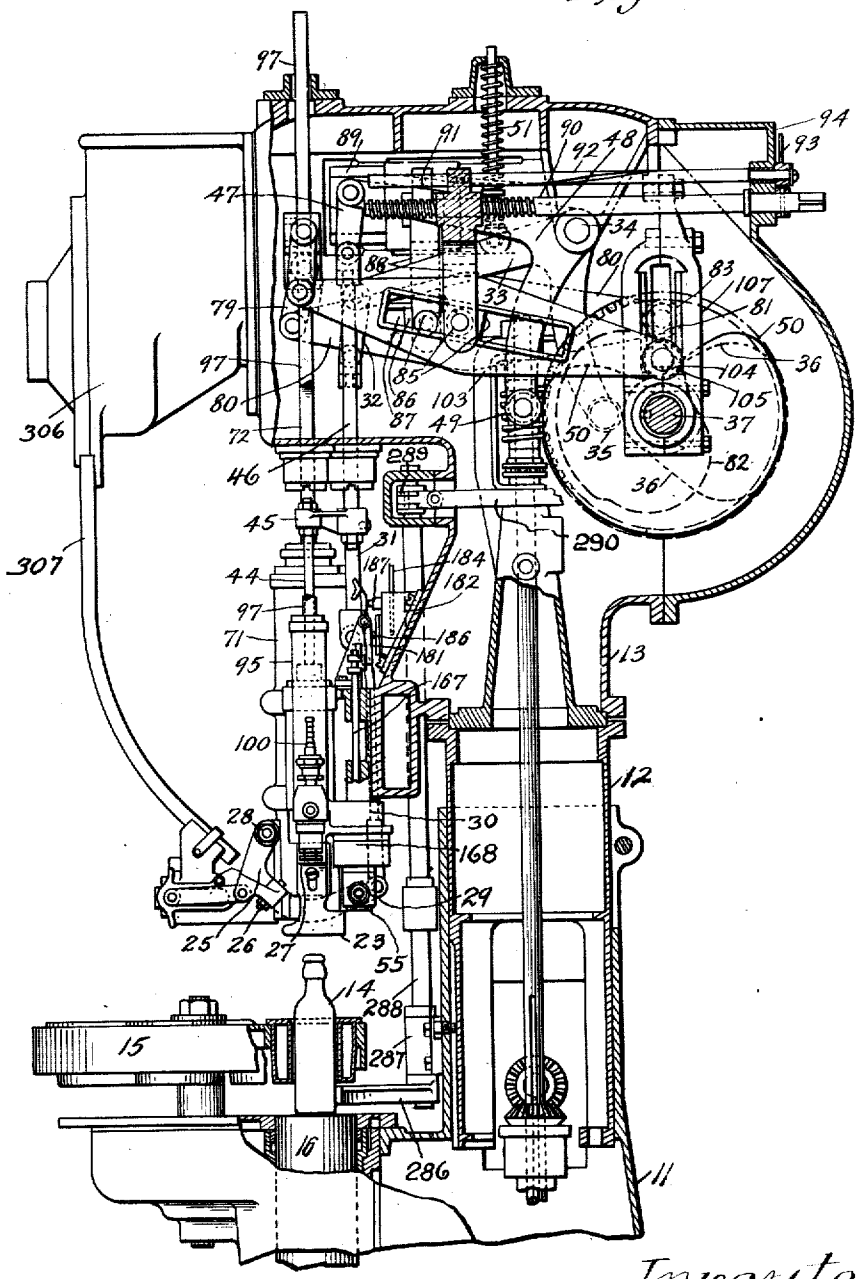
Oct. 2, 1923. 1,469,560

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PACKAGING APPARATUS

Filed Sept. 4, 1918 5 Sheets-Sheet 1

Fig. 1



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PACKAGING APPARATUS

Filed Sept. 4, 1918 5 Sheets-Sheet 2

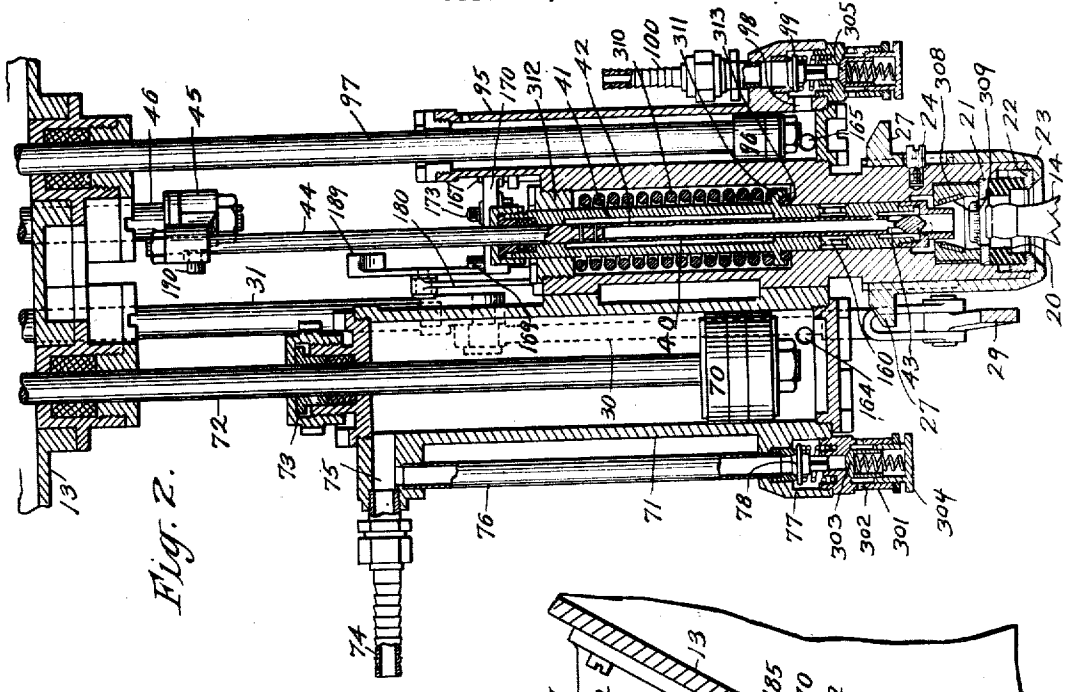


Fig. 2.

