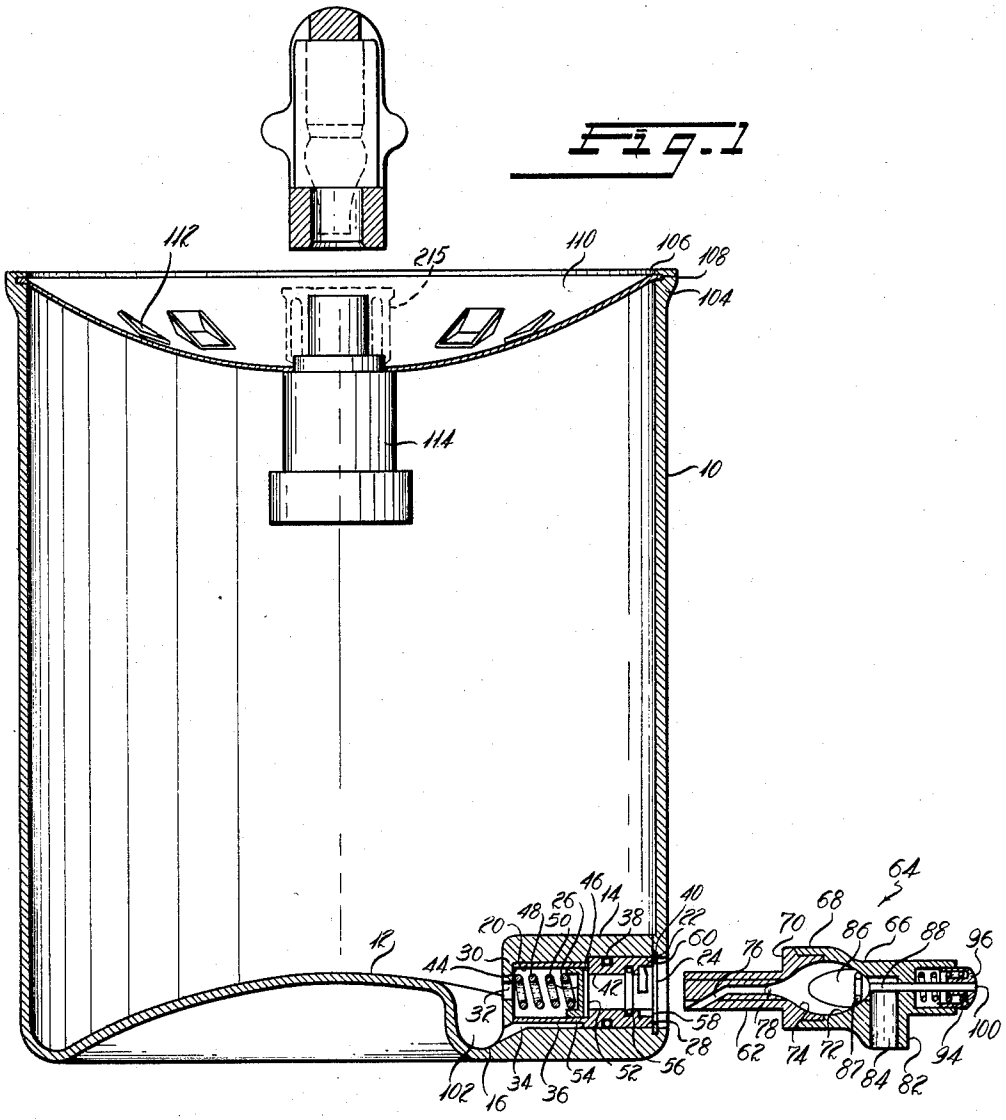
Feb. 10, 1959 H. F. HAMBURG ET AL 2,873,051

