Oct. 7, 1930. J. KANTOR ET AL 1,777,800

FILLING MECHANISM

Filed May 31, 1927

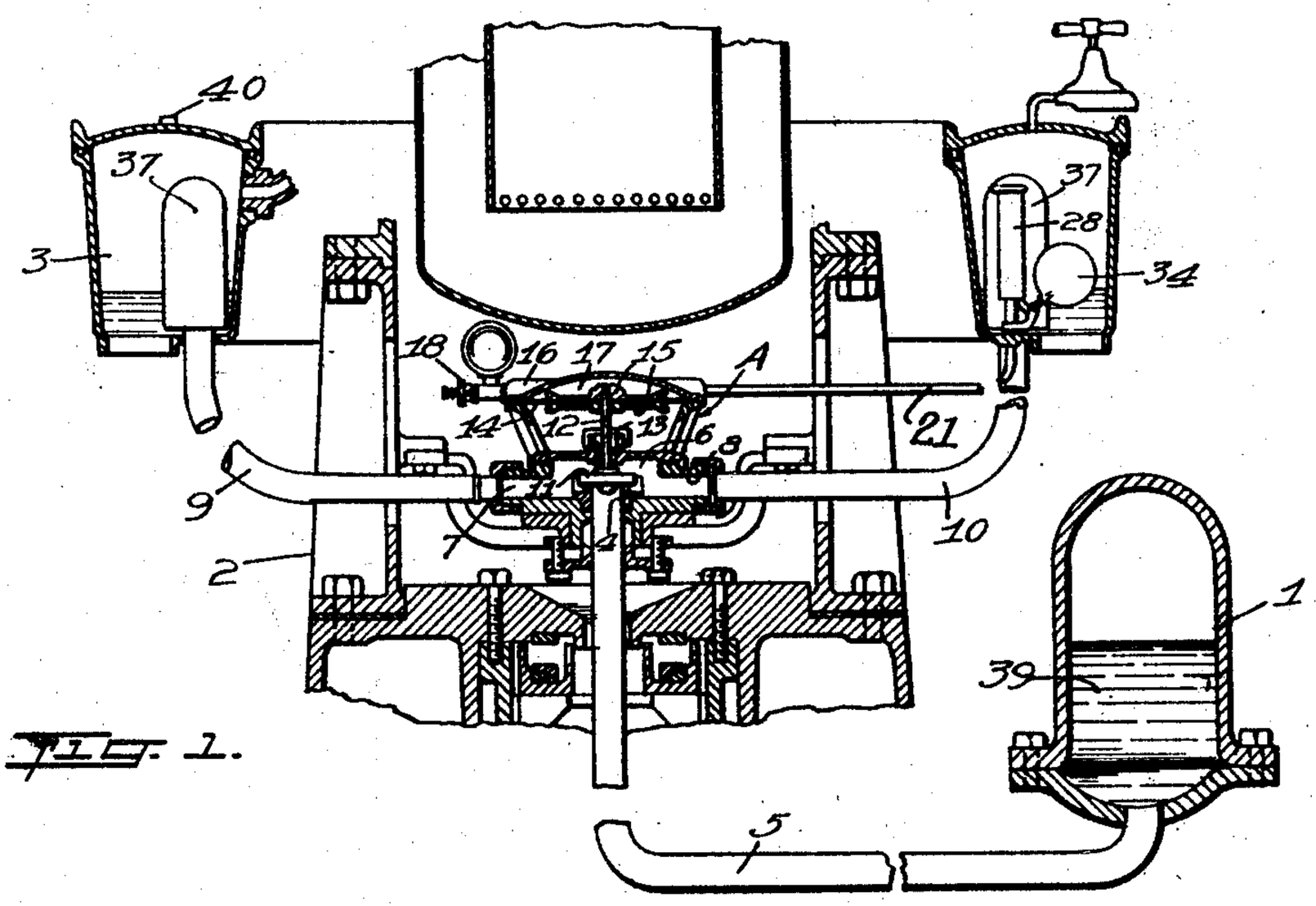

FIG. 1.

