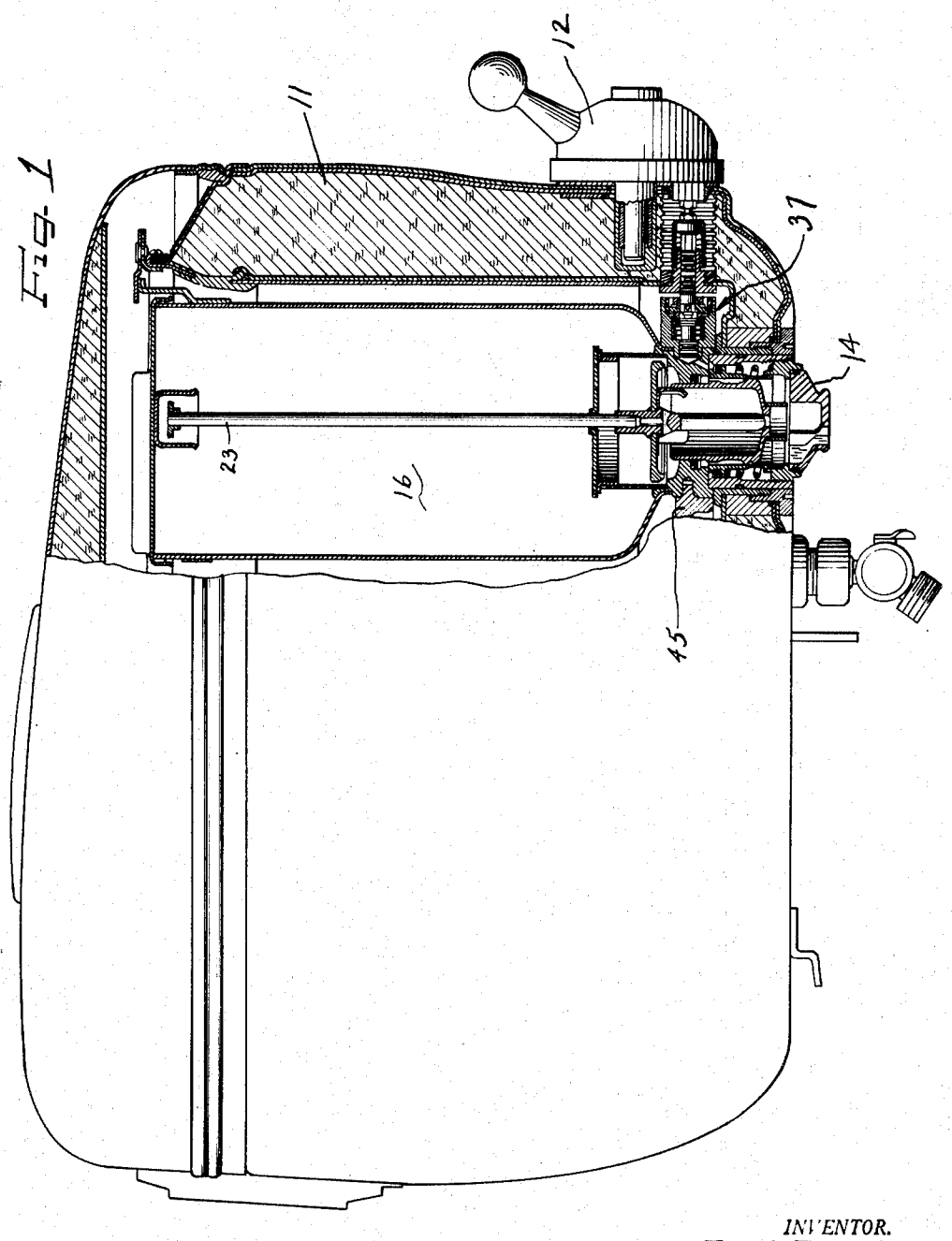
Sept. 19, 1950 F. E. SANBORN 2,522,898

SIRUP VALVE ASSEMBLY FOR BEVERAGE DISPENSERS

Filed Nov. 22, 1946 2 Sheets-Sheet 1

Fig. 1



