May 10, 1960 V. H. CHATTEN 2,936,100

DISPENSER FOR CARBONATED BEVERAGES

Filed March 6, 1957 4 Sheets-Sheet 1

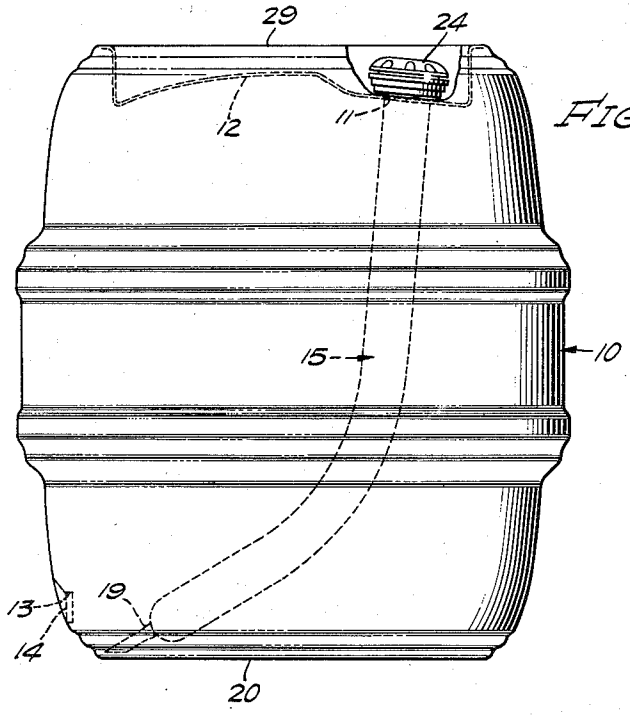


FIG. 1.

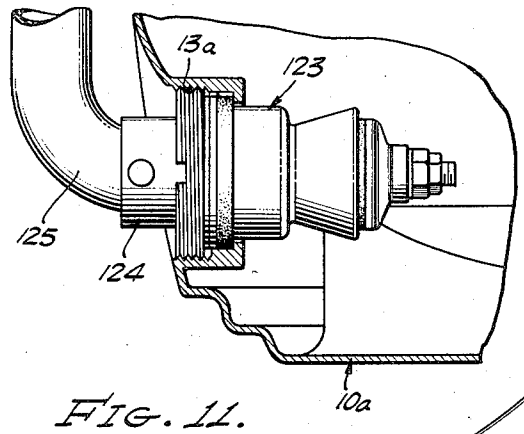


FIG. 11.

FIG. 2.

VICTOR H. CHATTEN
INVENTOR.

BY Lyon & Lyon

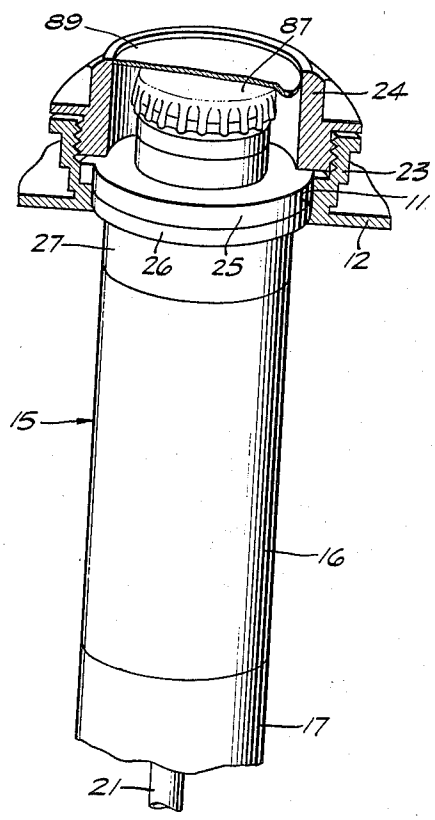
ATTORNEYS

May 10, 1960 V. H. CHATTEN 2,936,100

DISPENSER FOR CARBONATED BEVERAGES

Filed March 6, 1957 4 Sheets-Sheet 2

FIG. 3.



