

A. I. RISSEK.
MEASURING BOTTLE FILLING MACHINE.
APPLICATION FILED JULY 12, 1919.

1,360,023.

Patented Nov. 23, 1920.

3 SHEETS—SHEET 1.

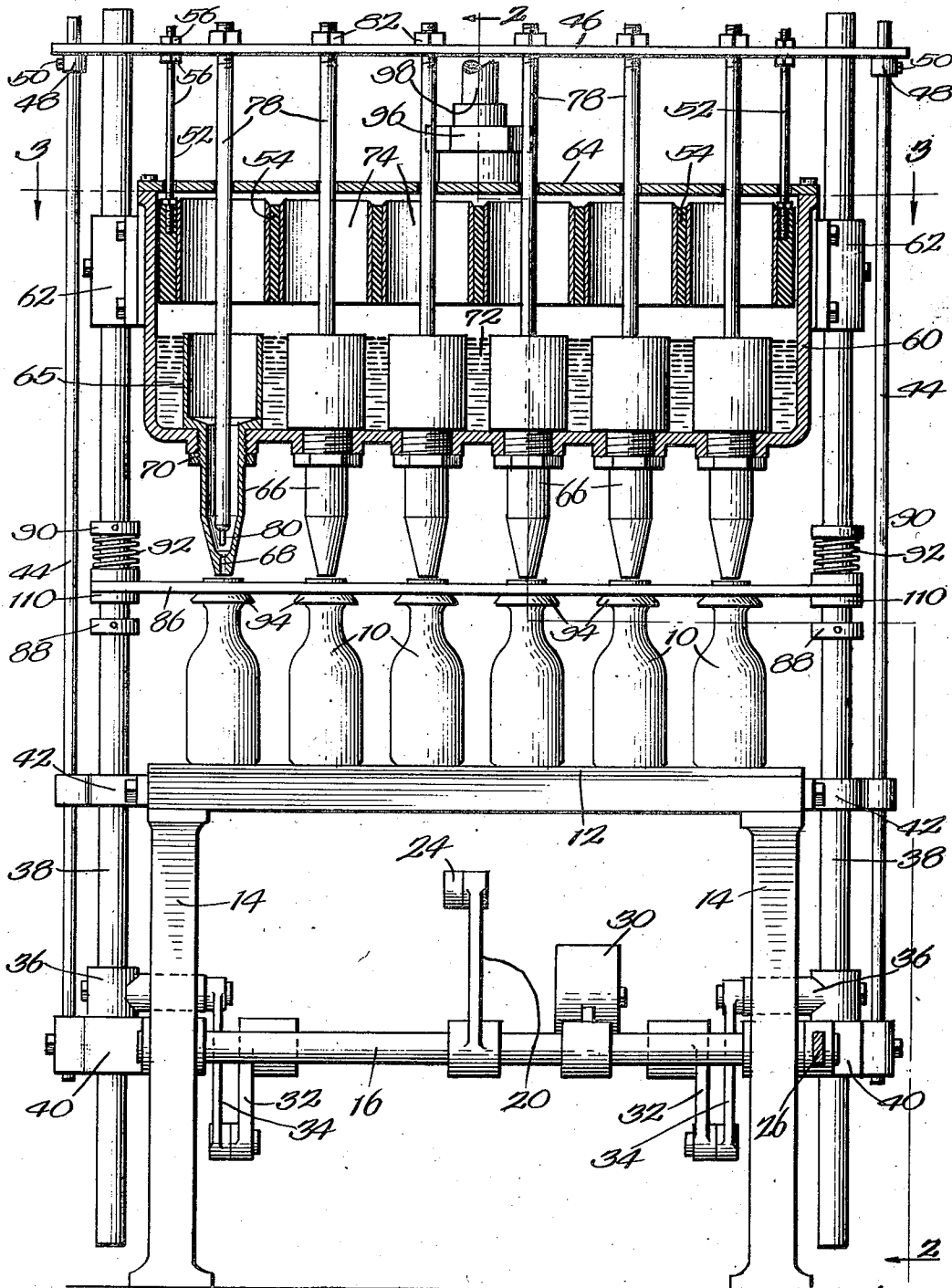


Fig. 1.