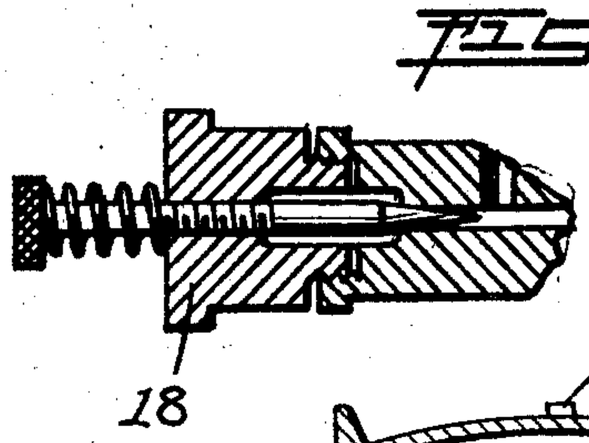

FIG. 4.

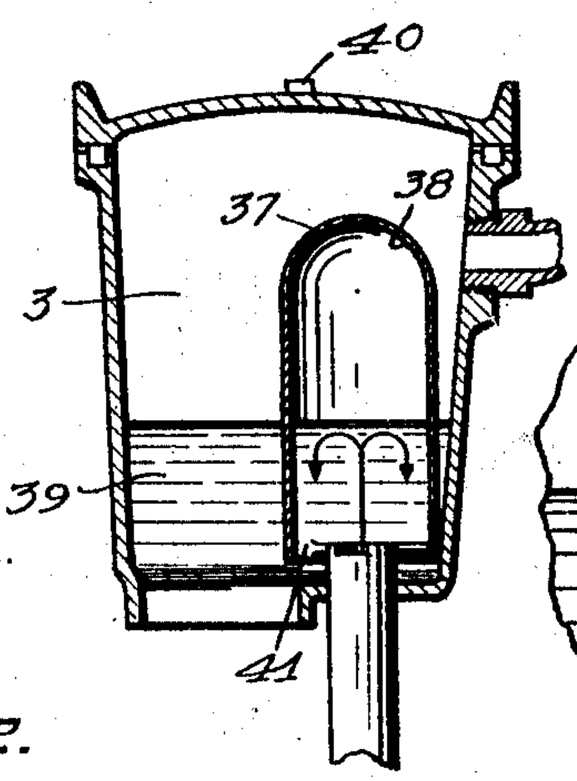

FIG. 2.

