July 31, 1934. J. KANTOR 1,968,523

AUTOMATIC BOTTLE FILLING MECHANISM

Filed June 15, 1928 4 Sheets-Sheet 1

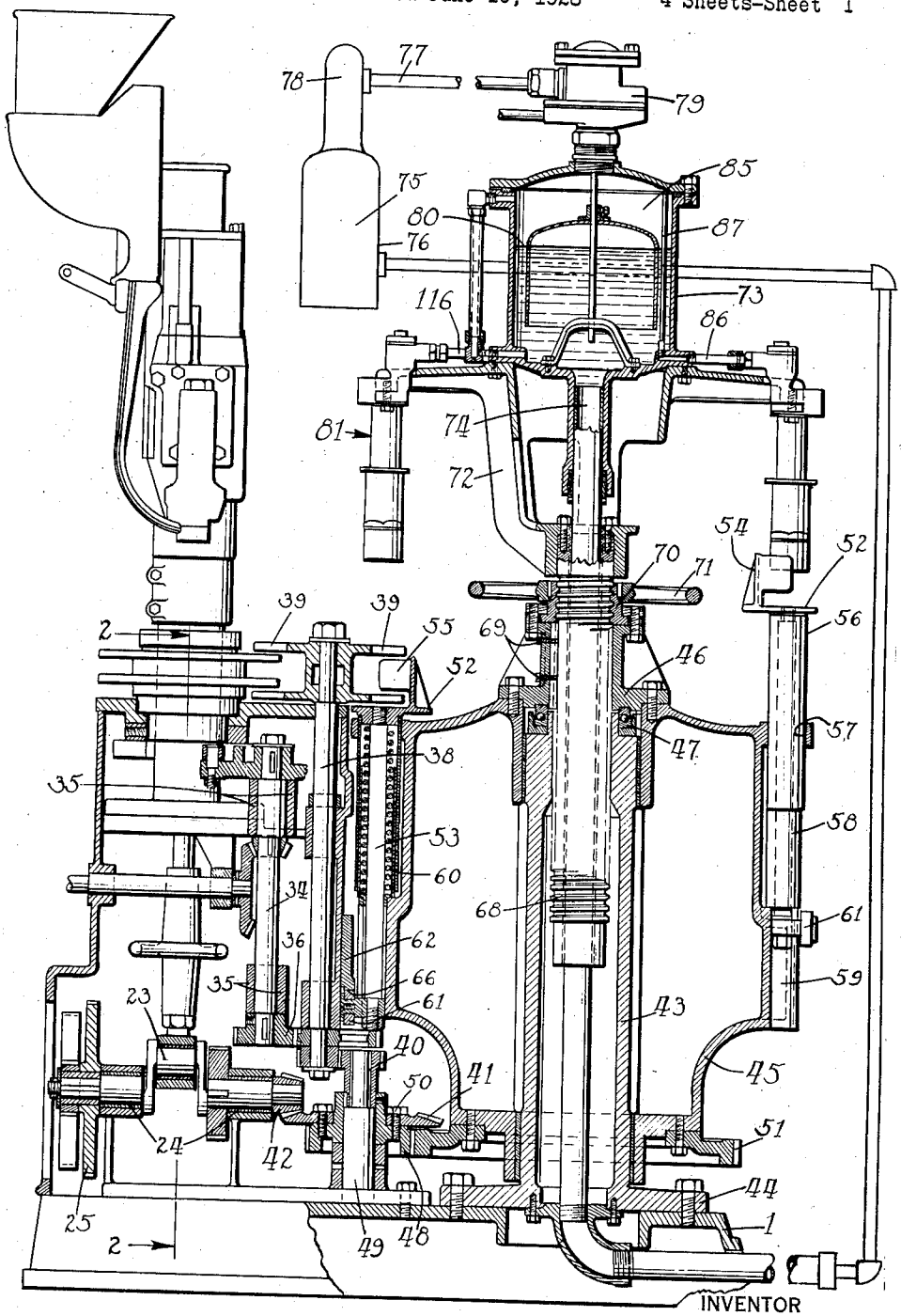


FIG. 1.

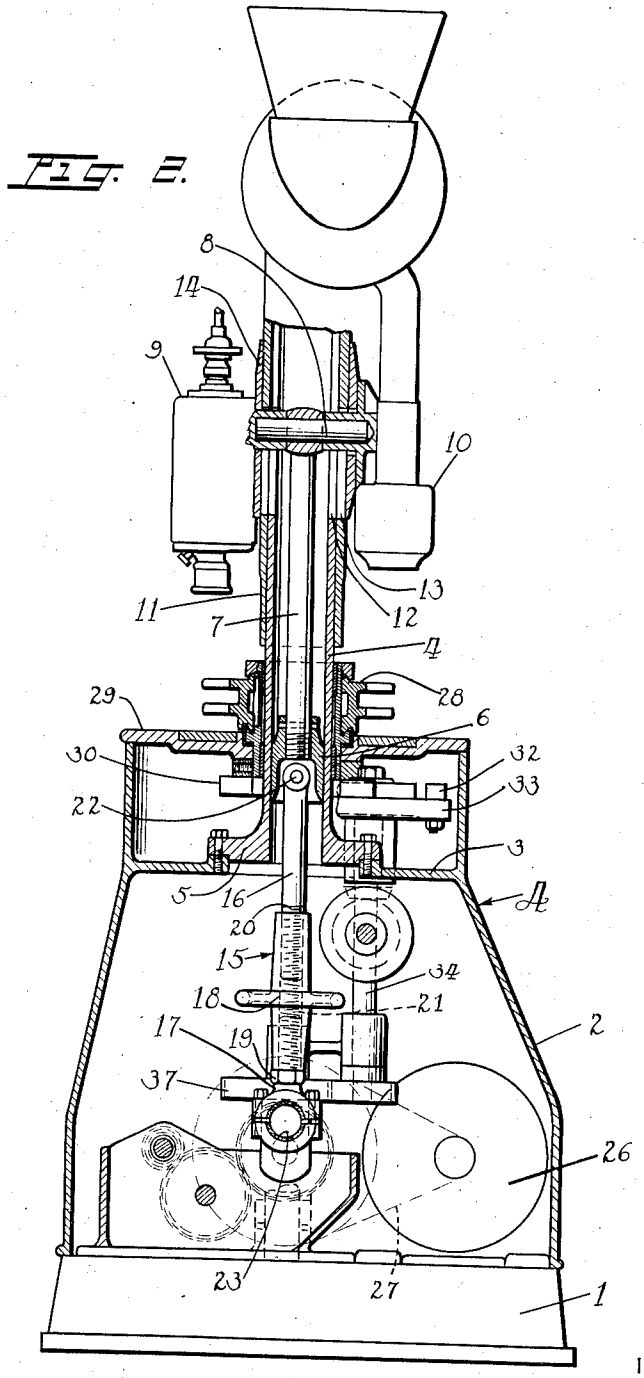
INVENTOR
J. Kantor
BY Munn & Co.
ATTORNEYS

