the air lock member is in contact with the liquid in the tank thereby airlocking the measuring chamber.

5. The structure in claim 4 with this addition, the tilting means then controlling the tilting of the measuring devices back to their charging position and means for moving the filled cans vertically to keep the discharge nozzles substantially in the mouths of the cans to catch any drip with means for then removing the filled cans from the apparatus.

6. An apparatus for filling liquids into unsealed cans comprising a rotatable turret, a series of cans supports carried thereby, a supply tank, measuring devices for receiving charges from said tank and pivotally mounted to move with said turret, means for tilting said measuring devices on their pivots, means for giving vertical motion to said can supports during a part of the time said measuring devices are being tilted, air lock means for stopping the flow of liquid into the cans as well as retaining surplus liquid in the measuring devices while being tilted back into the supply tank.

7. An apparatus for filling liquids into open end unsealed cans comprising a rotatable member, a series of can supports carried thereby, a supply tank, measuring devices pivotally mounted to move with said turret, means for tilting said measuring devices toward cans on said supports, and for controlling the tilting of said measuring devices away from the cans on said supports, the pivotal mounting of said measuring devices permitting said measuring devices to be immersed in the liquid in said tank to receive charges therefrom, an air lock member always in contact with the liquid in said tank and always in connection with the measuring chamber, vent pipe means connected with said measuring chamber and adapted to contact with liquid in the can to thereby stop the flow of liquid from said measuring chamber and to retain surplus liquid in said measuring chamber while it is being tilted to its normal charge receiving position after filling a can.

8. An apparatus for filling liquids into unsealed cans comprising a rotatable turret, a supply tank for liquid, measuring devices pivoted adjacent said supply tank, means for moving said measuring devices into and out of immersion in said liquid to receive charges therefrom, a series of can supports carried by said turret, means for giving vertical

movement to said supports to maintain a prescribed relation between cans on said supports and the movement of said measuring devices, air lock means comprising channeled members in contact with the liquid in said tank and the liquid filled into the cans to control the flow of liquid into the cans and retain the surplus liquid in said measuring devices after the cans are filled and while said measuring devices are being returned to their charge receiving positions.

9. An apparatus for filling liquids into unsealed cans comprising a rotatable member including a tank of liquid, measuring chambers pivoted to said tank, can supports adjacent said tank means for giving vertical movement to said supports to synchronize with the movement of said measuring devices, means for moving said measuring devices on their pivots to carry liquid from said tank to said cans, air lock means comprising channeled members in contact with said measuring chambers, the liquid in the tank and the liquid in the filled cans whereby the flow of liquid into the cans is controlled and the surplus liquid in the measuring chambers is retained after the cans are filled and the measuring chambers are returning to their charge receiving positions.

10. An apparatus for filling liquids into open end unsealed cans comprising a supply tank, a series of pivoted measuring chambers adjacent said tank and adapted to be moved into and out of the liquid in said tank to receive and discharge measured quantities of liquid therefrom, a series of can supports adjacent said tank and aligned with said measuring chambers, means for moving said supports vertically during the beginning of the filling of liquid into cans on said supports, holding said cans in a fixed plane during the final filling and again giving vertical movement to said supports after filling to keep the mouths of said cans in receiving position to said measuring chambers, means for moving said measuring chambers in synchronism with the movement of said cans, with air lock means comprising channeled members in contact with the liquid in said tank, the liquid remaining in said measuring chambers after the cans are filled and in contact with the liquid in the filled cans to thereby control the amount of liquid flowing into each can and to retain the surplus liquid in each measuring chamber after filling the can.

11. An apparatus for filling liquids into cans comprising a tank, a turret, vertically movable can supports, means for moving said supports and said turret, means for delivering and removing cans from said apparatus, a measuring and filling device having movement relative to said tank and said cans, said measuring device having a measuring chamber, an air lock member always in contact

with the liquid in said tank, a vent pipe open to the atmosphere during the time liquid flows from said measuring chamber into a can but is closed to the atmosphere when the can is filled by contact with the liquid in the can, the said air lock means then acting to retain the surplus liquid in said measuring device while it is returned to its normal charge receiving position, with means for moving said measuring chambers into and out of contact with the liquid in said tank to receive charges therefrom.

12. An apparatus for filling liquid into open end cans comprising a tank for a supply of liquid combined with a turret both mounted on the same vertical axis, can supports carried by the turret and measuring chambers pivotally mounted on the tank, manually operated means for moving said tank vertically relative to said turret to change the relative distances between the said pivoted measuring chambers and the said can supports to thereby change the fill of the cans on said supports.

13. An apparatus for filling cans while their ends are open to the atmosphere comprising means for positioning cans for filling, means for moving the cans through a circuitous path while being filled, means for moving the cans vertically during filling, a vertically swinging chamber through which filling material flows, means for synchronizing the said vertical and swinging movements of the cans and chamber so that the cans are filled during such movement, means venting said chamber, said venting means extending into the cans and contacting with the rising liquid therein to be closed thereby and stop the flow of material.

14. The method of filling cans consisting in placing a movable vented filling nozzle into a can open to the atmosphere and close to the bottom thereof, lowering the can as liquid flows from the nozzle until the fill approaches the desired level in the can, then arresting the lowering movement of the can so the continued rising of the liquid will encircle the filling nozzle and vent and stop the flow of liquid, then moving the nozzle away from its filling position and following the movement with the filled can and maintaining sealing contact with the vent until the liquid in the nozzle flows out of contact with the liquid in the can after which the movement of the can is arrested and the sealed vent released.

