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L. COLEMAN

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WATER CARBONATING APPARATUS

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2 Sheets-Sheet 1



LOUIS COLEMAN.
INVENTOR.

BY *Ely & Patterson.*

ATTORNEYS.

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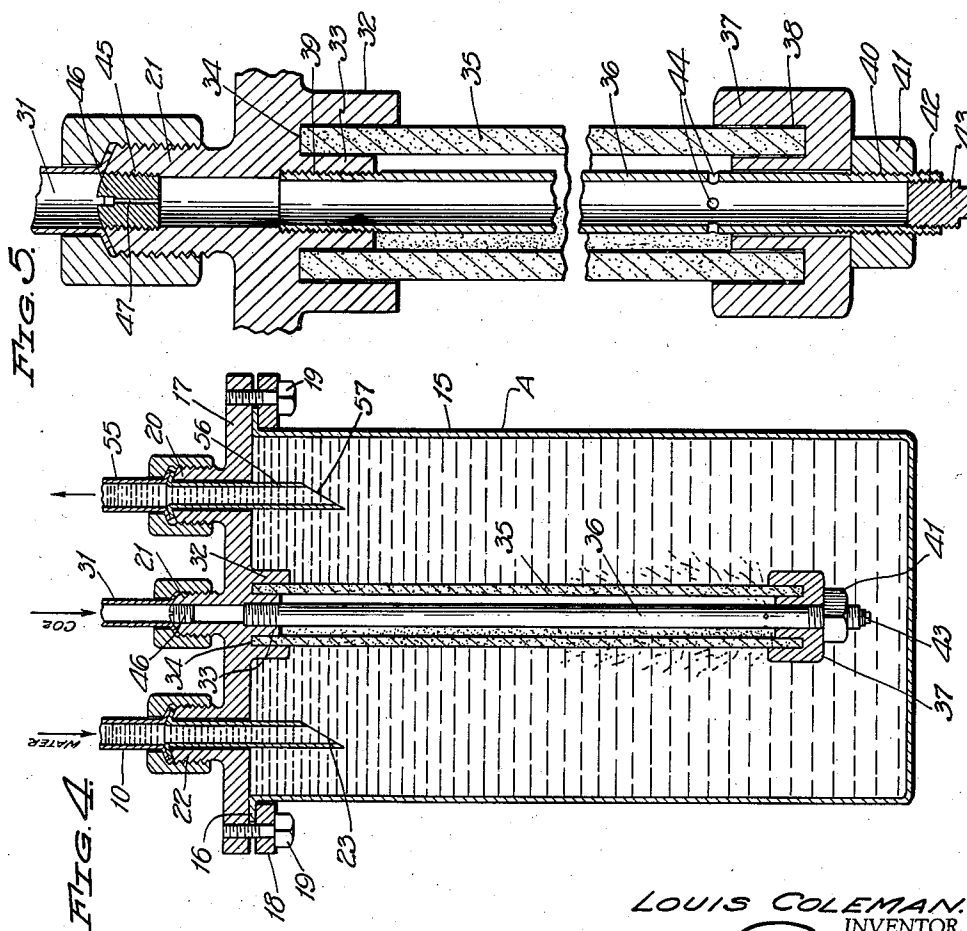
L. COLEMAN

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WITNESS:
Edw. J. Luby
 ATTORNEY

LOUIS COLEMAN,
 INVENTOR.
 BY *Ely Pattison*
 ATTORNEYS.

UNITED STATES PATENT OFFICE

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WATER CARBONATING APPARATUS

Louis Coleman, Park Ridge, N. J.

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1 Claim. (Cl. 261—21)

This invention relates to new and useful improvement in devices for carbonating liquids and more particularly it pertains to devices for carbonating water.

It is the primary object of the invention to provide a carbonating apparatus which may be incorporated directly in water supply lines, such as city and household water supply lines, in order that the water may be carbonated and drawn directly from said lines.

It is a further object of the invention to provide a device of the afore-mentioned character in which the water, after it has been carbonated, is drawn off at a pressure substantially equal to that in the water supply line from which it is taken, there being substantially no gas pressure, as is the common practice with containers of carbonated water.

