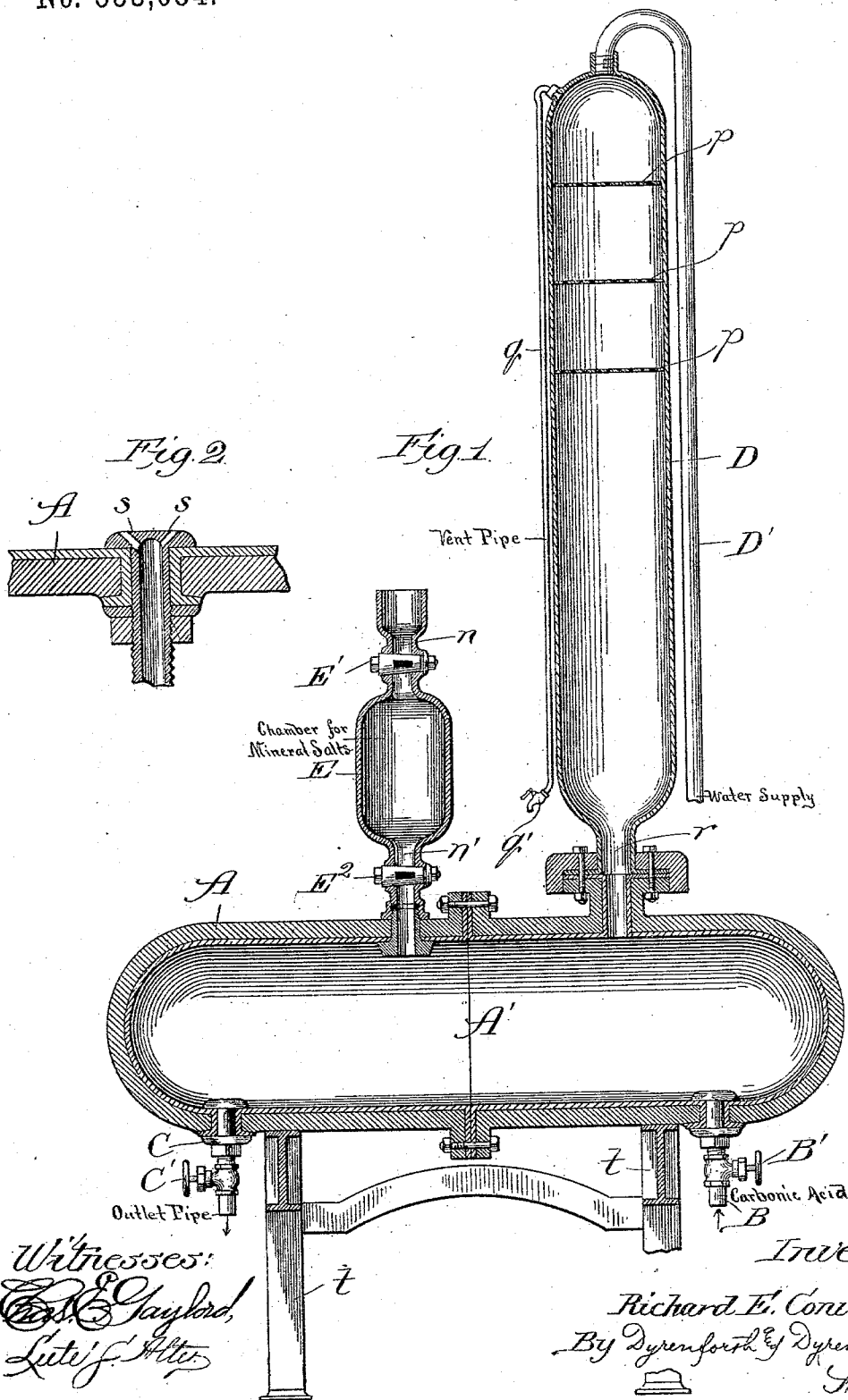


(No Model.)

R. E. CONVERT.
CARBONATOR.

No. 553,054.

Patented Jan. 14, 1896.



UNITED STATES PATENT OFFICE.

RICHARD E. CONVERT, OF CHICAGO, ILLINOIS.

CARBONATOR.

SPECIFICATION forming part of Letters Patent No. 553,054, dated January 14, 1896.

Application filed January 11, 1895. Serial No. 534,514. (No model.)

To all whom it may concern:

Be it known that I, RICHARD E. CONVERT, a subject of the Emperor of Germany, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Carbonators, of which the following is a specification.

My invention relates to improvement in carbonators for use more especially in the manufacture of carbonated beverages, as soda water or pop, or sparkling mineral waters.

My object is to provide an improved device of simple and easily operative construction in which the mixing of the liquid to be charged with the gas is produced by the flow of the fluids into the device and without the use of mechanical stirrers.

My invention consists in the general construction of my improved carbonator, and also in details of construction and combinations of parts, all as hereinafter set forth and claimed.

In the drawings, Figure 1 is a broken vertical and longitudinal section of my improved carbonator; and Fig. 2, an enlarged broken sectional view of a portion of the device, illustrating a detail of the construction.

