Sept. 29, 1936. W. C. BUTTNER ET AL 2,055,923

CARBONATED LIQUID DISPENSING APPARATUS

Filed June 22, 1934

Fig. 1.

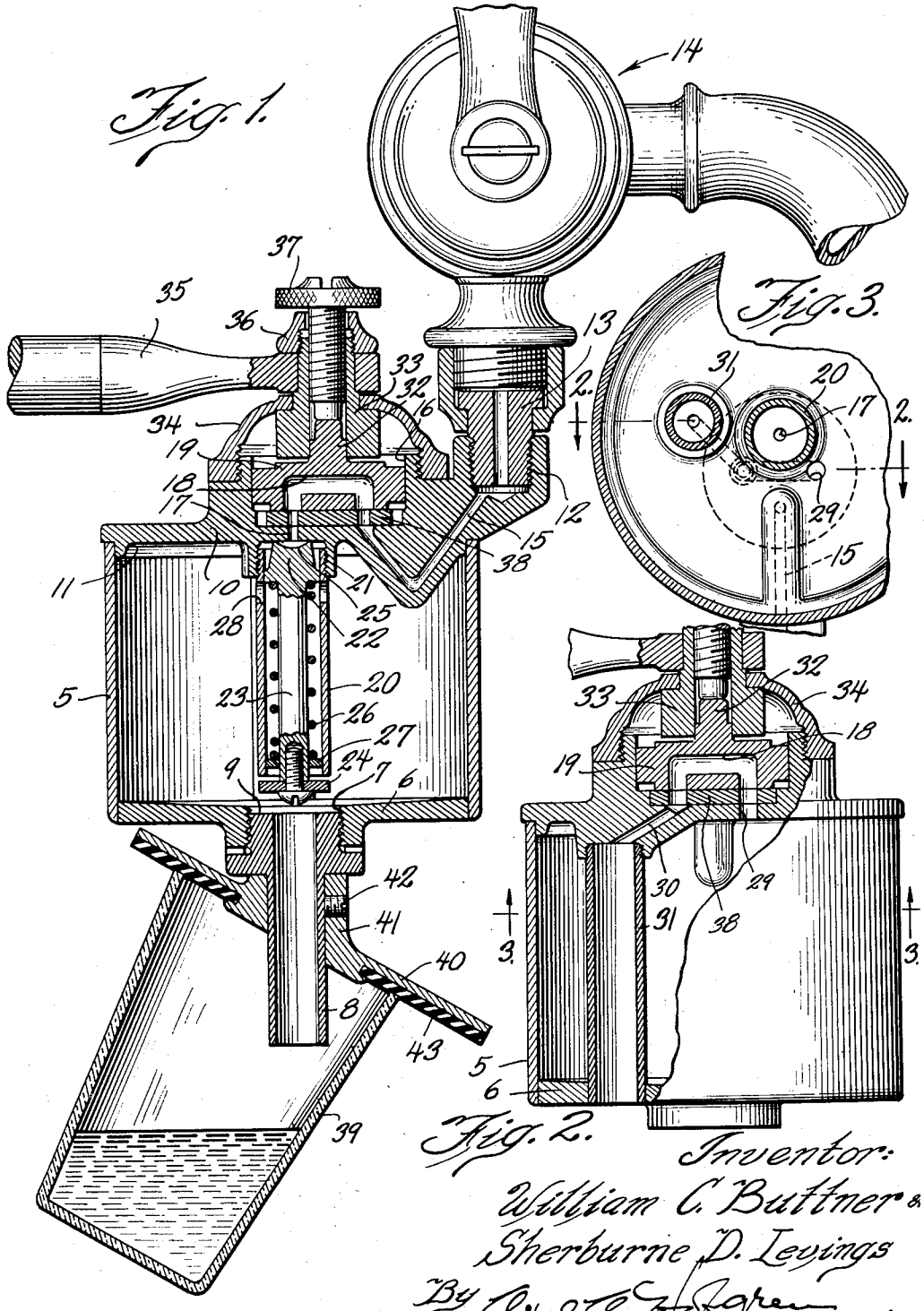


Fig. 3.