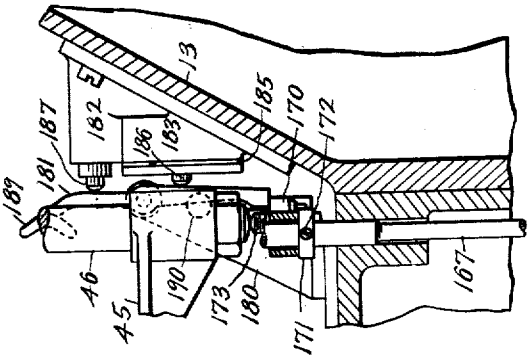


Fig. 7.

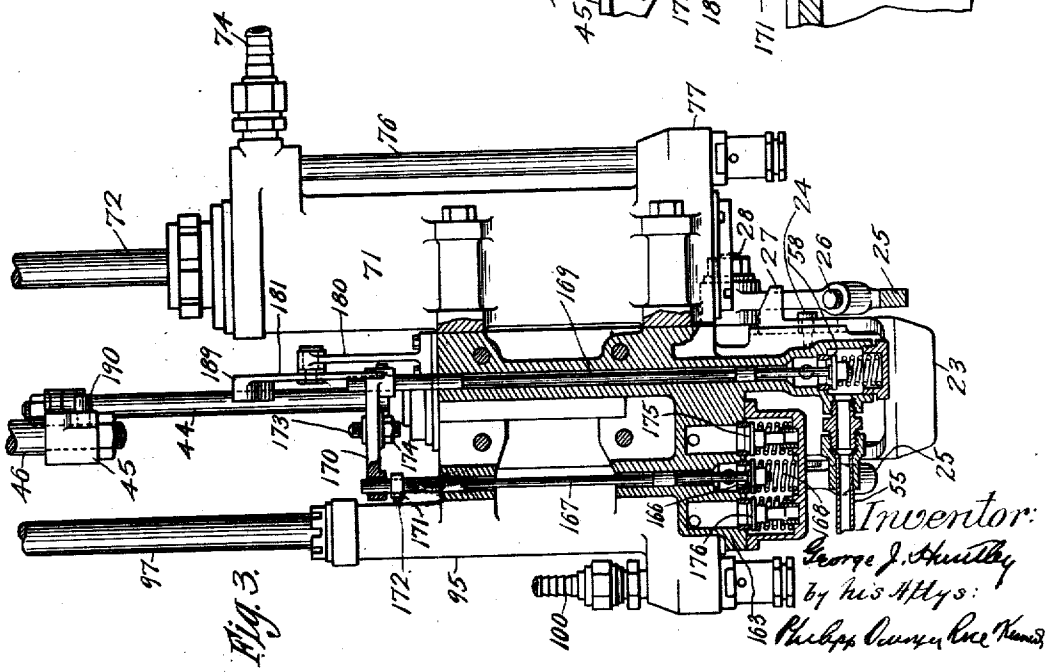


Fig. 3.

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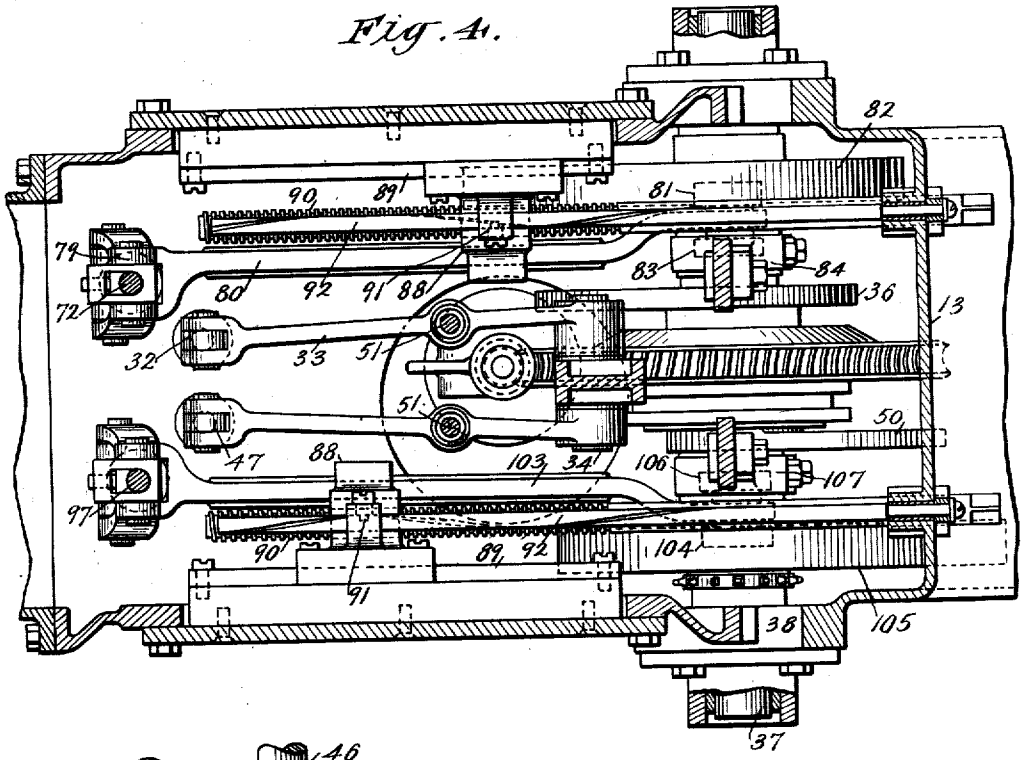
Oct. 2, 1923. 1,469,560

G. J. HUNTLEY

PACKAGING APPARATUS

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Fig. 4.



