

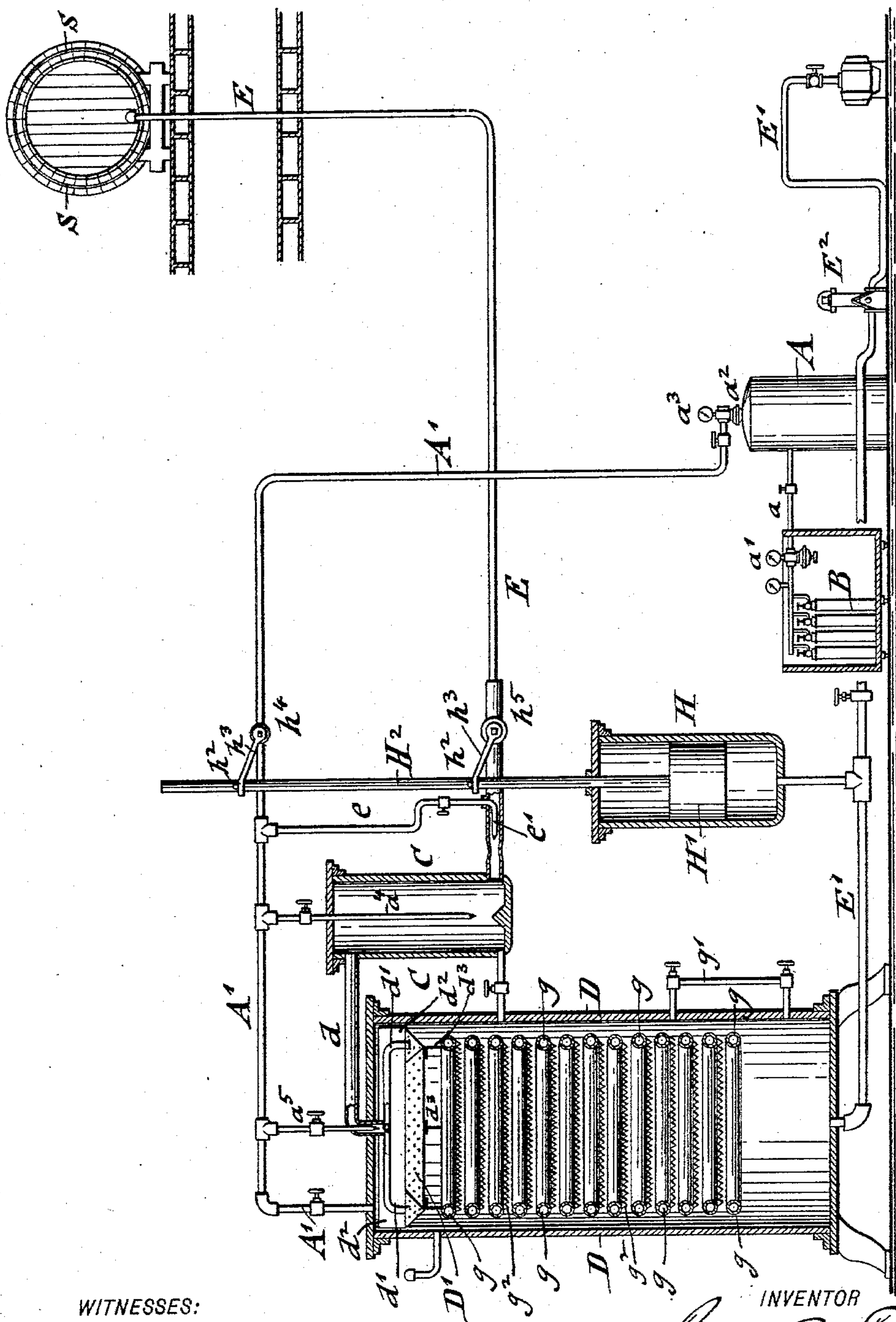
(No Model.)

J. Z. FORMEL.

# APPARATUS FOR CARBONATING FERMENTED BEVERAGES.

No. 561,879.

Patented June 9, 1896.



**WITNESSES:**

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# UNITED STATES PATENT OFFICE.

