

(No Model.)

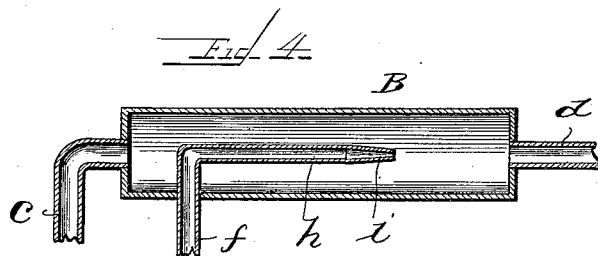
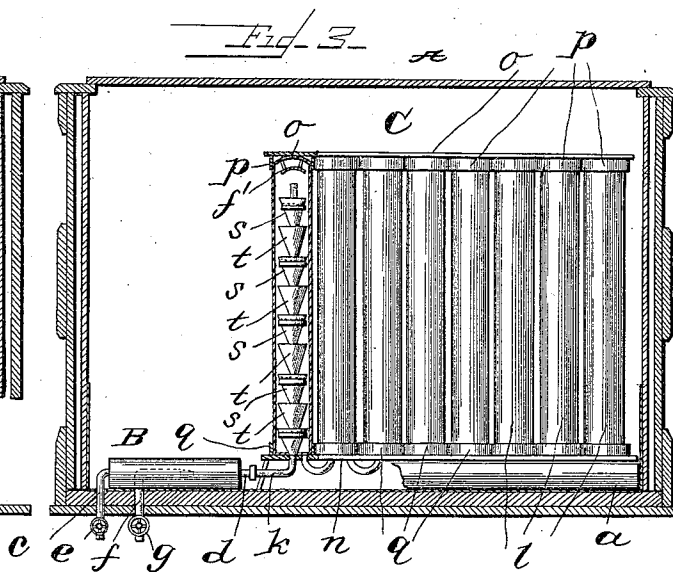
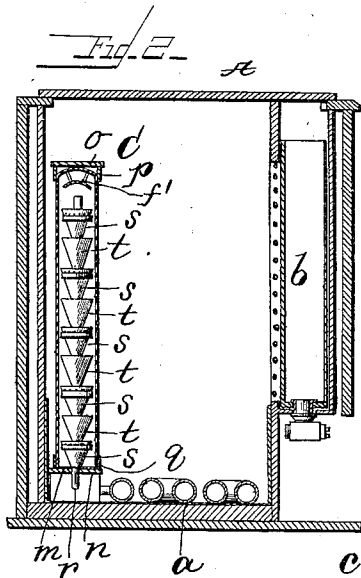
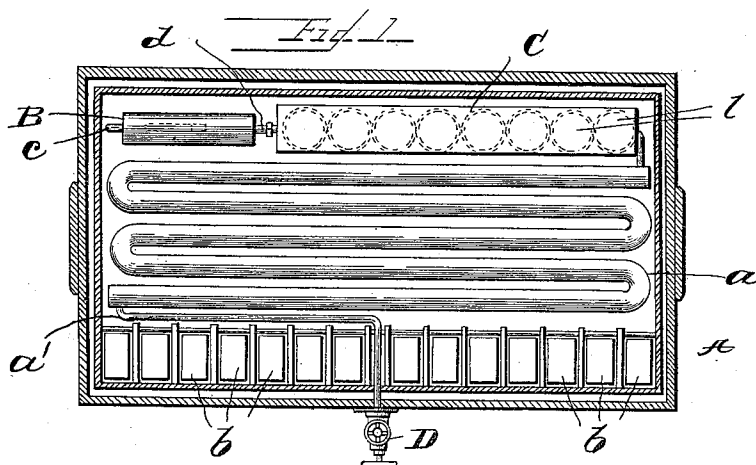
2 Sheets—Sheet 1.

H. S. FERRY.

APPARATUS FOR CARBONATING LIQUIDS.

No. 530,071.

Patented Nov. 27, 1894.



