June 25, 1935. C. A. GEDDES 2,006,313

SELF CARBONATING DISPENSING SYSTEM

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Fig. 1.

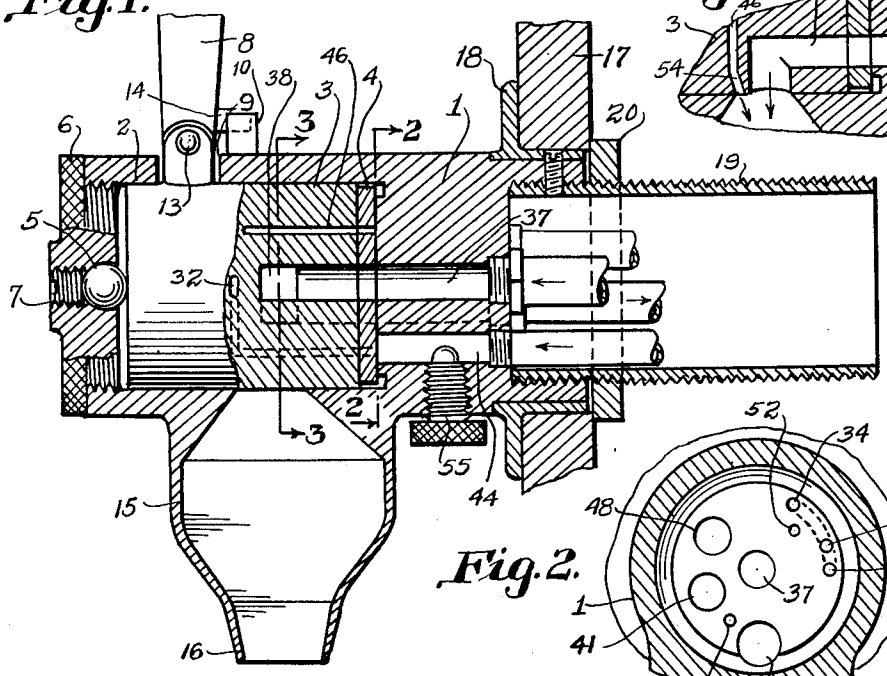

Fig. 12.

Fig. 2.

Fig. 3.

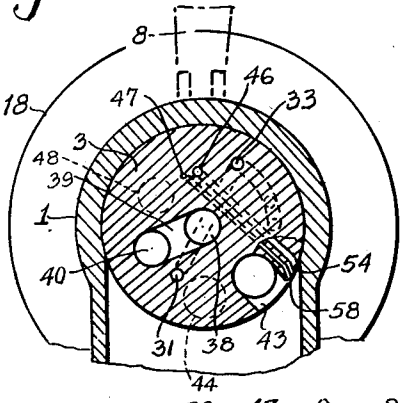

Fig. 4.

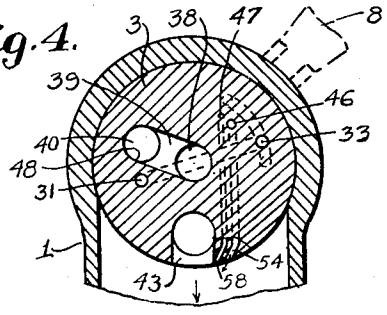

Fig. 5.

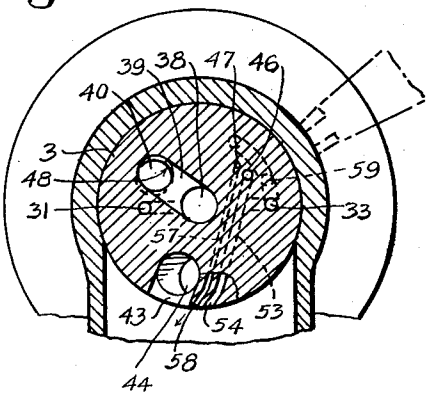

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Fig. 6.