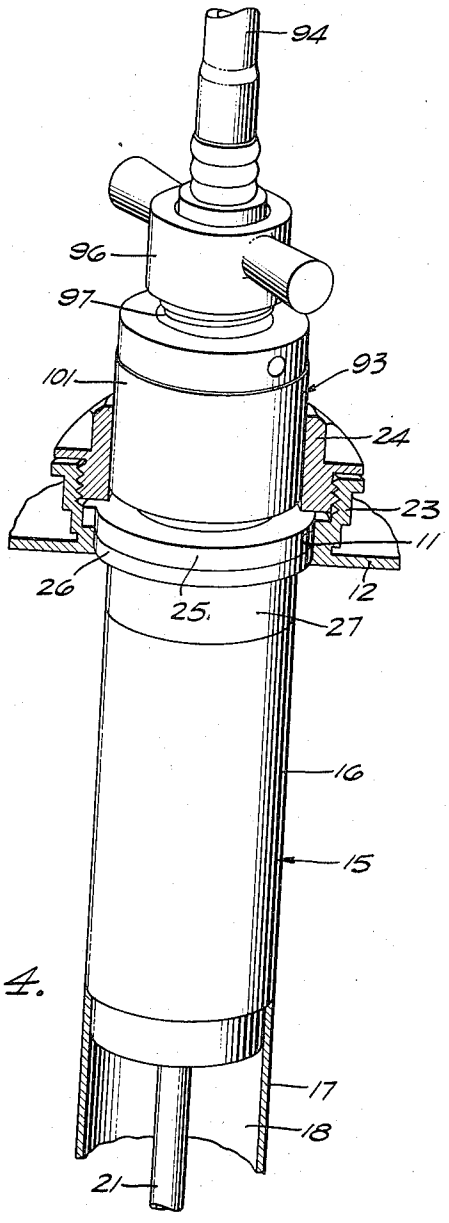


FIG. 4.

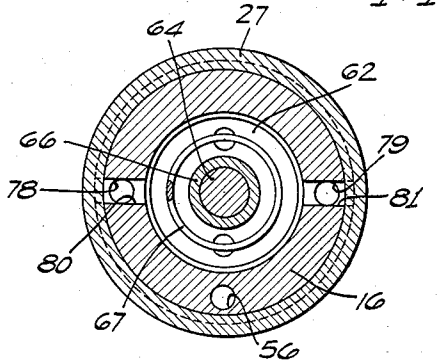


FIG. 9.

VICTOR H. CHATTEN
INVENTOR.

BY Lyon & Lyon

ATTORNEYS

May 10, 1960 V. H. CHATTEN 2,936,100

DISPENSER FOR CARBONATED BEVERAGES

Filed March 6, 1957 4 Sheets-Sheet 3

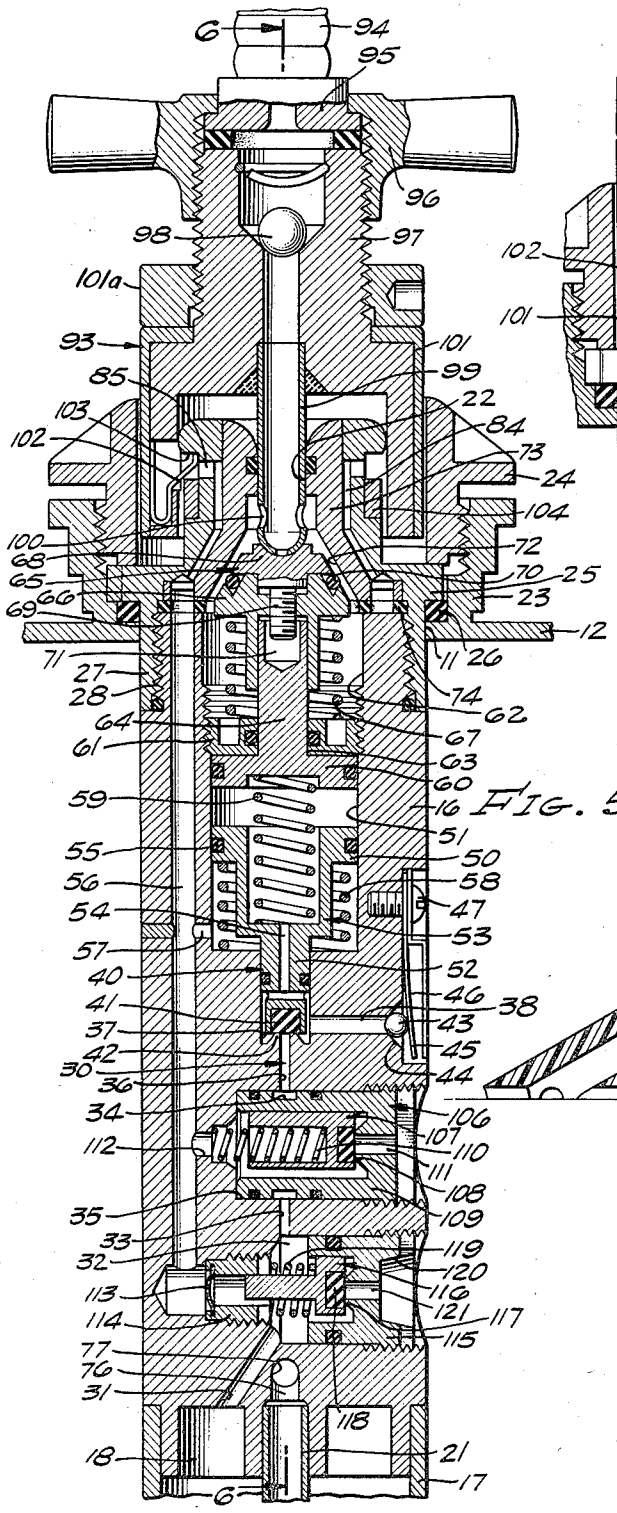


FIG. 5.