A is the body portion of the carbonator comprising preferably an oblong, rather shallow and horizontally-disposed chamber A' mounted upon supporting-legs *t*. Entering the under side of the chamber A' at one end portion is a pipe B provided with a valve B', and terminating in the chamber A' in reduced outlet-passages *s* extending at different angles. The pipe B communicates with a carbonic-acid-gas supply. (Not shown.) Toward the opposite end of the chamber A', at its lower side, is an outlet-pipe C provided with a valve C'. On the shell or body portion A is a vertically-disposed chamber or dome D, reduced at its lower end to afford a contracted outlet which registers with an opening in the top of the chamber A' and affording therewith a narrow passage *r* between the chambers D A'. Extending to the top of the dome D is a pipe D', which communicates with a water-supply or the supply of the beverage to be carbonated. Extending from the top of the chamber D is a vent-pipe *q* which extends down

the side of the dome nearly to the base thereof where it is provided with a cock *q'*.

In operation initially the valve C' may be closed and the valves B' *q'* opened. Carbonic-acid gas under pressure flows into the chamber A' through the reduced openings *s* and in its rise expels air from the chamber A' into the dome D and thence through the vent *q*. When the chamber A' and dome-chamber are filled the cock *q'* is closed and water or other liquid to be charged is turned into the pipe D' to flow into the top of the dome-chamber.

Extending across the dome-chamber between the inlet-pipe D' and outlet-passage *r* is a sieve or series of sieves *p*, which as the liquid flows downward from the inlet divides it into fine streams or a spray, whereby in its descent the liquid becomes closely mixed or saturated with the gas. As the liquid passes downward through the contracted passage *r* the gas arises from the chamber A' to the dome-chamber D against the down-coming liquid, and a further thorough mixing takes place. While the liquid is coming in the dome-chamber, as described, gas is caused to continue flowing into the chamber A' from the openings *s*, and the gas-pressure should, in practice, be somewhat greater than the pressure which forces in the liquid. Thus as the gas is forced in at different angles it stirs and impregnates the liquid flowing into the chamber A'.

The carbonated liquid is withdrawn from the chamber A' by opening the valve C', from which a pipe may lead to a suitable bottling-table. In practice, after the chamber A' is once filled the liquid may be withdrawn and bottled as fast, or approximately so, as it enters the said chamber without materially changing the level therein. Thus the operation of carbonating and withdrawing the liquid may be continuous. By carefully adjusting the valve B' the gas may be caused to enter as fast as, but no faster than, necessary to thoroughly charge the water passing through the chamber, and the operation may thus be very thorough and carried on without waste of the gas. The liquid descending freely from the sieve *p* through the body of gas becomes thoroughly impregnated, as stated, be-

cause each drop undergoes constant molecular changes and presents new surfaces as it descends. A large proportion of the liquid, however, instead of descending freely through the body of gas runs down the inner wall of the dome or chamber D and is therefore but slightly impregnated. By causing it to pass through the small opening *r*, the liquid which has descended along the wall of the dome mixes with the more thoroughly-charged portion and the whole stream is there subjected to the action of the ascending gas in the contracted passage with the result that more thorough impregnation is effected than could otherwise be accomplished. The gas constantly entering the chamber A' through the openings *s* by stirring up and passing through the body of liquid therein has the effect, still further, of insuring the most thorough saturation of the liquid with the gas.

For use in the manufacture of mineral beverages I provide upon the shell A a shell or chamber E having an inlet-passage *n* at the top provided with a valve E', and an outlet-passage *n'* in its lower end provided with a valve E², the passage *n'* leading into the top of the chamber A'. To impregnate the liquid flowing down through the passage *r* with mineral salts the valve E² is first closed and the valve E' opened and a solution of mineral salts is poured into the chamber E. The valve E' is then closed and the valve E² opened, whereby the solution flows down through the passage *n'* to the chamber A'. The constant agitation of the liquid in the chamber A', caused by the gas entering through the reduced passages *s*, produces a thorough mixing and

charging of the soluble mineral with the contents of the chamber A', all being thoroughly charged with the carbonic-acid gas.

While I prefer to construct my improved carbonator in every detail as shown and described, it may be modified without departing from the spirit of my invention as defined by the claim.

What I claim as new, and desire to secure by Letters Patent, is—

In a carbonator, a chamber A', a pipe B communicating with a carbonic acid gas supply and entering the chamber A' at the under side thereof, the pipe terminating at the said chamber in reduced outlets *s* extending to different angles, a valve B' interposed in the pipe B, an outlet pipe for the chamber A' provided with a valve, a vertically-disposed dome-chamber D mounted upon the chamber A', and having a reduced passage *r*, which enters the chamber A' at the upper side of the latter, a liquid supply-pipe extending to the top of the dome-chamber, a vent-pipe *q* extending from the top of the dome-chamber down one side of the latter and terminating in a cock *q'*, a chamber E mounted upon the chamber A' having an inlet passage *n* in its upper side, and an outlet passage *n'* in its lower side leading to the chamber A', and valves in the said passages, all constructed to operate substantially as and for the purpose set forth.

RICHARD E. CONVERT.

In presence of—

J. N. HANSON,
M. J. FROST.