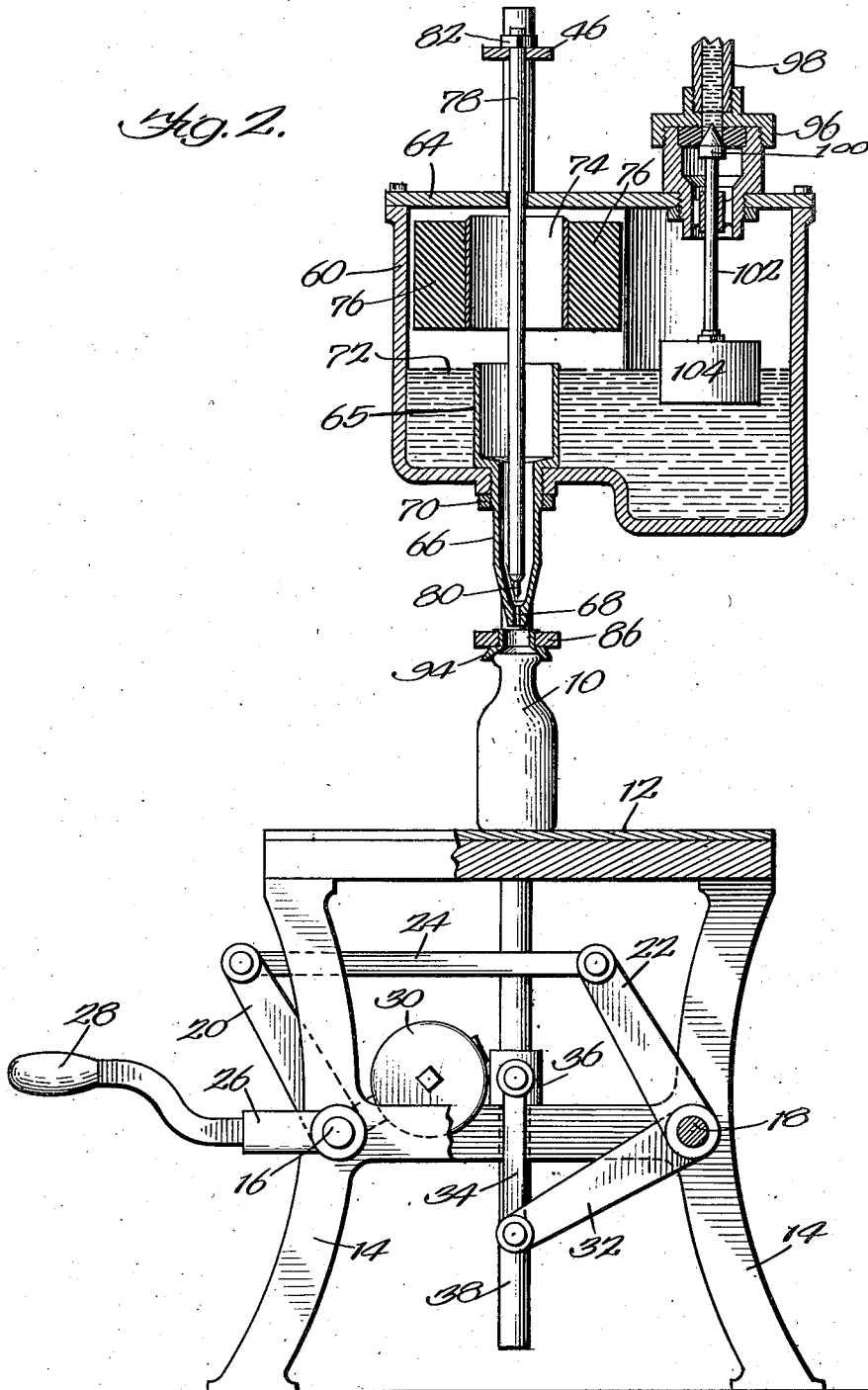
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