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FILLING MECHANISM

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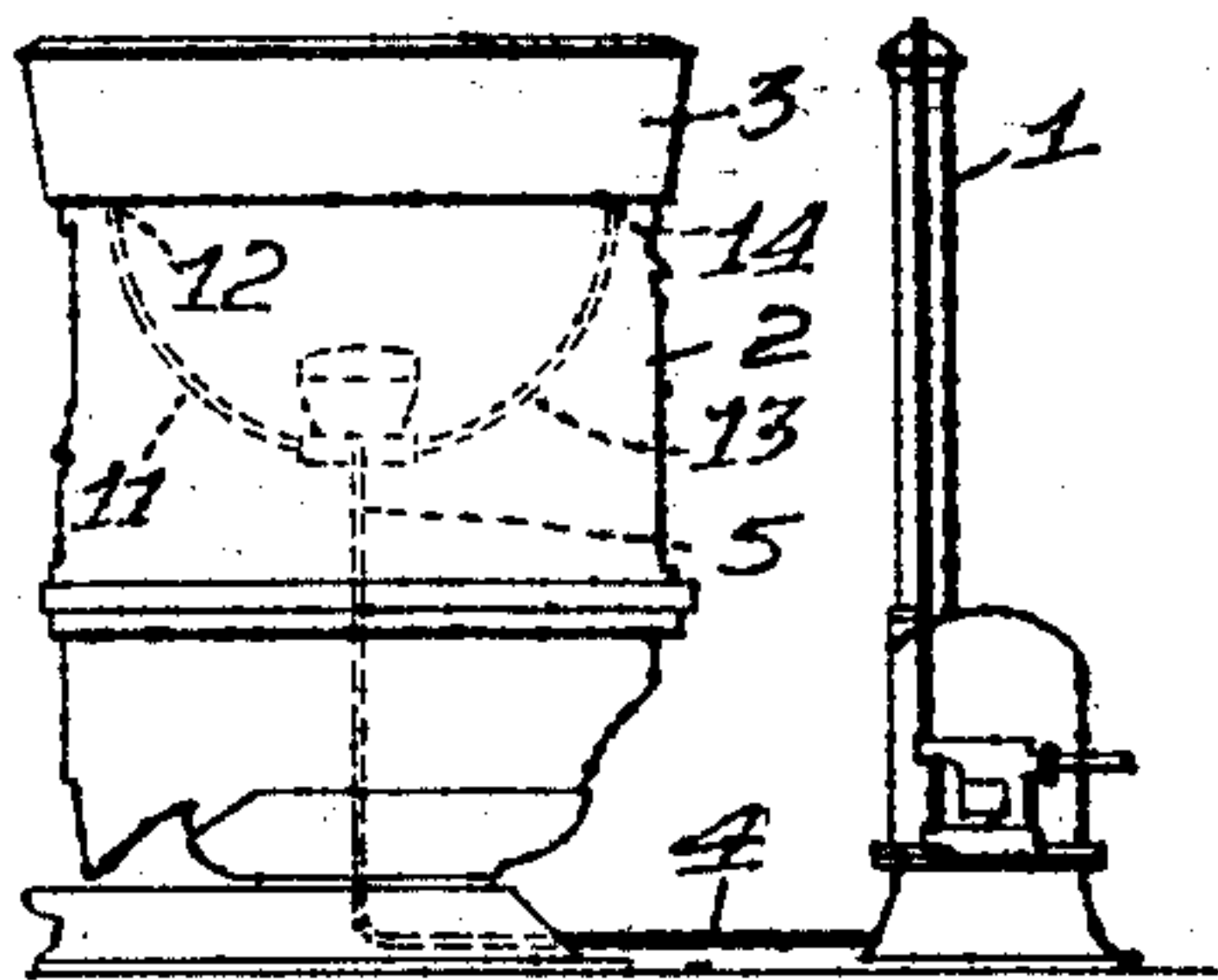
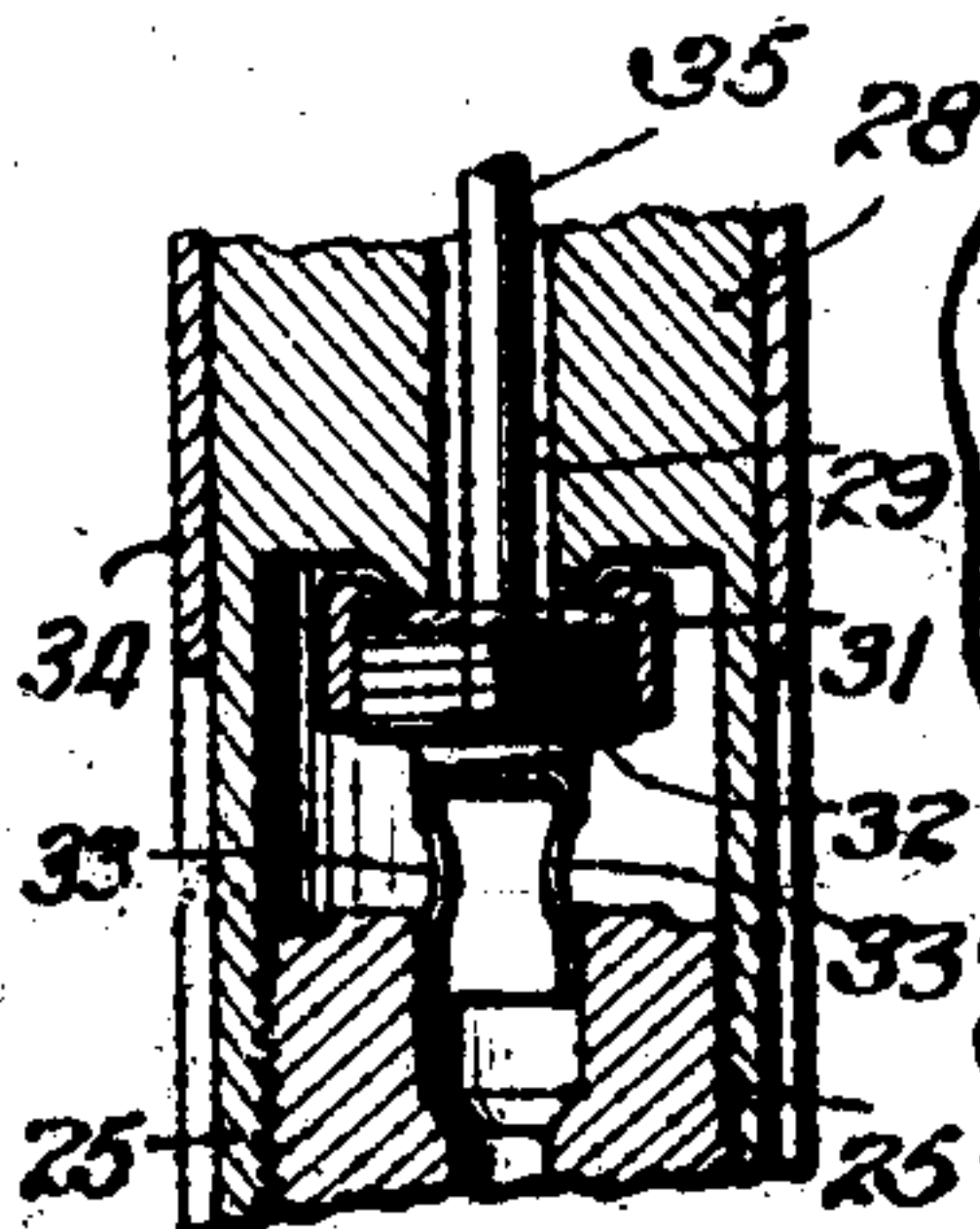