BEVERAGE DISPENSER

Filed May 11, 1956 3 Sheets-Sheet 1

Fig. 1



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BEVERAGE DISPENSER

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Fig. 2

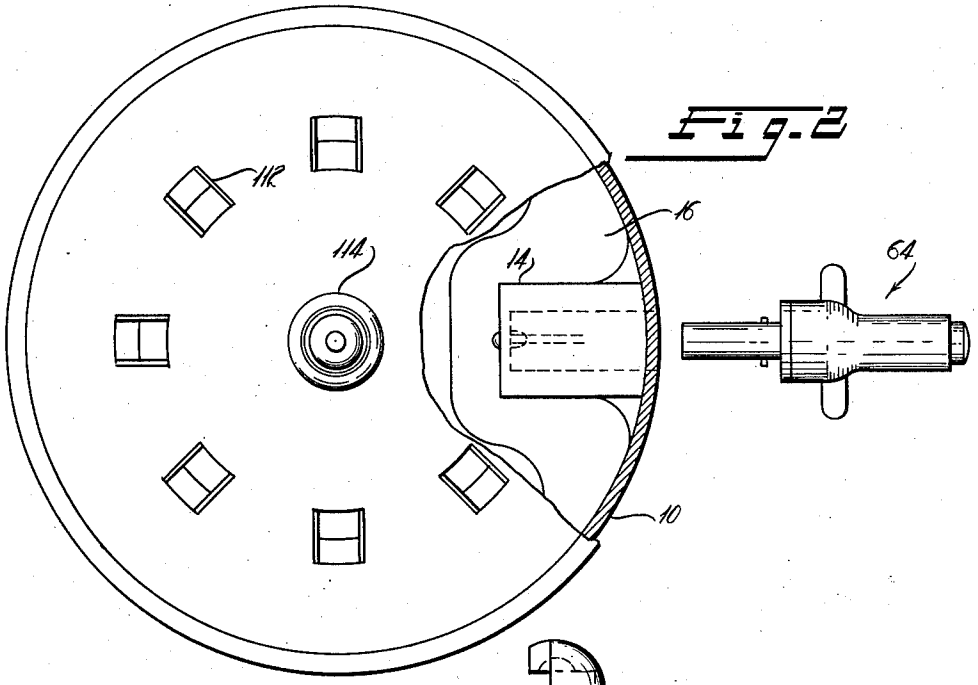
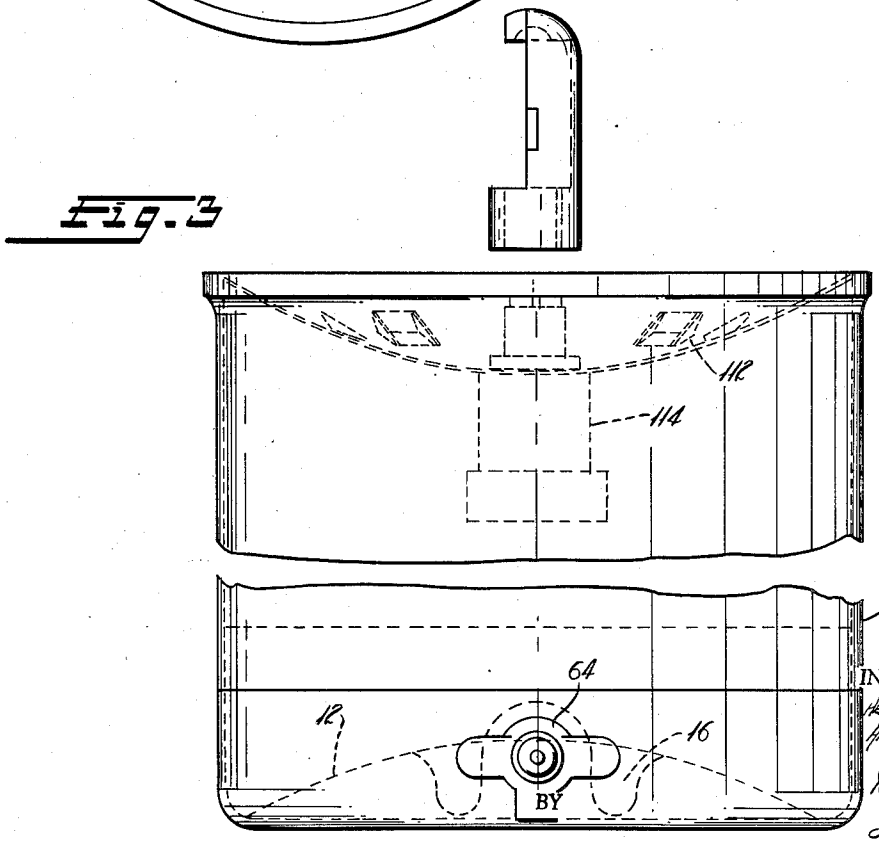