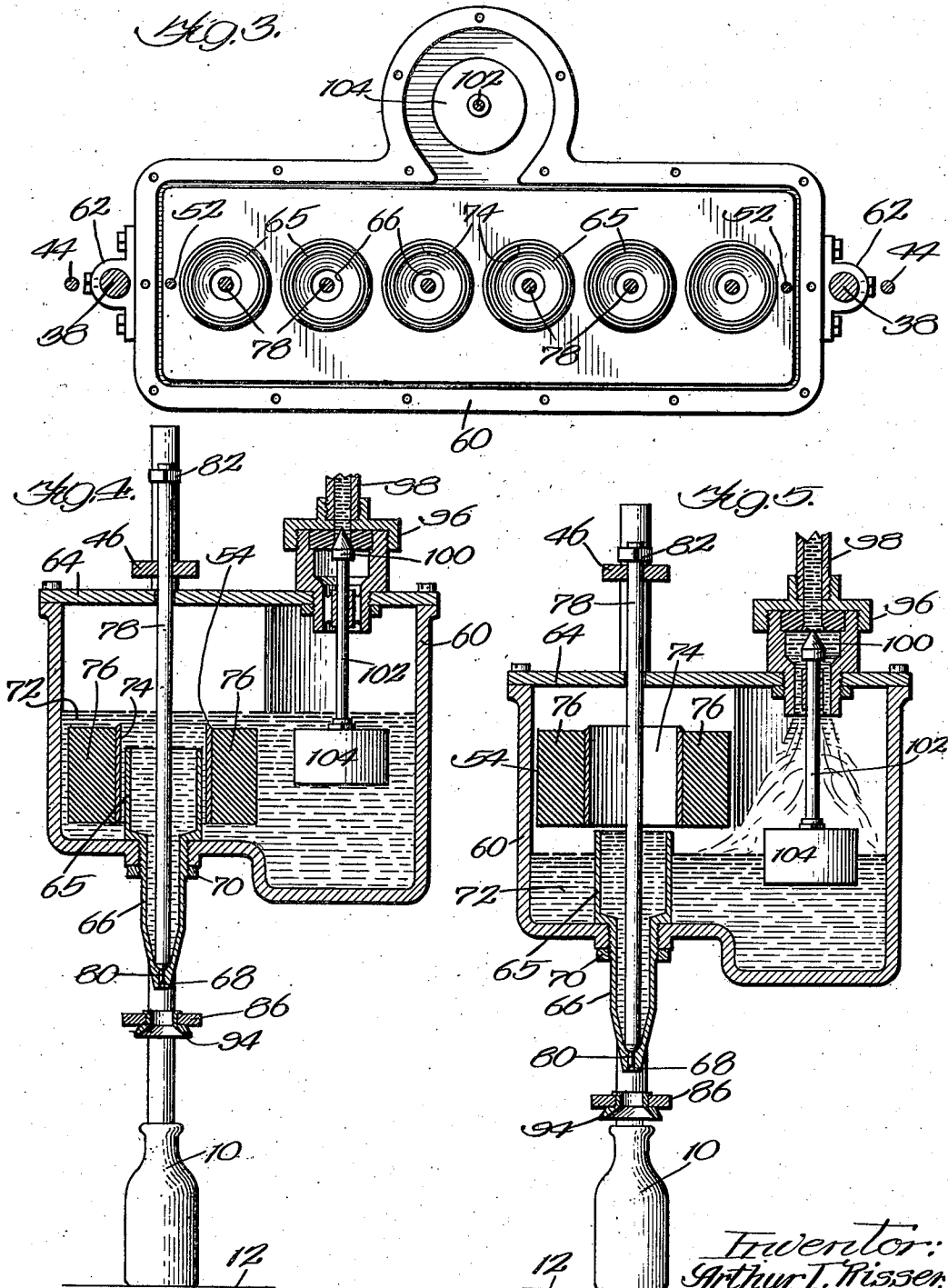