Fig. 1



FE 3.

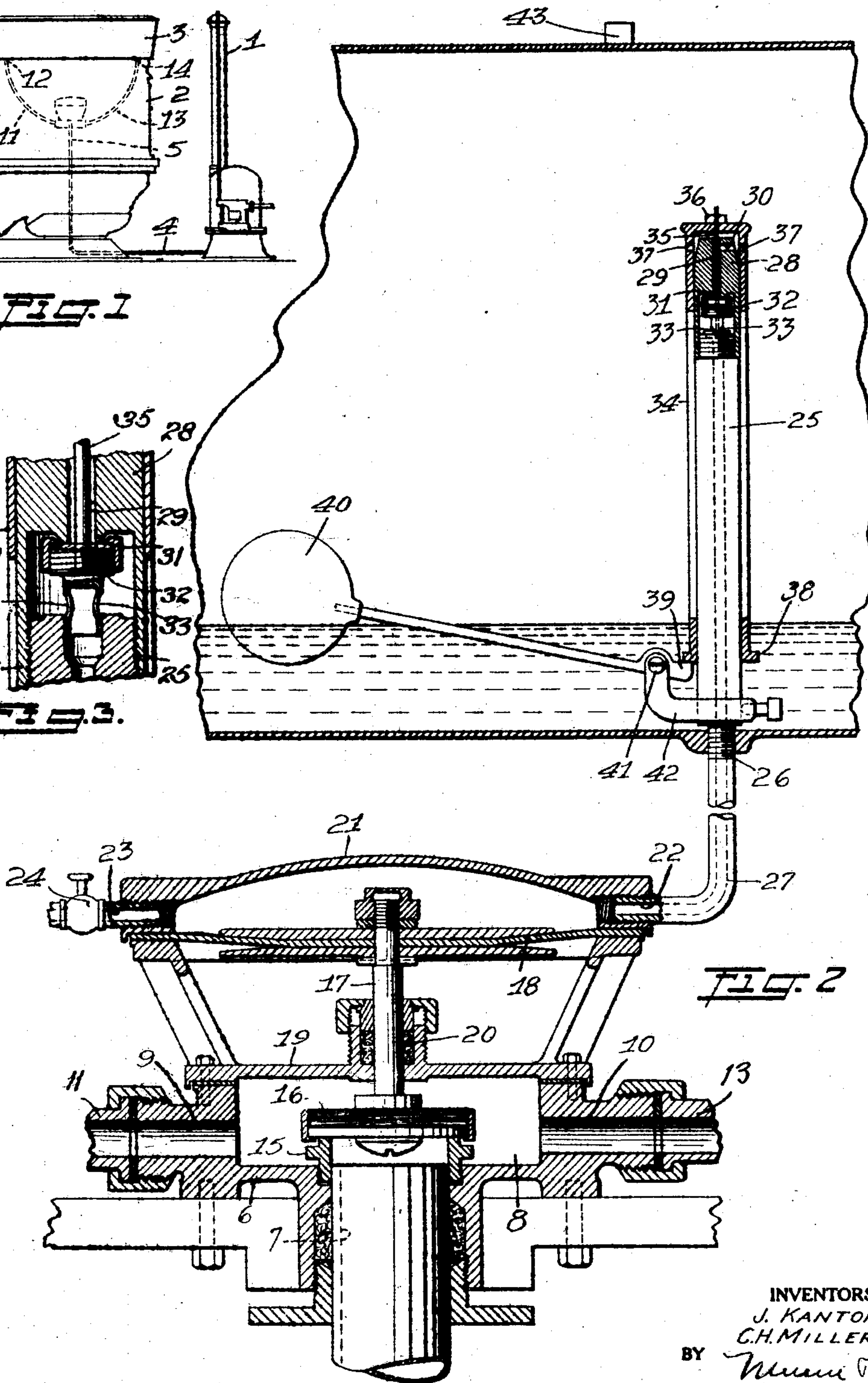


Fig. 2

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FILLING MECHANISM

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Our invention relates to improvements in filling mechanisms, especially the filling mechanisms which fill bottles with carbonated water under low air pressure, 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 obviates the need of valves, pressure reducers, and other devices positioned between the carbonator and the filling machine which wiredraw or interfere with the general 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 a portion of the gas escapes therefrom.

A further object of our invention is to provide a device of the type described with which a lower carbonator pressure is used to pass the same amount of gas into a beverage that is obtained with the old system.

A further object of our invention is to provide a device of the type described with which the water level in the filler tank is maintained irrespective of any possible air leaks therein.

A further object of our invention is to provide a device of the type described which obviates the necessity of refrigeration of the water in order to pass the desired volume of gas into the beverage.

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 claims.

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

Figure 1 is a diagrammatic view of the device,

Figure 2 is an enlarged sectional view of the device, and

Figure 3 is an enlarged sectional view of a portion of the device.

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 pipe line 4 extends from the carbonator 1 to a point 5 within the filling machine 2.

A liquid control valve is positioned at the point 5 upon the pipe line 4. The liquid control valve consists of a housing 6 having an inlet opening 7, a compartment 8, and outlet openings 9 and 10. The inlet opening 7 is in communication with the pipe line 4. A pipe 11 is secured at one end to the housing 6 and communicates with the outlet 9. The free end of the pipe 11 is secured at 12 to the lower part of the tank 3 and communicates therewith. A pipe 13 is secured at one end to the housing 6 and communicates with the opening 10. The free end of the pipe 13 is secured at 14 to the lower portion of the tank 3 and is in communication with the tank.

