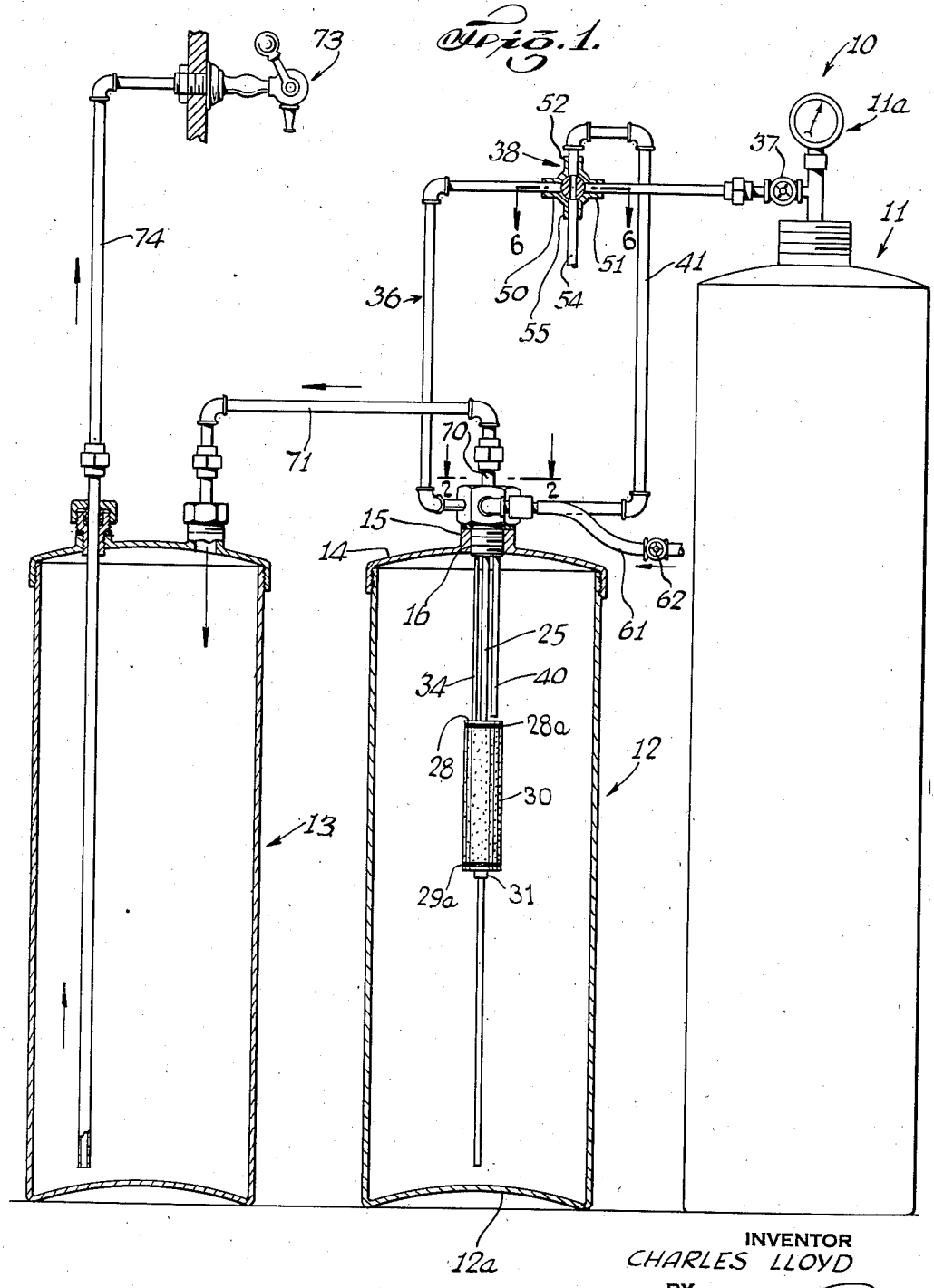
May 6, 1941. C. LLOYD 2,241,018

APPARATUS FOR MAKING AND DISPENSING CHARGED BEVERAGES

Filed Sept. 16, 1940 2 Sheets-Sheet 1

Fig. 1.