Fig. 3



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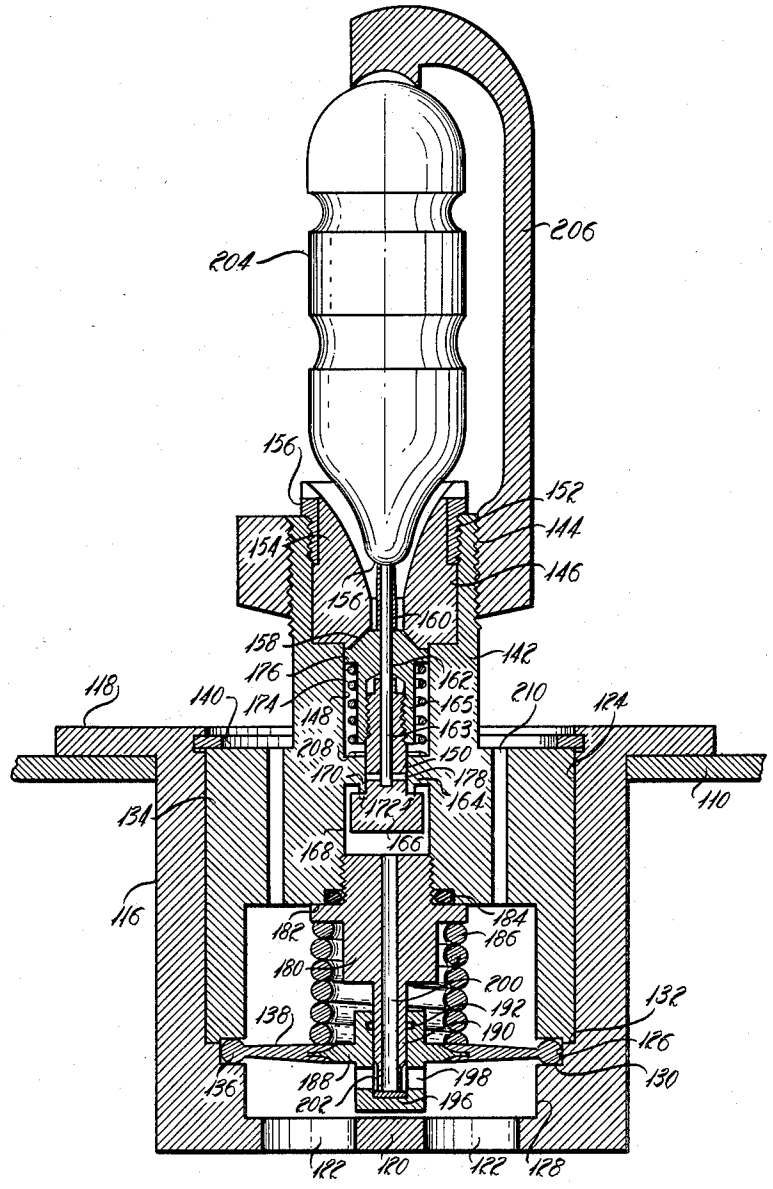


Fig. 4

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BEVERAGE DISPENSER

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12 Claims. (Cl. 222—396)

This invention relates to a beverage dispenser and more particularly relates to a dispenser for carbonated beverages.

Carbonated beverages such as various soft drinks and beer enjoy a widespread consumption in the home and are ordinarily supplied in individual bottles or cans. Once these containers are opened there is no truly satisfactory method of preserving the beverage carbonation since even perfect sealing is ineffective where a large air space exists in the container. The merchandising of beverages of this nature in such relatively small containers adds to the cost of the drink and often times results in a container disposal problem. While beer is customarily dispensed from kegs in commercial establishments, no satisfactory home dispenser has achieved any widespread usage, primarily because of the difficulty in supplying gas under pressure in an economical and safe manner. Problems of cleanliness and contamination also exist so that any dispenser of this nature for home use must be susceptible to effective but inexpensive sterilization.