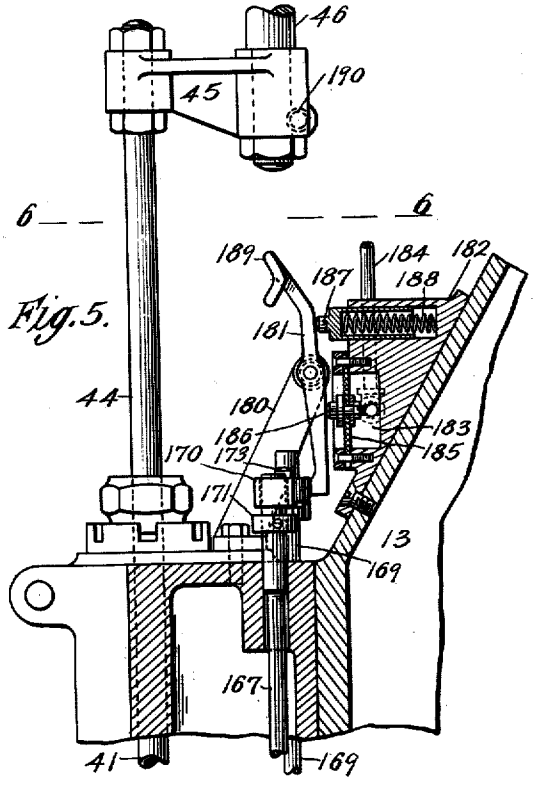
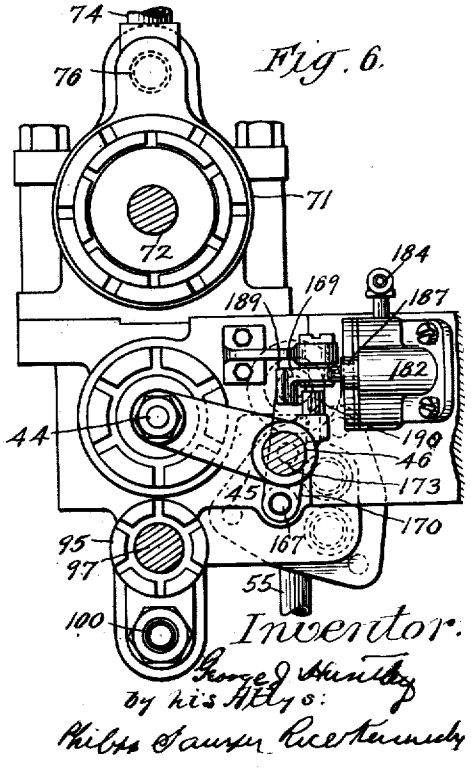


Fig. 5.

Fig. 6.



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PACKAGING APPARATUS

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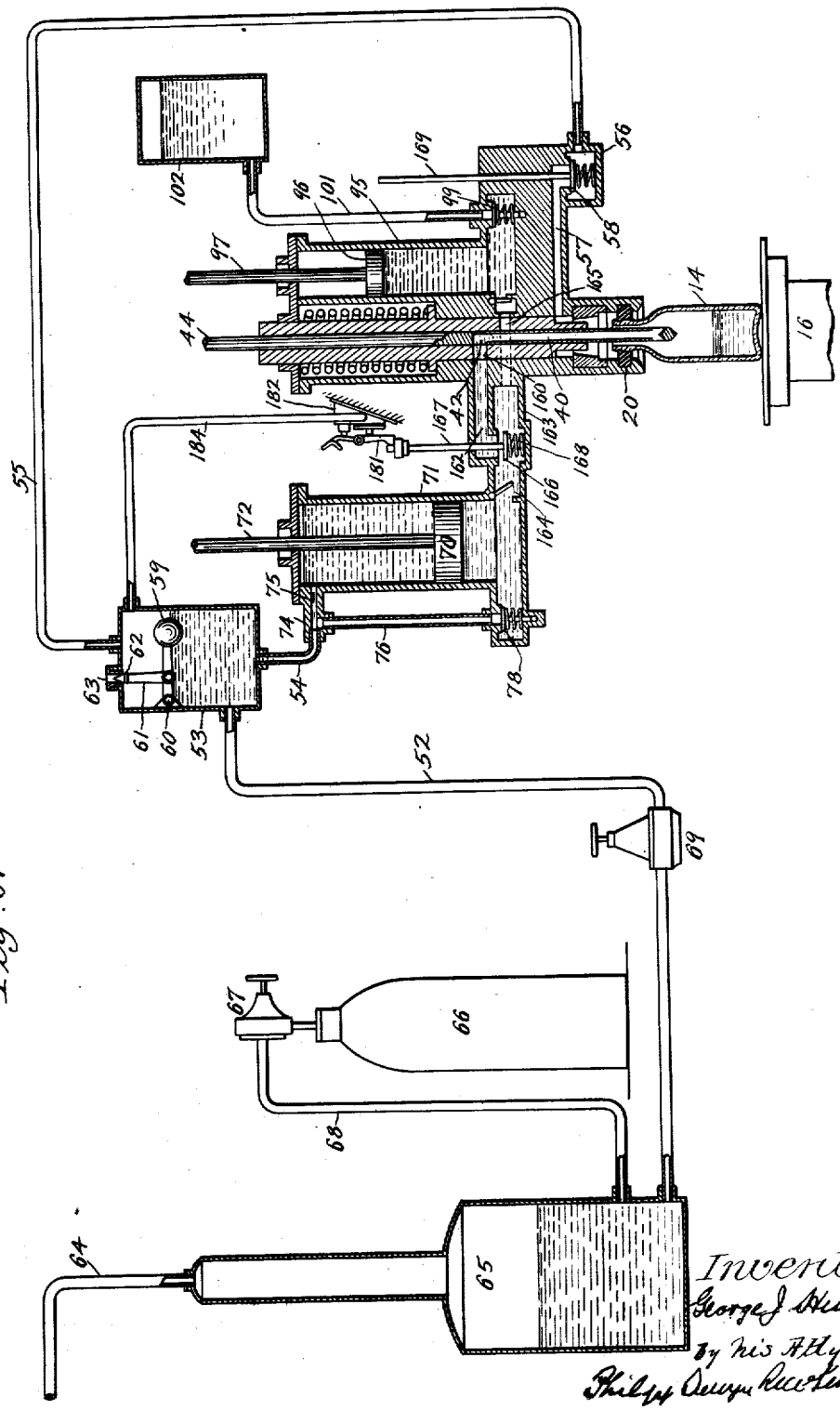


Fig. 8.