INVENTOR
CHARLES LLOYD
BY
J. B. Felshin
ATTORNEY

May 6, 1941. C. LLOYD 2,241,018

APPARATUS FOR MAKING AND DISPENSING CHARGED BEVERAGES

Filed Sept. 16, 1940 2 Sheets-Sheet 2

Fig. 4.

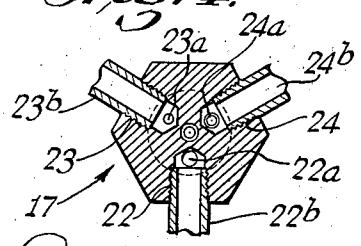


Fig. 2.

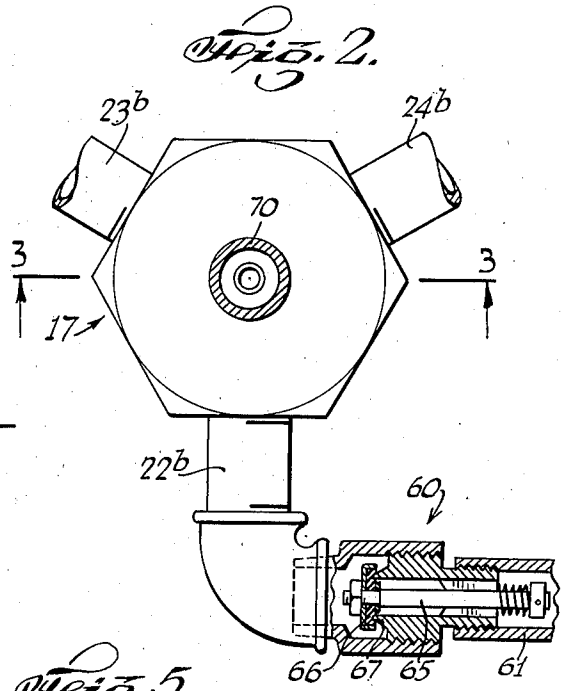


Fig. 3.

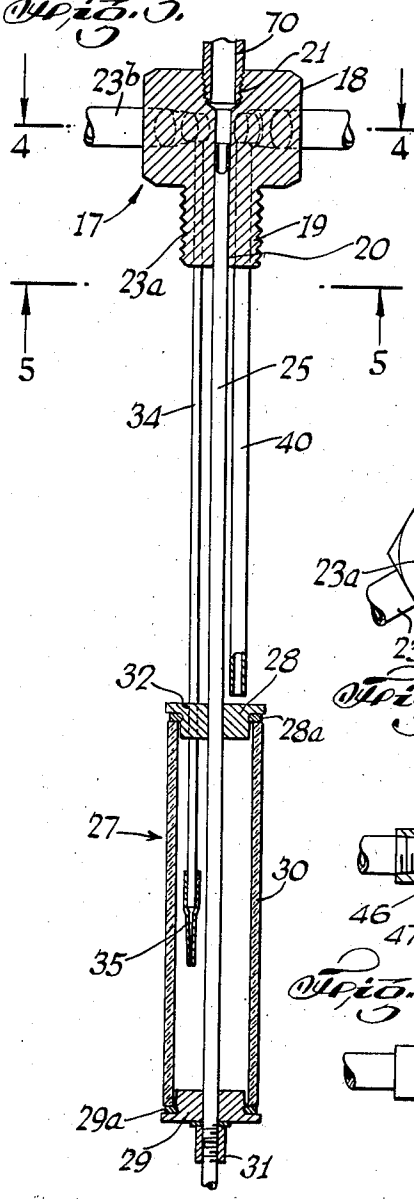


Fig. 5.

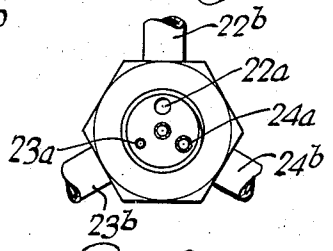


Fig. 8.