It is accordingly a primary object of the present invention to provide an improved bulk carbonated beverage dispenser.

It is another object of the invention to provide an improved bulk carbonated beverage dispenser having a safe and economical means for maintaining the beverage under pressure.

It is another object of the invention to provide an improved bulk carbonated beverage dispenser which may be easily sterilized.

It is another object of the invention to provide an improved bulk carbonated beverage dispenser having a novel and improved valve means for maintaining pressure therein.

It is another object of the invention to provide an improved bulk carbonated beverage dispenser having an improved dispensing valve means.

It is another object of the invention to provide an improved bulk carbonated beverage container which may be economically transported with a minimum amount of breakage.

These and further objects and advantages of the invention will become apparent upon reference to the following specification and claims and appended drawings wherein:

Figure 1 is a vertical cross section of a beverage dispenser constructed according to the present invention;

Figure 2 is a top plan view of the beverage dispenser of Figure 1;

Figure 3 is a side elevation of the beverage dispenser of Figure 1; and

Figure 4 is a cross sectional view of the pressure maintenance valve assembly.

Referring to Figure 1 there is shown at 10 a fiber glass reinforced plastic container having an open mouth at the upper end thereof and having an upwardly concave bottom 12. At one side of its bottom the container 10 is provided with a discharge valve housing 14 which is

formed integrally with the interior of the container and its bottom. The concave bottom 12 is formed with a depression 16 which surrounds the housing 14, as may be seen in Figures 1, 2 and 3, and the bottom of this depression is at the same level as the lowermost portion in the container surrounding the concave bottom 12 as shown.

The housing 14 is bored at 20 and counterbored at 22 to receive a container sealing valve assembly indicated generally at 24. This valve assembly consists of a sleeve having a smaller diameter end 26 received within the bore 20 and a larger diameter end 28 received within the counterbore 22. The back end 30 of the housing 14 is apertured at 32 to provide a vent and the bottom of bore 20 is cut away in an inclined manner at 34 to form a passage for beverage being removed from the container. The passage 34 communicates with a slot 36 in the wall of bore 20. The large diameter section 28 of the valve sleeve is sealed to the inside of the housing 14 by means of an O-ring 38 and is retained in the housing by a lock ring 40 received within the housing. The larger end 28 of the sleeve is bored at 42 and the smaller end 26 is provided with a bore 44 larger than the bore 42 which forms a shoulder 46 where the two bores meet. A coil spring 48 is mounted in the bore 44 and is received within a cap 50 sliding in bore 44. The face of the cap 50 is provided with a seal gasket 52 which is urged against the shoulder 46 by the spring 48. A drafting port 54 in the small end 26 of the sleeve provides communication between the passage 36 and the inside of the valve sleeve. It will be seen that in the position shown in Figure 1 the spring 48 forces the valve seal 52 against the shoulder 46 to prevent any escape of liquid from within the container.

The bore 42 has an O-ring 56 mounted therein and is provided with a counterbore 58 and bayonet slot 60. The bore 42 in the valve sleeve is adapted to receive the valve stem 62 of a drafting spigot indicated generally at 64. The drafting spigot consists of a body 66 having an enlarged end 68 which receives an enlarged portion 70 of the valve stem 62 and which is provided with a tapered bore 72. The bore 72 communicates with a tapered bore 74 in the end 70 of valve stem 62 and the smaller end of the bore 74 in valve stem 62 extends downwardly at 76 and passes through the cylindrical surface of the valve stem at the rear thereof. A pair of bayonet lock pins 78 are provided in the side of the valve stem 62 for engagement with the bayonet slot 60 in the valve sleeve. The large end 68 of the drafting spigot body 66 has a tubular extension 80 extending therefrom and a discharge conduit 82 extends downwardly from this extension. A bore 84 passes through the discharge conduit 82 and communicates with the small end of the bore 72. A pear shaped valve member 86 carrying an O-ring 87 is received within the bore 72 and has a rod 88 extending therefrom through a hole in the body 66. The end of body 66 is bored to receive a coil spring 94 which bears against the underside of the button 96 which is carried by the stem 88.