A valve seat 15 is disposed in the compartment 8, and is in communication with the pipe line 4. A valve head 16 having a valve stem 17 is adapted to engage with the valve seat 15. A diaphragm 18 is secured at its center to the valve stem 17. A compartment cover 19 is provided with packing 20 which not only prevents the liquid from escaping therefrom, but serves as a guide for the valve stem 17. A diaphragm cover 21 and the peripheral edge of the diaphragm are secured to the compartment cover 19. The diaphragm cover 21 is provided with an inlet opening 22 and an outlet opening 23. A valve 24 is secured to the diaphragm cover 21 in communication with the outlet opening 23.

A float valve is disposed in the tank 3 and consists of a tubular member 25 having a reduced end 26 which extends through the bottom of the tank 3 and is in communication with the inlet opening 22 by means of a tube 27. A head 28 is secured to the upper portion of the tubular member 25 and is provided with a vertically extending passageway 29 and a horizontally extending passageway 30 which communicates with the passageway 29. At the lower end of the passageway 29, the head 28 is provided with an outwardly extending annular valve portion 31. A valve seat 32 is adapted to contact with the annular valve portion 31. Openings 33 are provided within the lower portion of the valve seat 32.

A sleeve 34 is slidably disposed upon the tubular member 25 and is secured to the valve seat 32 by means of a stud 35 and an adjustable nut 36. Openings 37 are disposed in the side walls of the sleeve 34. The lower end of the sleeve 34 is provided with an outwardly extending integral flange 38. A cam 39 which is actuated by a float 40 is pivotally mounted at 41 to an adjustable bracket 42, and is in engagement with the flange 38. An air escape valve 43 is in communication with the liquid tank for permitting an undesired amount of air to pass therefrom.

From the foregoing description of the various parts of the device, the operation thereof may be readily understood. The carbonated water passes from the carbonator to the liquid control valve and into the tank under a certain amount of pressure. A portion of this pressure is maintained in the tank 3, the remainder escaping through the valve 43. When the level of the liquid in the tank moves downwardly, the float 40 is lowered, thus actuating the cam 39 and raising the sleeve 34. By raising the sleeve 34, the valve seat 32 is also raised into engagement with the annular valve portion 31, thus closing the passageway 29. In this manner, the air pressure is shut off from the upper portion of the diaphragm 18 and the pressure of the carbonated water is sufficient to raise the valve 16 and the valve stem 17 upwardly, thus permitting the water to pass into the compartment 8 through the outlet openings 9 and 10 and into the tank. As the carbonated water flows into the tank, the float 40 is raised upwardly, thus permitting the sleeve 34 to move downwardly and remove the valve seat 32 from the annular valve portion 31. In this manner, air pressure is permitted to pass through the openings 37, the passageways 30 and 29, around the valve seat 32, through the openings 33, through the tubular portion 25, the tube 27, and into the portion between the diaphragm 18 and the diaphragm cover 21. The diaphragm 18 being greatly larger in diameter than the opening 7 permits a movement downwardly of the valve against the relatively high pressure of the carbonated water with a relatively small amount of air pressure. In this manner, the valve 16 is held closed preventing carbonated water from entering the tank 3 until the float 40 again moves downwardly.

By this construction, the level of the carbonated water within the tank is constantly maintained at a predetermined position. The level of the carbonated water within the tank may be changed by adjusting the float 40 and the bracket 42.

The air above the diaphragm escapes slowly through the valve 24. The speed of the air passing from above the diaphragm is governed by the valve 24.

We claim:

1. The combination with a filling machine having a tank for receiving a liquid under pressure, of means for maintaining the liquid at a predetermined level in said tank, said means comprising a diaphragm, a housing for said diaphragm providing a compartment adjacent thereto, a valve connected to said diaphragm for stopping the flow of liquid into said tank when in closed position, said valve being normally held open by the force of the liquid, means for automatically supplying air pressure to the compartment for moving said diaphragm for closing said valve, and adjustable means for releasing the air pressure from said diaphragm.

2. The combination with a filling machine having a tank for receiving a liquid under pressure, of means for maintaining the liquid at a predetermined level in said tank, said means comprising a diaphragm, a housing for said diaphragm provided with a compartment adjacent thereto, a valve connected to said diaphragm for stopping the flow of liquid into said tank when in closed position, said valve being normally held open by the force of the liquid, means for automatically supplying air under pressure to the compartment for moving said diaphragm for closing said valve, said means comprising a tubular member disposed in said tank and having an open end, a head portion mounted upon the open end of said tubular member and having a passageway therethrough, a valve disposed in registration with the opening in said head portion and arranged to shut off the communication between the passageway in said head portion and said tubular member, and means for actuating said valve for moving said valve into registration with the opening in said head portion.