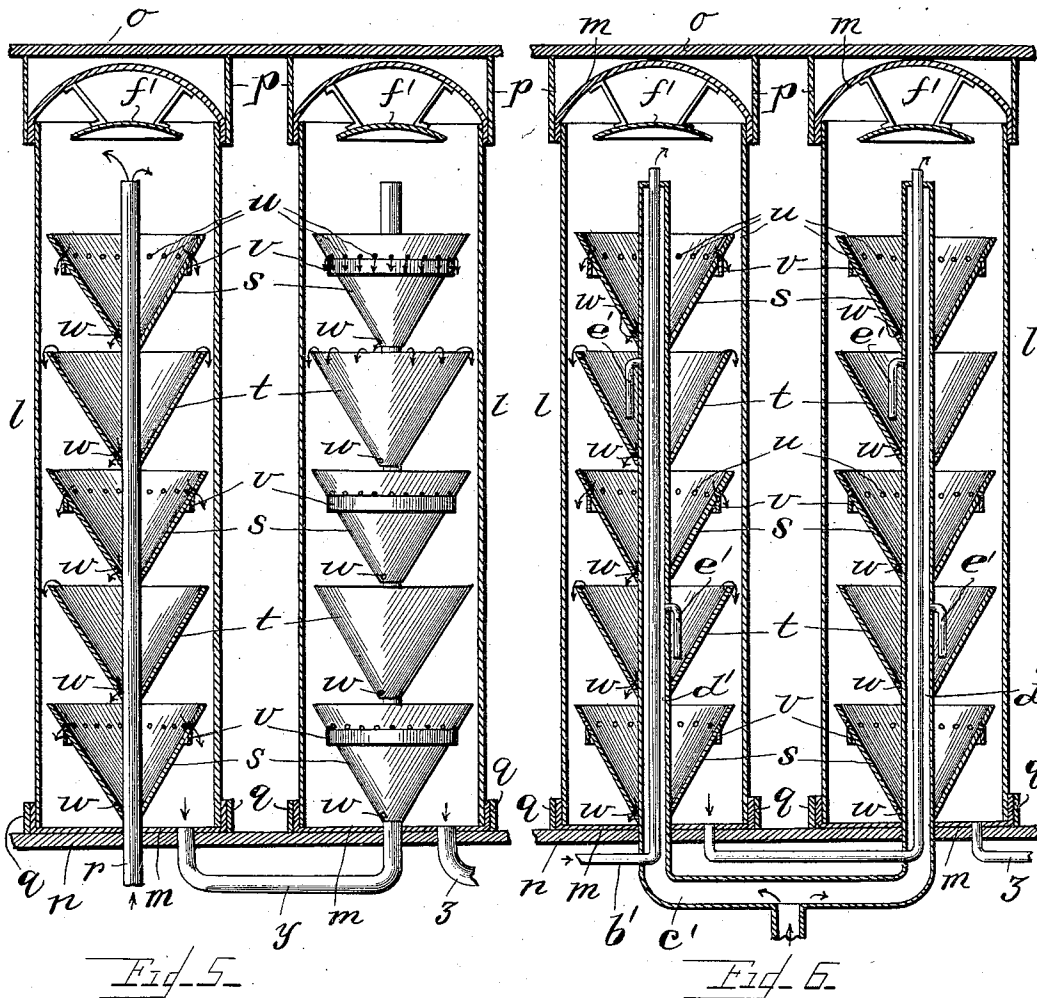
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UNITED STATES PATENT OFFICE.

HARVEY S. FERRY, OF MOUNT VERNON, ASSIGNOR TO THE FERRY MANUFACTURING COMPANY, OF NEW YORK, N. Y.

APPARATUS FOR CARBONATING LIQUIDS.

SPECIFICATION forming part of Letters Patent No. 530,071, dated November 27, 1894.

Application filed September 1, 1894. Serial No. 521,952. (No model.)

To all whom it may concern:

Be it known that I, HARVEY S. FERRY, a citizen of the United States, residing at Mount Vernon, in the county of Westchester and State of New York, have invented certain new and useful Improvements in Apparatus for Carbonating Liquids; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My present invention relates to apparatus for carbonating liquids for use with soda water dispensing apparatus and for bottling mineral waters and other liquids and has for its object certain improvements which will be fully disclosed in the following specification and claims.

Soda water dispensing apparatus as heretofore constructed have required the use of fountains to contain the liquids to be dispensed, and these fountains have been placed in the cell and connected to the dispensing apparatus by pipes. It is my purpose to dispense with the fountains and place the carbonator within the marble walls of the dispensing apparatus and draw water direct from a house service-pipe or other water supply and carbonate the water in its passage through the dispensing apparatus.

In the accompanying drawings, which form part of this specification, Figure 1 represents a top plan view of a soda water dispensing apparatus with the cover removed; Fig. 2, a vertical transverse section; Fig. 3, a vertical longitudinal section; Fig. 4, a vertical longitudinal section of the primary mixer detached and on an enlarged scale; Fig. 5, a vertical section partly in side elevation of the carbonating vessels on an enlarged scale, and Fig. 6, a vertical section of a modification of the carbonating vessels.

Reference being had to the drawings and letters thereon, A indicates a soda water dispensing apparatus of any preferred form, provided with the usual cooling pipes *a*, and sirup jars *b*, and on one side of the cooling pipes is the carbonating apparatus which consists of a primary mixing chamber B which is preferably in the form of an elongated cylindrical vessel having at one end a liquid

supply pipe *c* and at the opposite end a discharge pipe *d*, and the supply pipe is provided with a valve *e* to regulate the flow of water to the mixing chamber; the water being supplied from a house service pipe or any other suitable water supply to which the pipe *c* may be connected. In the use of tanks or reservoirs for holding the supply water, a small hand or power pump may be used to force the water into the mixing chamber, from which it is forced through the carbonator and the cooler and discharged from the dispensing faucet under pressure of the carbonic-acid gas admitted to the mixing chamber by pipe *f* provided with a valve *g* and with a reduced horizontal discharge nozzle *h* having a contracted end *i* and the discharge nozzle being directed toward the discharge or outlet pipe *d* of the mixing chamber and extending beyond the longitudinal center. The gas is preferably supplied from a reservoir of liquefied carbonic-acid gas or from a gas generator (not shown) and in its discharge in the mixing chamber under high pressure produces a violent agitation of the liquid and causes it to rebound from the discharge end of the chamber back toward the center of the chamber, which is due to the difference in the cross sectional area of the chamber B and its discharge pipe *d*. It will be observed that the nozzle *i* is beyond the longitudinal center of the chamber B, which causes the gas to drive the water at the discharge end of the chamber against the end wall with great force.