In drawing carbonated beverages through a valve it is important that the valve should not be only slightly opened inasmuch as this causes the beverage to foam. With the drafting spigot of this invention the valve member 86 is held in a closed position both by the spring 94 and by the pressure of the beverage in the container which acts upon the exposed side of the pear shaped member 86. When the button 96 is depressed the beverage has access to the right side of the member 86 in the drawing thereby completely eliminating the closing pressure previously applied to the valve member by the beverage. As this pressure is relieved the valve snaps completely open so

that no foaming occurs. The spring **94** is provided basically to reclose the valve and consequently it need not exert any appreciable pressure on the button **96**. The pressure of the beverage seals the valve once it is closed.

It will be seen that when the drafting spigot is mounted on the container, the valve stem **62** enters the bore **42** and engages the seal **52**. Further movement of the drafting spigot compresses spring **48** to uncover drafting port **54** and to provide communication between conduit **76** and passage **34** in the container. Leakage is prevented during the mounting operation by the O-ring **56** which tightly engages the stem **62** and the spigot is locked into position by means of the bayonet pins **78** and bayonet slot **60**. After the spigot is inserted beer may be drawn by depressing the button **96** which moves the valve member **86** and O-ring **87** away from the throat of conical bore **72** so as to permit beverage to flow from depression **16** through passage **34**, drafting port **54**, passage **76**, conical bores **74** and **72**, and conduit **84**. It will be noted that with this valve arrangement liquid may be withdrawn from the container until it reaches the level **102** at which time very little liquid remains in the container.

The upper end of the container is provided with a thickened portion **104** having a peripheral slot **106** on the inside thereof and this slot receives the lip **108** of a removable cover **110**. The cover is preferably metal and concave in shape and is provided with a plurality of clips **112** which are secured thereto in any suitable manner, such as by spot welding. The clips **112** serve as means for removing the cover. A suitable fixture, not shown, is provided for clamping onto the underside of clips **112** and urging them inwardly to deform the cover **110** sufficiently to allow its removal from the container. This operation generally entails the application of more pressure than may conveniently be applied by hand so that the container is not readily opened by users who do not possess the necessary fixture for properly accomplishing this function. This prevents unauthorized access to the interior of the container so that foreign articles may not readily be introduced thereinto. A gas charging valve assembly shown generally at **114** is mounted at the center of the cover.

Referring to Figure 4 it will be seen that the gas charging valve assembly consists of a cup member **116** having an outwardly extending upper flange **118** which is fastened to the cover **110** by any suitable means, such as welding. The bottom **120** of the cup **116** is provided with a series of charging ports **122** and the inside of the cup is formed into three bores **124**, **126** and **128** of increasingly smaller diameter, the bores abutting to form shoulders **130** and **132**.

A valve housing **134** is received within bore **124** in cup **116** and the lower edge of the housing seats against shoulder **132** to compress the rim **136** of a resilient diaphragm **138** into sealing engagement with the shoulder **130**. The housing **134** is secured in position in the cup by means of a lock ring **140**. A boss **142** extends upwardly from the housing **134** and is exteriorly threaded at its upper end at **144**. The interior of the boss is provided with three bores **146**, **148** and **150** of decreasing diameters and the uppermost portion of bore **146** is threaded at **152**. A rubber valve seat **154** is received within the bore **146** and is secured in position therein by means of an open mouthed retainer **156**. Slidably mounted within bore **148** is a puncturing plug **158** which carries a hollow needle **160** at the upper end thereof. A bore **162** in needle **160** extends through the puncturing plug **158** and communicates with a matching passage **163** in a valve member **165** which is screw threadedly secured to the underside of puncturing plug **158**. Valve member **165** is slidably received in a further bore **164** in housing **142** and has an enlarged head **166** which moves within a bore **168**. The juncture of bores **150** and **168** form a shoulder on which is formed a valve seat **170** and the head **166** carries a valve seal O-ring **172** which mates with the valve seat **170**. A coil spring **174** engages a flange **176** on puncturing plug **158** to urge the plug upwardly and to seal O-ring **172** against valve seat **170**. A radial passage **178** is provided in valve member **165** in communication with passage **163** so that when the puncturing plug **158** is depressed until passage **178** clears valve seat **170** communication is established between bore **168** and the mouth of needle **160**.