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PACKAGING APPARATUS

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Fig. 10.

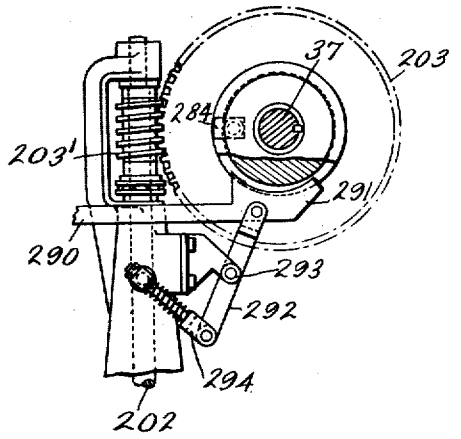
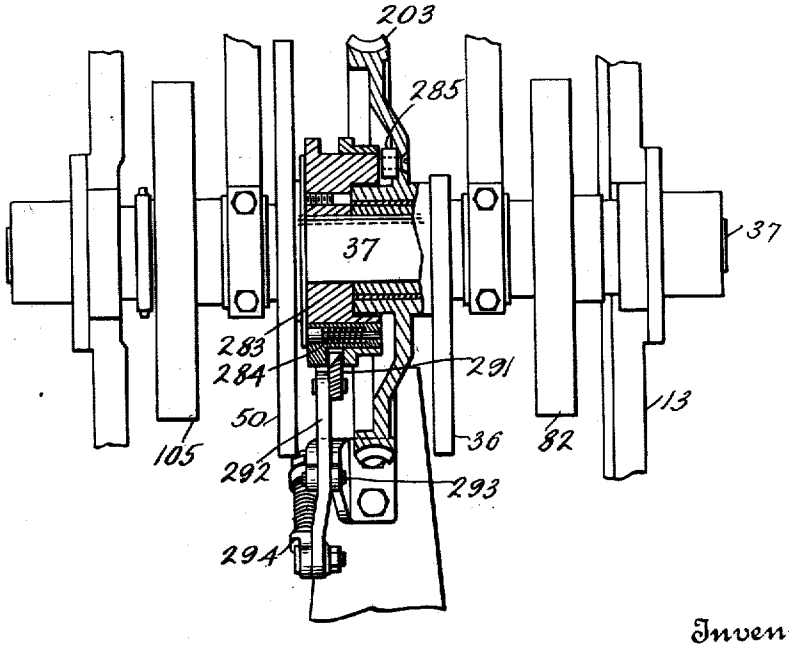


Fig. 9.



Inventor

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By his Attorneys

Philipp, Dawson & Kiesewetter

Patented Oct. 2, 1923.

1,469,560

UNITED STATES PATENT OFFICE.

GEORGE JOHN HUNTLEY, OF BALTIMORE, MARYLAND, ASSIGNOR TO THE CROWN CORK AND SEAL COMPANY OF BALTIMORE CITY, A CORPORATION OF MARYLAND.

PACKAGING APPARATUS.

Application filed September 4, 1918. Serial No. 252,536.

To all whom it may concern:

Be it known that I, GEORGE J. HUNTLEY, a subject of the King of Great Britain, residing at Baltimore, State of Maryland, have invented certain new and useful Improvements in Packaging Apparatus, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

This invention relates to packaging apparatus and particularly to that type of apparatus in which bottles are filled with a carbonated liquid and there is established in the bottle, during filling, a counter pressure.

In filling bottles with carbonated liquid there is some breakage and, in apparatus as heretofore known, when a bottle breaks there has been a loss of liquid and gas because of the escaping flow.

It is the principal object of the present invention to provide apparatus of the type indicated in which the flow of liquid and gas is cut off in case a bottle breaks during the filling operation.

With this general object, and other objects and advantages, which will be obvious to those skilled in the art, in view, the invention consists in the features, details of construction and combinations which will be described in connection with the accompanying drawings and then more particularly pointed out.

In the drawings:—

Figure 1 is a vertical cross sectional view, with parts in side elevation, of a packaging apparatus constructed in accordance with the invention.

Figure 2 is a vertical sectional view (enlarged) showing the capping and filling head and the water and syrup pumps.

Figure 3 is a view in rear elevation, with parts broken away and in section, showing the valve control.

Figure 4 is a horizontal sectional view taken near the top of the apparatus.

Figure 5 is a detail view in vertical section of the valve locking mechanism.

Figure 6 is a cross-sectional view taken on the line 6—6 of Figure 5.

Figure 7 is a detail view of side elevation with parts broken away, of the valve locking mechanism,

Figure 8 is a diagrammatic view of the apparatus.

Fig. 9 is a view partly in vertical section and partly in elevation of a portion of the mechanism shown in Fig. 1; and

Fig. 10 is a detail view in vertical section of a portion of the operating mechanism.

Referring to the drawings, illustrating an embodiment of the invention the machine is supported by a standard 11. Slidable in this standard is a column 12 which carries a housing 13 for supporting the packaging mechanism and associated parts.

Bottles to be filled, such as that shown at 14, and successively fed to a position beneath the packaging mechanism by a bottle dial 15, which may be constructed and operated in any suitable manner. In this position the bottle rests on a movable support 16 which is raised, by any suitable means to the packaging mechanism by two movements to place the bottle first in a position to be filled and thereafter to a position for capping.