July 31, 1934. J. KANTOR 1,968,523

AUTOMATIC BOTTLE FILLING MECHANISM

Filed June 15, 1928 4 Sheets-Sheet 2

Fig. 2.



INVENTOR
J. Kantor
BY Munn & Co.
ATTORNEYS

July 31, 1934. J. KANTOR 1,968,523

AUTOMATIC BOTTLE FILLING MECHANISM

Filed June 15, 1928 4 Sheets-Sheet 3

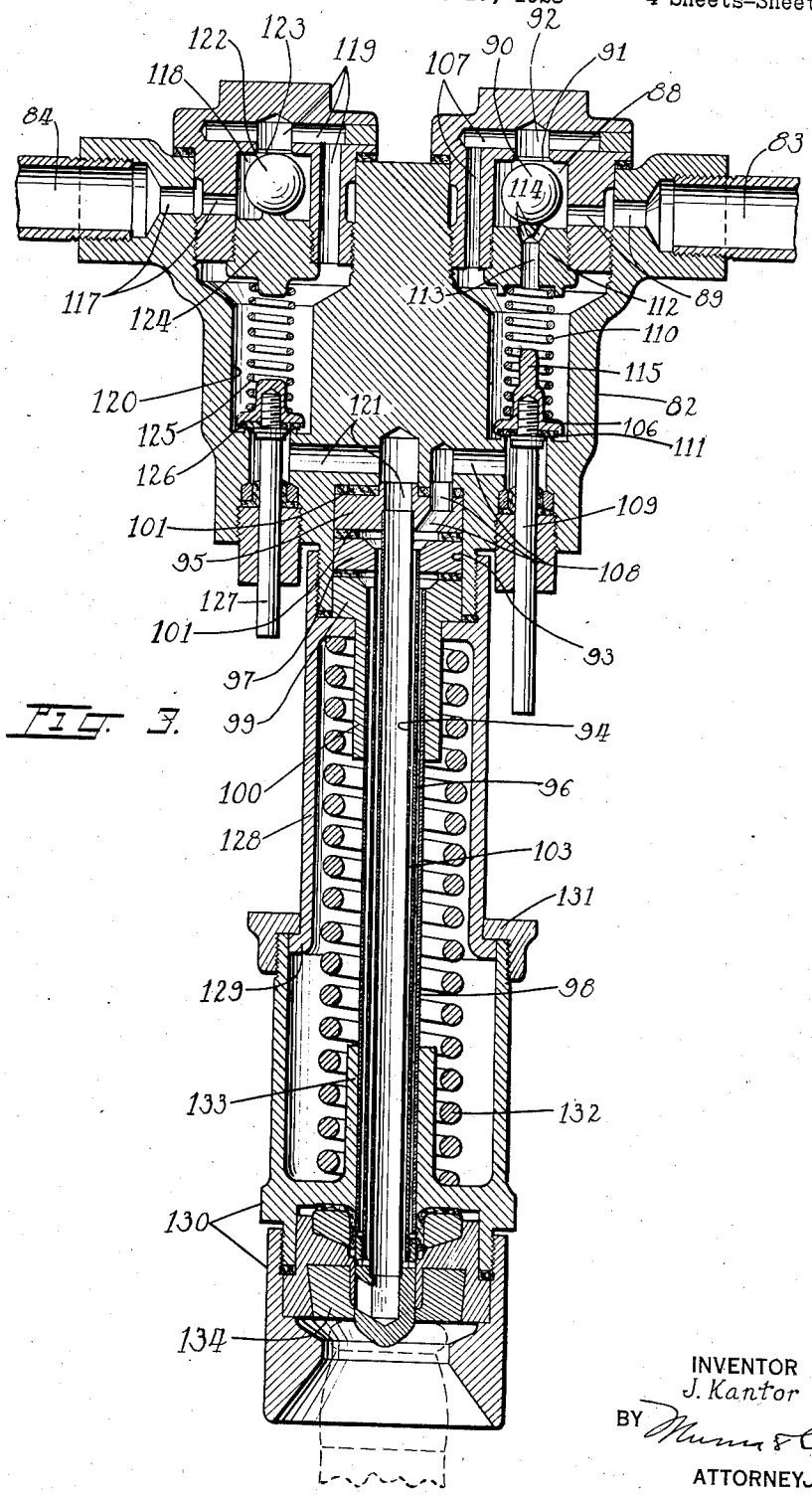


Fig. 3.