15. The method of controlling the flow of liquid into a container whose end is open to the atmosphere, consisting in segregating a supply of liquid in a sealable chamber for delivery to a container, holding a container in a fixed plane at the beginning of delivery of liquid thereto, then lowering the container as the fill continues, arresting the lowering movement as the desired level of fill is

approached so the rising liquid in the container will encircle and seal the supply chamber and stop further flow therefrom, then elevating the remaining supply in the chamber and the filled container to maintain the seal until the supply in the chamber flows out of contact with the liquid in the container when the seal may be broken and the container removed from filling location.

16. The method of filling a container with liquid consisting in positioning a container to be filled, elevating a quantity of liquid from a normal position to cause a flow into the positioned container and arresting the flow by producing a partial vacuum on the remaining elevated liquid when the liquid in the container has reached a predetermined level, and continuing contact between the remaining elevated liquid and that in the container while the elevated liquid is partially returned to its normal position.

17. The method of filling a container with a measured volume of liquid including the steps of confining a volume of liquid, measuring a quantity of liquid in the confined volume, elevating the measured quantity of liquid from a normal position, discharging a part of the measured liquid into a container, arresting the flow of liquid into the container by establishing an air lock on the remaining quantity of the measured charge through the rising liquid in the container, and continuing contact between the remaining elevated liquid and that in the container while the elevated liquid is partially returned to its normal position.

18. An apparatus for controlling the flow of liquid into a positioned container comprising a rocking chamber for segregating a charge of material and elevating it to a point of discharge, an air vent in said chamber to permit a flow of material therefrom, means for rocking said chamber to elevate the contained charge of liquid, means for positioning a container and holding it in a substantially fixed plane as the material begins to flow thereinto, means for then lowering said container as the flow continues and until the desired level of fill is approached, means for then arresting the lowering of the container to permit the flowing liquid to reach the desired level therein, the rising liquid sealing the said air vent and stopping the flow by creating a partial vacuum on the surface of the remaining liquid in the rocking chamber, the said chamber rocking back to its segregating position, other means for elevating the filled can at the same speed so the sealing of the said vent is not broken until the liquid in the chamber flows out of contact with the liquid in the container when the seal may be broken and no more liquid will flow into the container, means for then discharging the filled container.

19. An apparatus for controlling the filling

of liquid into containers comprising a tank for a supply of liquid, dippers pivoted to said tank and with means for dipping them into and out of the tank, each dipper having two spouts one of which always remains in immersion contact with the supply of liquid in the tank, the other spout being adapted to swing into filling relation with a container, an air vent to said dipper to permit a flow of liquid from the filling spout, means for bringing containers into filling relation with said filling spouts to receive a fill of liquid therefrom, the level of fill in said containers being determined by sealing the vent with the rising liquid, and then separating the dipper and containers to prevent further flow.

20. An apparatus for controlling the filling of liquid into containers comprising a tank for a supply of liquid, dippers pivoted to swing into and out of said tank with means for swinging said dippers in timed relation, each dipper having spouts on opposite sides and an air vent the said spouts and air vent being the only openings in the dippers, one spout acting as means for charging the dippers when immersed in the liquid in the tank and the other spout acting as discharge means when the dippers are in filling position, means for positioning containers for filling and means for effecting a relative movement between said dippers and containers so that a desired quantity of liquid may be placed in said containers, the said quantity being determined by a predetermined positioning of said containers so that the rising liquid in the filling containers will close said air vent to said dippers and stop the flow therefrom, then effecting a separation of said filling spouts and containers so the flow of liquid therein will be arrested.

21. An apparatus for controlling the filling of liquid into containers comprising a tank for a supply of liquid, dippers pivoted to swing over the top edge of the tank and remove measured charges of liquid therefrom, means for positioning containers around the tank, each dipper being provided with a filling spout and a discharge spout the said filling spout remaining in constant immersion with the liquid supply, the swinging of said dippers acting to elevate the charge of liquid over the top of the tank and to flow into the positioned containers, means for swinging said dippers, means for moving said dippers and containers in unison during the filling operation and means for removing the containers after filling.

22. A device for filling containers with a liquid comprising a chamber having spouts on opposite sides and an air vent, means for controlling the dipping of said chamber into a supply of liquid to receive a charge therefrom through one of said spouts, means for reversing the position of said chamber to discharge the contained liquid through the other

spout, means for positioning a container adjacent the discharge from the said chamber to receive liquid therefrom the rising liquid in the container closing the said air vent to said chamber to control the level of liquid in the container.

23. A device for filling containers with a liquid comprising a chamber having a plurality of spouts and an air vent, means for controlling the moving of said chamber to dip into a supply of liquid and receive a charge therefrom through one of said spouts, the same means then moving said chamber to elevate the contained charge and cause it to flow out of another of said spouts into a positioned container, means for positioning a container to receive the flow of liquid from said discharge spout, the said air vent to said chamber being positioned to contact with liquid in said container as being filled to check the flow thereinto.

24. An apparatus for filling liquid into open end cans comprising a combined turret and tank on a vertical axis, slidable drive means connecting said turret and tank to insure simultaneous rotative movement, an elevating screw and hand wheel for varying the vertical distance between said turret and tank, swingable measuring chambers, provided with filling nozzles carried by said tank, and can support on said turret, said measuring chambers moving into and out of said tank and out of filling relation with said cans, the varying of the vertical distance between said turret and tank resulting in increasing or decreasing the level of liquid flowing through the nozzles into the cans whereby the volume delivered thereto is controlled.

In testimony whereof I affix my signature.

JOHN SCHMIDT.