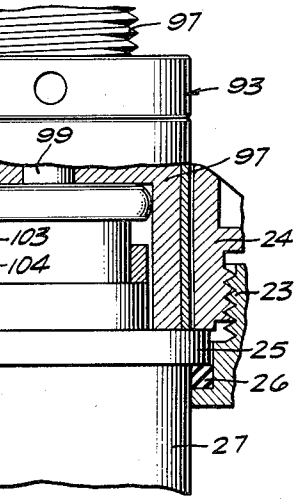


FIG. 7.

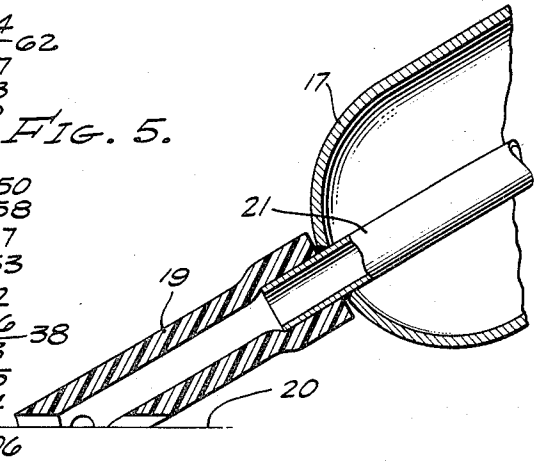


FIG. 8.

VICTOR H. CHATTEN
INVENTOR.

BY Lyon & Lyon

ATTORNEYS

May 10, 1960 V. H. CHATTEN 2,936,100

DISPENSER FOR CARBONATED BEVERAGES

Filed March 6, 1957 4 Sheets-Sheet 4

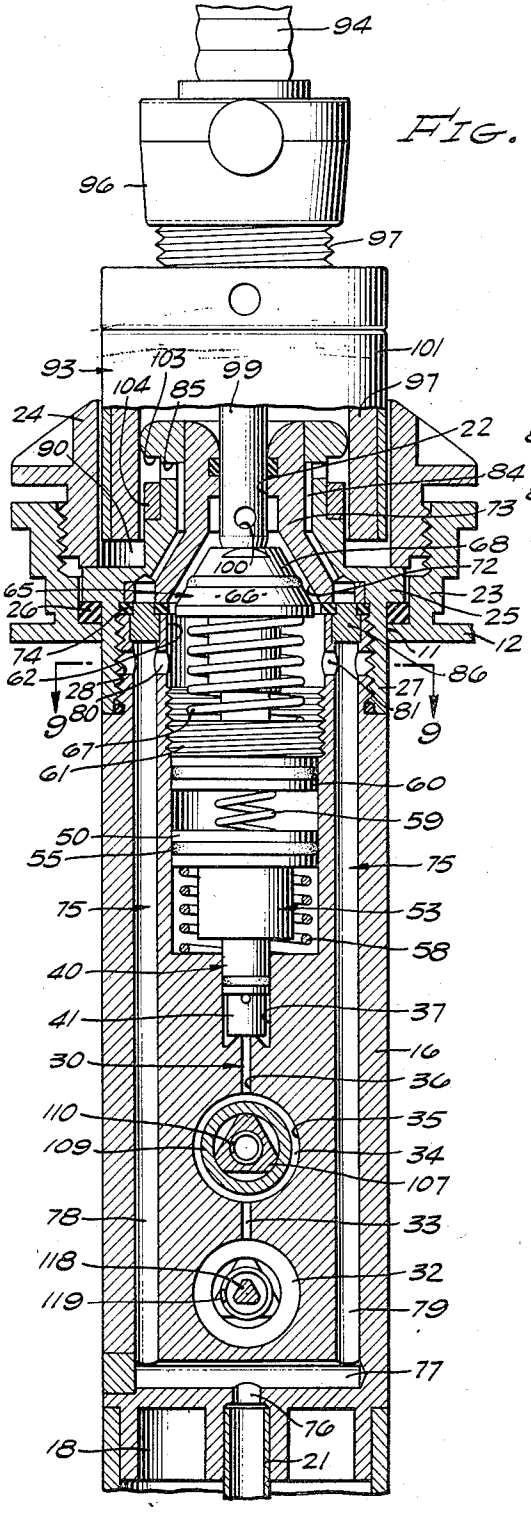


FIG. 6.