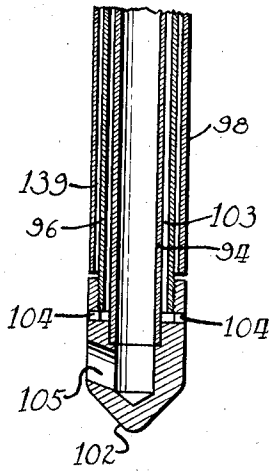
INVENTOR
J. Kantor
BY Munn & Co.
ATTORNEYS

July 31, 1934. J. KANTOR 1,968,523

AUTOMATIC BOTTLE FILLING MECHANISM

Filed June 15, 1928 4 Sheets-Sheet 4

Fig. 5.



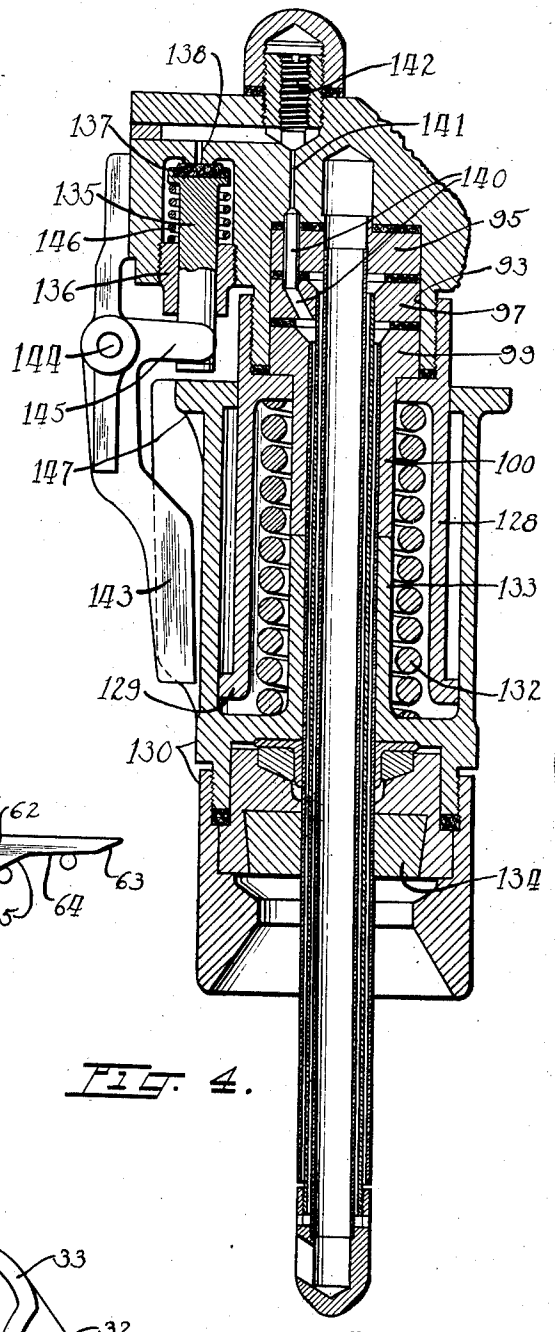


Fig. 6.

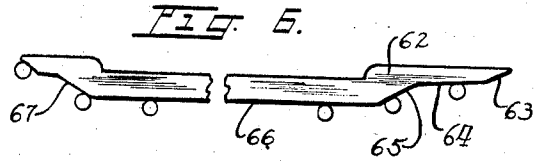


Fig. 7.

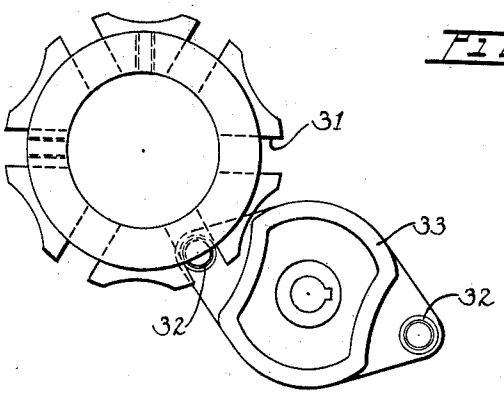


Fig. 4.

INVENTOR
J. Kantor
BY Munn & Co.
ATTORNEYS

Patented July 31, 1934 1,968,523

UNITED STATES PATENT OFFICE

1,968,523

AUTOMATIC BOTTLE FILLING MECHANISM

James Kantor, Chicago, Ill., assignor to The Liquid Carbonic Corporation, Chicago, Ill., a corporation of Delaware

Application June 15, 1928, Serial No. 285,629

13 Claims. (Cl. 226—98)

My invention relates to improvements in automatic bottle filling mechanisms, and it consists in the combinations, constructions, and arrangements herein described and claimed.

An object of my invention is to provide an automatic bottle filling mechanism which has novel means for placing a desired amount of syrup within the bottles and filling the bottles with carbonated water at any pressure.

A further object of my invention is to provide a device of the type described which has novel means for filling the bottles to an even level and for releasing the top pressure, i. e., the gas pressure between the liquid and the top of the bottle from each of the bottles before the bottles are actually released.

A further object of my invention is to provide a device of the type described in which gas is released from the bottles without disturbing the liquid within the bottles.