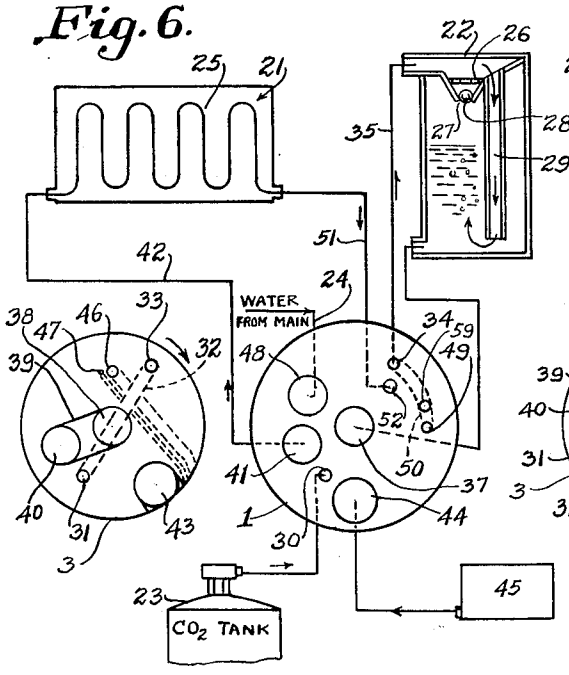


Fig. 7.

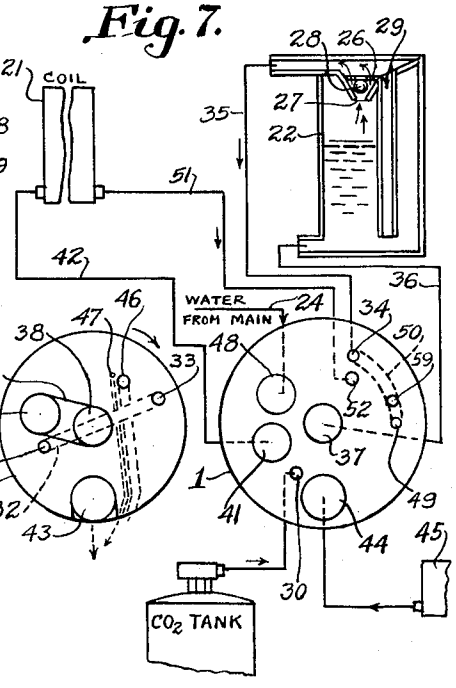


Fig. 8.

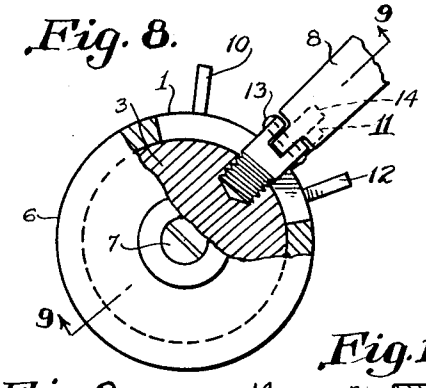


Fig. 10.

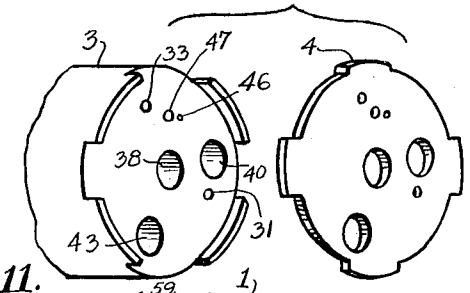


Fig. 9.

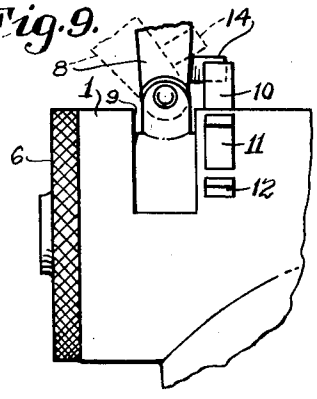
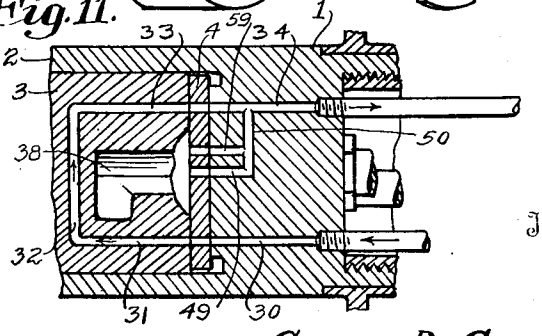


Fig. 11.