Fig. 2.

Inventor:
William C. Buttner &
Sherburne D. Levings
By Albert E. Hofgren their Atty.

Patented Sept. 29, 1936 2,055,923

UNITED STATES PATENT OFFICE

2,055,923

CARBONATED LIQUID DISPENSING APPARATUS

William C. Buttner and Sherburne D. Levings, Winnetka, Ill., assignors to Bastian-Blessing Company, Chicago, Ill., a corporation of Illinois

Application June 22, 1934, Serial No. 731,943

7 Claims. (Cl. 225—30)

The invention relates generally to beverage dispensing apparatus and more particularly to an apparatus for dispensing carbonated water.

It is well known to those skilled in the art that the palatability and sparkling appearance of beverages made from a flavoring syrup and carbonated water depend upon a high content of carbonic acid gas in the completely prepared beverage. Carbonated water, in order to contain many times its volume of carbonic acid gas, is normally maintained under a pressure of 125 to 150 pounds. When the water is discharged directly to atmospheric pressure, an excessive ebullition takes place with numerous undesirable results. Of these, the most undesirable is the extreme loss of carbonic acid gas with the result that the beverage is flat, non-sparkling and unpalatable. Another undesirable result is that with certain types of syrups the excessive ebullition overflows the receptacle in which the beverage is served and carries with it a large portion of the syrup and water so that often times the receptacle is only half full when the ebullition subsides. Also contributing to the loss of gas is the excessive agitation to which the water is subjected both in its discharge into the container and in the subsequent stirring or mixing of the drink.

It is a general object of the invention therefore to provide a novel and improved dispensing apparatus in which excessive ebullition and agitation of the water are prevented whereby a high carbonic acid gas content is maintained and a full receptacle of sparkling and palatable beverage results.

Another object of the invention is to provide a novel method of dispensing a carbonated liquid by means of which a high carbonic acid gas content is maintained, the method including the steps of first reducing the pressure of the carbonated liquid to atmospheric pressure and then discharging the liquid slowly into a receptacle by controlling the back pressure therein.

Another object is to provide a simple apparatus for practicing the above method, more particularly, to provide a carbonated water dispensing apparatus of such character having secured to its discharge spout a member adapted to constitute a closure for a glass or the like, placed beneath the spout, to form with the glass a back-pressure chamber.

Yet another object of the invention is to provide a dispensing apparatus of the character described having a discharge spout and a member secured thereto with the spout substantially centrally thereof, said member forming a closure for a glass or the like placed beneath the spout and disposed at an angle to the spout so that when the glass is positioned with its edge held against the sealing surface of the member, the discharge from the spout will strike the side of the glass at a slight angle and further prevent excessive ebullition of gas.

Other objects and advantages will become apparent from the following detailed description taken in connection with the accompanying drawing, in which:

Fig. 1 is a vertical sectional view of a dispensing apparatus embodying the features of the invention.

Fig. 2 is a fragmentary view of the apparatus shown in Fig. 1 partially in section taken approximately along line 2—2 of Fig. 3.

Fig. 3 is a fragmentary horizontal sectional view taken along line 3—3 of Fig. 2.

For purposes of disclosure, the invention is shown in the drawing and will be described hereinafter as embodied in a dispensing apparatus adapted to be attached to a conventional dispensing nozzle already installed. Generally the apparatus comprises a measuring and pressure reducing device in combination with means operable to form with a glass or other receptacle a chamber in which a slight back-pressure is built up to prevent excessive ebullition when the carbonated water is flowed into the glass at reduced pressure.

The measuring and pressure reducing device may be of any conventional construction suitable for the purpose, the specific construction disclosed being a preferred embodiment. Herein the device comprises a cylindrical container 5 having a bottom wall 6 with a threaded central aperture 7. Depending from the bottom wall 6 and threaded into the aperture 7 is an elongated discharge spout 8, the upper end of which forms a valve seat 9.