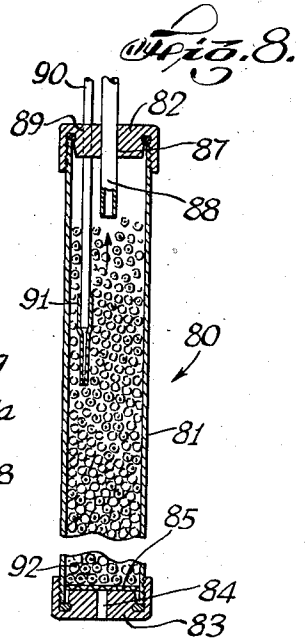


Fig. 6.

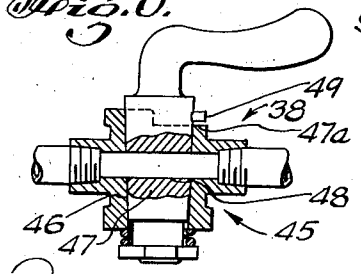
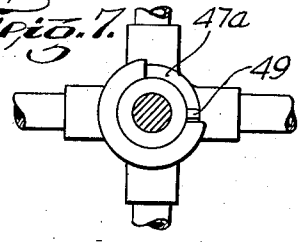


Fig. 7.



INVENTOR
CHARLES LLOYD
BY
J.B. Felshin
ATTORNEY

Patented May 6, 1941 2,241,018

UNITED STATES PATENT OFFICE

2,241,018

APPARATUS FOR MAKING AND DISPENSING CHARGED BEVERAGES

Charles Lloyd, Brooklyn, N. Y., assignor to Self-Service Carbonator, Inc., Brooklyn, N. Y.

Application September 16, 1940, Serial No. 356,940

12 Claims. (Cl. 261—75)

This invention relates to apparatus for making and dispensing charged beverages, such as carbonated water.

An object of this invention is to provide apparatus of the character described, comprising a charging tank, a chamber in said tank, means to feed gas to said chamber, means to feed water to said tank, and means to simultaneously cut off supply of gas to said chamber and bleed gas from the tank to reduce pressure therein.

Another object of this invention is to provide a highly improved compact and durable apparatus of the character described, which shall be relatively inexpensive to manufacture, easy to manipulate, economical to operate, which will produce a thoroughly charged beverage, and which shall yet be practical and efficient to a high degree in use.

Other objects of this invention will in part be obvious and in part hereinafter pointed out.

The invention accordingly consists in the features of construction, combinations of elements, and arrangement of parts which will be exemplified in the construction hereinafter described, and of which the scope of application will be indicated in the following claims.

In the accompanying drawings, in which is shown various possible illustrative embodiments of this invention—

Fig. 1 is an elevational view of apparatus embodying the invention with parts in cross-section;

Fig. 2 is an enlarged, cross-sectional view taken on line 2—2 of Fig. 1;

Fig. 3 is an enlarged, cross-sectional view taken on line 3—3 of Fig. 2;

Fig. 4 is a cross-sectional view taken on line 4—4 of Fig. 3;

Fig. 5 is a cross-sectional view taken on line 5—5 of Fig. 3;

Fig. 6 is an enlarged, cross-sectional view taken on line 6—6 of Fig. 1;

Fig. 7 is a cross-sectional view taken on line 7—7 of Fig. 6; and

Fig. 8 is an elevational, cross-sectional view of the mixing tube illustrating a modified construction.

Referring now in detail to the drawings, 10 designates apparatus for charging beverages, embodying the invention. The same comprises a gas tank 11 adapted to contain carbon dioxide gas under pressure, a charging or carbonating tank 12 and a reserve tank 13.

The charging or carbonating tank may be of any suitable metal and is preferably of steel, lined with block tin. The tank may be of any suitable size, and may be made practically to have a volume of about fifteen gallons. The tank may be cylindrical, and has a top wall 14 provided with a central boss 15 formed with an internally screw-threaded central opening 16.

Screwed within the opening 16 in a head 17 having a polygonal outer surface 18, and a reduced downwardly extending screw threaded portion 19, screwed within the opening 16. The head 17 is formed with a central through opening 20 communicating with an internally screw threaded opening 21 at its upper end. The upper portion of the head 17 is formed with three equiangularly spaced, radial, horizontal, screw threaded openings 22, 23 and 24 communicating at their upper ends therewith, and extending to the lower end of the screw threaded portion 19 of the head.