The lowermost portion of bore **168** in housing **134** receives the threaded upper end of a valve block **180** carrying a flange **182** which seals to an O-ring **184**. The other side of flange **182** is engaged by a coil spring **186** which seats against the upper surface of the diaphragm **138**. Diaphragm **138** consists of a resilient disc portion formed of a material such as rubber which is molded or cast about a metal cup shaped hub **188** which slides upon a tube **190** depending from valve block **180**. The hub **188** is sealed to tube **190** by means of an O-ring **192** and the bottom of the cup is covered by a seal **196** which is bonded thereto. Radial ports **198** extend into the bottom of the cup and communicate with a passage **200** in valve block **180**. The bottom of tube **190** is of a reduced diameter at **202** to provide a maximum sealing action with the seal **196**.

The operation of this gas charging assembly is as follows. A carbon dioxide cartridge **204** is mounted upon the rubber valve seat **154** and is advanced downwardly over needle **160** by means of a cartridge holder **206** which engages the threads **144** on stud **142**. As the cartridge holder **206** is advanced downwardly the puncturing plug **158** is forced down against the action of spring **174** until the lower edge of the plug engages shoulder **208**. This movement breaks the seal between valve seat **170** and O-ring **172** and places radial passage **178** in communication with the bore **168**. Further downward advance of the cartridge **204** causes the needle **160** to pierce the cartridge and release the gas through bores **162**, **163** and **178** into bore **168**. From here the high pressure gas passes downwardly through passage **200** to apply force to seal **196** which is carried by diaphragm **138**. A pair of vents **210** in housing **134** connect the space above diaphragm **138** to the atmosphere so that spring **186** forces diaphragm **138** downwardly into an unsealed position so long as the pressure in the container is insufficient to overcome the spring pressure. The spring **186** is normally designed to maintain a pressure of approximately 8 pounds per square inch within the container and so long as this pressure is maintained the diaphragm is forced up to seal the high pressure within the passage **200**. When the pressure in the container drops below this amount, as is caused by withdrawing of beverage from the container, the spring **186** forces the diaphragm downwardly so that seal **196** clears the lower end **202** of tube **190** and high pressure gas enters the container through passages **198** and ports **122**. Just as soon as sufficient gas has entered to raise the pressure within the container to the desired value the diaphragm **138** again moves upwardly to close off the high pressure from the cartridge. Proper pressure is thus maintained within the container completely automatically once the carbon dioxide cartridge has been mounted in position and pierced. The rubber valve seat **154** prevents any leakage of high pressure carbon dioxide and diaphragm **138** provides for feeding the desired amount into the container.

The container is of such a size that a commercially available carbon dioxide cartridge is capable of maintaining the beverage carbonated until the container is completely empty. When the cartridge is removed spring **174** forces puncturing plug **158** upwardly to close passages **178** and to seal O-ring **172** against valve seat **170**. Thus should it be necessary to change cartridges while the container contains some beverage this does not result in depressurization.

In normal usage the container is supplied to the consumer filled with the beverage to be dispensed and the top of the charging valve assembly is covered by means of

a plastic shipping cap **215** shown in broken lines in Figure 1. The container is precharged to the proper pressure at the factory so that the beverage therein is capable of being shipped relatively long distances without losing its carbonation. It will be noted that the plastic shipping cap **215** is within the concavity enclosed by the cover **110** and thus is protected from damage. Similarly the drafting spigot is not mounted upon the container during transportation so that the containers may be readily stacked and transported in an economical and easy fashion. Upon delivery, the user mounts the drafting spigot in the manner pointed out herein and affixes a carbon dioxide cartridge to the charging valve assembly after removing the plastic cap **215**. The dispenser is then ready for operation and maintains the liquid being dispensed in an optimum carbonated condition until the container is empty. When the container is empty the spigot and cartridge are removed from the container and it is returned to the factory. The top of the container is then removed through the use of a suitable fixture which engages clips **112** and the container may be sterilized in the same manner as any open ended container.