Since the bottles are being filled with liquid under pressure, means is provided for sealing the bottles in the filling head. Although capable of various constructions, as here shown, carried by the filling head is a compressible gasket 20 bearing at the top against an abutment ring 21, and engaged about the bottom edge by an angle ring 22 carried by a slotted yoke 23 riding on the pins 24 which are carried by the head. This yoke is moved against the sealing gasket to contract the same by means of oscillating arms 25 carrying adjustable pins 26 arranged to engage lugs 27 on the yoke 23. The arms 25 are connected by a pivotal shaft 28 and one of them is provided with an extension 29 to which is secured a rod 30 reciprocated by a plunger 31. This plunger is connected by a link 32 with a rocker lever 33 pivoted on a cross shaft 34 and having a cam roller 35 riding on a cam 36. This cam is keyed to a shaft 37 journaled in bearings 38 carried by the housing 13 and rotated as later described. Rotation of the cam 36 causes the arms 25 to alternately move the compressing yoke to contract and release the sealing gasket.

In the embodiment of the invention illustrated both water and syrup are conveyed to the bottle by a nozzle connected with the two sources of supply, this nozzle being introduced into the bottle for the filling opera-

tion. The nozzle illustrated in Figure 2 comprises a tube 40 sliding in a capping plunger 41. This tube is provided, near its upper end, with inlet ports 42 and at the bottom with discharge ports 43 arranged to discharge the liquid into the bottle with a minimum amount of disturbance. To lower and raise the nozzle to and from the bottles the tube 40 is secured to a reciprocating rod 44 connected by a cross piece 45 with a plunger 46, operated, for example, by mechanism similar to that which operates the gasket controlling plunger. As shown, the plunger 46 is connected by a link 47 with a rocker lever 48 pivoted on the cross shaft 34. The rocker lever 48 carries a cam roller 49 which rides on a cam 50 driven by the cam shaft 37 by being secured to a clutch member 283 later referred to. Rotation of the cam 50 causes the nozzle to be alternately lowered into and raised from the bottle presented.

The rocker levers 33 and 49 are held to their duty by spring pressed rods 51 which yield in case the nozzle, on its downward stroke should chance to encounter a bottle already capped, or other obstruction opposing its full stroke.

There is provided means for establishing in the bottle during filling, a counter pressure which may conveniently be substantially equal to the pressure of the carbonated water. In structures embodying the invention to the best advantage, there is provided a pressure line including a source of carbonated water and a source of free gas and the bottle is made part of this pressure line during filling. The air displaced from the bottles filled, discharges into the pressure line and means is provided for maintaining a substantial balance of pressure in the line. This may be accomplished by providing a reservoir for water, gas and air having associated therewith means for causing venting of the gaseous contents (which includes the displaced air) upon its accumulating beyond a given point. As here illustrated as an example, carbonated water and free gas are delivered as hereinafter described by a pipe 52 to a reservoir tank 53. This reservoir has a water delivery pipe 54 leading from the bottom thereof, and from the upper portion thereof is a counter pressure connection with the bottle, comprising a pipe 55, valve chest 56 and duct 57, the last opening into the filling head. This connection is normally closed by a spring pressed valve 58 in the valve chest 56. After a bottle has been sealed in the head, the valve is opened as later described, and the bottle is thus made part of the pressure line.

In the reservoir 53 is a float 59 pivoted as at 60 and carrying a spindle 61 on which is a vent valve 62 seating in a vent port 63 formed in the top of the reservoir tank. Valve 58 being closed, the water and free gas enter the reservoir and the water raises the float until the vent valve closes. Thereafter the flow continues until the pressure of the gas in the line substantially equals the pressure of the carbonated water. When water is withdrawn from the reservoir as hereinafter described, and delivered to the bottles presented for filling, the displaced air from the bottles discharges into the counter pressure connection and a new supply of water and free gas flows into the reservoir until the pressure of the free gas and air balances the water pressure and again stops the flow. Should the pressure of the gaseous matter (i. e., air and free gas) reach a given point, the water level recedes sufficiently to lower the float and open the vent valve. This vents the excess gas and air and the inflowing water raises the float to close the valve again. Thus the accumulated air is positively vented upon exceeding a given amount and the balance of pressure is maintained in the pressure line without permitting the relative proportion of water to drop below a given minimum.

There is provided means whereby the pressure line is supplied with free gas and with carbonated water at a minimum pressure for a given degree of carbonation. As here shown as an example, water from any suitable source flows by pipe 64 to a carbonator 65, which may be of any suitable construction. The carbonator receives gas from a drum 66 through control valve 67 and pipe 68. From the carbonator a pipe for the carbonated water leads to a reducer valve 69 from which the delivery pipe 52 leads to the reservoir. The ordinary carbonator is not 100% efficient and consequently the carbonated product holds an excess of gas. The reducer valve 69 is set to remove substantially all of the excess gas. From the valve the water and freed gas pass to the reservoir. Thus the water supplied for delivery to the bottles has a minimum pressure for the degree of carbonation and the removed gas is utilized in building up the counter pressure in the pressure line.

There is provided means for forcing the carbonated liquid into the bottles to be filled, and provision is further made for so doing with a fixed effective force. This may be accomplished for example, by an impeller working in a cylinder or the like. As here shown, an impeller or pump is provided comprising a piston 70 reciprocating in a cylinder 71 and secured to a piston rod 72 sliding in a stuffing box 73. This pump is connected with the reservoir and the bottle so as to draw water from the reservoir on its suction stroke and to force the water into the bottles on the impelling stroke. To this end, a nozzle 74 (Fig. 2) connected with the reservoir in any suitable manner as by pipe

54, opens into a passage 75 formed near the top of the cylinder. This passage is connected by a pipe 76 with a chamber 77 formed near the bottom of the cylinder and communicating therewith. In the chamber 77 is a spring pressed check valve 78 arranged to open on the suction stroke and to be closed on the impelling stroke of the piston. The passage 75 also communicates with the cylinder 71, water being admitted above the piston to partially balance the pressure thereon during the impelling stroke. The connection from the pump cylinder to the bottle is later described.

Means is provided for reciprocating the piston with a given stroke. Although capable of various constructions, as here shown, the piston rod 72 is connected by a link 79 with a rocker lever 80. This latter member carries a cam roller 81 which rides on a cam 82, driven by the upper cam shaft 37. Rotation of the cam oscillates the rocker lever to reciprocate the piston rod. In order that the lever may have a vertical movement it is provided with a second roller 83 riding in a bracket 84.