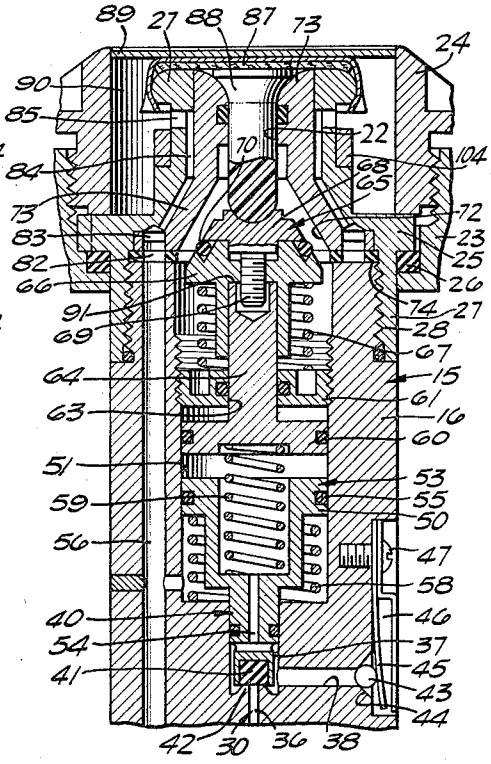


FIG. 10.

VICTOR H. CHATTEN
INVENTOR.

BY Lyon & Lyon

ATTORNEYS

United States Patent Office 2,936,100 Patented May 10, 1960

2,936,100

DISPENSER FOR CARBONATED BEVERAGES

Victor H. Chatten, Torrance, Calif., assignor to Anheuser-Busch, Incorporated, St. Louis, Mo., a corporation of Missouri

Application March 6, 1957, Serial No. 644,373

3 Claims. (Cl. 222—396)

This invention relates to apparatus for dispensing a gas-charged liquid from a container and is particularly directed to apparatus for dispensing a carbonated beverage, for example, beer, from a conventional keg.

It is the principal object of this invention to provide an insert member which can be introduced into the interior of the container through an opening therein which member includes a cavity containing liquified gas under pressure and which member also contains a regulator device for introducing gas from the cavity into the container, the action of the regulator being controlled from a member accessible exteriorly of the container. Another object is to provide dispensing apparatus of this type in which the insert member includes a passage for delivery of fluid from the interior of the container. A more detailed object is to provide dispensing apparatus of this type in which means accessible exteriorly of the container are provided to control flow of gas from the cavity to the interior of the container and also to control flow of liquid from the interior of the container.

Other and more general objects and advantages are to provide dispensing apparatus for carbonated beverages which is readily adaptable to standard kegs now in use and which requires a single connection on the upper end of the container or keg. Another advantage is to eliminate the requirement for tilting the keg in order to withdraw the entire contents thereof.

Another object is to provide a dispensing device for carbonated beverages, the device including an insert member having a cavity filled with liquid under pressure, the member being insertable into one of two openings provided in the container and the contents of the container being dispensed through a valve controlled discharge conduit connected to the other opening in the container.

Other and more detailed objects and advantages will appear hereinafter.

In the drawings:

Figure 1 shows a preferred embodiment of my invention as applied to a standard metallic beer keg of the type now in common use.

Figure 2 shows the insert member on an enlarged scale.

Figure 3 is a perspective view, partly broken away, showing the mounting of the insert member on an end wall of the container.

Figure 4 is a view similar to Figure 3 showing a liquid dispensing conduit and speed coupling attached to the upper end of the insert member.

Figure 5 is a longitudinal sectional elevation showing the upper portion of the insert member and showing details of the speed coupling.

Figure 6 is a sectional elevation taken substantially on the lines 6—6 as shown in Figure 5.

Figure 7 is a detail partly in section, showing details of operation of the speed coupling.

Figure 8 is a sectional detail showing construction of the lower end of the insert member.

Figure 9 is a transverse sectional view taken substantially on the lines 9—9 as shown in Figure 6.

Figure 10 is a sectional elevation similar to Figure 5 showing the position of the parts in the upper end of the insert member during shipment and prior to connection with the speed coupling.

Figure 11 is a fragmentary view similar to the lower end of Figure 1 and showing a modification.