It will be apparent that through the use of the container of this invention it is possible to market carbonated beverages in bulk form in a safe, convenient and economical manner. A minimum amount of equipment is needed by the consumer and this may be supplied by the beverage vendor.

The invention may be embodied in other specific forms without departing from the spirit or essential characteristics thereof. The present embodiment is therefore to be considered in all respects as illustrative and not restrictive, the scope of the invention being indicated by the appended claims rather than by the foregoing description, and all changes which come within the meaning and range of equivalency of the claims are therefore intended to be embraced therein.

What is claimed and desired to be secured by United States Letters Patent is:

1. A container for carbonated beverages comprising an open mouthed container having a mouth of substantially the same diameter as the container, a removable cover closing said open mouth, a valve containing spigot removably mounted in an aperture in a lower portion of said container, valve means associated with said aperture for closing said aperture when said spigot is removed, charging valve means mounted on said cover, means on said charging valve means for receiving a high pressure gas vessel, and means associated with said charging valve means for admitting said high pressure gas to said container to maintain a substantially constant pressure in said container as beverage is withdrawn therefrom.

2. A container for carbonated beverages comprising an open mouthed plastic container, a removable concave cover closing said open mouth, said open mouth being of substantially the same diameter as said container, a valve containing spigot removably mounted in an aperture in a lower portion of said container, valve means associated with said aperture for closing said aperture when said valve containing spigot is removed, charging valve means mounted on said cover, means on said charging valve means for receiving a high pressure gas vessel, and means associated with said charging valve means for admitting said high pressure gas to said container to maintain a substantially constant pressure in said container as beverage is withdrawn therefrom, said charging valve means being located within the concavity of said cover so as to be below the mouth of said container.

3. A container as set out in claim 2 wherein the peripheral edge of said cover engages a peripheral groove in the wall of said container adjacent the mouth thereof, and clips on said cover to permit deformation thereof to disengage said cover from said groove.

4. A container as set out in claim 2 wherein the bottom of said container is concave upwardly and wherein said valve means associated with said aperture has an inlet port below the uppermost portion of said concave bottom.

5. A container as set out in claim 1 wherein said valve means associated with said aperture includes a housing within said container defining said aperture, a sleeve in said aperture and defining an internal shoulder, a valve seal engaging said shoulder to seal said aperture, and a spring urging said seal into said shoulder.

6. A container as set out in claim 5 wherein said housing includes a passage in the lowermost portion thereof connecting the inside of said housing to the inside of said container.

7. A container as set out in claim 5 in which said valve containing spigot has a stem in said sleeve, said stem compressing said spring to open said valve seal and admit beverage to the valve in said spigot.

8. A container as set out in claim 1 wherein said charging valve means comprises, a seat for a high pressure gas vessel, piercing means for said vessel, and a valve which is opened by piercing said vessel.

9. A container as set out in claim 8 wherein said means associated with said charging valve comprises a flexible diaphragm having one side thereof exposed to the pressure in said container and the other side thereof exposed to atmospheric pressure, a spring engaging the atmospheric side of said diaphragm, and valve means actuated by said diaphragm to admit said high pressure gas to said container when the pressure in said container falls below an amount determined by said spring.

10. A container as set out in claim 9 wherein the peripheral edge of said diaphragm is secured to the peripheral inner wall of a cup mounted in said cover, a valve housing mounted above said diaphragm at least partially in said cup and housing said charging valve.

11. A container as set out in claim 10 wherein said diaphragm carries a valve member sealingly engaging the lower end of a tube extending down from said valve housing, said spring engaging said diaphragm and said valve housing.

12. A container as set out in claim 11 wherein said valve housing and diaphragm form a chamber vented to the atmosphere through ports in said valve housing.

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