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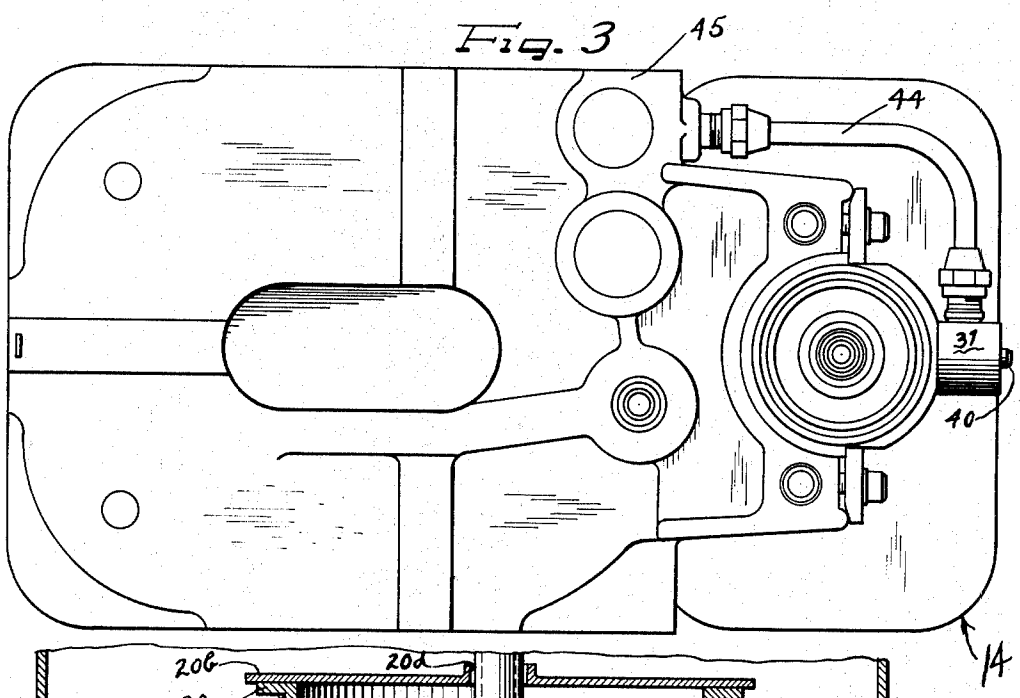
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SIRUP VALVE ASSEMBLY FOR BEVERAGE DISPENSERS