A further object of my invention is to provide a device of the type described which has novel means for allowing gas under pressure to enter each of the bottles before the liquid is allowed to enter the bottles, therefore permitting the liquid to enter the bottles under gravity, thus preventing a disturbance of the liquid.

A further object of my invention is to provide a device of the type described which has novel means for holding the bottles in filling position, and novel means for releasing the bottles so as to actuate the top pressure releasing mechanism and then completely releasing the bottles.

A further object of my invention is to provide a device of the type described which has novel means for adjusting the device for taking care of bottles of different sizes.

A further object of my invention is to provide a device of the type described which has a syruping unit and a crowning unit so arranged that they may be actuated simultaneously for disposing syrup in one bottle while another bottle which has been filled with syrup and liquid may be crowned.

A further object of my invention is to provide a device of the type described which has novel means for placing the strain of the bottle-holding members upon the base of the device.

Other objects and advantages will appear in the following specification, and the novel features of the invention will be particularly pointed out in the appended claims.

My invention is illustrated in the accompanying drawings, forming part of this application, in which

Figure 1 is a vertical sectional view of my device,

Figure 2 is a section substantially along the line 2—2 of Figure 1,

Figures 3, 4 and 5 are enlarged sectional views of a portion of my device which will be termed as a filling valve,

Figure 6 is a diagrammatic illustration of a cam, and

Figure 7 is a plan view of a portion of the actuating mechanism.

In carrying out my invention, I provide a base 1 upon which a syruping and crowning mechanism A is disposed and upon which a liquid filling mechanism B is disposed. I will first describe the construction of the syruping and crowning mechanism which consists of a housing 2 mounted upon the base 1 and provided with a supporting partition 3. A cylinder 4 has a flared-out portion 5 which is secured to the partition 3.

A piston 6 is slidably disposed in the cylinder 4 and is provided with a connecting bar 7 which is pivotally connected to a pin 8. A syruping unit 9 is supported by one end of the pin 8 and a crowning unit 10 is supported by the other end of the pin 8.

A collar 11 is disposed concentric with the cylinder 4 and is secured in place. Elongated openings 12 and 13 are provided in the cylinder 4 and the collar 11, respectively, for allowing vertical movement of the bar 7 and the units 9 and 10. A sleeve 14 is disposed concentric with the collar 11, extends over the openings 12 and 13 and is arranged to move with the units 9 and 10.

A connecting rod 15 is provided with portions 16 and 17 which are adjustably secured to each other by means of a hand-operated adjusting member 18 which is arranged to be locked in adjusted position by means of a lock nut 19. The portion 16 is provided with right-hand threads 20 and the portion 17 is provided with left-hand threads 21. The upper end of the connecting rod is pivotally secured to the piston 6 at 22 and the lower end of the connecting rod 15 is pivotally secured to a crank shaft 23.

The crank shaft 23 is pivotally supported by bearings 24 which are mounted upon the base 1. A drive gear 25 is rigidly secured to the crank shaft 23 and is operatively connected to a power means, such as a motor 26, by means of a chain 27.

An intermittent bottle-moving star wheel 28 is disposed concentric with the cylinder 4 adjacent a top member 29 which is disposed upon the housing 2. The star wheel 28 is rigidly secured

to an intermittent actuating wheel 30 which is positioned beneath the top 29 within the housing 2. The actuating wheel 30 is provided with a plurality of slots 31 arranged to receive actuating rollers 32 which are mounted upon a rotating member 33.

The member 33 is keyed to a shaft 34 which is supported by bearings 35. The lower end of the shaft 34 is provided with a gear 36 which is in mesh with a gear 37. The gear 37 is keyed to a shaft 38 which has secured at its upper end a continuously rotated bottle-moving star wheel 39. The gear 37 is operatively connected to a gear 40 which is rotated by the actuation of the motor through a ring gear 41 and a pinion 42 which is keyed to the crank shaft 23.

The liquid filling mechanism B is composed of a vertical stationary shaft member 43 which is rigidly mounted upon the base 1 as at 44. A rotatable drum 45 is disposed concentric with the shaft member 43 and is arranged to be rotated with respect thereto. A head portion 46 is secured to the drum 45 and is supported together with the drum upon a bearing 47 which is carried by the shaft 43. A gear 48 is rotatably mounted upon a stationary stub shaft 49 which rotatably supports the gear 40 and is rigidly secured to the ring gear 41 by any suitable means, such as machine screws 50. A relatively large gear 51 is secured to the lower portion of the drum 45 and is in mesh with the gear 48. In this manner, the liquid filling mechanism is operatively connected to the driving mechanism.

A plurality of bottle rests 52 is supported by actuating rods 53. The bottle rests 52 are provided with back portions 54 which have outwardly extending integral arms 55 for holding the bottles in a vertical position. An outer sleeve 56 is provided for each of the bottle rests and are slidably disposed in supporting bearings 57 which are integral with the drum 45. The upper ends of the outer sleeves are secured to the bottle rests. Inner sleeves 58 are provided for each of the outer sleeves and are so arranged that the outer sleeves are movably disposed thereupon.

Outwardly projecting guide portions 59 are integral with the drum 45 and are arranged to receive the guide rods 53. Compression springs 60 are disposed in the sleeves 56 and 58 between the bottle rests 52 and the guides 59. Cam rollers 61 are rotatably carried by the lower ends of the guide rods 53.

An arcuate-shaped cam 62 is rigidly secured to the housing 2 and is disposed substantially adjacent the drum 45. The cam 62 is provided with an engaging tapered portion 63 so positioned that the cam rollers 61 will engage therewith. The cam 62 is then tapered slightly for a short distance as at 64 and this portion may be termed as the pressure release cam portion. The cam 62 has a transversely extending portion 65 which connects the pressure release cam portion 64 to the bottle release cam portion 66. The opposite end of the cam has an upwardly extending portion 67 for a purpose hereinafter described.