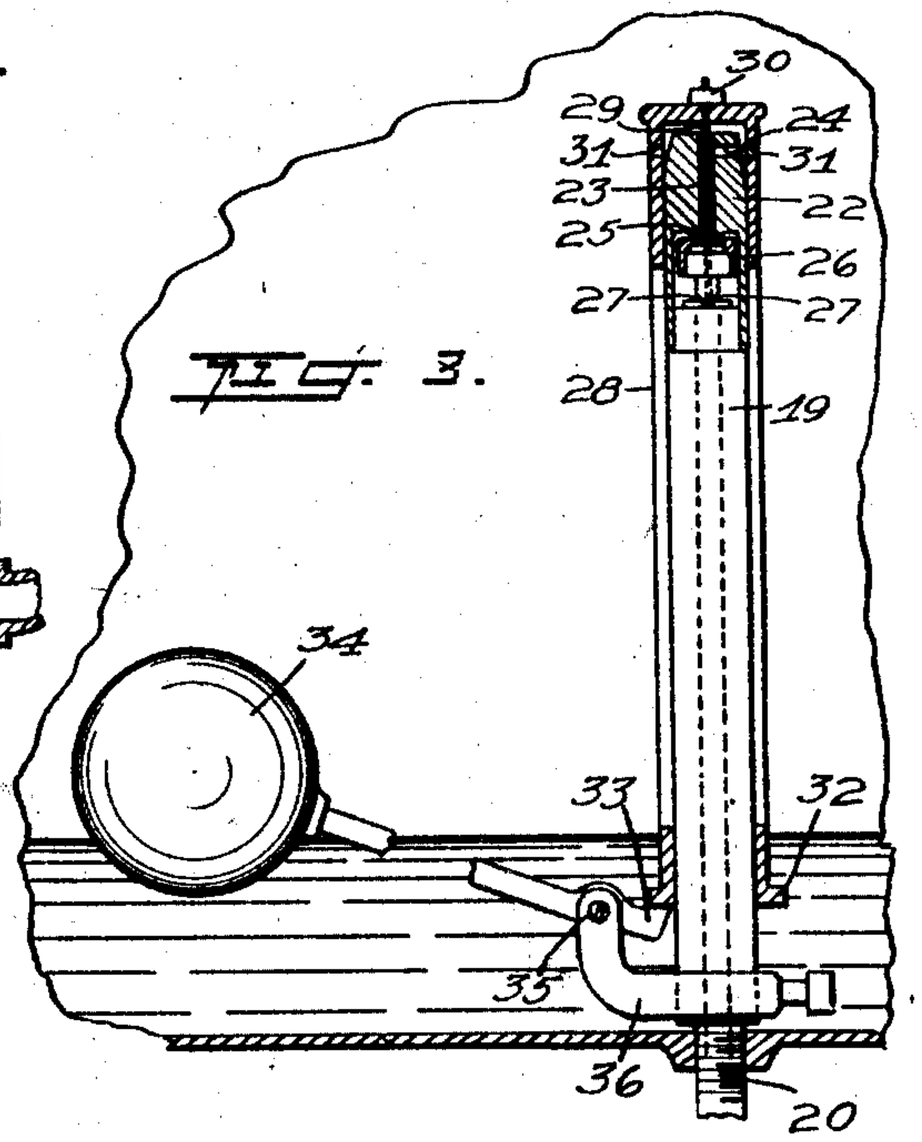

FIG. 3.

INVENTOR
J. KANTOR
C. H. MILLER
BY Munn Reo
ATTORNEYS

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UNITED STATES PATENT OFFICE

JAMES KANTOR AND CHARLES HERMAN MILLER, OF CHICAGO, ILLINOIS, ASSIGNORS TO THE LIQUID CARBONIC CORPORATION, OF CHICAGO, ILLINOIS

FILLING MECHANISM

Application filed May 31, 1927. Serial No. 195,471.

Our invention relates to improvements in filling mechanisms and it consists in the combinations constructions and arrangements herein described and claimed.

An object of our invention is to provide a filling mechanism which has novel means for transferring the highly charged carbonated water from the carbonator to the filler tank in such a manner that the saturation of the water by the gas is maintained in the filler tank thus controlling the gas volumes in the finished beverage.

A further object of our invention is to provide a device of the type described which obviates the need of pressure reducers and other devices positioned between the carbonator and the filling machine which wiredraw or interfere with the smooth travel of the carbonated water. By the term "wiredraw", we mean the act of drawing the carbonated water through a wire mesh. It is a well known fact that in wiredrawing carbonated water the velocity of the water is increased and hence a portion of the gas escapes therefrom.

A further object of our invention is to provide a device of the type described with which the same amount of gas volumes may be disposed in the finished beverage at approximately 40 per cent lower carbonated pressure than was formerly used.

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

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

Figure 1 is a sectional view of a filling mechanism embodying our invention,

Figure 2 is an enlarged sectional view of a portion of our device,

Figure 3 is an enlarged sectional view of another portion of our device, and

Figure 4 is an enlarged sectional view of the bleeder valve construction.

In carrying out our invention, we provide a carbonator 1 and a filling machine 2. The filling machine is provided with a liquid tank 3.

A gas control valve A is provided with an inlet opening 4. A liquid supply pipe 5 extends from the carbonator 1 into communication with the inlet opening 4. The gas control valve A is provided with a compartment 6 in communication with the inlet opening 4 and the supply pipe 5, and is provided with outlet openings 7 and 8. Supply tubes 9 and 10 have one of their ends in communication with the outlet openings 7 and 8, respectively.

A valve 11 is disposed in alignment with the inlet opening 4 and is adapted to be moved into engagement with the inlet opening for a purpose hereinafter described. The valve 11 is provided with a valve stem 12 which extends through a packing gland 13 and is rigidly secured to a diaphragm 14 by means of disc-shaped members 15. A cover 16 is provided for securing the diaphragm to the valve A and for providing a chamber 17. A bleeder valve 18 is disposed in communication with the chamber 17 for varying the speed at which the pressure passes from the chamber.

A float valve is disposed in the tank 3 and consists of a tubular member 19 having a reduced end 20 which extends through the bottom of the tank 3 and is in communication with the chamber 17 by means of a tube 21. A head 22 is secured to the upper portion of the tubular member 19 and is provided with a vertically extending passageway 23 and a horizontally extending passageway 24 which communicates with the passageway 23. At the lower end of the passageway 23, the head 22 is provided with an outwardly extending annular valve portion 25. A valve seat 26 is adapted to contact with the annular valve portion 25. Openings 27 are provided within the lower portion of the valve seat 26.