Filed Nov. 22, 1946 2 Sheets-Sheet 2

Fig. 3



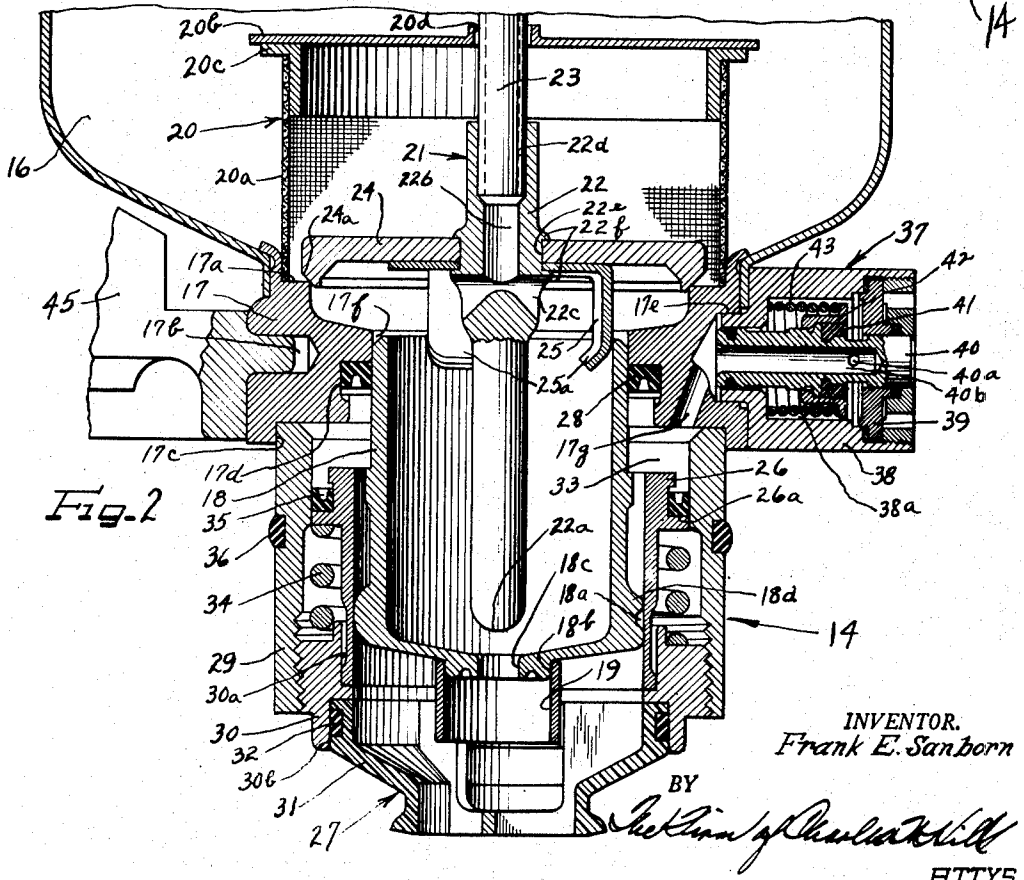


Fig. 2

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SIRUP VALVE ASSEMBLY FOR BEVERAGE DISPENSERS

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4 Claims. (Cl. 225—21)

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This invention relates to improvements in valves of the type used in drink-dispenser machines, and more particularly to the type of valves used to control the flow of syrup which is to be mixed with a carbonated liquid in the preparation of a carbonated beverage.

In the preparation of a beverage in which a carbonated liquid is mixed with a flavoring syrup, it is highly desirable that the correct proportions of the two ingredients be maintained in each drink in order to insure the uniformity of taste of the drink. It is, therefore, important that the amount of syrup introduced into the glass with the carbonated liquid be accurately measured. It is further desirable that the syrup be introduced into the glass as soon as possible so that the stream of incoming carbonated liquid will have a chance to thoroughly mix it.

In order to accomplish the contemporaneous operations of introducing the metered amount of syrup and the carbonated liquid into the glass by actuating one handle mechanism, it is expedient that the pressure of the incoming carbonated liquid actuate the syrup valve means to cause the syrup to flow into the glass.

It is, therefore, an object of this invention to provide a syrup valve means which will accurately measure the amount of syrup to be introduced with each glass of carbonated beverage.

It is another object of this invention to provide means for aiding the liquid syrup to quickly flow from the syrup measuring chamber.

It is a further object of this invention to provide a positive seating valve means which will prevent further entrance of syrup into the syrup chamber.

It is another and further object of this invention to provide means for mixing a carbonated liquid with a flavoring syrup in which the fluid pressure of the carbonated liquid is employed to open the syrup valve.

Another object of the present invention is to provide a syrup valve mechanism of novel construction which is economical to manufacture and which is efficient and effective in use.

In accordance with the general features of my invention there is provided a syrup tank having a telescoping cup-like orifice member which, when subjected to the pressure of a carbonated liquid with which the syrup is to be mixed, moves downwardly to first shut off the main tank from the cup-like member thus entrapping a fixed amount therein, and then to open the exit port to allow the syrup to leave the cup-like member.

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Another feature of this invention is the provision of a vent line connected to the metering chamber which permits the rapid flow of syrup from the chamber.

A further feature of this invention is the provision of a valve member having beveled edges which contact the valve seat to very efficiently shut off the incoming syrup from the syrup chamber.

Other objects, features, and advantages of the present invention will be readily apparent to those skilled in the art from the detailed description of the annexed sheets of drawings.

On the drawings:

Figure 1 is a side elevational view, partly in section and partly broken away, of a drink dispenser unit in which is incorporated a syrup valve means embodying the features of my invention;

Figure 2 is a side elevational view, partly in section and partly broken away, of a dispenser head unit showing the syrup valve in a position to permit the discharge of syrup from a syrup chamber; and

Figure 3 is a bottom plan view of a drink dispenser unit particularly showing the connection between the cooling block and the dispenser head assembly.

In Figure 1 is illustrated a drink dispenser unit of the type in which the valve means of my invention is particularly suited to be used. This dispenser unit comprises essentially an insulated casing **11**, an operating handle mechanism **12**, a dispenser head assembly **14**, a carbonated liquid release valve assembly **37**, and a cooling block assembly **45**.