A closure for the top of the container 5 forms a housing for valve means controlling the flow of carbonated water to the container and the reduction of pressure in the container at the time the water is discharged. This closure comprises a cast top wall 10 formed with a peripheral, inwardly-projecting flange 11 fitting snugly within the cylindrical side walls of the container 5. Cast integrally with the top wall and extending beyond the periphery thereof, is a threaded socket 12 by means of which the device may be attached to the nozzle 13 of a conventional draft arm and valve generally designated 14. The socket 12

through the top wall 10 also constitutes the means for supporting the dispensing apparatus.

Leading from the socket 12 is an inlet passage including a duct 15 terminating within a circular, upwardly opening recess 16 formed in the top wall 10 eccentrically thereof. Disposed diametrically opposite the terminous of the duct 15 and located concentrically of the top wall 10 is an aperture 17 affording communication between the container 5 and the recess 16. The inlet passage is completed by an inverted U-shaped duct 18 formed in a rotary valve member 19 positioned in the recess 16, the duct 18 operating in one position of the valve member to connect the duct 15 and the aperture 17.

Means is provided within the container 5 automatically to close the discharge spout 8 in response to the influx of water from the draft arm 14. Herein this means comprises an elongated tube 20 threaded at its upper end into an annular, inwardly-projecting flange 21 on the top wall 10. Reciprocable vertically within the tube 20 is a piston 22 having a rod 23 rigid therewith which carries at its lower end a valve 24 operable to seat on the upper end of the discharge spout 8 to close the opening therein. The piston 22 has a depression 25 in its upper surface and is normally retained in the upper portion of the tube 20 by means of a compression spring 26 abutting at one end against a shoulder of the piston and at the other end against a washer 27 secured in the lower end of the tube 20.

Formed in the tube 20 just below the annular flange 21, are a plurality of circumferentially spaced slots 28. These slots are so positioned and the piston 22 and its rod 23 are so proportioned that when the piston moves downwardly a distance permitting communication between the aperture 17 and the slots 28, the valve member 24 rests upon valve seat 9 to prevent discharge of water from the container. Thus it will be seen that when the rotary valve member 19 is in the position shown in Fig. 1, the aperture 17 communicates with the draft arm 14. The water in the passage then acts upon the piston 22 to move the same downwardly until the apertures 28 are uncovered, such movement of the piston also causing the member 24 to rest on the seat 9 and prevent discharge of water from the container. Once the valve member 24 is seated the pressure of water on the top surface thereof maintains the valve closed against the action of the spring 26 until the pressure in the container is reduced.

During the flow of water into the container 5, a certain amount of carbonic acid gas escapes therefrom and accumulates in the upper portion of the container. Means is provided herein for venting the free carbonic acid gas so accumulating and thereby also reducing the pressure on the water within the container. To that end the top wall 10 is provided with an aperture 29 (see Figs. 2 and 3) and with a duct 30 terminating at one end in the recess 16 diametrically opposite the aperture 29 and in a plane at right angles to a plane passing through the aperture 17 and duct 15. The duct 30 terminates at the other end in a vertically disposed tube 31 threaded into the top wall 10 and extending downwardly through the bottom wall 6 where it vents to the atmosphere. The duct 30 and the aperture 29 are adapted to be connected by the duct 18 in the valve member 19 when the same is disposed in the position shown in Fig. 2, that is, at right angles to the position of Fig. 1. Thus rotation of the valve member 19 to the position of Fig. 2 first cuts off the supply of carbonated water to the container 5 and then connects the container to atmosphere to enable the free carbonic acid gas in the top thereof to escape.