With the construction described, the amount of liquid delivered by the pump is a function of the length of stroke of the piston and equal charges are delivered to successive bottles regardless of the speed of operation or variation in the size of the bottles. Apparatus embodying the invention in its entirety, however, is adapted to fill bottles of different sizes, as, for example, quarts, pints and splits. To vary the equal charges delivered, therefore, means is provided for adjusting the stroke of the piston to suit the size of bottles being filled, or in other words, to vary the quantity delivered as may be desirable. As here shown, the pump piston has a neutral or zero position midway of the cylinder and its stroke either way therefrom is varied by varying the effective stroke of the operation mechanism. When operating means such as that described is utilized, means may be provided for shifting the pivot on which the lever rocks. This varies the stroke of the driving end of the lever without affecting the stroke of the cam driven end. In the present embodiment, the lever rocks on a pivoted pin 85 carried by a block 86 which is slidable in a slot 87 formed in the rocker lever. This block is carried by a yoke 88 which has a sliding support on a dove-tailed bracket 89. Through the yoke 88 is threaded an adjusting rod 90 which may be rotated in any suitable manner. It will be seen that rotation of the rod 90 will move the yoke along the bracket 89 thus shifting the pivot 85 on which the rocker lever swings.

Means is provided for indicating the adjustment for which the pump is set. Although capable of various constructions, as here shown, the yoke 88 carries a pin 91 which moves in a spiral groove on a rod 92 so as to rotate the same as the yoke moves. At the end of this rod 92 is a pointer 93 revolving over a dial 94 divided to show the adjustment in terms of ounces.

As before mentioned, the apparatus illustrated is of the type which delivers a quantity of "syrup" to the bottle. There is provided means for delivering syrup to the bottles in variable measured quantities in the same manner the water is delivered. In the apparatus shown this is accomplished by means similar to the water delivery means. The syrup impelling means comprises a cylinder 95 in which reciprocates a piston 96 on a piston rod 97. Opening out of the lower end of the cylinder is a passage 98 connecting through a check valve 99 with a nozzle 100 which is connected by pipe 101 with a source of supply 102. The piston 96 is reciprocated from a neutral position midway of the cylinder by mechanism which is a counterpart of the operative mechanism for the water pump. That is to say, the piston rod is linked to a rocker lever 103 carrying a cam roller 104 riding on a cam 105 driven by the upper cam shaft 37. The lever also carries a roller 106 riding on a guiding bracket 107. The mechanism for varying the stroke of the lever by shifting the pivot pin and for indicating the point of adjustment is a counterpart of the similar mechanism for the water pump and no further description is necessary.

There is provided a connection between the source of carbonated liquid and the bottle and means for closing said connection to stop the flow upon the breaking of a bottle during the filling operation, or upon any predetermined drop of pressure in the pressure line of which the bottle forms a part. This may be accomplished, for example, by providing a valve in the connections between the source and the bottle for controlling the flow, such valve being caused to close upon a predetermined drop of pressure in the pressure line, as by the breakage of a bottle.

In the embodiment here shown a common passage for water and syrups leads to the nozzle and the flow therethrough is controlled by a valve spring pressed to be nominally closed. To this end, the nozzle ports 42 are arranged to register, when the nozzle is in filling position with a chamber 160 formed in the plunger 41. This chamber is in communication with a common delivery duct 162 leading from a valve chest 163. Water is received into the valve chest by way of a duct 164 leading from the bottom of the water pump cylinder 71, and syrup by way of a duct 165 leading from the bottom of the syrup pump cylinder 95. In the valve chest, to control the flow to the noz-

zle is a liquid control valve 166 secured to a valve rod 167, normally held closed by a spring 168.

Means is provided for operating the valve rod to open the valve and in constructions embodying the invention to the best advantage, this operation is dependent on the position of the nozzle. That is to say, provision is made for causing the valve to open to permit the flow of liquid when the nozzle has reached the proper position with relation to the bottle. Means is also provided for operating the gas controlling valve 58 so as to open the latter slightly in advance of the liquid control valve, and these two operations may be performed by the same means. As shown, for example, the valve 58 is actuated by a valve rod 169. This valve rod and the valve rod 167 are moved by an operating bar 170. This bar is secured to the valve rod 169 and is slidable on valve rod 167. On the latter, in a position to be engaged by the bar, is a collar 171 adjustably secured in place by a set screw 172. It will be seen that movement of the bar causes movement of the valve rod 169 and that rod 167 will also be displaced as soon as the bar engages collar 171. The bar 170 is moved by the plunger 46 which reciprocates the nozzle, the bar carrying a pin 173 which is engaged by the end of the plunger 46 as the latter makes its downward stroke. Thus, as the nozzle takes filling position, the valves are opened, the gas control valve being opened sufficiently in advance to allow the bottle to attain its proper counter pressure prior to the admission of the liquid. Further, the operation is such that the valves are positively controlled, their opening taking place only after the nozzle has reached filling position in the bottle. Thus there can be no premature flow of gas or liquid. To perfect the timing as may be desirable, the pin 173 is made adjustable by being threaded through the bar 170. It is locked in position by a lock nut 174. The relative opening of the two valves may be timed by shifting the collar 171.

Since one pump is making a suction stroke while the other is making its impelling stroke, check valves are provided for the water and syrup connections. As shown, in the valve chest 163 is a spring pressed check valve 175 for controlling the water passage to the valve chest and a similar valve 176 for controlling the syrup passage.

These valves are arranged to be closed by their springs on the suction stroke of their respective pumps and opened by the force of the impelling stroke.