3. The combination with a filling machine having a tank for receiving a liquid under pressure, of means for maintaining the liquid at a predetermined level in said tank, said means comprising a diaphragm, a housing for said diaphragm provided with a compartment adjacent thereto, a valve connected to said diaphragm for stopping the flow of liquid into said tank when in closed position, said valve being normally held open by the force of the liquid, means for automatically supplying air under pressure to the compartment for moving said diaphragm for closing said valve, said means comprising a tubular member disposed in said tank and having an open end, a head portion mounted upon the open end of said tubular member and having a passageway therethrough, a valve disposed in registration with the opening in said head portion and arranged to shut off the communication between the passageway in said head portion and said tubular member, a sleeve mounted upon said tubular member and arranged to receive said head portion, said

sleeve being provided with an opening arranged to communicate with the opening in said head portion, and means for moving said sleeve with respect to said tubular member, whereby the air in said tank may pass through the openings in said sleeve and said head portion and through said tubular member to said diaphragm.

4. The combination with a carbonator, and a tank for a filling machine adapted to hold a liquid, of a housing having an inlet communicating with said carbonator and an outlet communicating with said tank, a valve disposed in said housing adjacent said inlet for closing said inlet, said valve being adapted to be opened by liquid forced from said carbonator into said housing and from said housing into said tank, a valve stem for said valve, a diaphragm operatively connected to said valve stem, an air compartment disposed upon one side of said diaphragm, said filling tank adapted to contain air under pressure, an air valve disposed in said tank, a sleeve disposed over said air valve, and means controlled by the liquid in said tank for opening said air valve for allowing air under pressure to pass into said air compartment for actuating said diaphragm for closing said first named valve.

5. The combination with a carbonator, and a tank for a filling machine adapted to hold a liquid, of a housing having an inlet communicating with said carbonator and an outlet communicating with said tank, a valve disposed in said housing adjacent said inlet for closing said inlet, said valve being adapted to be opened by liquid forced from said carbonator into said housing and from said housing into said tank, a valve stem for said valve, a diaphragm operatively connected to said valve stem, an air compartment disposed upon one side of said diaphragm, said filling tank adapted to contain air under pressure, an air valve disposed in said tank, a sleeve disposed over said air valve, and means controlled by the liquid in said tank for opening said air valve for allowing air under pressure to pass into said air compartment for actuating said diaphragm for closing said first named valve, said means controlled by the level of the liquid in said tank being adapted to close said air valve for shutting off the passage of air to said air compartment.

6. The combination with a carbonator, and a tank for a filling machine adapted to hold a liquid, of a housing having an inlet communicating with said carbonator and an outlet communicating with said tank, a valve disposed in said housing adjacent said inlet for closing said inlet, said valve being adapted to be opened by liquid forced from said carbonator into said housing and from said housing into said tank, a valve stem for said valve, a diaphragm operative-

ly connected to said valve stem, an air compartment disposed upon one side of said diaphragm, said filling tank adapted to contain air under pressure, an air valve disposed in said tank, a sleeve disposed over said air valve, means controlled by the liquid in said tank for opening said air valve for allowing air under pressure to pass into said air compartment for actuating said diaphragm for closing said first named valve, said means controlled by the level of the liquid in said tank being adapted to close said air valve for shutting off the passage of air to said air compartment, and means for allowing the air to escape from said air compartment.

7. The combination with a carbonator, and a tank for a filling machine adapted to hold a liquid, of a housing having an inlet communicating with said carbonator and an outlet communicating with said tank, a valve disposed in said housing adjacent said inlet for closing said inlet, said valve being adapted to be opened by liquid forced from said carbonator into said housing and from said housing into said tank, a valve stem for said valve, a diaphragm operatively connected to said valve stem, an air compartment disposed upon one side of said diaphragm, said filling tank adapted to contain air under pressure, an air valve disposed in said tank, a sleeve disposed over said air valve, means controlled by the liquid in said tank for opening said air valve for allowing air under pressure to pass into said air compartment for actuating said diaphragm for closing said first named valve, said means controlled by the level of the liquid in said tank being adapted to close said air valve for shutting off the passage of air to said air compartment, and adjustable means for allowing the air under pressure to pass from said air compartment.

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