Fixed within the central opening 20 is an elongated tube 25 to take off charged liquid, preferably made of copper, tinned inside and outside, extending down into the tank 12, and terminating somewhat short of the bottom wall 12a of said tank. The upper end of tube 25 terminates short of the central screw threaded opening 21 in the head 17.

Mounted on tube 25 is a chamber 27 to break up the gas which is fed to said chamber from the gas tank 11, in the manner hereinafter appearing. The chamber 27 comprises a pair of oppositely facing annular heads 28 and 29 supporting therebetween a tube 30 made of porous stone or composition of the type which serves to break up gas passing therethrough. Rubber washers 28a and 29a may be interposed between the ends of the tube 30 and the heads 28 and 29. The upper head 28 may be soldered or otherwise fixed to the tube 25 and the lower head 29 may be clamped against the tube by means of a nut 31 screwed onto the tube 25 in any suitable manner.

The head 23 may be formed with a through opening 32 aligned with opening 23a in head 17, and of the same size as said head. Fixed within opening 23a is a gas tube 34 passing through the opening 32 and projecting substantially half way into the tube 30. At the lower end of the tube 34 is a rubber tube check 35. Tube 34 may likewise be made of copper, tinned inside and outside.

Screwed within the screw threaded opening 23 is a nipple 23b connected by piping 36 to the gas tank 11. The tank 11 may be provided with the usual pressure gauge 11a; and interposed in the

piping 36 is a hand valve 37 and a two way cock 38 which will be described in detail hereinafter.

Upon opening the valve 37 and properly manipulating the valve 38, gas is fed from the tank 11 to the piping 36, and through the tube 34 into the chamber 27, for the purpose hereinafter appearing.

Fixed within the opening 24a and extending downwardly therefrom, is a bleeder tube 40 likewise preferably made of copper, tinned outside and inside and terminating somewhat above the head 28.

Screwed within the opening 24 is a nipple 24b connected by piping 41 to the cock 38. The cock 38 is so arranged, as will appear hereinafter, that when the passage of gas from the gas tank to the tube 34 is shut off, gas from the carbonator tank 12 may pass through the tube 40, piping 41 and cock 38 to a suitable exhaust, to reduce pressure in the carbonator tank.

The cock 38 comprises a head 45 formed with an internal, central, tapered chamber 46. The head 45 is formed with a quadrangular cut-out 47a, and received within the tapered opening 46 is a rotary valve member 47 having a transverse through passage 48, and provided with a pin 49 disposed within said cut-out. On the rotary valve member 47 is a usual handle to rotate the same.

The head 45 has oppositely extending sockets 50 and 51 receiving the piping 36; and a pair of oppositely extending sockets 52 and 53 disposed at right angles to the sockets 50 and 51 and receiving the pipe 41, and an exhaust pipe 54, respectively. In one position of the rotary valve 47, the piping 36 is open, and when the rotary valve is turned through an angle of 90 degrees, the piping 36 is closed, and the bleeder piping is connected to the exhaust pipe 54.

Screwed within the opening 22 in the head 17, is a nipple 22b connected through a check valve 60 to a pipe 61 leading to any suitable source of water supply. Within the pipe 61 may be interposed a hand valve 62. The check valve 60 permits water to pass to nipple 22b and through opening 22a to the interior of the carbonating tank 12. The check valve 60 may comprise a spring pressed valve stem 65 having a head 66 adapted to seat on the valve seat 67 when the pressure within the tank 12 is above a predetermined pressure. When the cock 38 is turned to bleed the excess pressure from the tank 12, the pressure is reduced permitting the normal water pressure to open the check valve and admit water to the tank 12.

The operation of the apparatus described thus far, is as follows:

Starting with both tanks being empty, faucet 73 is closed. Two way cock 38 is opened to permit excess air or gas to exhaust from the bleed pipe 54. When the carbonator fills with water until it runs out of the bleed pipe 54, the two way cock is moved to such a position as will result in gas and water flowing into the carbonator until the gas pressure is greater than the water pressure, which will cause the check valve 61 to close. The gas pressure continues until the carbonator is filled with gas to its maximum pressure. At that time, the faucet 73 is opened to allow the air to escape from the reserve tank 13, and thus allowing it to fill with carbonated water.