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UNITED STATES PATENT OFFICE.

ARTHUR I. RISSE, OF CHICAGO, ILLINOIS, ASSIGNOR TO U. S. BOTTLERS MACHINERY COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

MEASURING BOTTLE-FILLING MACHINE.

1,360,023.

Specification of Letters Patent.

Patented Nov. 23, 1920.

Application filed July 12, 1919. Serial No. 310,406.

To all whom it may concern:

Be it known that I, ARTHUR I. RISSE, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Measuring Bottle-Filling Machines, of which the following is a specification.

This invention is a machine for automatically filling one or more bottles at a time with a definite predetermined measured quantity of liquid.

The object of the invention is to provide such a machine in which the quantity of liquid delivered to the bottle or bottles is accurately measured, and to provide valve mechanism by which, as such measured liquid is delivered to a bottle, the initial supply in the machine is automatically renewed.

The invention consists in mechanism for carrying out the foregoing objects which can be easily and comparatively cheaply made, which is satisfactory in operation, and not readily liable to get out of order. More particularly the invention consists in the features and details in construction hereafter more fully set forth in the specification and claims.

Referring to the drawings, in which the same numerals represent like parts throughout the several views:—

Figure 1 is an end view, partially in section, showing mechanism illustrating this invention in its preferred form.

Fig. 2 is a transverse view partially in section on the line 2—2 of Fig. 1.

Fig. 3 is a plan view of the filling mechanism taken on the line 3—3 of Fig. 1.

Figs. 4 and 5 are changed position views of the mechanism shown in the upper half of Fig. 2.

The particular machine of the drawings has a capacity for filling six bottles at once but it may be built for one or any number more.

The bottles 10 to be filled, are placed upon and removed from a suitable supporting table 12 by hand or otherwise as desired. This table is carried on legs 14 or other suitable supporting frame work which, in the particular case here illustrated, supports the power mechanism for operating the machine. Extending across the front

and back of the frame 14 are two parallel shafts 16 and 18 provided respectively, near their centers, with upwardly extending lever arms 20 and 22 connected together by a link 24. Shaft 16 carries an operating lever 26, terminating in a handle 28 adapted to be grasped by the operator. It also carries a counterweight 30 so positioned and arranged as to normally hold all the parts of the mechanism in the position of Figs. 1 and 2.

On each end of shaft 18 is, as shown in the drawings, a downwardly inclined lever 32 pivotally connected to a vertical connecting rod 34 whose upper end is pivotally attached to a crosshead 36, rigidly attached to and carried by vertical plunger rods 38 slidable in suitable guides 40 and 42 attached to the table frame 12—14.

Rising from the table frame and rigidly secured in the supports 40 and 42, just referred to, are a pair of stationary rods 44 supporting, at their tops, a normally stationary fixed cross bar 46. Adjustment of this cross bar vertically is provided however, through the collars 48 placed below the bar on the rods 44 and suitably detachably connected to the rods, as for instance, by the set screws 50.

Normally, permanently secured to the cross bar 46 are two depending rods 52 carrying, at their lower ends, a displacing block 54. These rods 52 are, however, selectively adjustable in height with reference to the cross bar 46 through the use of nuts 56 provided for the purpose and usable in the obvious manner.

Displacing block 54 is inclosed within a liquid tank 60 rigidly attached to the vertical rods 44 by any suitable means, as for instance, that shown at 62. The cover of tank 60 is perforated for the reception of the rods 52, heretofore described, so that the tank as a whole may be reciprocated with reference to the displacing block 54 and said rods 52. On the bottom of tank 60 and inside it, are arranged a plurality of measuring cups 65 one for each bottle 10 to be filled. Each such cup 65 terminates at its bottom in a tubular portion 66 contracted at its bottom into a discharge nozzle 68 adapted to deliver liquid to the adjacent bottle. Each measuring cup 65 is detachably secured in the bottom of the

tank 60 by being screw-threaded from above through the bottom and finally fastened by a lock nut 70. The measuring cups 65 are so placed with reference to each other and to the walls of the tank 60 that there is space between them for liquid 72 to be measured. Correspondingly, the displacing block 54 is provided with recesses 74 adapted to receive the cups 65 when the parts are moved to the position of Fig. 4 and with corresponding adjacent solid portions 76 which, in the position of Fig. 4, enter the liquid 72 without interference or clash with the cups 65.