In a drink dispenser unit, the dispenser head assembly is that part of the unit at which the carbonated liquid and the flavoring syrup are brought together for discharge from a common nozzle into a glass. The dispenser head assembly **14** shown in Figure 2 comprises a syrup chamber **16**, a syrup valve means **21**, a passageway **33** for the carbonated liquid, and a nozzle portion **27**. In practice, when the handle mechanism **12** is pulled down from its vertical position, it actuates a plunger in the carbonated liquid release valve assembly **37** which permits the carbonated liquid to enter the passageway **33**. As the carbonated liquid flows through the passageway **33**, it contacts the syrup-valve actuating mechanism causing a metered amount of syrup to be discharged for mixing with the carbonated liquid.

In order that the syrup may be gravity fed to

the dispenser head, the syrup chamber 16 is disposed vertically above the dispenser head proper. At its lower end the chamber 16 is suitably secured in sealed relation with a base member 17. On the upper surface of the member 17 there is a flat annular surface 17*a*. A groove 17*b*, extending approximately one-half way around the member 17, is provided in the side thereof disposed substantially midway between the upper and lower surfaces. On the lower surface of the member 17 there is provided a cylindrical recess 17*c* and a second cylindrical recess 17*d* is provided inside the recess 17*c*. As a means of securing the carbonated liquid release valve mechanism 37 to the dispenser head, a port 17*e* is provided at one side of the body member 17. Adjacent port 17*e* is a passageway 17*g* which leads to the carbonated liquid passage 33. At the inner central portion of the member 17 there is provided a cylindrical aperture 17*f*. Disposed in the aperture 17*f* for sliding movement therein is a cup-like hollow member 18 which forms the lower portion of a metering chamber. A passageway 18*c* through which the syrup may leave the metering chamber is provided in the lower wall of the member 18. On the under side of the member 18 there is disposed a boss 18*b* which provides a seat for a cylindrical extension member 19 depending therefrom.

In order to prevent any foreign matter or congealed syrup from passing down through the dispenser head, there is provided a strainer assemby 20. This assembly comprises a cylindrical strainer member 20*a* supported on the surface 17*a* of the member 17, a strainer cover 20*b* and an adapter 20*c* by which the strainer member 20*a* is secured to the cover 20*b*. Centrally disposed on the cover 20*b* is a cylindrical aperture 20*d*.

In this invention I have provided a novel valve means 21 including a substantially cylindrical central member 22 which is adapted at its lower end 22*a* to be seated on the outlet orifice 18*c* of the cup-like member 18. To allow air to enter the chamber and thus expedite the discharge of syrup therefrom I have provided a cylindrical passageway 22*b* in the member 22. Passageway 22*b* connects with a lower horizontal passageway 22*c* which opens into the syrup-measuring chamber. At the upper end of the member 22 there is provided a cylindrical opening 22*d* in which is positioned a tube 23. As best seen in Figure 1, the tube 23 extends to the top of the syrup chamber 16 thus providing a means of allowing air to enter the syrup-measuring chamber.

In this invention I have provided a valve 24 having a lower outer beveled edge 24*a* which is adapted to be seated on the upper surface of the member 17.

Disposed immediately below the valve 24 and abutting the lower surface thereof is a centering member 25 having a plurality of downwardly extending arms 25*a*. Both the valve 24 and the centering member 25 are securely held in a groove 22*e* of the member 22 by outwardly extending shoulders 22*f*. The centering member 25 is adapted to slide up and down in the cup-like member 18 and, since it is rigidly secured to member 22, it will tend to center the lower plunger portion 22*a* of the member 22 in the orifice 18*c* of the member 18 through which the syrup is discharged.

For the purpose of providing a channel through which the carbonated liquid may pass through

the dispenser head, there is provided a cylindrical member 26 which is suitably secured as by a press fit to the lower end of member 18. Due to the fact that at the lower end of the member 18 there is an enlarged annular ring portion 18*d* against which the cylinder member 26 will be supported, there is formed immediately above this section between the member 26 and the reduced outer wall of member 18 the lower portion of passageway 33. A spiral groove 18*a* on the outer surface of the ring portion 18*d* connects the passageway 33 with the upper nozzle opening and causes the carbonated liquid to enter the nozzle in a spiral path. On the outer surface of the cylindrical member 26 there is an annular ring portion 26*a*.

