March 21, 1939. J. G. CAMERON 2,151,586

MEANS FOR CARBONATING WATER AND BEVERAGES

Filed July 19, 1937

Fig. 1.

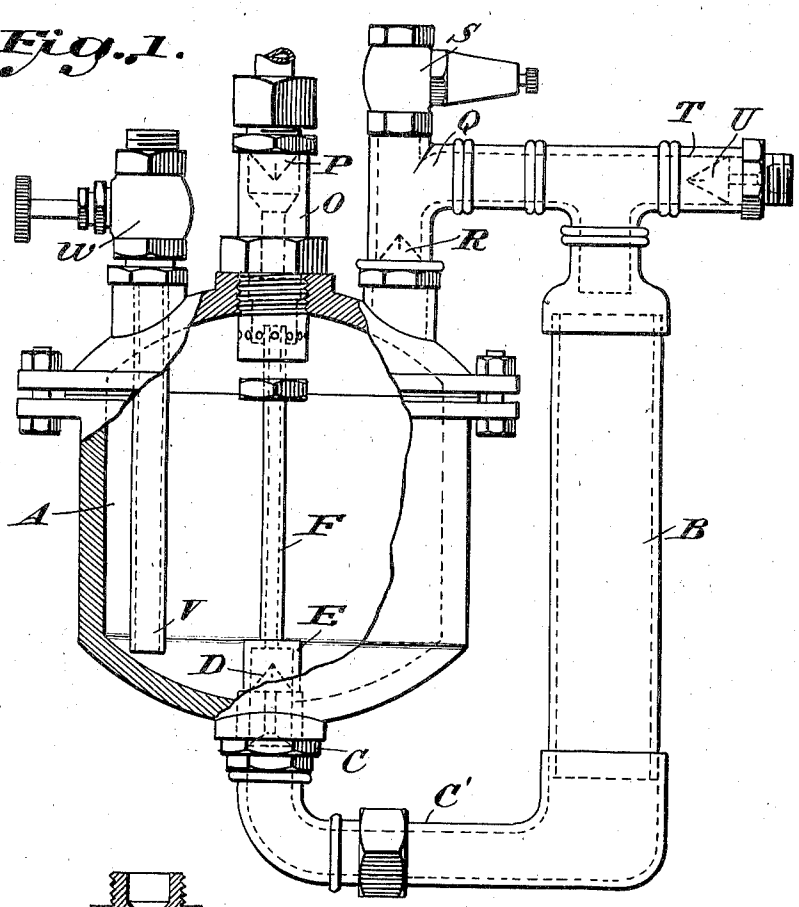


Fig. 2.

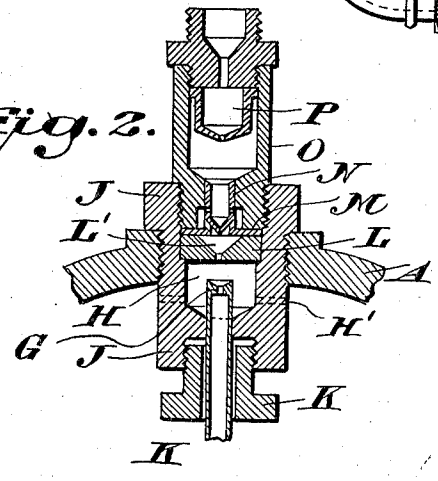
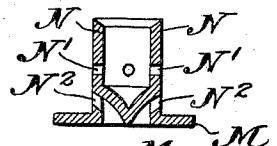


Fig. 3.



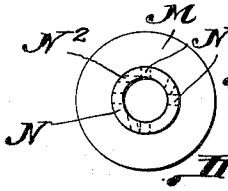


Fig. 4.

Inventor;

J. G. CAMERON

By Young, Emery & Thompson Attys.

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MEANS FOR CARBONATING WATER AND BEVERAGES

John Griffiths Cameron, Newstead, Brisbane, Queensland, Australia, assignor to Barnes Engineering (Pty.) Ltd., Newstead, Queensland, Australia, a company incorporated of Australia

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2 Claims. (Cl. 261—19)

This invention relates to the manufacture of carbonated water, or soda water as it is generally called, and also to the carbonation of other beverages, the object being to provide a continuous supply of carbonated beverage by simple and automatic means.

Reference will now be made to the accompanying drawing wherein:

Figure 1 is a sectional elevation of apparatus according to this invention.

Fig. 2 is a fragmentary vertical sectional view of the upper portion of Fig. 1.

Figs. 3 and 4 are, respectively, enlarged detail sectional elevation and plan of the water swirling means into the mixing chamber.