Each measuring cup 65 is provided with a vertical valve rod 78 terminating at its lower end in a valve member 80 fitting into passage 68, heretofore described. Each one of these valve rods 78 slides freely through a suitable opening in tank cover 64 and also through bar 46 and is adjustably positioned with reference to this bar by an adjusting nut 82 screw-threaded on the upper end of the rod. The rod is so adjusted that when the parts are in the positions of Figs. 1 and 2, bar 46 will hold each rod 78 with its end 80 out of engagement with nozzle 68 and permit liquid in the adjacent measuring cup 65 to flow out of nozzle passage 68, while when the parts move slightly from that position toward and to the position in Fig. 4 the rod will, by gravity, hold passage 68 closed, as shown in Figs. 4 and 5.

Extending across the machine between the nozzles 66-68 and the tops of the bottles 10 is a bar 86 slidably mounted on rods 38 between the collars 88 and 90 provided for the purpose and normally pressed downward by the springs 92. This bar 86 is perforated above each bottle 10 to receive a perforated bottle centering rubber cap 94 fittable at its lower end over the top of the bottle 10 to insure accurate discharge of liquid passing from nozzle 68 into the bottle. This member 94 is provided in each case to insure accurate positioning of the bottle with reference to the nozzle irrespective of irregularities in the size and construction of different bottles placed under the nozzles of the machine.

The cover 64 of the tank 60 is provided with an intake or supply valve mechanism housing 96 to which liquid material to be used in filling bottles is delivered from a source of supply, not shown, through a pipe 98. The exit end of this pipe 98 entering this housing 96 is closable by a valve 100 on the upper end of a rod 102 terminating in a float 104 in tank 60. The parts, just described, are so positioned that when the rest of the mechanism is in the position of Figs. 1, 2, and 4, the valve 100 is closed and no liquid is supplied through pipe 98 into tank 60 but, what when the parts are in the po-

sition of Fig. 5 and the intermediate positions, valve 100 is more or less open and liquid is admitted to tank 60.

Operation.

Starting with the machine in the position of Figs. 1 and 2, with the bottles 10 shown just filled from the cups 65 which are now empty, the passages 68 being still open, with liquid 72 in the tank ready for filling bottles. The operator takes hold of handle 28 and moves it upward, thus moving rods 38 and, consequently, tank 60 upward. As this movement begins, blocks 88 move up into engagement with the ends 110 of bar 86 and lift it against the action of springs 92 to remove caps 94 from the bottle necks. As and while the parts are moving on to the position of Fig. 4, the operator removes the full bottles 10 and substitutes others for them. As soon as, in raising tank 60, the nozzles 68 move against members 80 on rods 78, the passages 68 are closed and remain so until the same point is reached on the return stroke. Measuring block 54, being stationary, the movement described in effect immerses the block in the liquid 72, as shown in Fig. 4, thus raising the level of liquid 72 sufficiently so that it runs over into and fills cups 65. This movement has raised valve rod 78, as shown in Fig. 4, but they still hold valves 80 seated, as shown in Fig. 4. When sufficient time has elapsed for all the cups 65 to fill, the operator starts handle 28 back toward initial position. In so doing the parts first reach the position of Fig. 5, in which the liquid 72 is below the upper edges of the measuring cups 65, thus causing float 104 and attached parts to move down and open valves 100, thus admitting new liquid to the tank. As the mechanical mechanism continues from the position of Fig. 5 to normal position, this valve 100 remains open until such time as liquid delivered to pipe 98 refills tank 60 to the condition shown in Figs. 1 and 2, whereupon the liquid in the tank raises float 104 and closes valve 100. As the parts move from the position of Fig. 5 to that of Fig. 1, and just as they reach the latter position, the nuts 82 on rods 78 catch upon the bar 46 so that further downward movement of the tank 60 results in opening the valves 68 and allowing the measured quantity of liquid, viz., the entire contents of the respective cups 65 to flow into the newly placed respective bottles.