C indicates the carbonator which is supplemental to the mixing chamber B, and is connected thereto by a pipe *k* and consists of a plurality of cylindrical vessels *l* having their ends *m* soldered thereon and rest on a base *n* supported on the bottom of the dispensing apparatus as shown in Figs. 2 and 3 of the drawings, and at their tops or upper ends the vessels are secured together by a plate *o* having cylindrical pockets *p* on its under side which extend down over the vessels. The base *n* is provided with like cylindrical pockets *q* in which the vessels set.

The cooling coil is of ordinary construction, as are sirup jars *b* and the dispensing faucet D.

The vessels *l* are provided with a central

supply pipe *r* upon which are conical or funnel shaped vessels *s, t* in alternation. The former are provided with fine perforations *u* above the center and around the vessel and directly below the perforations is a skirt *v* upon which the liquid passing through the perforations in fine streams forms into a thin sheet or film and falls into the next vessel *t* below in said sheet and while falling the gas rising from the liquid in the vessel *t* permeates the liquid and is absorbed thereby, and the overflowing liquid in the vessel *t* flows in thin sheets down the outside surface of the vessel into the vessels *s* and is permeated by the gas rising therefrom. The skirts *v* in their position on the vessels *s* are of less diameter than the vessels *t* and cause the liquid passing through their perforations and down over the skirt to fall within the perimeter of the vessels *t*. Each vessel is provided at its bottom with a drip hole *w* to allow the liquid to flow out of the vessels slowly and thus cause a change of the liquid in the vessels and to discharge the liquid from the vessels when the carbonator is not in operation. The gas charged liquid in one of the vessels *l* is discharged into another vessel through a pipe *y* and is conducted through the vessels *s t* of each successive vessel *l* until the last of the series, from which it is conducted through pipe *z* to the cooler *a*. From thence the liquid is conducted through pipe *a'* to the dispensing faucet *D*.

For carbonating mineral water for bottling, the form of carbonator shown in Fig. 6, is preferred. In this construction the liquid is supplied through pipe *b'* and the gas through pipe *c'* which surrounds pipe *b'* and forms an annular gas chamber *d'* closed at the top, and from the pipe *c'* a pipe *e'* extends down into each vessel *t* near the bottom thereof and supplies gas to the liquid in said vessel, from which liquid the gas rises and permeates the liquid falling down in a sheet from vessels *s* into *t* as in the construction shown in Fig. 5. The liquid supplied to either of the vessels *l* impinges against a spreader *f'* in the upper and of the vessels and falls in a sheet into the upper vessel *s*.

The number of vessels *l* to form the carbonator may be varied to suit the requirements of the liquid being carbonated.

It will be observed that the carbonating apparatus is connected to the cooling coil and that the gas and the water are subject to the low temperature of the cooling medium from the time the gas and the water enter the primary carbonator, thereby effecting saving of gas and thoroughly carbonating and cooling the liquid while in transit through the inclosing casing of the dispensing apparatus.

The ice used for cooling the liquid passing through the coil *a* rests upon the coil and fills the space between the front of the casing of the dispensing apparatus and the carbonator *C* and covers the primary mixing chamber *B*, so that the carbonating of the liquid is effected under a uniformly low temperature.

Having thus fully described my invention, what I claim is—

1. The combination of a dispensing apparatus a carbonator consisting of one or more connected vessels provided with means for separating the liquid into sheets or films and a cooler connected to the carbonator and supported within said apparatus and exposed to the cooling medium.

2. The combination of a dispensing apparatus, the carbonator consisting of a primary horizontal mixing chamber and a plurality of supplemental vertical carbonating vessels and a cooler connected to the carbonators and contained within said apparatus.

3. A carbonating vessel provided with a plurality of conical vessels, each alternate vessel having circumferential perforations and a vertical skirt below said perforations near the vertical median line of the vessels.

4. A carbonating vessel provided with a plurality of conical vessels part of which vessels are provided with circumferential perforations, a vertical skirt below said perforations near the vertical median line of the vessels and leak holes in the bottom of the vessels.

5. A carbonating vessel provided with a central liquid supply pipe, a concentric gas supply pipe, a series of conical vessels and branch gas pipes extending into said vessels.

In testimony whereof I affix my signature in presence of two witnesses.

HARVEY S. FERRY.

Witnesses:

H. F. HOLLER,
J. B. KAUTZ.