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Patented June 25, 1935 2,006,313

UNITED STATES PATENT OFFICE

2,006,313

SELF-CARBONATING DISPENSING SYSTEM

Charles A. Geddes, New York, N. Y.

Application September 26, 1933, Serial No. 691,047

6 Claims. (Cl. 225—21)

This invention relates to a self-carbonating dispensing system for charged drinks.

It has for its object the provision of a water supply, a source of carbon dioxide under pressure, and a controlling faucet, with driving means for receiving in alternate sequence a body of gas, a body of water, a body of gas, a body of water, etc., the sequence of alternation being controlled by and synchronous with the movements of the faucet, the gas being admitted to the said means during the closed phase of the faucet, during which phase the water displaced by the gas is driven to a cooler, and the admission of water taking place during the open phase of the faucet and during the same phase the gas displaced by said water being driven to the cooler whereby, while the faucet is performing its normal and known function of dispensing and cutting off the discharge of a carbonated drink, it is at the same time determining a routine of operation in the system involving two carbonating stages for the water, one being where the gas contacts with the water in the said means and the second being where the gas displaced from the said means by the entrance of the water passes into the water displaced to the cooler.

Another object of the invention is the provision of a system embracing the instrumentalities as above described in which the water is made to bubble through the gas in the said driving means and the gas is made to bubble through the water in the cooler in order that the maximum absorptive efficiency of the gas by the water may be maintained, it being understood that the valve in open position provides an exit from the cooler for the discharge of the carbonated water into the drink being dispensed.

Still another object of the invention is a system embracing the self-carbonating features as above described and in addition, a source of syrup or the like, the valve being provided with bores or passages constituting conduits through which the several fluids move from their sources to the several instrumentalities which they effect or in which they are effected, and to a discharge point at which the carbonated water impinges into the discharging column of syrup, the valve being so constructed and arranged that by shifting from closed to one of two selective open positions, a solid or creamy drink is produced and simultaneously the cyclic functions of the system are carried out.

A further object of the invention is the provision of a faucet having a closed and open position, the carbonated water discharge in the open position being relatively copious so as to produce a solid carbonated drink, said faucet having a secondary open position in which all of the conduits remain in registry as in the primary open position of said faucet excepting that a restricted carbonated water discharge is substituted for the copious charge whereby an attenuated jet of water impinges into the syrup stream producing a frothy or creamy beverage.

Other objects of the invention relate to the novel structure of the faucet by means of which its functions as above indicated are performed.

In the drawings which accompany and form a part of the following specification and throughout the several figures of which the same characters of reference have been employed to designate identical parts:

Figure 1 is a longitudinal section through the faucet of the present invention, the parts being in closed position;

Figure 2 is an end view of the ported body of the faucet taken along the section line 2—2 of Figure 1;

Figure 3 is a similar view through the barrel taken along the line 3—3 of Figure 1, the barrel being in closed position;

Figure 4 is a similar section through the barrel, the parts being in primary open position,

Figure 5 is a similar view showing the barrel in its secondary open position;

In the several positions of the valve as shown, the open or occluded relations of the several ports may be understood by considering the barrel sections to be superposed above the body section shown in Figure 2.

Figure 6 is a diagrammatic view of the system with the faucet in closed position;

Figure 7 is a similar diagrammatic view showing the faucet in its primary open position;

Figure 8 is a detail view partly in section showing the hinged handle of the faucet and the stops determining its single closed and two open positions;

Figure 9 is a view taken on the line 9—9 of Figure 8;

Figure 10 is a perspective view showing the end of the barrel and the ported washer keyed by said barrel and abutting against the adjacent end of the body;

Figure 11 is a longitudinal section of a portion of the body and barrel, showing an arrangement of ports by which the carbonated water discharged from the cooler is in communication with the final discharge of the faucet in either of the open positions of said faucet; and

Figure 12 is a detail in section showing the valve and barrel with the syrup ports in communication, in the position of discharge.