Other objects of the invention relate to various new combinations and arrangements of parts which will be obvious as the nature of the invention is better understood.

In the accompanying drawings, apparatus constructed in accordance with the present invention is illustrated, and in said drawings,

Figure 1 is a schematic view of the apparatus,

Figure 2 is a top plan view of one of the carbonating tanks or receptacles,

Figure 3 is a horizontal sectional view on an enlarged scale taken substantially on the line 3—3 of Figure 1,

Figure 4 is a vertical sectional view on an enlarged scale of one of the carbonating tanks or receptacles, the view being taken substantially on the line 4—4 of Figure 2,

Figure 5 is a longitudinal sectional view, on a still further enlarged scale and partly broken away, of the element for introducing carbonating gas into the main carbonating tank or receptacle.

In the accompanying drawings there is illustrated an apparatus of the type afore-mentioned and which comprises two carbonating tanks or receptacles A and B. The water to be carbonated is lead to the carbonating tank or receptacle A from a main water supply line 10, which may be the city supply line. This supply line includes a control valve 11 and a check valve 12, which check valve 12 prevents any back pressure entering the supply line 10 when the control valve 11 is open. As best illustrated in Figure 4 of the drawings, each of the carbonating tanks or receptacles A and B comprises a main body portion 15 having a flanged open end, the flange thereof being designated 16. A

cover plate 17 is secured to the main body portion 15 by a clamping ring 18 and cap screws or bolts 19. The flange 16 being clamped between the head and clamping ring as best illustrated in Figure 4.

The cover plate 17 of the carbonating tank or receptacle A has three nipple fittings 20, 21 and 22. The water supply line 10 leads into the carbonating tank or receptacle A through the nipple fitting 22 and terminates in a beveled discharge end 23 at a point relatively near the top of said tank or receptacle.

The reference character 30 designates a tank of carbonating gas, preferably CO₂, and leading therefrom there is a gas line 31 which gas line leads into the carbonating tank of receptacle A through the nipple fitting 21 which nipple fitting is arranged substantially centrally of the cover plate 17. Upon the under side of the cover plate 17, there are two flanges 32 and 33 spaced with respect to each other to provide a channel seat 34 for a tubular porous element 35. The tubular porous element 35 is held in position by means of a tubular pipe or rod 36 which passes through a collar member 37 formed with a channel seat 38 in which the lower end of the porous element 35 is adapted to seat. The upper end portion of the tubular pipe or rod 36 is threaded as at 39 for attachment to the cover plate 17 and at its lower end it is threaded as at 40 for the reception of a clamping nut 41. The lower end of the tubular member 36 is internally threaded as at 42 to receive a cleanout plug 43. The tubular member 36 is also provided with a plurality of perforations 44 preferably at a point just above the inner flange of the member 37 and these openings are employed to establish communication between the interior of the tubular member 36 and the interior of the porous element 35 at a point closely adjacent the lower end thereof. The nipple fitting 21 heretofore mentioned, is internally threaded as at 45 to receive a plug 46 having a very small passage 47 therethrough. This plug acts as a reducing element to reduce the gas pressure in the gas supply line 31 and to discharge said gas into the interior of the tubular member 36 at a lower pressure than that at which it is retained in the line 31.

The cover plate 50 of the carbonating tank or receptacle B is substantially the same as the cover plate 17 heretofore described except that it has but two nipple fittings designated 51 and 52. Leading from the nipple fitting 20 of the carbonating tank or receptacle A, there is a pipe line 55 the opposite end of which is connected to the

nipple fitting 51 of the carbonating tank or receptacle B. The nipple fitting 20 also carries a tubular member 56 which projects through the cover plate 17 of the carbonating tank or receptacle A and terminates in a beveled end 57.