JULIUS Z. FORMEL, OF SARATOGA SPRINGS, NEW YORK, ASSIGNOR TO THE CHAMPION NATURAL CARBONIC ACID GAS COMPANY, OF SAME PLACE.

## APPARATUS FOR CARBONATING FERMENTED BEVERAGES.

SPECIFICATION forming part of Letters Patent No. 561,879, dated June 9, 1896.

Application filed August 21, 1895. Serial No. 559,982. (No model.)

*To all whom it may concern:*

Be it known that I, JULIUS Z. FORMEL, a citizen of the United States, residing at Saratoga Springs, in the county of Saratoga and State of New York, have invented certain new and useful Improvements in Apparatus for Carbonating Fermented Beverages, of which the following is a specification.

This invention has reference to an improved apparatus for carbonating beer and other fermented beverages, so as to dispense with the so-called "kraeusen" process and obviate the reintroduction of yeast-cells into said beverages; and the invention consists of an apparatus for charging fermented liquids with carbonic-acid gas, which comprises a receiver for the carbonic-acid gas, a primary mixing-tank connected with the receiver and storage-cask for producing the primary mixing of the liquid and gas, a carbonating-tank in which the liquid is intimately mixed with carbonic-acid gas by being minutely distributed within the same and brought in contact with the gas, supply-pipes for the gas and liquid, and a float-tank connected with the carbonating-tank and with the valves of said gas and liquid supply pipes, so as to interrupt or establish automatically the supply of gas and liquid to the carbonating-tank as the level of the liquid in the same rises and falls, and means for conducting the carbonated liquid to the shipping-keg.

The accompanying drawing represents a side elevation, partly in vertical longitudinal section, of my improved apparatus for carbonating fermented liquids.

In the drawing, A represents the receiver for the carbonic-acid gas under pressure. The receiver A is connected by means of a pipe *a* with a suitable battery of cylinders B, containing liquefied carbonic acid, the pipe *a* being provided with a pressure-reducing valve *a'*, so that the carbonic acid is expanded to the required pressure into the receiver A. The receiver A is provided with another pressure-reducing valve *a''* and pressure-gage *a'''*, so that the gas can be supplied at any desired pressure into the carbonating apparatus. The gas-supply pipe A' connects the supply-tank A with a primary mixing-tank C and a carbonating-tank D. From the gas-supply pipe

A' extends a valved branch pipe *e*, having a small discharge-nozzle *e'* into the liquid-supply pipe E, which connects the storage-cask S with the primary mixing-tank C. The upper part of the primary mixing-tank C is connected by a pipe *d* with the carbonating-tank D. Valved branch gas-supply pipes *a''* *a'''* extend from the main supply-pipe A' respectively into the primary mixing-tank C and carbonating-tank D, the nozzles of said branch pipes *e* and *a'''* coming in connection with the liquid-supply pipes E and *d* in the nature of injectors, the nozzles of said branch pipes *e* and *a'''* being placed in line with the axis of the liquid-supply pipes E and *d*. The liquid is thereby first forced into the primary mixing-tank C and there kept in agitation by the supply of gas by the branch pipe *a''*, while the main supply-pipe A' supplies the carbonating-tank D directly with gas of the required pressure, so as to permit the starting of the carbonating operation. After this is done the valve near the end of the main supply-pipe A' is closed off.

The carbonating-tank D is made of a closed cylinder, which is provided at its upper part with a perforated annular trough or funnel D', to which the liquid is supplied from the primary mixing-tank C by the pipe *d* and branch pipe *d'*, it being impelled by the gas supplied by the branch pipe *a'''*. The funnel D' is surrounded by a ring-shaped flange *d''*, applied to its outer edge, so as to prevent the running over of the funnel D' and prevent the spattering of the liquid. The funnel D' is provided at its lower edge with short legs *d'''*, by which it rests on the uppermost ring-shaped tube *g* of a series of similar tubes *g*, which are arranged vertically below the funnel and vertically below each other in the carbonating-tank D. The ring-shaped tubes *g* are each provided at their lowermost portions with a serrated drip-plate *g''*, of sheet metal, so that the liquid which passes over the same is transmitted in drops onto the next tube *g*, and so on over all the tubes of the series.