Referring now in detail to the several figures and first adverting to the views which show the general structure of the faucet which by virtue of its controlling function may be considered the heart of the system, the numeral 1 represents a cylindrical body portion, the forward end of which is extended so as to form a cylindrical socket 2 adapted to receive a cylindrical valve or barrel 3. The adjacent faces of the barrel 3 and the confronting end of the body 1 lie in planes perpendicular to the axis of rotation of the barrel, a washer 4 intervening, to insure a fluid-tight seat between said barrel and body. The barrel is pressed against its seat by suitable friction engendered by a ball 5 mounted in a cap 6 which screws into the outer end of the socket 2. Said ball is tangent to the adjacent face of the barrel in the axis of the latter, and the frictional pressure of the ball against the barrel can be varied by screwing in the plug 7.

The barrel 3 and the body 1 are suitably ported in a manner presently to be described, the ports being brought into and out of registry by turning the barrel, an operating handle 8 being provided which extends through a slot 9 in the upper wall of the socket 2 and is screwed or otherwise suitably secured to the barrel. Figures 8 and 9 show that there are three determinative positions of the handle, an off-set position when it is against the stop 10, a primary on-position against the stop 11 and a secondary on-position against the stop 12. The handle is jointed as indicated by the pivotal connection 13 and the outer section has a lug 14 adapted to engage any one of the stops 10, 11 and 12. The jointed construction of the handle enables it to be swung to permit the lug 14 to pass the stop 11. The lower wall of the socket 2 has a chambered extension 15 into which certain of the ports of the barrel debouch, said chambered extension terminating in a discharge nozzle 16.

The faucet may be installed in any suitable manner being usually placed above a counter not shown and secured through an opening in a wall 17. A wall flange 18 is shown surrounding the body adjacent the point at which it enters the wall, and at the rear is a conduit 19 screwing into the body 1 and preferably provided with external threads upon which a ring nut 20 may be screwed to clamp the faucet to the wall. Pipes necessary to the functioning of the system pass through said conduit and are connected to the several ports of the body 1.

Before adverting to a description of the system, it may be stated that the ultimate function of the faucet is to deliver a measured drink of carbonated beverage selectively in solid or creamy form, 10 being the off-position of the handle, 11 the position in which the faucet delivers a solid drink and 12 the position in which it yields a creamy beverage. When in the primary open position, the faucet simultaneously discharges a stream of syrup into the chambered extension 15 and a relatively large jet of carbonated water, so directed as to impinge upon the stream of syrup and produce a solid carbonated beverage. When the faucet is in its secondary open position, the column of syrup is discharged into the chambered extension, together with an attenuated jet of carbonated water, which impinging upon the stream of syrup breaks it up into a mixture of syrup and carbonated water of creamy consistency.

The more important function of the faucet and which it performs automatically concurrently with the acts of drawing the drink or turning it off, is the carbonation of water, the cooling of the water, the measuring of the carbonated water necessary for a single drink, and the delivery of said carbonated water to the point of discharge.

Now, referring to the system, a diagrammatic representation of which is repeated in Figures 6 and 7, one showing the closed and the other an open position of the faucet, the following instrumentalities are involved, a cooler 21, a displacement cylinder 22, a tank 23 of carbon dioxide or equivalent gaseous fluid under pressure, a city water main 24, and a syrup supply 45, all in combination with the faucet. The cooler and the displacement cylinder function as means for effecting successive stages of charging the water with carbon dioxide supplied by the main and in quantities at a time sufficient for one drink. The conduits which connect these several instrumentalities all pass through the body of the faucet and are controlled according to the position of the barrel 2.

The cooler 21 may be of any desired form, but is preferably shown as a coil 25 submerged in a tank of brine, or otherwise refrigerated. The displacement cylinder 22 comprises a receptacle having a partition 26 near the top provided with an opening 27 controlled by a check valve 28. Carbon dioxide gas is admitted to the space above said partition and travels downward through a tube 29 the lower end of which opens near the bottom of a body of water in said cylinder. The carbon dioxide gas bubbles up through said water being absorbed by the same, and what is not absorbed collects beneath said partition, displacing the partially carbonated water from said cylinder and delivers it to the cooler. The weight of the check valve 26 is such that it will not open to the gaseous pressure.