An adjusting screw sleeve 68 extends through the head portion 46 and is receivable in the shaft portion 43. The drum is secured against rotation to the adjustable screw 68 by means of a key which is held by locking screws 69 which extend through the head portion 46. A cover 70 is disposed upon the head portion 46 and is provided with an internally threaded opening which is arranged to receive the threads of the adjusting screw 68. A hand wheel 71 is keyed to the cover 70 for a purpose hereinafter described.

A support 72 is mounted upon the upper end of the adjusting screw 68. A filling tank 73 is mounted upon the support 72 and is provided with a liquid supply pipe 74 which extends through the adjusting screw 68, through the shaft 43, the base 1 and in communication with the water compartment 75 of a carbonator 76. A gas line 77 provides communication between the gas tank 78 of the carbonator 76 and the filling tank 73 through a valve 79. The liquid is maintained at a level indicated at 80. Therefore the upper portion of the filling tank 73 contains air or gas under pressure.

A plurality of filling valves 81 is disposed around the peripheral edge of the support 72 in alignment with the bottle rests 52. The filling valves 81 are identical in construction. Therefore, a description of one will apply to them all. The filling valve is composed of a casing 82 which has a gas inlet 83 and a water inlet 84. The gas inlet 83 communicates with the gas chamber 85 of the filling tank 73 through tubes 86 and 87. It will be noted that the tube 87 extends through the liquid and terminates substantially adjacent the upper extremity of the filling tank. The gas inlet 83 communicates with a ball valve compartment 88 through passageways 89. A ball 90 is disposed in the compartment 88 and is arranged to be moved in engagement with a valve seat 91 for closing a passageway 92.

A central cutaway portion 93 is provided in the casing 82. An inner or liquid tube 94 is provided with a disc member 95 at its upper end which is receivable in the cutaway portion 93. A central or gas tube 96 is provided with a disc portion 97 at its upper end which is receivable in the cutaway portion 93 when the central tube 96 is disposed concentric with the inner tube 94. An outer or snift tube 98 is provided with a disc portion 99 which is receivable in the cutaway portion 93 when the outer tube 98 is disposed concentric with the central tube 96. A supporting collar 100 is integral with the disc portion 99 for supporting the outer tube 98 and used as a stop. Fiber or sealing washers 101 are disposed between and adjacent the disc portions 95, 97 and 99.

A filling valve tip 102 frictionally receives the lower end of the inner tube 94 and is secured to the central tube 96. The central tube is spaced away from the inner tube so as to provide a gas passageway 103 therebetween which communicates with gas outlet openings 104 in the tip 102. An upwardly projecting liquid outlet opening 105 provides communication with the inner tube 94 through the tip 102.

A gas valve 106 is disposed in the casing 82 and is arranged to allow gas to pass from the gas inlet 83 through the passageways 89, through the ball valve chamber 88, the passageway 92, through the passageways 107, passageways 108, and through the passageway 103 between the inner tube and the central tube when the valve 106 is in an opened position. A relatively long valve stem 109 is provided for the gas valve 106 and extends through and beneath the casing 82. A compression spring 110 is provided for normally holding the gas valve 106 against its seat 111.

A ball valve seat 112 is provided with a passageway 113 which communicates with transversely extending passageways 114 communicating with the ball valve compartment 88. This arrangement permits the free passages of gas from the compartment 88 through both passages

113 and 92 immediately upon the opening of the valve 106. The continued upward movement of the valve 106 closes the passage 113 by the tongue portion 115 so that, in event the bottle is broken, permitting the continued fast flow of gas, this flow will raise the valve 90 closing the passage 92. A tongue portion 115 is carried by the gas valve 106 and arranged to enter the passageway 113 when the valve 106 is in the uppermost position.

The liquid inlet 84 is in communication with the filling tank 73 through a liquid pipe or tube 116. The liquid inlet 84 communicates with the inner tube 94 through liquid passageways 117, through a ball valve compartment 118, through passageways 119, a valve chamber 120, and through passageways 121 to the inner tube.

A ball valve 122 is disposed in the compartment 118 and is adapted to cut off communication between the compartment 118 and the passageways 119 by moving into contact with the valve seat 123. A valve seat 124 is provided for the ball valve 122. A compression spring 125 has one end disposed against the valve seat 124 and the other end in engagement with the liquid valve 126. The liquid valve is adapted to cut off communication between the valve chamber 120 and the passageways 121. A relatively short valve stem 127 is provided for the valve 126 and extends through and beyond the casing 82.

A retaining sleeve 128 is secured to the lower extremity of the casing 82 and is provided with an outwardly extending annular flange 129 at the lower extremity thereof. A bell unit 130 is arranged to be disposed concentric with the retaining sleeve 128 and to be limited in its downward movement by the annular flange 129 which engages with a cap 131 which is secured to the bell unit. A compression spring 132 is disposed within the retaining sleeve 128 and the upper portion of the bell unit 130 for normally holding the bell unit in a downward position. The bell unit 130 is provided with a sleeve portion 133 which movably receives the outer tube 98. A bottle-sealing portion 134 is disposed in the bell unit 130 for a purpose hereinafter described.

From the foregoing description of the various parts of the device, the operation thereof may be readily understood. The manner in which the bottles are fed in and taken from the mechanism is immaterial in this application.