The pipe line 55 is extended through the nipple fitting 51 into the interior of the carbonating tank or receptacle B and terminates in a beveled end 57 at a point near the bottom or inner end thereof, illustrated in dotted lines in Figure 1. Leading from the nipple fitting 52 of the carbonating tank or receptacle B, there is a pipe line 60 which terminates at one end in a discharge faucet 61 and leading from the nipple fitting 52 inwardly of the carbonating tank or receptacle B, there is a pipe 62 which terminates in a beveled end 63 at a point near the upper or outer end of the carbonating tank or receptacle B.

The apparatus operates in the following manner. After the device has been installed, the preparation for the initial operation is as follows.

The control valve 11 is opened to supply water to the carbonating tanks or receptacles A and B and the water lines are filled with water at substantially the same pressure as that in the water supply line 10. After this has been done, the valve 90 of the gas tank 30 is opened to admit gas at the desired pressure to the carbonating tank or receptacle A, which pressure is discernible upon the gauge 91 and the gas discharged from the tank 30 through the line 31 reducing plug or element 46 in the interior of the tubular member 35, from which it escapes through the opening 44 to the space between the tubular member 36 and the porous element 35. From this space the gas passes through the porous element throughout its length and performs the carbonating action upon the water contained in the carbonating tank or receptacle A. The draw-off faucet 61 is then operated to draw off water from the tank B and the pressure in the line 10, and the carbonating tank or receptacle A, forces the water from the tank or receptacle A through the line 55 to the carbonating tank or receptacle B, discharging the same at a point near the bottom thereof. As the level in the tank A falls below the lower end of the fitting 56, any gas which may be present in the top of the carbonating tank or receptacle A passes through the line 55 and is discharged into the water contained in the carbonating tank or receptacle B at a point near the bottom thereof, thus preventing the accumulation of gas pressure above the water level in the carbonating tank or receptacle A. The gas, if any, which enters the carbonating tank or receptacle B further performs the carbonating action and is spent, without accumulation in the upper portion of the carbonating tank or receptacle B.

An initial operation over a relatively short period is necessary in order to obtain from the draw-off faucet 61, thoroughly carbonated water, but after the apparatus is once in operation, it is then continuous and automatic in its carbonating action and in actual practice has been found

to deliver a high quality of carbonated water from the draw-off faucet 61, and without presence of too great a quantity of gas in the discharge nozzle.

5 This last feature I attribute to the fact that gas, if any present in the line 60, is discharged through the mouth 72 of the faucet 61 and escapes at a point prior to the actual discharge of the carbonated water.

10 By this construction and arrangement of parts, ample time is provided for properly carbonating water drawn from a city service or other line under relatively low pressure and also for the discharge of said water under a relatively low pressure as compared to siphon bottles and the like employed for the purpose. Furthermore, the operation of the apparatus has proven that there is very appreciable reduction in the cost of producing carbonated water with the present apparatus over that of the use of siphon bottles which is an important item where carbonated water is used in large quantities. Furthermore, it has been found in actual practice that in an apparatus of this type, refrigeration of the water may be more easily and conveniently accomplished than where it is stored in siphon bottles or other containers.

While the invention has been herein illustrated in its preferred form, it is to be understood that it may be practiced in other forms within the scope of the appended claim and that it is not to be limited to the specific construction herein illustrated.

Having thus described the invention what is claimed is:

35 A carbonating apparatus comprising an upright oblong carbonating tank, water supplying means connected with and emptying into the tank for filling said tank with water to be carbonated, said water supply means being in constant communication with said tank in one direction and under regulation city service pressure in said direction, a porous diffusing element carried by the tank and providing a carbonating gas chamber within the tank, said gas chamber being co-extensive with the major portion of the length of the tank for introducing carbonating gas continuously into the water throughout the length of the chamber, means connected with the tank and communicating with the chamber for supplying the carbonating gas to said chamber, a second upright oblong carbonating tank, means for conveying carbonated water and accumulated gas from a point near the top of the first tank and delivering said water and gas to an inlet point near the bottom of the second tank, and outlet means for discharging the carbonated water from a point near the top of the second tank whereby a second carbonating action occurs while the carbonated water and gas traverse the second tank between the inlet and outlet points and the outlet means also serving to relieve excessive gas accumulation near the top of the second tank.

LOUIS COLEMAN.