Figure 6 shows that the carbon dioxide tank 23 is connected at the back of the body 1 with a passage 30 through which the gaseous carbon dioxide flows toward the front and into a registering passage 31 in the barrel. From here is crosses by a transverse passage 32 to a passage 33 at the opposite side of said barrel, the lower end of which registers in the closed position of the valve with a port 34 in the fixed member of the valve. It passes downward through the port 34 and out by way of a conduit 35 to the upper part of the displacement cylinder, the latter being at the time filled with water, and the admitted carbon dioxide gas first bubbling through the water, then collecting on top of said water and beneath the partition 26, displacing said water which exits by way of a conduit 36 communicating with the central passage 37 in the body and which registers with a central passage 38 in the barrel. The displaced water flows from the passage 38 through a radial internal passage 39, to a bore 40 from which it flows back into a passage 41 in the body, and from whence it passes by way of a conduit 42 to one end of the cooling coil, filling the latter. The capacity of the displacement cylinder 22 is equal to the volume of water necessary for one drink, and it is this quantity of water which is displaced and delivered to the cooler. The above described sequence of operation takes place during the closed position of the valve indicated in Figure 6 in

which it will be observed that the syrup discharge port 43 is out of registry with the syrup passage 44 which is connected to the syrup supply 45 and that the carbonated water discharge passages represented by the large and small passages 46 and 47 are out of registry with any corresponding passages in the body of the valve.

Now, adverting to Figure 7 which shows the system when the valve is in open position it will be noted in the first place that the port 40 which formerly was out of registry with any avenue of communication in the body of the faucet is now in alinement with the passage 48 in communication with the city water main, so that water flows through the passage 40, through the transverse passage 39 to the central bore 38, back through the central passage 37 of the valve body and out by way of the conduit 36 to the bottom of the displacement cylinder, the water displacing the gas which fills said displacement cylinder, the gas escaping by raising the check valve 27 and passing by way of the conduit 35 back to the passage 34 in the valve body. The passage 33 which registered with the passage 34 has, in the opening movement of the faucet moved to a position in registry with the passage 59, but which is in communication with the passage 34 by way of an arcuate bore 50. The displaced gas therefore after traversing the bore 50 passes from the forward end of the passage 34, through the passage 33, across the transverse connecting bore 32 to the passage 31 which now is in communication with the passage 41 which is connected to the cooler by the conduit 42. Thus the gas displaced from the cylinder 22 by the influx of water from the main enters the cooler bubbling into the partially carbonated water in the coil 25, and completing its carbonation.

Concurrent with this operation, the opposite end of the cooler coil 25 which is in communication by means of a conduit 51 with the passage 52 in the body of the faucet, discharges a quantity of water through the passage 52 and through the passage 46 in the barrel which now registers with it, the latter passage communicating by way of a transverse bore 53 with an inclined nozzle 54, permitting discharge of the carbonated water displaced from the cooler coil 25, into the chambered extension 15 of the faucet. At the same time, the syrup discharge passage 43 has moved into registry with the passage 44 which is connected to the syrup supply tank 45, so that a stream of syrup is now discharging into the said chambered extension. It will be observed from Figure 4 that the nozzle 54 of the carbonated water discharge passage is directed to the axis of the syrup passage so that the jet of carbonated water impinging upon the stream of discharging syrup, mixes with it and carbonates it. Due to the relatively large size of the passage 46, the transverse passage 53 and the nozzle 54, the jet of carbonated water is relatively large, having the effect characteristic of producing a solid drink, that is to say, a carbonated drink which is not frothy.

The open position of the valve just described and the functions attending the same represent that position of the barrel in which the lug 14 of the handle 8 is against the stop 11. The operator obtains a solid drink by throwing the handle from the off-position to the position determined by the stop 11, keeping the parts of the handle in rectilinear relation. He does not control the amount of carbonated water discharged, for the capacity of the displacement cylinder determines this and said capacity is selected for the proper quantity required for one drink. The syrup is gravitationally or otherwise controlled so as to flow proportionately to the carbonated water, and this proportioning is initially determined by means of a throttling valve 55 which may be screwed in so as partly to obstruct the syrup passage 44 in the body of the faucet.

When the drink has been drawn, that is to say, when the measured quantity of carbonated water has been delivered into the glass, the operator throws the handle to off-position.