Let us assume that the motor 26 is set in motion. During this motion of the motor, the crank shaft 23 will be rotated causing a vertical reciprocatory movement of the piston 6 and the units 9 and 10. Therefore, as bottles are moved into engagement with the star wheel 28, the star wheel will move the bottles intermittently beneath the syruping unit where a desired quantity of syrup will pass through the unit and into the bottle from a syrup tank, not shown. It will be seen that the empty bottle will be moved beneath the syruping unit 9 while the piston 6 and the unit 9 are in the upward position and that the bottle will be held stationary and in alignment with the syruping unit as the unit 9 completes its downward movement and until the unit is freed from the bottle.

The intermittent motion of the star wheel 28 is caused by the rotation of the shaft 34 which swings the rotating member 33 about its center causing the rollers 32 to alternately pass into the slots 31 and rotate the actuating wheel 30 together with the star wheel 28. The star wheel 28 is therefore rotated about one-sixth of a revolution during one-sixth of a revolution of the shaft 34 and then remains stationary during the balance of one-half a revolution of the shaft 34.

After the bottle has received a desired proportion of syrup and moved to one side by the intermittent star wheel 28, the continuously moving star wheel 39 will move the bottle upon the adjacent bottle rest 52. It will be noted that when the power means, such as the motor 26, is set in motion, the drum 45 is rotated in a clockwise direction, viewing the top of the drum. Therefore as each bottle is moved from the intermittent star wheel 28 by the continuously moving star wheel 39, the drum 45 has rotated a sufficient distance to bring the next adjacent bottle rest into receiving position for the next bottle.

The bottle rests when in the position for receiving the bottles from the star wheel 39 are in their lowermost positions which is caused by the rollers 61 riding beneath the surface 66 of the cam 62. After the bottle is moved from the rotating star wheel 39, the roller 61 of the bottle rest 52 upon which the bottle is disposed rides upwardly along the surface 67 of the cam 62, allowing the bottle rest and the bottle to move upwardly.

As the bottle moves upwardly, the neck or top of the bottle engages with the sealing portion 134 of the bell unit 130 and causes an upward movement of the bell unit against the tension of the spring 132. The bell unit is moved upwardly and strikes against the valve stem 109. During a continued upward movement, the valve stem 109 is moved upwardly, thus moving the valve 106 from off the valve seat 111 and against the tension of the spring 110 until the tongue portion 115 extends within the passageway 113.

Immediately upon the movement of the valve 106 from the valve seat 111, the communication between the gas inlet 83 will be opened allowing the gas or air under pressure to pass through the inlet opening 83, the passageways 89, through the chamber 88, the passageways 92, 107, around the valve 106 through the passageways 108, the passageway 103, between the inner tube 94 and the central tube 96 and into the bottle through the passageways 104.

The speed of the gas passing from the gas inlet 83 and through the various pasasgeways into the bottle is sufficiently great to fill the bottle and the passageways with the gas pressure before the valve 106 has been moved upwardly a sufficient distance to position the tongue portion 115 into the passageway 113. Therefore the gas may first pass through both the passageway 92 and the passageways 114 and 113. If the bottle should become broken or chipped so as to allow the gas to escape therefrom, the tongue portion 115 will stop the free passage of gas through the passageways 114 and 113 and the onrush of gas will force the ball valve 90 against its seat 91 and close the passageway 92. This only occurs however when the bottle is chipped or broken.

Let us assume that the bottle is not chipped or broken and is filled with gas under pressure. By pressure I mean gas at approximately fifty pounds pressure. The gas under pressure in entering the bottle will also enter the inner tube through the passageway 105 and pass upwardly to the valve 126. As the bell unit is moved still further upwardly, it engages with the lower end of the valve stem 127 and moves the valve stem and the valve 126 upwardly. Immediately upon moving the valve 126 from its seat the gas under pressure will pass upwardly into the chamber 118. The purpose of this is to prevent the rapid flow of the liquid through the inlet 84 and to prevent

the ball 122 from seating, but to allow the liquid to pass at a moderate rate of speed from the inlet 84 through the passageways 117, through the compartment 118, through the passageways 119, the valve chamber 120, around the valve 126, through the passageways 121, through the inner tube 94 and through the passageway 105 into the bottle.

The passageway 105 is tapered slightly upwardly so as to direct the liquid upwardly through an arc so that the water or liquid will contact with the inner wall of the bottle without causing any disturbance of the liquid. In this manner, the liquid will flow down the inner wall of the bottle and fill the bottle to the outlet air openings 104.

The purpose of allowing gas under pressure to enter the bottle prior to the filling of the bottle with liquid is to allow the liquid to enter the bottle filled with gas pressure and provide a cushioning effect for the liquid so as to avoid disturbance thereof. If the bottle is chipped or broken so as to prevent a perfect sealing, the gas under pressure which passes into the bottle after the valve 106 has been opened will escape therefrom causing the ball valve 90 to close and prevent the further escapement of gas. Also the counter gas pressure which is against the ball valve 122 when the bottle is in good condition is eliminated and the liquid in passing rapidly into the compartment 118 will force the ball valve 122 against its seat 123, thus shutting off the flow of the liquid.

Assuming that the bottle is in good condition and the bottle has been filled with the liquid, there will remain a top pressure between the level of the liquid and the top of the bottle. A special means is provided for releasing this top pressure gradually so as to prevent any disturbance of the liquid when the bottle is released from the filling valve. This means consists in the provision of a snift valve 135 which is loosely mounted in a bushing 136 in the casing 82. The valve 135 is arranged to seat at 137 for closing an air passageway 138 which communicates with a passageway 139 between the outer tube 98 and the central tube 96 by means of passageways 140 through the discs 95 and 97 and a passageway 141. A needle valve 142 is adjustably carried by the casing 82 and is arranged to vary the speed of the gas in passing through the passageway 141.