To this end, there is screwed into the threaded opening 21 in head 17, a nipple 70 connected by piping 71 to the top of tank 13. The carbonated water thus passes from tube 25, through piping 71 into the tank 13. The carbonated water in the tank 13 is delivered to the faucet 73 through the medium of the pipe 74.

As the carbonated water is drawn off in different quantities, the reserve tank and carbonator repeat the above operations automatically.

The hand cock 62 on the water pipe may be closed when it is desired to work on the tank 12. The pressure in the carbonating tank may be maintained at about 120 pounds pressure, to keep the water back by closing the check valve on the water line. The tank is filled up with water, then the charging of the water takes place, and the carbonated water in the tank is used up. Then, the bleeder is opened to fill up the tank again. The bleeder bleeds gas pressure from the tank to allow water to come into the tank 12, because during the bleeding operation the pressure in the tank 12 decreases below the water inlet pressure causing check valve 60 to automatically open, letting water into the tank again. The water in the tank 12 is never allowed to run below the lower end of tube 25 to prevent escape of free CO^2 from tank 12 to tank 13. The CO^2 gas remains in solution in the water in tanks 12 and 13 because said tanks are kept cold.

If tank 12 would run out of water and allowed the reserve to fill with CO^2 gas, then the first time the faucet 73 was opened after bleeding tank 12 and hence allowing water to fill said tank, the CO^2 gas in tank 13 would be forced out of the faucet by charged water coming into tank 13.

In Fig. 8, there is shown a modified construction of chamber for breaking up the gas. In Fig. 8, the chamber for breaking up the gas, designated by numeral 80 comprises a brass tube 81 tinned inside and outside. Fixed to the upper and lower ends of the tube 81 are heads 82 and 83. The head 83 is formed with a central opening 84 covered by a wire mesh tinned screen 85. The head 82 is formed with a central opening 87 to receive a tube 88 terminating somewhat below the head 82, for taking off the carbonated water.

The head 82 is also provided with a through opening 89 through which there passes tube 90 to feed gas into the chamber 80. At the lower end of tube 90 is a rubber check valve 91 of usual construction. The inside of tube 81 is filled with glass beads 92. The beads are preferably small and are formed with through openings. Gas is thus fed into the chamber 80, and water comes into said chamber to mix with the gas to carbonate the water which passes upwardly through the tube 88 and thus passes through the head 17 to the reserve tank.

It will thus be seen that there is provided a device in which the several objects of this invention are achieved, and which is well adapted to meet the conditions of practical use.

As various possible embodiments might be made of the above invention, and as various changes might be made in the embodiments above set forth, it is to be understood that all matter herein set forth or shown in the accompanying drawings is to be interpreted as illustrative and not in a limiting sense.

Having thus described my invention, I claim as new and desire to secure by Letters Patent:

1. Apparatus for making charged beverage, comprising a tank, a head fixed to the top of the tank and formed with a through opening, a tube within said opening and extending downwardly

into the tank, a chamber mounted on said tube, said head being formed with a passage, a gas tube connected to said passage and extending into said chamber, a second tank adapted to contain gas under pressure, piping connecting said passage with said gas tank, said head being formed with a second passage, a bleeder tube connected to said second passage and projecting into said first tank, a two way valve on said piping adapted in one position, to open said piping to permit gas to pass from the gas tank to said chamber, a pipe connecting said second passage with said two way valve, an exhaust pipe connected to said two way valve, said two way valve being adapted in another position thereof to close the piping which connects the gas tank to the first passage and to open the bleeder pipe to the exhaust pipe, said head being formed with a third passage, a water supply pipe attached to said passage, said passage opening into said first tank.