The rotary valve member 19 is provided with a squared hub 32 which is received within a socket member 33 extending outwardly through a cap 34 threaded to the top wall 10. The socket carries a suitable operating handle 35 which is secured thereon by a nut 36. A thumb screw 37 is threaded in the socket member 33 and abuts the hub 32 of the rotary valve to seat the same firmly on a washer 38 suitably apertured and interposed between the valve member and the bottom of the recess 16. If desired, spring means may be incorporated in the valve mechanism returning it to venting position to prevent the operator from permitting water to stand in the chamber and become stagnant.

As a result of the venting of the free carbonic acid gas accumulated in the top of the container 5, the pressure within the container 5 is reduced to atmospheric pressure enabling the spring 26 to move the piston 22 upwardly and open the discharge spout 8. The water in the container 5 then flows by gravity through the discharge spout 8 into a glass or other suitable receptacle 39 positioned beneath the spout. Because of the described method of drawing the carbonated water, the carbonic acid gas content is materially higher than when the water is discharged under high pressure directly into the glass 39.

It was found by experiment however, that even though the water is discharged into the bottom of the glass at atmospheric pressure, there is still excess ebullition with a result that much gas escapes, much of the beverage is carried out of the glass and when the effervescing subsidies, the glass is often only partially filled and the beverage has not been thoroughly mixed. Means is provided herein for preventing such excessive ebullition with its undesirable results and for properly mixing the water and syrup without mechanical stirring with its further loss of gas. This is effected by discharging the carbonated water into the glass 39 under a slight back-pressure and the means provided comprises simply a disk 40 having a hub 41 slidably mounted on the discharge spout 8. The disk constitutes a closure for the glass 39 and forms therewith a back-pressure chamber. The disk is secured to the spout in the desired position by means of a set screw 42 and is preferably provided on its under surface with a pad 43 of resilient material to provide an effective seal for the top of the glass and to prevent breakage of the glass. As the carbonated water flows into the glass, any escaping gas will build up a back-pressure retarding the flow of water thereby causing the same to be discharged gently into the glass with very little agitation. The operator of the apparatus can control the back-pressure to insure continued flow of the water by merely tilting the glass slightly away from the disk. The rate of flow of water from the container 5 may also be influenced by moving the valve member 19 to an intermediate position in which is closes both the inlet passage and the vent to atmosphere.

Further to insure the maintenance of a high gas content, the disk 40 is positioned at an angle with respect to the horizontal so that when the operator places the glass 39 against the disk, the spout 8 will be directed toward a side wall of the glass rather than the bottom. As a result the

carbonated water is caused to run gently down the side of the glass and thus has a minimum amount of disturbance. Discharging the water down the side of the glass also gives thereto a stirring motion thus mixing the syrup at the bottom of the glass with the water and, in most instances, obviating the necessity of stirring with a spoon when the contents of the glass is exposed to atmosphere.

The operation of the apparatus is extremely simple, in fact, because of its feature of construction compelling the operator to follow a certain method in drawing the carbonated water, less skill and technique are required to insure a palatable beverage than with present apparatus. Assuming that the handle **35** is in the position of Fig. 2, that is, with the valve **19** closing the supply passage and venting the chamber **5** to atmosphere, preparing a beverage would involve the following simple operations:—The valve is first rotated to connect the chamber **5** to the supply of carbonated water. In the subsequent discharge the valve **24** automatically closes the spout **8** and the discharge takes place with a minimum loss of gas because it is directed into an air tight container and not directly to atmosphere.

When the chamber is full or the supply line pressure is equalized, the valve handle is returned to its initial position whereby the carbonated water supply is automatically cut-off and the chamber vented to atmosphere to reduce the pressure on the water. While the valve is so manipulated with one hand the operator places a glass under the discharge spout with its mouth against the disk **40**. The tilt of the disk induces the operator to place the glass in the proper position below the spout, namely, with the water flowing down the side of the glass. Thus when the valve **24** opens automatically, as a result of venting of the chamber **5**, the water flows by gravity gently down the side of the glass. In this manner it has a minimum of agitation and also has a stirring action on the syrup or other solution in the bottom of the glass obviating the necessity of stirring the mixture with a spoon. There is thus a minimum loss of gas.