A sliding valve lever 143 is pivotally mounted at 144 to the casing 82 and is provided with an arm 145 which extends inwardly in engagement with the valve 135. A tension spring 146 is adapted to hold the valve 135 normally in closed position. A cam 147 is integral with the bell unit 130 and is arranged to engage with the valve lever 143.

The tapered portion 67 of the cam 62 allows the gradual upward movement of the bottle rest causing the bottle to engage with the bell unit and move the bell unit upwardly so as to first open the valve 106, fill the bottle with gas under pressure, and then opening the valve 126 so as to allow the liquid to enter the bottle under pressure. When this has been accomplished, the roller 61 has been moved free from the cam 62 by the rotation of the drum 45, and during the rotation of the drum the liquid slowly passes into the bottle.

By the time the bottle reaches the position whereby the roller 61 of the rest 52 thereof reaches the cam 62, the bottle will be filled with the liquid. As the roller engages with the surface 63 of the cam and the rest 52 is moved downwardly together with the bottle and the bell unit, the liquid valve 126 and the gas valve 106 will be released and allowed to close, thus cutting off the flow of the liquid and the gas. As the roller 61 passes upon the surface 64 of the cam 62, the bell unit 130 will have been moved downwardly a sufficient distance to cause the cam 147 to engage with the valve lever 143 and swing the lever about its pivot and move the snift valve 135 away from its seat 137. During this operation the bottle is still sealed.

It will be noted that the outer tube 98 terminates a short distance from the filling valve tip 102, thus allowing the top pressure or that gas pressure in the bottle between the upper level of the liquid and the top of the bottle to escape through the passageway 139, the passageways 140 and 141, by the needle valve 142, through the passageway 138, around the valve 135, through the opening in the bushing 136, and out into the atmosphere.

By the time the roller 61 reaches the transversely extending portion 65 of the cam 62, the top pressure will have been allowed to escape. As the roller 61 passes downwardly over the surface 65 and upon the surface 66, the bottle rest together with the bottle will be drawn downwardly to their lowermost positions releasing the bottle from the bell unit. Before the bottle is released, however, the gas valve 106 is closed and then the valve lever 143 is released allowing the spring 146 to move the valve against its seat 137.

The filled bottles are taken from the bottle rests by the rotating star wheel 39 and moved into engagement with the intermittent moving star wheel 28. The star wheel 28 receives the filled bottles and moves them one at a time into a position beneath and in alignment with the crowning unit as an empty bottle is moved into alignment with the syruping unit 9. The star wheel 28 holds the empty bottle under the syruping unit and the filled bottle under the crowning unit as has been heretofore described. While the star wheel 28 is at rest, the units 9 and 10 will be moved downwardly into engagement with the bottles placing a desired amount of syrup in the empty bottle and crowning the filled bottle. The filled bottles are then moved by the star wheel 28 upon a conveying means, not shown.

I claim:

1. A device of the type described comprising a base, a housing disposed upon said base, a top for said housing, a drum rotatably mounted upon said base adjacent said housing, a plurality of bottle rests carried by said drum adjacent the peripheral edge thereof, means for moving and normally holding said bottle rests in an upward position, means for moving said bottle rests downwardly a slight distance and holding said bottle rests in this position for a predetermined distance during the rotative travel of said drum, means for moving said bottle rests into alignment with said top when said bottle rests are moved adjacent said housing, means for holding said bottle rests in alignment with said top until said rests are moved away from said housing, and means for releasing said bottle rests whereby said bottle rests may again move to their normal upward positions.

2. In a bottle filling valve, the combination with a valve casing of means for connecting said casing with a gas supply, means for connecting said casing with a liquid supply, a liquid delivery

tube supported by and extending downwardly from said casing, a gas delivery tube supported by said casing and telescoping said liquid tube, a valve in said casing controlling the flow of liquid to said liquid tube and having a stem projecting below said casing, a second valve in said casing controlling the flow of gas through said gas tube and having a stem projecting below said casing to a point beyond said liquid stem and a bottle sealing bell telescoping said tube and vertically moved by the bottle to be filled, first into engagement with said gas valve stem and then with said liquid valve stem.

3. In a bottle filling valve, the combination with a casing having a liquid passageway therethrough connected with a liquid supply and having a gas passage therethrough connected with a gas supply, a downwardly extending liquid tube supported by said casing, a gas tube supported by said casing and telescoping said liquid tube, a liquid controlling valve in said liquid passage having a stem extending below the casing, a ball valve in said passage for controlling the passage of fluid therethrough, a valve in said gas passage having a stem projecting below the casing to a point beyond that of the liquid valve stem, a ball valve in said passage for controlling the passage of gas therethrough, and a bottle sealing bell telescoping said tubes and movable by the bottle, first into engagement with the gas valve stem, and then into engagement with the liquid valve stem.

4. In a bottle filling valve, the combination with a casing of means for connecting said casing with a gas supply, means for connecting said casing with a liquid supply, a liquid supply tube supported from said casing and extending downwardly, a valve in said casing for controlling the passage of liquid through said tube and having a stem extending below said casing, a gas supply tube supported from said casing and telescoping said liquid supply tube, a valve for controlling the passage of gas through said tube and having a stem projecting below the casing to a point beyond that of the liquid valve stem, a snifter tube supported from said casing and telescoping the gas tube, a valve controlling the communication of said snifter tube with the atmosphere, a bottle sealing bell movable by the bottle first into engagement with the gas valve stem and then in engagement with the liquid valve stem and means operated by the movement of the bottle toward its retracted position for opening said snifter valve.