As the liquid is thus conducted in a minutely-divided state through the atmosphere of carbonic-acid gas in the tank D the gas is incorporated with the same, the carbonated liquid being drawn off through the discharge-



pipe E', forced through a filter E<sup>2</sup>, and finally  
racked off into the shipping barrels or kegs.  
Any suitable racking-off faucet can be used.  
The carbonating-tank D is provided with a  
5 gage g', which indicates the level of the liquid  
in the tank D. The discharge-pipe E' is also  
connected with the bottom of a float-tank H,  
the float H' of which moves up and down in  
the tank H and operates a rod H<sup>2</sup>, provided  
10 with pins h<sup>2</sup>, that engage the forked ends of  
lever-arms h<sup>3</sup> on the spindles of stop-cocks  
h<sup>4</sup> h<sup>5</sup>, which are located, respectively, in the  
gas and liquid supply pipes A' and E. When,  
therefore, the level of the liquid in the car-  
15 bonating-tank D rises to a certain level,  
preferably up to the lowermost ring-shaped  
tube g of the series g g, the float H' is raised  
to such an extent that the stop-cocks h<sup>4</sup> h<sup>5</sup>  
are closed by the action of the pins h<sup>2</sup> on the  
20 lever-arms h<sup>3</sup>, whereby the operation of the  
apparatus is automatically interrupted. As  
soon as the level in the carbonating-tank  
falls the float is lowered, the supply-valves  
opened, and the operation of the apparatus  
25 continued by the supply of liquid and gas  
to the carbonating-tank.

The advantages of my improved apparatus  
are that by the primary and secondary mix-  
ing of the gas with the liquid a very effective  
30 impregnation of the liquid with the carbonic-  
acid gas is obtained, so that the carbonated  
liquid can be racked off directly into the  
shipping barrels or kegs, the liquid contain-  
ing a comparatively large quantity of car-  
35 bonic-acid gas without requiring to pass  
through the second fermentation produced  
by the so-called "kraeusen" process, so that  
the well-known objectionable features of this  
latter process are obviated and a fermented  
40 liquid of better quality and greater life is  
supplied.

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

1. An apparatus for carbonating fermented 45  
liquids, which comprises a gas-receiver, a  
primary mixing-tank, a carbonating-tank, a  
gas-supply pipe connecting the receiver with  
the mixing and carbonating tanks, a liquid-  
50 supply pipe for the mixing-tank, a valved  
branch pipe connecting the gas-supply pipe  
with the liquid-supply pipe, a pipe connect-  
ing the mixing-tank with the upper part of  
the carbonating-tank, valved branch pipes  
55 leading from the gas-supply pipe respectively  
into the mixing-tank and the supply-pipe,  
means located at the interior of the carbon-  
ating-tank for impregnating the liquid with  
the gas, and a discharge-pipe leading from  
the bottom of the carbonating-tank to the 60  
racking-off faucet, substantially as set forth.

2. An apparatus for carbonating fermented  
liquids, which comprises a receiver for the  
carbonic-acid gas, a primary mixing-tank, a  
carbonating-tank, a main supply-pipe con- 65  
necting the receiver with the mixing and car-  
bonating tanks, valved branch pipes leading  
from the gas-supply pipe into the liquid-sup-  
ply pipe, mixing-tank and carbonating-tank,  
a pipe connecting the receiver with the upper 70  
part of the carbonating-tank, a discharge-  
pipe at the bottom of the carbonating-tank,  
a float-tank connected with the discharge-  
pipe, a float in said tank and means connect-  
ing the rod of the float with the stop-cocks in 75  
the gas and liquid supply pipes, so as to in-  
terrupt the operation of the apparatus when  
the carbonated liquid arrives at a certain  
level in the carbonating-tank, substantially  
as set forth. 80

In testimony that I claim the foregoing as  
my invention I have signed my name in pres-  
ence of two subscribing witnesses.

JULIUS Z. FORMEL.

Witnesses:

PAUL GOEPEL,  
GEORGE W. JAEKEL.