Referring to the drawings, the metallic barrel or keg 10 is conventional in form and is provided with an opening 11 in the upper end wall 12. In this form of my invention the second opening 13 in the lower side wall is closed by plug 14.

In accordance with my invention, I provide an insert member generally designated 15 which is insertable into the interior of the keg or container 10 through the opening 11. The insert member 15 comprises a body 16 and a cartridge 17 connected in end to end relationship. A cavity 18, within the cartridge 17 contains liquified carbon dioxide under pressure. Since the maximum outer diameter of the cartridge 17 is limited by the size of the opening 11 in the container, the volume of the cavity 18 may be increased by curving the cartridge to increase its length. In this way sufficient liquid carbon dioxide is contained within the cartridge to empty the entire contents of the container 10. Discharge of liquid from the interior of the container takes place through the inlet fitting 19 which contacts the bottom wall 20 of the container 10. This fitting 19 is attached to the lower end of the cartridge 17 and communicates with the central discharge pipe 21 which extends longitudinally through the center of the cartridge 17. The body 16 contains passage means as described below adapted to carry liquid through the body 16 and to the discharge chamber 22 formed centrally at the upper end thereof.

Means are provided for securing the upper end of the body 16 to the container 10 and as shown in the drawings, this means includes a stationary internally threaded ring 23 formed integrally on the upper end wall 12 of the container and an annular nut 24 engages the threaded ring 23 and serves to clamp the annular abutment 25 against the sealing ring 26 and wall 12. The abutment 25 is carried on a terminal fitting 27 which is connected by threads 28 to the upper portion of the body 16 and functions as an integral portion thereof. As shown in Figure 1 the upper extremity of the clamping nut 24 lies below the level of the lip or chine 29 which defines the upper end of the container or keg 10. Accordingly, the presence of the clamp nut 24 and the insert member 15 does not interfere with normal stacking of the kegs 10.

First passage means are provided in the body 16 for delivering gas under pressure from the cavity 18 to the interior of the container 10. As shown in the drawings, this passage means generally designated 30 includes the passage 31, bore 32, passage 33, annular space 34 within bore 35, passage 36, axial bore 37 and lateral passage 38. A regulator valve assembly generally designated 40 includes a movable valve part 41 which is adapted to close against seat 42 to shut off flow through the passage means 30. A check valve may be provided to prevent return flow from the container into the lateral passage 38, and as shown in the drawings, this check valve may comprise a ball 43 maintained against a seat 44 by means of a leaf spring 45. The leaf spring is mounted in a recess 46 and held in position by means of a fastening 47. From this description, it will be understood that upward movement of the valve part 41 away from the stationary seat 42 allows gas from the cavity 18 to flow through the first passage means 30 into the interior of the container 10.

The movable valve element 41 of the regulator assembly 40 is mounted on the piston 50 which slides within the axial bore 51 within the body 16. The projection 52 forms a smaller piston sliding within the axial bore 53. A central opening 54 in the piston 50 establishes

communication between the axial bores 51 and 53. The annular space within the bore 51 and below the seal ring 55 is connected to the vent passage 56 by means of the port 57. A spring 58 within this space acts to move the piston upward while a spring 59 tends to move it downward. The regulator part 53 is therefore balanced between the springs 58 and 59. The part 53 is subjected to a pressure force tending to move it downward and this force results from pressure within the bore 51 below the piston 60 acting on the relatively large upwardly facing effective area on the regulator part 53. The pressure in the bore 51 between pistons 50 and 60 is the same as the pressure in the small bore 37. Since these spaces are in communication through the central opening 54, the high pressure in the passage 36 acts on the relatively small downwardly effective area of the movable valve part 41 within the seat 42. From this description it will be understood that the regulator part 53 and the movable valve part 41 which constitutes a portion thereof will move upward as a unit whenever the upward force developed by the pressure in the passage 36, plus the force of the spring 58, overcomes the downward force of the pressure in the bore 51 between the pistons 60 and 50, together with the force of the spring 59.

When the movable valve part 41 moves upward away from the seat 42, high pressure gas from the cavity 18 passes through the first passage 30 and into the interior of the container 10 by way of the check valve 43, 44. The regulator part 53 moves downward and closes the valve part 41 against the seat 42 as soon as fluid pressure builds up to a predetermined level in the space between the pistons 50 and 60.

A stationary bushing 61 is threaded into the central bore 62 in the upper end of the body 16 and is provided with a central aperture 63 which slidably receives the upstanding post 64 fixed on the piston 60. A fluid discharge valve generally designated 65 includes a movable valve part 66 slidably mounted on the upper portion of the post 64. A spring 67 within the bore 62 extends between the bushing 61 and the valve part 66 and acts to move the valve part upward with respect to the body 16. The valve part 66 may be provided with a nose piece portion 68 which is connected thereto by means of a threaded stem 69. A seal ring 70 is clamped between the nose piece portion 68 and the valve part 66. Clearance space 71 is provided in the extreme upper end of the post 64 around the lower end of the stem 69.