When a creamy drink is desired, the operator tilts the handle, throwing it from off-position to the position in which it will be stopped by the stop 12, the lug 14, missing the stop 11 in transit. It will be understood that this movement rotates the barrel of the faucet through an angular displacement a little farther than that indicated in describing the primary open position of the faucet illustrated in Figure 7 and in Figure 4. The passages represented by the large circles in the several figures are made large not because they are designed to pass greater quantities of liquid than the small passages, but merely so that the large passages in the body will remain in registry with the same passages in the barrel in both open positions of the faucet. The only difference in the two open positions is that instead of the large discharge passage 46 being in registry with the passage 52 leading from the cooler, a small discharge passage 56 now moves into registry with the passage 52, the large discharge passage 46 passing to a blank portion of the body and being thus occluded. The passage 33 meanwhile has moved over from registry with the passage 59, to alinement with the passage 49 also communicating with the bore 50. The small passage 56 communicates by way of a small transverse bore 57 with an attenuated nozzle 58 directed toward the axis of the syrup discharge port 43. The impingement of this very fine jet of carbonated water whips the stream of syrup into a froth and gives a creamy drink.

In the foregoing specification, I have endeavored to describe a practical embodiment of a broad inventive concept and it is therefore to be understood that the details of construction and the arrangement of the parts and the particular type of the several instrumentalities which combine in establishing the principles of the invention are to be regarded merely as exemplary and not to be construed as limiting the scope of the invention as claimed.

What I claim is:

1. Self-carbonating system for dispensing carbonated drinks comprising a cooler, a displacement vessel, and sources of carbon dioxide gas and water under pressure, and a faucet having a carbonated water discharge and a syrup discharge simultaneously opened and shut by movement of the valve of said faucet, conduits connecting said displacement vessel and said cooler, through said faucet, conduits connecting said carbon dioxide and water under pressure sources to said displacement vessel through said faucet, and a conduit connecting said cooler with said carbon dioxide discharge, through said faucet, the conduit from said carbon dioxide source being in communication with said displacement vessel and the latter with said cooler when said faucet is closed, all other conduits being then occluded, permitting the carbon dioxide to fill that displacement cylinder, driving the displaced and partially carbonated water into said cooler, said

conduits being so arranged that when the faucet is opened to discharge syrup and carbonated water, the conduit from the source of water under pressure replaces the conduit from the source of carbon dioxide in communication with said displacement vessel, filling the latter with water and driving the carbon dioxide into the cooler, there completing the carbonation of said water, said cooler being simultaneously placed in communication with said carbon dioxide discharge.

2. System as claimed in claim 1, the displacement vessel having a capacity to contain the quantity of water required for one drink, which quantity displaced into the cooler determines the volume of water discharged from the carbonated water discharge of said faucet during the open period of said faucet.

3. System as claimed in claim 1, said displacement vessel and said cooler being so constructed as to cause the carbon dioxide gas entering said displacement vessel and cooler to bubble through the water therein.

4. System as claimed in claim 1, the carbonated water discharge conduit being so directed as to impinge a jet upon the discharging stream of syrup.

5. System as claimed in claim 1, said faucet having primary and secondary open positions and a pair of carbonated water discharge passages, one of large and the other of small cross section, the former registering with the carbonated water discharge conduit from said cooler in the primary open position of said faucet and the latter registering with said carbonated water discharge conduit in the secondary open position of said faucet, said large and small carbonated water discharge passages being so directed as, in one or the other selective open positions of said faucet, to impinge a large or small jet upon the stream of discharging syrup, producing a solid or creamy drink.

6. Faucet comprising a body having a socketed portion, the end of which constitutes a valve seat, a barrel valve in said socketed portion rotatable on said seat, conduits penetrating said barrel and body and adapted to register in different combinations according to the functioning of the faucet, a syrup discharge conduit and a plurality of carbonated water discharge passages of different size penetrating both said body and barrel and adapted to be cut on or off selectively by oscillation of said barrel, the latter having primary and secondary open positions, stops on said body determining the closed, primary and secondary open positions of said barrel, a hinge handle projecting through a slot in the socketed portion of said body for operating said barrel, said handle having a lug engageable with said stops and being rockable so as to clear the stops which determines the primary open position when it is desired to avoid said position, said plurality of carbonated water discharge passages being both inclined so as to cause the jets issuing therefrom to impinge against the stream of discharging syrup, the larger passage registering with the source of carbonated water in the primary open position of said barrel and producing a solid drink, and the smaller passage registering with said source of carbonated water in the secondary open position of said barrel for producing a creamy drink.

CHARLES A. GEDDES.