The apparatus according to the present invention comprises a carbonated water reservoir A which is connected to a gas chamber B. Reservoir A is connected at its upper end to a fitting Q having two branches, one of which is connected to a relief valve S and the other of which is connected by a T-fitting to the upper end of chamber B. A non-return valve is provided between reservoir A and fitting Q to prevent the flow of gas from fitting Q into reservoir A. A gas inlet adapter T, provided with a non-return valve U, is affixed to the other part of the T-fitting.

A valve chamber D is fitted into an opening in the bottom of reservoir A and is connected to the lower end of chamber B through an adapter C and a conduit C'. A pipe F extends upwardly from valve chamber E, which contains the non-return valve D, through reservoir A and into a mixing chamber H formed in the member J fitted into an opening in the top of reservoir A. Pipe F is sealed to member J by a packing gland K and terminates at its upper end in a nozzle G.

The mixing chamber H has a plurality of ducts H' opening into reservoir A for the discharge of carbonated water.

Fitted into the open upper end of member J is an annular ring L seated on a shoulder provided on the walls of chamber H. Ring L has a cavity L' formed in the upper side thereof about the opening extending therethrough. Seated on the upper part of ring L is an annular disc M forming part of cone N provided with holes N' at the top and holes N^2 at the bottom between disc M and cone N, said holes being tangential to the center of the cone. Cone N is contained in an annular valve chamber O which houses a non-return valve P.

Chamber O is threaded into the upper end of member J and serves to retain ring L and disc M in position.

A discharge pipe V for carbonated water extends from a point near the bottom of reservoir A up through the top thereof. The upper end of said pipe is provided with a discharge valve W.

Assuming the apparatus to contain no water or CO_2 gas the first operation is the complete filling of the chambers A and B with water via non-return valve P, holes N' in cone N, chamber N^3, through holes N^2 into chamber L', through hole in annular ring L into chamber H, through ducts H' into chamber A, then through non-return valve R through fitting Q into chamber B. At this stage any air entrapped at the top of chamber A rises to the top of chamber B and is allowed to escape through valve S. By then opening the delivery cock W upon pipe V and admitting gas into chamber B through non-return valve U, water will discharge from pipe V. The water will be forced from chamber B into chamber A. When the level of water in chamber A has fallen sufficiently low, discharge cock W on pipe V is closed and the pressure of the water in chamber A and that of the gas in chambers A and B gradually become equalized. At this stage the gas and water supply cocks are fully opened but no water or gas passes. The gas above the level of the water in chamber A is compressed enabling the equilibrium. By then opening the discharge cock W on pipe V, carbonated water is discharged from chamber A and lowers the pressure of the gas above the water in chamber A, thereby allowing water to flow in through non-return valve P and gas to flow in through non-return valve U. As the water is delivered normally at a higher pressure than the gas it forces its way down into mixing chamber H being given a swirling motion in its passage through holes N^2 around cone N. Simultaneously, gas issues through nozzle G into mixing chamber H. This inter-mingling of the gas and water in chamber H continues until the pressure of the gas at the top of the water in chamber A is sufficient to equalize the pressure of the water flowing into mixing chamber H. The carbonated water from mixing chamber H passes into chamber A via ducts H' and the replenished supply of carbonated water in chamber A is available to be drawn from pipe V. Upon water being again drawn the pressure is lowered at the head of the water in chamber A and the entrance of gas and water to form fresh carbonated water in mixing chamber H proceeds as

before described. The supply of carbonated water is thus continuously replenished.

I claim:

1. Apparatus for carbonating and delivering water or the like comprising a carbonated water reservoir and a gas chamber, an inlet for the gas to the gas chamber, a non-return valve in said gas inlet permitting the flow of gas into said gas chamber but preventing the return of gas from said gas chamber, an inlet for the water to said reservoir, a non-return valve in said water inlet permitting the flow of water into said reservoir but preventing the return of water from the reservoir, a discharge pipe with a cock for the discharge of carbonated water from said reservoir, a passage from the top of the reservoir to the top of the gas container, a non-return valve in said passage permitting flow through said passage from the reservoir to the chamber but preventing a reversed flow, a pipe extending from the gas chamber into said reservoir, a non-return valve in said last-mentioned pipe permitting the flow from the gas chamber into the reservoir but preventing a reversed flow, a mixing chamber in said reservoir above water level in which the water and the gas from said last-mentioned pipe oppositely meet and intermingle, the gas being under lower pressure than the water, and ducts leading from said mixing chamber to said reservoir.

2. Apparatus for carbonating and delivering water and the like as claimed in claim 1 in combination with means for giving the water a swirling motion preparatory to entering the saturation chamber.

JOHN GRIFFITHS CAMERON.