The seal ring 70 is adapted to seal against the conical seat 72 provided in the seat member 73 which functions as an integral part of the body 16. This seat member 73 is clamped in position by means of the terminal sleeve 27. An apertured gasket ring 74 prevents leakage between the body 16 and the extension or seat member 73.

A second passage is provided in the body 16 through which liquid from the interior of the container 10 passes to the discharge chamber 22. As best shown in Figure 6 of the drawings, this second passage includes the delivery pipe 21, the port 76, the lateral branch 77, the drilled holes 78 and 79, the lateral ports 80 and 81, the bore 62 and the space within the seat 72. The movable valve part 66 of the valve assembly 65 is thus positioned in the second passage generally designated 75 to control the discharge of liquid from the interior of the container 10.

The apertured gasket 74 is provided with an opening 82 which is in alignment with the vent passage 56 in the body 16 and with the drilled hole 83 in the seat member 73. The hole 83 communicates with the annular space 84 between the seat member 73 and the terminal sleeve 27. This annular space 84 communicates to atmosphere through ports 85 in the terminal sleeve 27. Alignment plugs 86 are positioned at the upper ends of the drilled holes 78 and 79 in the body 16 and these plugs extend through apertures provided in the gasket 74 and into drilled holes provided in the terminal sleeve 27. Figure 10 shows the position of the parts at the upper end of the insert member 15 during shipment and before a hose connection is made to the keg to withdraw the contents thereof. A standard bottle cap 87 is mounted on the upper end of the terminal sleeve 27 in sealing relationship. A central plug 88 is held in position by this bottle cap and extends downward through the discharge chamber 22 in the seat member 73. The bore end of this plug engages the nose piece portion of the movable valve part 66, thereby holding the valve part 66 in a retracted position against the force of the compression spring 67. The seal ring 70 is thus maintained out of contact with the conical seat 72. A cover disk 89 may be provided within the clamping nut 24 above the bottle cap 87 to exclude foreign matter from the annular cavity 90 within the nut 24.

When the contents of the keg or container 10 are to be withdrawn, the cover disk 89 is removed and the bottle cap 87 is removed by a conventional tool from the upper end of the terminal sleeve 27. The plug 88 is then withdrawn from the discharge opening 22, allowing the spring 67 to close the valve part 66 by bringing the seal ring 70 into contact with the conical seat 72. Upward movement of the valve part 66 permits the post 64 and piston 60 to move upward within the bore 51 until the piston 60 contacts the lower side of the bushing 61 as shown in Figure 5. So long as the piston 60 remains in the retracted position shown in Figure 10 by reason of contact of the upper end of the post 64 with the shoulder 91 on the valve part 66, the regulator part 53 is held down by the force of the spring 59. In this way the movable valve element 41 is maintained in contact with the stationary seat 42 so long as the bottle cap 87 and plug 88 are in place, and hence, discharge of gas from the cavity 18 into the container 10 is prevented. When the piston 60 moves to its upper position as shown in Figure 5, the compression spring 59 is permitted to lengthen and hence reduce the force which it applies to the regulator part 53. Thereafter, the regulator valve assembly 40 functions to maintain a substantially constant pressure within the interior of the container 10 by admitting gas under pressure from the cavity 18 as the liquid contents of the container are drawn off through the discharge chamber 22.

Discharge of the contents of the container 10 through the chamber 22 is accomplished by means of a quick connection assembly generally designated 93 and a discharge hose 94. The hose 94 is provided with a terminal fitting 95 clamped by means of a nut 96 to the upper end of the connection sleeve 97. A check valve 98 is mounted in the central passage of the sleeve 97. A hollow spear 99 is fixed to the sleeve 97 and is adapted to project downward through the discharge opening 22. Apertures 100 in the lower portion of the spear 99 communicate with the space inside the conical seat 72. The lower end of the spear is rounded and engages the upper end of the nose piece portion of the movable valve part 66, thereby moving the seal ring 70 out of contact with the conical seat 72. Liquid from the said second passageway 75 therefore flows through the discharge valve assembly 65 through the interior of the spear 99 past the check valve 98 and into the discharge hose 94. A valve or spigot, not shown, at the end of the hose 94 controls discharge of liquid from the interior of the container 10.