In order to prevent the carbonated liquid from working up along the outer wall of the member 18 into the syrup chamber there is provided a seal ring 28 which is disposed in the annular recess 17*d* of the base member 17. This seal ring permits the member 18 to slide up and down thereon without permitting the carbonated liquid to pass along the contact surface.

As best seen in Figure 2, the nozzle assembly 27 comprises a cylindrical positioning member 29 into which is threaded an adapter member 30. An annular recess 30*a* on the inner surface of member 30 provides a guide surface for the travel of the cylindrical member 26 and also provides a seat for member 26 when the valve mechanism is in its discharge position. There is further provided in the adapter 30 a lower annular recess 30*b* into which is pressed a nozzle 31. A seal ring 32 is disposed between the nozzle member 31 and the adapter 30 to prevent passage of carbonated liquid at this joint.

The valve means 21 is returned to its normal closed position by a coil spring 34 which is disposed about the cylindrical member 26 and is adapted to act on the lower surface of the projection 26*a* of member 26. The spring 34 rests at its lower end on the upper surface of adapter member 30.

It is important that no air be allowed to reach the carbonated liquid at any point before it is discharged into the nozzle. This would cause the carbonated liquid to emerge in a flat, uncarbonated condition. There is therefore disposed between the positioning member 29 and the cylindrical member 26 a seal ring 35 which prevents the possibility of air leaking out through the spring chamber to mix with the carbonated liquid.

As is best seen in Figure 1, when the dispenser head assembly is positioned in the casing of the dispenser unit, it is necessary that there be a seal to prevent the liquid coolant from leaking past the dispenser head. For this purpose, a seal ring 36 is disposed in the outer wall of the positioning member 30.

The carbonated liquid is introduced into the dispenser head by means of a release valve assembly 37 which includes an outer body member 38 suitably secured in the opening 17*e* of the base member 17. A substantially cylindrical chamber 38*a* is centrally disposed inside the member 38. A valve seat member 39 is rigidly secured relative to the body member 38 having a central aperture therethrough which serves as a guide for a plunger 40. Disposed in grooves on the outer surface of plunger 40 is a sealing member 41 and a sealing member housing 42. The plunger 40 is normally urged outwardly by the action of a coil spring 43 acting on the hous-

ing 42. Thus the housing 42 and the sealing member 41 are normally pressed down on the valve seat 39. When the plunger 40 is pushed inwardly as shown in Figure 2, the member 41 and the housing 42 are removed from the seat 39 and a port 40*a* is uncovered. Thus the carbonated liquid which has entered chamber 38 of valve assembly 37 by means of a tube 44 leading from the cooling block 45 (Figure 3) enters a central passageway 40*b* of the plunger 40 through the port 40*a* and is directed by the passageway 17*g* of member 17 to the passage 33 which leads to the nozzle.

In its normal position, the valve means of my invention is positioned as indicated in Figure 1, with the cup-like member 18 urged upwardly by the spring 34. It is to be noted that, in its upward movement, the member 18 telescopes around the centering member 25 until the lower end 22*a* of the center member 22 rests in the orifice 18*c* of the member 18. Further upward movement will cause the valve assembly 21 to move upwardly bodily, thus pushing the valve 24 off its seat on the member 17. Syrup will now flow into the cup-like member 18 through the strainer member 20*a* and completely fill the chamber.

When it is desired to draw a drink, the handle 12 is pulled down. This handle, acting through suitable mechanism, forces the plunger 40 inwardly, allowing the carbonated liquid to enter the passage 40*b*, pass through the opening 17*g*, and enter the upper part of the passage 33. In this upper part of the passage 33 the carbonated liquid under pressure comes in contact with the upper flat surface of the cylindrical member 26, and, by acting on this surface, forces the member 26 downwardly. The cup-like member 18, being secured to member 26, also moves downwardly. As the member 18 moves downwardly, the valve assembly 21, which was being held off its seat by the action of member 18, also moves downwardly and its beveled edge 24*a* immediately comes to rest on the valve seat of member 17. At this point, the downward movement of the valve assembly 21 stops and, as the member 18 continues its descent, the lower end 22*a* of the plunger 22 is removed from its seat in the orifice 18*c* and the syrup is permitted to flow out of the orifice.

The carbonated liquid entering by way of the passage 33 and the syrup entering through the orifice 18*c* meet in the nozzle 31 and are mixed therein before being discharged into a glass.