5. In a bottle filling valve, the combination with a casing of means for connecting said casing with a liquid supply, means for connecting said casing with a gas supply, a liquid delivery tube supported by said casing extending downwardly and having a radially disposed delivery opening at its bottom, a valve in said casing for controlling the passage of fluid through said tube, a gas delivery tube telescoping said liquid tube and having a delivery opening above said liquid tube delivery opening, a valve in said casing for controlling the passage of gas through said gas tube, a snifter tube telescoping said gas tube and having an inlet at its lower end above said gas and liquid and delivery outlets, a valve controlling the communication of said snifter tube with the atmosphere, means operated by the vertical upward movement of the bottle to be filled for successively operating said gas and liquid valve and means operated by the vertical downward movement of the bottle for opening said snifter valve.

6. In a bottle filling valve, the combination with a casing, of a liquid supply tube supported from said casing and extending downwardly therefrom, a valve in said casing for controlling the passage of liquid through said tube, a gas supply tube supported from said casing and telescoping said liquid supply tube, a valve for controlling the passage of gas through said tube, a snifter tube supported from said casing and telescoping said first mentioned tubes, a valve controlling the communication of said snifter tube with the atmosphere, and means operated by the relative vertical movement of the bottle to be filled to said filling valve in one direction for initially opening said gas valve and then opening said liquid valve and by the movement of the bottle in its retracted position for opening said snifter valve.

7. A bottle filling valve having a normally closed gas passageway, a normally closed water passageway for delivering gas and water to the bottle to be filled and a normally closed passageway communicating with the atmosphere and with the bottle to be filled, of means operated by the initial movement of the bottle to be filled in one direction for opening said gas valve and by a continued movement of a bottle in the same direction for opening said liquid valve and by a retractal movement of the bottle for opening said snifter valve.

8. A bottle filling valve having a normally closed gas passageway and a normally closed liquid passageway for delivering gas and liquid to the bottle to be filled, a valve for said gas passageway, a valve for said liquid passageway, means operated by the relative movement between the bottle and the filling valve for successively operating said gas and liquid valves to permit a flow to the bottle to be filled and a second valve gravity opened, controlling the flow of gas through said filling valve and operated to shut off the flow of gas to the bottle with the first mentioned gas valve opened, by a preponderant flow of gas in event of the escape of gas from the bottle.

9. A bottle filling valve having a gas passageway and a liquid passageway for delivering gas and liquid to the bottle to be filled, a valve for said gas passageway, a valve for said liquid passageway, means operated by the relative movement between said filling valve and the bottle for successively opening said valves and a second normally gravity opened valve controlling the passage of liquid to the liquid passageway, said valve being maintained opened during the passage of liquid therethrough by the counter-pressure of gas in the bottle, and moved to closed position by the preponderant flow of liquid therethrough in event of the removal of said counter-pressure by the escape of gas from the bottle.

10. A bottle filling valve having a gas passageway and a liquid passageway for delivering gas and liquid to the bottle to be filled, a valve for said gas passageway, a valve for said liquid passageway, means operated by the relative movement between said filling valve and the bottle for successively opening said valves, a second valve, gravity opened, controlling the flow of gas through said filling valve and operated to shut off the flow of gas to the bottle with the first mentioned gas valve opened by a preponderance of flow of gas in event of escape of gas from the bottle and a second normally gravity opened valve for said liquid passageway, said valve being maintained opened during the passage of

liquid therethrough by the counter-pressure of gas in the bottle and moved to closed position by the preponderant flow of liquid therethrough in event of the removal of said counter-pressure by the escape of gas from the bottle.

11. In a bottle filling valve, the combination with a valve casing, of means for connecting said casing with a gas supply, means for connecting said casing with a liquid supply, a liquid delivery tube supported by and extending downwardly from said casing, a gas delivery tube supported by said casing and telescoping said liquid tube, a valve in said casing controlling the flow of liquid to the liquid tube and having a stem projecting below said casing, a second valve in said casing controlling the flow of gas through said gas tube and having a stem projecting below said casing to a point below said liquid valve stem, a bottle sealing bell telescoping said tubes and vertically moved by the bottle to be filled first into engagement with said gas valve stem and the said liquid valve stem and a second gas valve in said casing automatically closed by the gas pressure in event of the escape of gas from the bottle to be filled.

12. In a bottle filling valve, the combination with a valve casing, of means for connecting said casing with a gas supply, means for connecting said casing with a liquid supply, a liquid delivery tube supported by and extending downwardly from said casing, a gas delivery tube supported by said casing and telescoping said liquid tube, a valve in said casing controlling the flow of liquid to the liquid tube and having a stem projecting below said casing, a second valve in said casing controlling the flow of gas through said gas tube and having a stem projecting below said casing to a point beyond said liquid stem, a bottle sealing bell telescoping said tube and vertically moved by the bottle to be filled first into engagement with the gas valve and then with said liquid valve and a second valve controlling the passage of liquid through said liquid tube maintained open during the passage of liquid therethrough by the counter-pressure of gas in the bottle to be filled and automatically closed by the passage of liquid therethrough in event of the escape of gas from the bottle to be filled.

13. A bottle filling valve having a gas passageway and a water passageway for delivering gas and water to the bottle to be filled, means operated by the bottle for successively opening said gas and water passageways to permit the admission of gas and water to the bottle, a by-pass in said gas passageway, said bottle operated means being moved to close said by-pass when the gas passageway is opened and a valve automatically operated by a preponderance of flow of gas on escape of gas from the bottle to be filled to close the main portion of said gas passage.

JAMES KANTOR.