The quick connection parts 93 may be of conventional design as shown in Figure 5 of the drawings and may include a shell 101 clamped to the sleeve 97 by means of the nut 101*a*. A series of spring fingers 102 within the lower end of the shell engage under a shoulder 103 formed on the upper end of the terminal sleeve 27. The quick connection is accomplished by moving the sleeve 101 axially into the annular space 90 within the nut 24. The hollow spear 99 enters the discharge opening 22 at the same time. When the parts reach the position

shown in Figure 5, the spring fingers **102** engage under the shoulder **103** to prevent separation of the parts. When it is desired to disconnect the hose **94** and associated parts from the keg or container **10**, the sleeve **97** and shell **101** are moved manually downward as a unit to the position shown in Figure 7. Spring fingers **102** then engage the loose spring **104** mounted on the terminal sleeve **27**. The spring fingers **102** frictionally grip the loose ring **104** so that subsequent upward movement of the shell **101** and spring fingers **102** causes the loose ring **104** to move upwardly at the same time, thereby preventing the spring fingers from reengaging under the shoulder **103**. Upward movement of the shell **101** and sleeve **97** under the annular space **90** within the nut **24** also withdraw the hollow stem **99** from the discharge chamber **22** with the result that the movable valve part **66** moves upwardly under force of the spring **67** to engage the seal ring **70** with the conical seat **72**. Removal of the discharge hose **94** by means of the quick connection **93** therefore automatically results in closing of the said second passage through the body **16**.

Safety valve means are provided to vent both the cavity **18** and the interior of the keg or container **10** in the event that internal pressure should build up to objectionable magnitudes. As best shown in Figures 5 and 6 of the drawings, a safety valve **106** for venting the interior of the keg or container **10** is provided by the movable valve part **107** cooperating with the seat **108** on the cage **109**. The spring **110** holds the valve closed against the seat for normal pressures within the container but allows the valve part **107** to move away from the seat under abnormal pressures to vent the container through the ports **111** and **112** to the vent passage **56**.

The safety valve for the high pressure cavity **18** takes the form of a rupture disk **113** carried on the bushing **114** and communicating with the lower end of the vent passage **56**. The interior of the bushing communicates with the bore **32** and the passage **31** leading to the interior of the cavity **18**.

Means are provided on the body for filling the cavity **18** with liquified gas under pressure, for example, liquid carbon dioxide. This means includes the cage **115** mounted on the body **16** and provided with the filling valve assembly generally designated **116**. This valve assembly includes the stationary seat **117** provided on the cage **115** and a movable valve part **118** adapted to close against the seat under action of the spring **119**. It will be observed that the high pressure of gas within the cavity **18** and within the bore **32** acts to maintain the valve part **118** in closed position against the seat **117**. When it is desired to charge the cavity **18** with the liquified gas under pressure, the insert member **15** including the body **16** and cartridge **17** is withdrawn through the opening **11** in the container wall **12**. A connection fitting, not shown, is then engaged within the taper bore **120** of the cage **115** and liquified gas under pressure is admitted through the port **121** and inlet valve assembly **116**. The regulator valve part **41** remains closed during the filling operation.

In the modified form of my invention as shown in Figure 11, the plug **14** is removed from the opening **13** in the lower portion of the keg or container **10***a* and a discharge valve assembly **123** of conventional design is substituted for the plug **14**. A conventional connection assembly **124** connects the valve **123** with the discharge hose **125**. A control valve or spigot, not shown, on the hose regulates discharge of fluid from the interior of the container **10***a*. In this form of my invention the "second passage" in the cartridge and body of the insert member is not required since discharge of the contents of the keg or container **10***a* occurs through the second opening **13***a*, not through the insert member. In this form of my invention, the regulator valve assembly **40** is brought into action by removal of the bottle cap **87** and plug **88** in the same manner as described above.

In both forms of my invention as described above, the action of the regulator valve assembly is such as to insure proper carbonation of the beverage and to avoid overcarbonation thereof. For example, beer may be carbonated to the proper extent by constructing the regulator valve assembly so that a pressure of 12 pounds per square inch is maintained on the beer within the container at 38° F. This pressure is maintained regardless of the quantity of the beer remaining within the container, and therefore, the beer which is dispensed is neither "wild" nor "flat" but contains just the desired amount of carbonation.

Having fully described by invention, it is to be understood that I do not wish to be limited to the details herein set forth, but my invention is of the full scope of the appended claims.