2. Apparatus for making charged beverage, comprising a tank, a head fixed to the top of the tank and formed with a through opening, a tube within said opening and extending downwardly into the tank, a chamber mounted on said tube, said head being formed with a passage, a gas tube connected to said passage and extending into said chamber, a second tank adapted to contain gas under pressure, piping connecting said passage with said gas tank, said head being formed with a second passage, a bleeder tube connected to said second passage and projecting into said first tank, a two way valve on said piping adapted in one position, to open said piping to permit gas to pass from the gas tank to said chamber, a pipe connecting said second passage with said two way valve, an exhaust pipe connected to said two way valve, said two way valve being adapted in another position thereof to close the piping which connects the gas tank to the first passage and to open the bleeder pipe to the exhaust pipe, said head being formed with a third passage, a water supply pipe attached to said passage, said passage opening into said first tank, and a one way check valve in said water supply pipe.

3. Apparatus for making charged beverage, comprising a tank, a head fixed to the top of the tank and formed with a through opening, a tube within said opening and extending downwardly into the tank, a chamber mounted on said tube, said head being formed with a passage, a gas tube connected to said passage and extending into said chamber, a second tank adapted to contain gas under pressure, piping connecting said passage with said gas tank, said head being formed with a second passage, a bleeder tube connected to said second passage and projecting into said first tank, a two way valve on said piping adapted in one position, to open said piping to permit gas to pass from the gas tank to said chamber, a pipe connecting said second passage with said two way valve, an exhaust pipe connected to said two way valve, said two way valve being adapted in another position thereof to close the piping which connects the gas tank to the first passage and to open the bleeder pipe to the exhaust pipe, said head being formed with a third passage, a water supply pipe attached to said passage, said passage opening into said first tank, a one way check valve in said water supply pipe, a reserve tank, a pipe connected to said head and communicating with the first tube and connecting the same with the reserve tank, a faucet, and piping connecting the faucet with said reserve tank.

4. Apparatus for making charged beverage, comprising a tank, a head fixed to the top of the tank and formed with a through opening, a tube within said opening and extending downwardly into the tank, a chamber mounted on said tube, said head being formed with a passage, a gas tube connected to said passage and extending into said chamber, a second tank adapted to contain gas under pressure, piping connecting said passage with said gas tank, said head being formed with a second passage, a bleeder tube connected to said second passage and projecting into said first tank, a two way valve on said piping adapted in one position, to open said piping to permit gas to pass from the gas tank to said chamber, a pipe connecting said second passage with said two way valve, an exhaust pipe connected to said two way valve, said two way valve being adapted in another position thereof to close the piping which connects the gas tank to the first passage and to open the bleeder pipe to the exhaust pipe, said head being formed with a third passage, a water supply pipe attached to said passage, said passage opening into said first tank, said chamber comprising a porous stone tube.

5. Apparatus for making charged beverage, comprising a tank, a head fixed to the top of the tank and formed with a through opening, a tube within said opening and extending downwardly into the tank, a chamber mounted on said tube, said head being formed with a passage, a gas tube connected to said passage and extending into said chamber, a second tank adapted to contain gas under pressure, piping connecting said passage with said gas tank, said head being formed with a second passage, a bleeder tube connected to said second passage and projecting into said first tank, a two way valve on said piping adapted in one position, to open said piping to permit gas to pass from the gas tank to said chamber, a pipe connecting said passage with said two way valve, an exhaust pipe connected to said two way valve, said two way valve being adapted in another position thereof to close the piping which connects the gas tank to the first passage and to open the bleeder pipe to the exhaust pipe, said head being formed with a third passage, a water supply pipe attached to said passage, said passage opening into said first tank, said chamber comprising a porous stone tube, and a rubber check valve on the lower end of the gas tube.

6. Apparatus for making charged beverage, comprising a tank, a head fixed to the top of the tank and formed with a through opening, a tube within said opening and extending downwardly into the tank, a chamber mounted on said tube, said head being formed with a passage, a gas tube connected to said passage and extending into said chamber, a second tank adapted to contain gas under pressure, piping connecting said passage with said gas tank, said head being formed with a second passage, a bleeder tube connected to said second passage and projecting into said first tank, a two way valve on said piping adapted in one position, to open said piping to permit gas to pass from the gas tank to said chamber, a pipe connecting said second passage with said two way valve, an exhaust pipe connected to said two way valve, said two way valve being adapted in another position thereof to close the piping which connects the gas tank

to the first passage and to open the bleeder pipe to the exhaust pipe, said head being formed with a third passage, a water supply pipe attached to said passage, said passage opening into said first tank, said chamber being filled with beads.