Not only is the flow of water without agitation because it is down the side of the glass but the flow is retarded and gentle because it is against a slight back-pressure built up in the glass closed by the seal established by pad **43** against the edge of the glass. The back-pressure may be regulated to maintain the flow by tilting the glass slightly away from the pad.

It is believed apparent from the foregoing that the use of the apparatus described will result in a sparkling, more palatable beverage than has been obtained heretofore. This result is obtained because the carbonic acid gas content of the finished beverage is materially increased over regular soda draft arm dispensing and this increase is obtained regardless of how the operator may mix the drink because the apparatus insures a high content of gas in the water employed. The apparatus further increases the content in the final beverages because in many instances it obviates the necessity of mechanically mixing the drink.

We claim as our invention:

1. An apparatus for dispensing carbonated water comprising a container having a downwardly projecting discharge spout, pressure responsive means within the container operating automatically to close said spout at a predetermined pressure, valve means for controlling the flow of high pressure water to said container and for venting the same, said pressure responsive means operating automatically upon venting of the container to open the discharge spout and permit flow from the container by gravity, and a member secured to the spout and positioned to form a closure for a receptacle placed to receive the discharge from the spout and forming therewith a back-pressure chamber effective to prevent excessive ebullition.

2. For use with a receptacle in which a beverage is served, a carbonated water dispensing apparatus comprising a container having an inlet opening for connection with a supply line and a downwardly projecting discharge spout, pressure responsive means within the container operating automatically to close said spout when said container is connected to the supply line, valve means for controlling the flow of high pressure water to said container and for connecting the same to atmosphere to vent the container, said pressure responsive means operating automatically upon venting of the container to open the discharge spout, and a disk-like member secured to said spout and positioned to close the receptacle placed to receive the discharge from the spout and forming therewith a back-pressure chamber, the pressure of which is controlled by manipulation of the receptacle, effective to control the rate of discharge and thereby prevent excessive ebullition during discharge into the receptacle.

3. An apparatus for dispensing carbonated water comprising, in combination, a pressure reducing device having an elongated discharge spout and a disk-like member mounted on said spout for adjustment longitudinally thereof and adapted to close the mouth of a receptacle receiving the discharge from said spout to form with the receptacle a back-pressure chamber, said member being disposed at an angle less than a right angle to said spout so that the discharge will be directed down a side wall of the receptacle.

4. An apparatus for dispensing carbonated water comprising, in combination, a pressure reducing device having a discharge spout and a disk-like member secured to said spout and adapted to form a closure for the mouth of a receptacle receiving the discharge from said spout, said member being disposed at less than a right angle to said spout at the point of attachment so that the spout will discharge against a side wall of the receptacle placed with its mouth against the disk.

5. An apparatus for discharging carbonated water from a high pressure source at atmospheric pressure into a receptacle held in a hand of an operator of the apparatus comprising a pressure reducing device for first drawing the carbonated water and reducing the pressure thereof to atmospheric pressure and then permitting flow therefrom by gravity, and sealing means for the mouth of the receptacle forming with the receptacle when positioned to receive the discharge from the device a back-pressure chamber the pressure of which is controlled by manipulation of the receptacle for controlling the rate of discharge thus preventing excessive ebullition.

6. As an element in an apparatus for dispensing carbonated water, a disk adapted to be secured to the discharge spout of the apparatus and having a hub the axis of which is at an angle less than a right angle with the plane of the disk and a facing material forming a seal for the mouth of a receptacle placed against the disk.

7. The method of dispensing carbonated water for use in mixing a beverage having a syrup base including the steps of discharging a measured

quantity of water into a closed container, venting the container to atmosphere to reduce the pressure of the water within the container to atmospheric pressure, flowing the water in the container by gravity into a receptacle containing the syrup base and having a slight back-pressure built up therein and controlling the back-pressure in the receptacle by manipulation of the receptacle to control the rate of flow of water.

WILLIAM C. BUTTNER.
SHERBURNE D. LEVINGS.