I claim:

1. An apparatus for dispensing beer, said apparatus comprising a conventional beer keg having a recessed upper end wall with a standard size opening therein and an upper chine above the level of said upper end wall, said keg having a beer chamber therein, and a device adapted to be inserted through said opening into said beer chamber, said device comprising an elongated body of dimension substantially the entirety of its length smaller than said standard size opening and with substantially all of the body being disposed within said beer chamber, means sealingly securing said body adjacent the upper end thereof to that portion of said upper end wall bounding said opening therein, the uppermost part of the body which protrudes above the upper end wall being below the upper chine of said keg, the major portion of the lower part of said body being hollow to present a cavity containing sufficient liquid gas to expel the entire contents of said keg, control means for said device contained within said body immediately above said cavity but disposed substantially wholly within the confines of said keg, said control means including a pressure regulator, there being passage means in said body within which said pressure regulator is located, such passage means extending from said cavity in the lower part of said body to a point of discharge intermediate the ends thereof so as to discharge gas under pressure into said beer chamber, second passage means in said body opening at the lower end thereof into said beer chamber and opening for discharge at the upper extremity of said body exteriorly of the keg, and third passage means in the device extending from a point in the body communicating with said beer chamber to the atmosphere outside the beer keg, and safety valve means in said third passage, said safety valve means being normally closed under proper operating conditions to prevent venting of the beer chamber but being openable upon attainment of a predetermined pressure within said beer chamber to vent the same to atmosphere.

2. An apparatus for dispensing beer, said apparatus comprising a conventional beer keg having a recessed upper end wall with a standard size opening therein and an upper chine above the level of said upper end wall, said keg having a beer chamber therein, and a device adapted to be inserted through said opening into said beer chamber, said device comprising an elongate body of dimension substantially the entirety of its length smaller than said standard size opening and with substantially all of the body being disposed within said beer chamber, means sealingly securing said body adjacent the upper end thereof to that portion of said upper end wall bounding said opening therein, the uppermost part of the body which protrudes above the upper end wall being below the upper chine of said keg, the major portion of the lower part of said body being hollow to present a cavity containing sufficient liquid gas to expel the entire contents of said keg, control means for said device contained within said body immediately above said cavity but disposed substantially wholly within the con-

fines of said keg, said control means including a pressure regulator, there being passage means in said body within which said pressure regulator is located, such passage means extending from said cavity in the lower part of said body to a point of discharge intermediate the ends thereof so as to discharge gas under pressure into said beer chamber, second passage means in said body opening at the lower end thereof into said beer chamber and opening for discharge at the upper extremity of said body exteriorly of the keg, third passage means in the device extending from a point in the body communicating with said beer chamber to the atmosphere outside the beer keg, and safety valve means in said third passage, said safety valve means being normally closed under proper operating conditions to prevent venting of the beer chamber but being openable upon attainment of a predetermined pressure within said beer chamber to vent the same to atmosphere, said body having an axial bore adjacent the upper end thereof, said pressure regulator comprising a pair of opposed pistons reciprocable within said axial bore, spring means normally urging said pistons apart and the lower of said pistons having a valve portion adapted to seat upon a portion of the body to close said first passage therein, spring means normally urging said pistons together, and the upper of said pistons having sealing means thereon in opposition to a portion of said body for sealing engagement therewith when such upper piston is in its uppermost position to close said second passage, and means for depressing said upper piston to open said second passage.

3. A device for dispensing liquid from a conventional container, the conventional container being of the type having an upper chine and a recessed upper end wall with a standard size opening therein below the level of the upper chine, said device being in the form of an elongated body of dimensions cross sectionally smaller than the opening in the conventional container so that the body may be inserted into the container through such opening,

said body having an annular abutment closely adjacent one end thereof for seating engagement upon the conventional container around the opening therein with the remaining portion of the body being disposed within such container and leaving only a minor portion thereof projecting from the container, control means in said body immediately below said annular abutment so that the control means substantially in its entirety is housed within a portion of the body totally confined within the associated container, the lower extremity of the body constituting the major extent of its length being in the form of a cavity containing liquefied gas of such volume as to expel the entire contents of the associated conventional container, a first axial passage in said body leading from said cavity to a discharge point intermediate the ends of the body, a second passage in said body leading from the lower extremity thereof to the upper extremity thereof, a pressure regulator disposed in said first passage, a fluid discharge valve in said second passage, said pressure regulator and fluid discharge valve including opposed axially movable portions disposed within said body and being normally spring biased in opposite directions, a vent passage extending axially of said body communicating the upper end of the body with a point intermediate the ends thereof, and a safety valve in said vent passage normally closing the same.

References Cited in the file of this patent

UNITED STATES PATENTS

456,161	Rennerfelt	July 21, 1891
1,412,321	Tate	Apr. 11, 1922
1,964,345	Feller	June 26, 1934
2,157,966	Reisinger et al.	May 9, 1939
2,514,773	Kramer	July 11, 1950
2,812,109	Wentz	Nov. 5, 1957
2,812,783	Bufogle	Nov. 12, 1957