It will be seen that the springs 92 allow for the use of different sizes of bottles in the machine and that, irrespective of the size of bottle used, the amount of liquid delivered into the bottles may be varied by selectively changing the size and capacity of the particular measuring cups used and also

by determining, in advance, the exact distance which the displacing block 54 is submerged in the liquid.

Having thus described my invention what I claim as new and desire to secure by Letters Patent, is:—

1. In a device of the class described, a measuring cup having a discharge port and a valve controlling it, a tank capable of delivering liquid to the cup, means supplying liquid to the tank, a valve controlling said supply means, and means moving the tank to cause liquid in the tank to flow into the cup: open the cup valve to empty the full cup; and control the supply valve to replenish the tank after filling the cup, for the purposes set forth.

2. In mechanism of the class described, the combination of a measuring cup having a discharge nozzle delivering outside the hereafter mentioned liquid tank, valve mechanism for said nozzle, a liquid tank inclosing the body of the measuring cup and capable of delivering liquid thereto, a displacing member capable of entering the liquid in the tank outside of cup, means supplying liquid to the tank, a valve mechanism therefor, and means moving the tank to immerse the block in the liquid in the tank to fill the cup and to automatically manipulate said valves whereby only a predetermined quantity of liquid is delivered from said discharge nozzle at a time.

3. In mechanism of the class described, the combination with a bottle support, a measuring cup having a discharge nozzle directed toward a bottle on the support, a valve controlling said nozzle, a liquid tank inclosing the outside of said cup except the nozzle, a displacing member immersible in the liquid in said tank to drive liquid into the cup to fill it, and means for moving the tank to so immerse the displacing member.

4. In mechanism of the class described, the combination with a bottle support, a measuring cup having a discharge nozzle directed toward a bottle on the support, a valve controlling said nozzle, a liquid tank inclosing the outside of said cup except the nozzle, a displacing member immersible in the liquid in said tank to drive liquid into the cup to fill it, means for moving the tank to so immerse the displacing member, and means operated by said moving means for opening the valve in the discharge nozzle when the measuring cup is full.

5. In mechanism of the class described, the combination with a bottle support, a measuring cup having a discharge nozzle directed toward a bottle on the support, a valve controlling said nozzle, a liquid tank inclosing the outside of said cup except the nozzle, a displacing member immersible in the liquid in said tank to drive liquid into the cup to fill it, means for moving the tank

to so immerse the displacing member, means operated by said moving means for opening the valve in the discharge nozzle when the measuring cup is full, a valve controlling a liquid supply leading to the tank, a float in the tank controlling said last mentioned valve so positioned that enough and only enough liquid flows into the tank to replace what is delivered to the measuring cup.

6. In mechanism of the class described, the combination of a supporting table adapted to have a bottle rest thereon, a measuring cup located above the bottle, the same provided with a discharge port leading to a bottle placed upon the support, a tank for liquid inclosing said receptacle, means for reciprocating said tank and inclosed measuring receptacles toward and from the bottle, another fixed support above said tank, a displacing member capable of entering the liquid in the tank outside said measuring cup, suspended from said second fixed support, in such a position that when the tank is reciprocated it so enters the liquid in the tank to drive some of its liquid into the measuring cup, a gravity acting valve for the discharge port of the measuring cup suspended from and slidable with reference to the second fixed support in such a position that when the tank is at the bottom of its stroke, the valve in the measuring cup is open and is closed in all other positions of the device.