Thus it may be seen that, when the valve means of my invention is forced downwardly by the action of the carbonated liquid under pressure on an exterior ledge surface, it first positions a valve member on its seat thus preventing further inflow of syrup to the measuring chamber. There is then entrapped in the measuring chamber a fixed charge of syrup and, as the valving member is further moved downwardly, it uncovers the orifice out of which the syrup is discharged into the nozzle. The syrup so discharged is sufficient to make one glass of a carbonated drink. Thus it is evident that every succeeding glass of the carbonated beverage will contain an equal concentration of syrup. The vent tube 23 permits the syrup to flow quickly from the syrup-measuring chamber.

It will, of course, be understood that various details of construction may be varied throughout a wide range without departing from the principles of this invention, and it is, therefore, not the purpose to limit the patent granted hereon otherwise than necessitated by the scope of the appended claims.

I claim as my invention:

1. In a device for mixing a syrup with a carbonated liquid for dispensing a carbonated beverage, a casing, a syrup tank mounted in said casing having a base member resting thereon, a cup-like member adapted to receive syrup from said syrup tank and to slide within said base member between a closed and a discharge position, a discharge orifice in said cup-like member, a spring biasing said cup-like member to a closed position, pressure actuated means responsive to the pressure of the carbonated liquid for moving said cup-like member to a discharge position, valving means cooperating with said cup-like member to effect the opening and the closing of said discharge orifice including an upper valve movable downwardly by gravity for restricting the flow of syrup to said cup-like member, a lower valve for covering and uncovering said discharge orifice, a vent tube communicating with said cup-like member and a centering unit having an arm contacting the inner wall of said cup-like member for guiding the travel of said first and second valves, said first and second valves being arranged in fixed relation to each other so that in their movement toward a discharge position said first valve will seat ahead of said second valve opening thereby metering a quantity of syrup before discharging it from said cup-like member, and valve-release means for controlling the flow of carbonated liquid to said pressure-actuated means whereby said carbonated liquid will cause said cup-like means to move toward discharge position first entrapping a metered amount of syrup in said cup-like means and then discharging the syrup into a nozzle for mixing with the carbonated liquid.

2. A device for mixing a syrup with a carbonated liquid for dispensing a carbonated beverage comprising a casing having a syrup tank mounted in an upper portion thereof, a mixing head housing mounted below said tank, a discharge head slidable within said housing between upper and lower position, said discharge head including a cup-like member arranged to receive syrup from said tank, said tank including a port opening into said cup, a gravity-actuated port-closing member movable into port-closing position, said cup-like member having an opening in the face thereof, an elongated valve member rigidly secured to said port-closing member and projecting downwardly therefrom into proximity with said cup opening, said valve member being of such length that said port-closing member is seated on said port to close the same and said cup opening is free from said valve member when said discharge head is in said lower position and said port-closing member is lifted off of said port and said cup member when said discharge head is in upper position, said discharge head also including a guide arm secured to said port-closing member and to said elongated valve being in contact with said cup-like member for guiding movement of said port-closing member and said valve for seating thereof, and a nozzle portion below said cup-like member into which the syrup flows when said cup opening is free from said valve member, and means for conducting a carbonated liquid into said nozzle portion, valve means for interrupting the flow of carbonated liquid to said nozzle portion and means responsive to the flow of carbonated liquid to said nozzle portion

for moving said discharge head from its said upper position to its said lower position.

3. In a liquid and fluid mixing dispenser control head including a receptacle for containing a given charge of liquid to be mixed with the fluid and having a discharge opening, fluid pressure responsive plunger valve means extending into said receptacle and cooperable with said opening including means bearing against and centered by the wall of said receptacle for guiding the plunger valve means upon relative lengthwise movement as between same and the receptacle in the mixing of the liquid and fluid and in the charging of the receptacle with liquid.

4. In a liquid and fluid mixing dispenser control head including a receptacle for containing a given charge of liquid to be mixed with the fluid and having a discharge opening, fluid pressure responsive plunger valve means extending into said receptacle and cooperable with said opening including means bearing against and centered by the wall of said receptacle for guiding the plunger valve means upon relative lengthwise movement as between same and the receptacle, said plunger valve means carrying a vent tube in communication with the atmosphere for venting said receptacle.

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