7. Apparatus of the character described, comprising a charging tank, and a tank for gas under pressure, a chamber in said first tank having means for breaking up gas, means for feeding gas from the gas tank to said chamber, means for feeding water to said charging tank, means for bleeding pressure from the charging tank, means for opening the passage of gas from the gas tank to said chamber upon closing the bleeder means, and a check valve within the water supply means adapted to open when the pressure in the charging tank is reduced by opening the bleeder means and the passage of gas from the gas tank to the chamber is closed.

8. Apparatus of the character described, comprising a charging tank, and a tank for gas under pressure, a chamber in said first tank having means for breaking up gas, means for feeding gas from the gas tank to said chamber, means for feeding water to said charging tank, means for bleeding pressure from the charging tank, means for opening the passage of gas from the gas tank to said chamber upon closing the bleeder means, and a check valve within the water supply means adapted to open when the pressure in the charging tank is reduced by opening the bleeder means, and the passage of gas from the gas tank to the chamber is closed, said chamber comprising a porous stone tube.

9. Apparatus of the character described, comprising a charging tank, and a tank for gas under pressure, a chamber in said first tank having means for breaking up gas, means for feeding gas from the gas tank to said chamber, means for feeding water to said charging tank, means for bleeding pressure from the charging tank, means for opening the passage of gas from the gas tank to said chamber upon closing the bleeder means, and a check valve within the water supply means adapted to open when the pressure in the charging tank is reduced by opening the bleeder means, and the passage of gas from the gas tank to the chamber is closed, said chamber comprising a porous stone tube, the means for feeding gas from the gas tank to said chamber including a tube connected to the gas tank and projecting into said chamber.

10. Apparatus of the character described, comprising a charging tank, and a tank for gas under pressure, a chamber in said first tank having means for breaking up gas, means for feeding gas from the gas tank to said chamber, means for feeding water to said charging tank, means for bleeding pressure from the charging tank, means for opening the passage of gas from the gas tank to said chamber upon closing the bleeder means, a check valve within the water supply means adapted to open when the pressure in the charging tank is reduced by opening the bleeder means, and the passage of gas from the gas tank to the chamber is closed, said chamber comprising a porous stone tube, the means for feeding gas from the gas tank to said chamber including a tube connected to the gas tank and projecting into said chamber and a rubber check at the end of the tube which projects into said chamber.

11. Apparatus for making charged beverage, comprising a tank, a head fixed to the top of the tank and formed with a through opening, a tube within said opening and extending downwardly into the tank, a chamber mounted on said tube, said head being formed with a passage, a gas tube connected to said passage and extending into said chamber, a second tank adapted to contain gas under pressure, piping connecting said passage with said gas tank, said head being formed with a second passage, a bleeder tube connected to said second passage and projecting into said first tank, a four way valve on said piping adapted in one position, to open said piping to permit gas to pass from the gas tank to said chamber, a pipe connecting said second passage with said four way valve, an exhaust pipe connected to said four way valve, said four way valve being adapted in another position thereof to close the piping which connects the gas tank to the first passage and to open the bleeder pipe to the exhaust pipe, said head being formed with a third passage, a water supply pipe attached to said passage, said passage opening into said first tank, said chamber being filled with beads and being formed with an opening, and a screen covering said opening.

12. Apparatus of the character described, comprising a charging tank, and a tank for gas under pressure, a chamber in said first tank having means for breaking up gas, means for feeding gas from the gas tank to said chamber, means for feeding water to said charging tank, means for bleeding pressure from the charging tank, means for opening the passage of gas from the gas tank to said chamber upon closing the bleeder means, a check valve within the water supply means adapted to open when the pressure in the charging tank is reduced by opening the bleeder means and the passage of gas from the gas tank to the chamber is closed, and a hand valve on said water supply pipe.

CHARLES LLOYD.