A sleeve 28 is slidably disposed upon the tubular member 19 and is secured to the valve seat 26 by means of a stud 29 and an adjustable nut 30. Openings 31 are disposed in the inner walls of the sleeve 28. The lower end of the sleeve 28 is provided with an outwardly extending integral flange 32. A cam 33 which is actuated by a float 34 is pivotally mounted at 35 to an adjustable bracket

36 and is in engagement with the flange 32.

Liquid control receptacles 37 are secured to the supply tubes 8 and 9 within the tank 3. The receptacles 37 are somewhat cylindrical in shape and are provided with concave upper ends 38, see Figure 2.

From the foregoing description of the various parts of the device, the operation thereof may be readily understood. The carbonated water indicated at 39 passes from the carbonator to the gas control valve A and into the tank 3 under a certain amount of pressure. A portion of this pressure is maintained in the tank 3, the remainder escaping through a valve 40. When the level of the liquid in the tank 3 moves downwardly, the float 34 is lowered, thus actuating the cam 33 and raising the sleeve 28. By raising the sleeve 28, the valve seat 26 is also raised into engagement with the annular valve 25, thus closing the passageway 23. In this manner, the air pressure in tank 3 is shut off from the upper portion of the diaphragm 14 and the pressure of the carbonated water is sufficient to fully raise the valve 11 and the valve stem 12 upwardly, thus permitting the water to pass into the compartment 6, without any substantial reduction of pressure, through the outlet openings 7 and 8 and through the tubes 9 and 10.

As the water passes from the tubes 9 and 10, it passes upwardly into the receptacles 37. The outlets of the receptacles 37, as indicated at 41, are positioned close to the bottom of the tank 3 and beneath the level of the carbonated water 39 in the tank. Therefore, those portions of the receptacles above the level of the liquid therein form gas cushions. As the water passes from the tubes 9 and 10 into the receptacles, it strikes the gas cushions in the receptacles, thus checking the flow of the water and directing the same downwardly through the outlet 41 and into the tank 3. If the receptacles 37 were not used in connection with the tubes 9 and 10, the water passing from these tubes would be forced against the top of the tank 3 where it would splash in all directions. This splashing causes agitation of the carbonated water already in the tank, and a very pronounced liberation of gas would take place from the splashing water. This is obviated by the aid of the receptacles 37 and the water is passed into the tank without agitation, due to the cushioning effect thereof in the receptacles.

As the carbonated water flows into the tank 3, the float 34 is raised upwardly, thus permitting the sleeve 28 to move downwardly and remove the valve seat 26 from the annular valve portion 25. In this manner, air pressure in tank 3 is permitted to pass through the openings 31, the passageways 24 and 23, around the valve seat 26, through the openings 27, through the tubular portion 19, the tube 21, and into the chamber 17. The diaphragm 14 being greatly larger in diameter than the opening 4 permits a movement downwardly of the valve 11 against the relatively high pressure of the carbonated water with a relatively small amount of air pressure. In this manner, the valve 11 is held closed preventing carbonated water from entering the tank until the float 34 again moves downwardly. The motion of valve 11 is very rapid in closing and opening, therefore no wire-drawing.

With this construction, the carbonated water is permitted to pass smoothly from the carbonator through the valve A when the valve 11 is opened, through the tubes 9 and 10, and into the tank 3 by way of the receptacles 37 without causing agitation of the carbonated water and therefore practically no loss of gas. Hence, a relatively low carbonator pressure is required to get the same number of gas volumes in the finished beverage as was heretofore obtained with a much higher carbonator pressure.

We claim:

A device of the type described comprising a housing having a liquid inlet and a liquid outlet, a valve disposed in said housing and arranged to be moved into engagement with said liquid inlet, a valve stem secured to said valve, a diaphragm secured to said valve stem and carried by said housing, an air compartment disposed in said housing on one side of said diaphragm for receiving air under pressure for closing said valve, means for releasing the air under pressure from said air compartment, whereby a liquid under pressure may open said valve and pass through said inlet and said outlet, a filling tank, communication between said filling tank and said outlet for receiving the liquid from said outlet, and a receptacle disposed in said tank in alignment with the communication with said outlet and extending above the liquid in said tank for cushioning the liquid as the liquid is forced into said tank.

JAMES KANTOR.
CHARLES HERMAN MILLER.