As before stated the valve controlling the flow to the bottle is caused to close upon a predetermined drop of pressure, as by the breakage of a bottle. In structures embodying the invention to the best advantage, associated with the valve is means tending to close the same, and means for opening such closing means, to hold the valve open as long as a predetermined pressure is maintained. This controlling mechanism may also control the gas valve 58. Although capable of various constructions, in the embodiment here illustrated as an example, pivoted on a bracket 180 is a valve locking arm or latch 181, the lower end of which is adapted to engage a portion of the bar 170 when the latter is in valve opening position, and to hold it in such position. This member 181 is acted upon by two forces, one tending to move it into unlocking position, the other dependent upon the pressure tending to move it into and hold it in locking position as long as a predetermined pressure is maintained in the pressure line. As shown, in a bracket 182 carried in the upper housing is a diaphragm chest 183 connected by a pipe 184 with the pressure line. As illustrated, the pipe 184 leads to the top of the reservoir tank. Secured to the bracket 182, across the diaphragm chest 183 is a flexible diaphragm 185. This diaphragm carries a pin 186 adapted to engage the latch member 181 in a position and manner tending to move or hold it in locking position. Also engaging the latch 181 is a plunger 187 slidable in bracket 182 and pressed outwardly against the latch by a spring 188. The tendency of this plunger is to swing the latch to remove the lower end from the bar 170, thus releasing the valves and allowing them to close. The spring 188 is given a predetermined force which is somewhat less than the pressure normally maintained in the pressure line. After the bar 170 has been moved down by the nozzle operating plunger, to open the liquid and gas valves, the superior force of the diaphragm over the plunger moves the latch 181 into a position to engage the bar 170 and thus the valves are locked open. This situation continues under normal conditions until the latch is unlocked after filling, as later described. Should, however, a bottle break, it will be seen that the pressure line is opened to the atmosphere and there will be a sudden drop of pressure in the line. This drop of pressure is communicated to the diaphragm chest by pipe 184 and as a result, the force of spring 188 is now superior to the force on the diaphragm and the latch 181 will be swung in a manner to remove it from engagement with the bar 170. The latter member being released, it will be seen that the valves are free to close under their springs, thus shutting off the flow of both liquid and gas to the bottle.

With such a construction loss of liquid and gas due to a breaking bottle, or the like, is prevented.

Means is also provided for releasing the valve lock under normal conditions and this release may be dependent on the position of the nozzle. As here illustrated as an example, the locking arm 181 has a cam portion 189 at its upper end arranged to be engaged by a wiper pin 190 carried by the cross piece 45 on the nozzle plunger. As the latter rises to withdraw the nozzle, the pin 190 engages the cam 189 and swings the locking arm against the force of the diaphragm, out of locking position, thus freeing the bar 170 and allowing the valves to close by virtue of their springs. This release is arranged to take place as the nozzle is about to leave the bottle. The construction described effects a saving of time, as the flow continues substantially as long as the nozzle remains in the bottle.

Since it sometimes happens that the pump pistons will make a part or all of their impelling stroke with the valves closed, relief valves may be provided. As here shown as an example, the bottom of chamber 77 is in the form of a cylindrical nut 301 having discharge ports 302. These ports are normally closed by a spring pressed relief valve 303 slidable in a sleeve like cap 304 which is threaded into nut 301. This valve is arranged to open in case the pressure in the pump cylinder increases beyond a predetermined point due, for example, to the pump operating with the passage to the head closed. A similar valve 305 is provided for the syrup pump as appears in Fig. 2.

Means is provided for causing the filling apparatus to be inactive in case no bottle is presented. This may be accomplished, for example, by having the upper cam shaft driven by a clutch mechanism which is controlled by the presence of a bottle in filling position. In the present embodiment, freely rotatable on the hub of the gasket operating cam 36 (which is keyed to shaft 37) is a worm wheel 203 driven by a worm 203′ on a vertical shaft 202. This shaft 202 is driven in any suitable manner from a source of power. Keyed to the cam shaft 37 is a clutch member 283 which carries a sliding bolt 284 adapted to be engaged by a block 285 secured to the worm wheel 203. In case the sliding bolt 284 is in a position to be engaged by the block 285, the clutch member will be rotated, thereby driving the cam shaft. The sliding bolt 284 is normally in driving position and means is provided for withdrawing the bolt in case no bottle is presented. This withdrawing means is so arranged as to be normally in position to withdraw the bolt and to be rendered inoperative by the presence of a bottle. As here illustrated, extending out from the bottle table is a lever 286 pinned to a tubular element 287, this connection being adjustable. Having a slidable connection with the tubular element 287 is a vertical rod 288 at the upper end of which is pinned a lever 289, the yoked end of which is secured to a cross bar 290 which carries a wiper 291. In order to hold the wiper in normal position and to return it thereto, it is secured to a lever 292 pivoted as at 293 and controlled by a spring pressed element 294. The wiper is normally in a position to engage a projection on the clutch bolt to withdraw the latter. When, however, a bottle is presented, its movement into filling position displaces lever 286, thus withdrawing, through the connections described, the wiper to such position that it does not operate to withdraw the clutch bolt, and the cam shaft is rotated. If no bottle is presented, lever 286 is not displaced and the wiper withdraws the clutch bolt and renders the cam shaft inactive. It is noted that four of the major mechanisms are driven by the cam shaft 37. With the construction described, should the operator, for example, cease feeding bottles without stopping the machine, these four mechanisms will not operate.

Since the bottles, in the apparatus described, are filled with liquid under pressure, they are capped while sealed in the packaging head. As here illustrated, caps, such as crown corks, are supplied from a hopper 306 carried by the main housing to a chute 307 leading to the packaging head. The hopper may contain crown selecting mechanism of any suitable construction. A crown being delivered to the head, the crown entrance port is sealed by any suitable mechanism.

In the packaging head (Fig. 2) is a throat carrier 308 carrying a conical throat ring or capping die 309. Extending into the throat is the capping plunger 41 normally held down by a spring 310 bearing against a shoulder 311 on the plunger and against a nut 312 threaded into the head to have an adjustable position. The downward movement of the plunger is limited by the engagement of a gasket 313 carried by shoulder 311 with part of the head. As the elevated bottle, loosely carrying the previously fed cap, engages the plunger 41, the latter is forced back against its spring, and the closing of the spring definitely stops the plunger and consequently limits the extent to which the bottle may enter the throat. After this limit is reached, further upward movement of the elevating device is compensated for by yielding of the bottle elevating table, the amount of compensation depending on the height of the bottle. By this construction, a uniform pressure is applied to the successive bottles. This pressure provides the necessary sealing contact between cap and bottle and the cap skirt is crimped about the bottle by the capping die in the manner well known in the art.