7. In mechanism of the class described, the combination with a suitable support, a liquid receptacle, provided with a discharge port, reciprocable with reference to the support, a rod slidable with reference to the support carrying a portion which serves to close the port in the liquid receptacle, means limiting the movement of the rod on the support in such a way that in one position of the reciprocation of the receptacle it moves away from the rod sufficiently to open the discharge port in the receptacle, while in all other positions of the reciprocation of the receptacle the port is held closed.

8. In mechanism of the class described, the combination with a suitable support, a liquid receptacle, provided with a discharge port, reciprocable with reference to the support, a rod slidable with reference to the support carrying a portion which serves to close the port in the liquid receptacle, means limiting the movement of the rod on the support in such a way that in one position of the reciprocation of the receptacle it moves away from the rod sufficiently to open the discharge port in the receptacle, while in all other positions of the reciprocation of the receptacle the port is held closed, means for selectively adjusting the position of the rod with reference to the support in order to adjust the point of valve opening.

9. In mechanism of the class described, the combination with a suitable support for a bottle, a reciprocable filling mechanism adjacent to the mouth of the bottle, means
5 moving parallel to the axis of the bottle for reciprocating said filling means, a bar slidable with but carried by said reciprocating means extending between the bottle and the filling means and adapted to engage the
10 top of the bottle to hold and position it on the support, spring means on the reciprocating means tending to urge said bar against the bottle, and other means on the reciprocating means adapted in one position
15 of the reciprocating means to lift the bar off from the bottle.

10. In mechanism of the class described, the combination of a suitable table, a pair of vertically reciprocable rods on opposite
20 sides of the table, a bar loosely mounted on said rods extending across the table over a bottle placed thereon, two stationary members on each rod on opposite sides of said bar, a spring on each rod abutting
25 one of said stationary members, and the bar to urge it against the bottle, the other stationary member on each rod being so positioned that when the rods are moved in the proper direction they engage the bar to move
30 it off from the bottle.

11. In mechanism of the class described, the combination of a suitable table, a pair of vertically reciprocable rods on opposite
35 sides of the table, a bar loosely mounted on said rods extending across the table over a bottle placed thereon, two stationary members on each rod on opposite sides of said bar, a spring on each rod abutting one of said stationary members, and the bar to
40 urge it against the bottle, the other stationary member on each rod being so positioned that when the rods are moved in the proper direction they engage the bar to move it off from the bottle, an opening in the bar
45 at the point where it engages the bottle and a perforated cushion member inserted in

said opening adapted to engage the top of the bottle when the bar is moved toward the bottle by the springs to admit liquid to the bottle through said perforation. 50

12. In mechanism of the class described, a supporting frame comprising upper and lower portions, the latter adapted to receive and support the bottle to be filled, a valve
55 rod suspended from the upper support in line with the bottle and slidable with reference to said upper support, a liquid tank containing within it a smaller measuring cup having a discharge port extending toward the bottle, said discharge port being
60 closable by said valve rod when ever the tank is moved to a position so that the end of the rod contacts with portions of said port, means for vertically reciprocating said
65 tank mechanism from a position in which said discharge port is immediately adjacent to the bottle and is open to higher positions in which said port is always closed, a displacing member suspended from the
70 upper support in such a position that when said valve mechanism is open it does not enter the liquid in the tank and that when said tank is elevated it does enter the tank to force liquid therein into the interior
75 measuring receptacle, supply mechanism for liquid for said tank, a valve for said supply mechanism controlled by a float in the tank, said float being so positioned that said supply valve automatically opens and
80 closes during the movement of the tank to maintain a sufficient level of liquid in the tank, whereby, when the tank is elevated, the displacing member can force enough liquid into the measuring cup to fill it, for
85 the purposes set forth.

In witness whereof, I have hereunto subscribed my name in the presence of two witnesses.

ARTHUR I. RISSER.

Witnesses:

DWIGHT B. CHEEVER,

A. ROSENTHAL.