The operation of the apparatus as a whole

will be clear from the foregoing without further description.

Certain features above described are claimed in a copending application, Ser. No. 243,652.

What is claimed is:—

1. In a packaging apparatus, and in combination, a carbonator, a reducing valve connected therewith, a reservoir connected with the reducer valve, a filling head having a nozzle, a liquid connection between the reservoir and the nozzle, a fluid connection for connecting the upper part of the reservoir with the bottle to be filled, means for sealing the bottle in the filling head, the reservoir and said connections constituting a pressure line of which the bottle is made a part, and means for opening both of said connections after the bottle has been sealed in the head, closing them before the sealing means is released, and closing one of them upon a predetermined drop in the pressure line, as by the breaking of a bottle.

2. In a packaging apparatus, and in combination, a filling head having a nozzle, means for sealing the bottle to be filled in said head, a reservoir connected to a source of carbonated liquid, a liquid connection between the reservoir and the nozzle, a fluid connection for connecting the upper part of the reservoir with the bottle, the reservoir and said connections constituting a pressure line of which the bottle is made a part, and means for opening both of said connections after the bottle has been sealed in the head, closing them before the sealing means is released, and closing one of them upon a predetermined drop in the pressure line, as by the breaking of a bottle.

3. In packaging apparatus, and in combination, a filling head, means for sealing the bottle to be filled in said head, a pressure line including a source of carbonated liquid and the bottle, means for causing a flow of liquid into the bottle, a valve for controlling the flow of liquid, means tending to close said valve, and means for opposing said closing means, to hold the valve open, as long as a predetermined pressure is maintained in the pressure line.

4. In packaging apparatus, and in combination, a filling head, means for sealing the bottle to be filled in said head, a pressure line including a source of carbonated liquid and the bottle, means for causing a flow of liquid into the bottle, a valve for controlling the flow of liquid, means for normally holding said valve closed, means for opening said valve, means for holding said valve open, and means for rendering said holding means inoperative, to allow the valve to close, upon a predetermined drop of pressure in the pressure line.

5. In packaging apparatus, and in combination, a filling head, means for sealing the bottle to be filled in said head, a pressure line including a source of carbonated liquid and the bottle, means for causing a flow of liquid into the bottle, a valve for controlling the flow of liquid, means for normally holding said valve closed, means for opening the valve, means for holding said valve open, means for releasing said holding means, and means for rendering said holding means inoperative, to allow the valve to close, upon a predetermined drop of pressure in the pressure line.

6. In packaging apparatus, and in combination, a filling head, means for sealing the bottle to be filled in said head, a pressure line including a source of carbonated liquid and the bottle, a nozzle, means for reciprocating said nozzle to and from the bottle, a valve for controlling the flow of liquid to the nozzle, means for normally holding said valve closed, means dependent on the position of said nozzle for opening said valve, means for holding said valve open, and means for rendering said holding means inoperative, to allow the valve to close, upon a predetermined drop of pressure in the pressure line.

7. In packaging apparatus, and in combination, a filling head, means for sealing the bottle to be filled in the filling head, a pressure line including a source of carbonated liquid and the bottle, a valve for controlling the flow of liquid to the bottle, means dependent on the maintenance of a predetermined pressure in said pressure line for locking said valve open, and means for unlocking said valve.

8. In packaging apparatus, a filling head, means for sealing a bottle to be filled in said head, a pressure line including a source of carbonated liquid and the bottle, a valve for controlling the flow of liquid to the bottle, means for normally holding said valve closed, a latch for holding said valve open, means including a flexible diaphragm having a connection with the pressure line for holding said latch in latching position, and means for removing said latch from latching position upon a predetermined drop of pressure in the pressure line.

9. In packaging apparatus, and in combination, a filling head, means for sealing a bottle to be filled in said head, a pressure line including a source of carbonated liquid and the bottle, a normally closed valve for controlling the flow of liquid to the bottle, means for opening said valve, a latch for holding said valve open, means including a flexible diaphragm having a connection with said pressure line for holding said latch in latching position, and means for removing said latch from latching position, including a spring having a force less than the normal predetermined pressure of said pressure line.

10. In packaging apparatus, and in com-

bination, a filling head having a nozzle, means for sealing a bottle therein, a reservoir connected to a source of carbonated liquid, a fluid connection between the reservoir and the nozzle, a fluid connection for delivering pressure fluid from the reservoir to the bottle, valves in said connections, the reservoir and said connections constituting a pressure line of which the bottle is made a part, and means for causing said valves to close upon a predetermined drop of pressure in the pressure line, as by the breaking of a bottle.

11. In packaging apparatus, and in combination, a filling head, means for sealing a bottle therein, a pressure line including a source of carbonated liquid and a passage leading to the filling head, a normally closed valve in said passage, a normally closed valve for controlling the flow of liquid to the bottle, means for opening said valves, means for holding said valves open, and means for rendering said holding means inoperative, to allow the valves to close, upon a predetermined drop of pressure in the pressure line.

12. In packaging apparatus, and in combination, a filling head, means for sealing a bottle therein, a pressure line including a source of carbonated liquid and a passage leading to the filling head, a valve for controlling the flow of liquid to the bottle, means for normally holding said valve closed, means for positively opening said valve, and means dependent on the maintenance of a predetermined pressure in said pressure line for holding the valve open.

13. In a packaging apparatus, and in combination, a filling head, means for sealing a bottle therein, a pressure line including a source of carbonated liquid and a passage leading to the filling head, a valve for controlling the flow of liquid to the bottle, a spring for normally holding said valve closed, means for positively opening the valve, means for holding the valve open, pressure actuated means for rendering said holding means inoperative, and positively operating means for rendering the holding means inoperative.

In testimony whereof, I have hereunto set my hand.

GEORGE JOHN HUNTLEY.