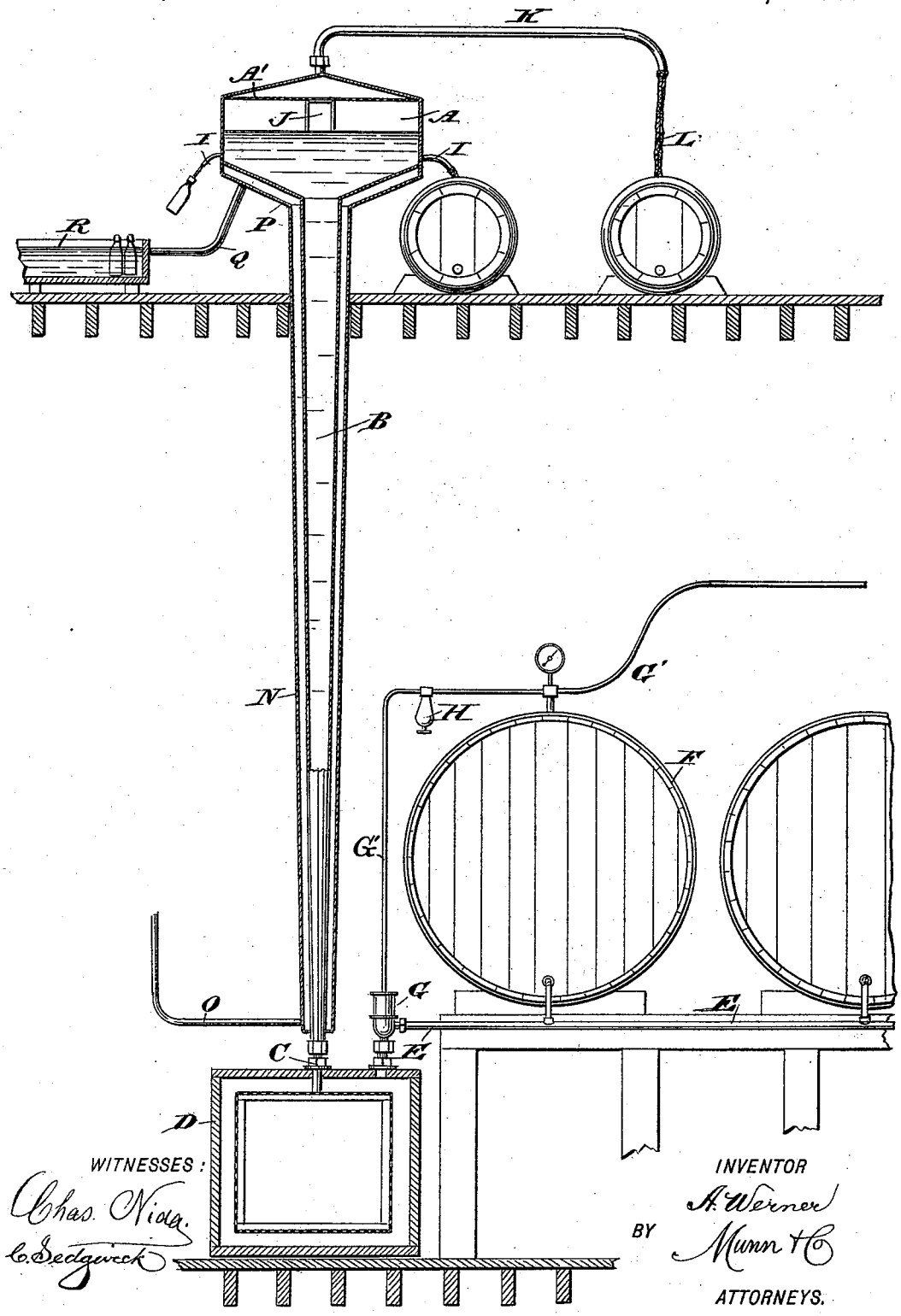
(No Model.)

A. WERNER.

FROTH AND LIQUID SEPARATOR.

No. 490,521. Patented Jan. 24, 1893.



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FROTH AND LIQUID SEPARATOR.

SPECIFICATION forming part of Letters Patent No. 490,521, dated January 24, 1893.

Application filed April 4, 1892. Serial No. 427,663. (No model.)

To all whom it may concern:

Be it known that I, AUGUST WERNER, of Brooklyn, in the county of Kings and State of New York, have invented a new and Improved Froth and Liquid Separator, of which the following is a full, clear, and exact description.

The invention consists of a receiving receptacle provided with filling nozzles and connected with the base end of an inverted cone shape liquid supply tube, a liquid supply cask connected with the small end of said tube, and a gas supply connected with the said cask for maintaining a pressure on the liquid therein corresponding to the hydrostatic pressure of the column of liquid in the said supply tube and the pressure desired in the vessels to be charged.

The invention consists principally of an inverted cone-shaped tube formed at its lower end with an inlet and in which rises the liquid to finally pass into the receiving receptacle.

The invention also consists of certain parts and details of combinations of the same, as will be fully described hereinafter and then pointed out in the claims.

Reference is to be had to the accompanying drawing forming a part of this specification, in which the figure represents a sectional side elevation of the improvement.

The improved froth and liquid separator is provided with a receiving receptacle or vessel A, of suitable size and dimensions and connected at its bottom with the large end of a downwardly-extending inverted cone-shaped tube B, of suitable length, and connected at its lower, small end with a pipe C forming an inlet for the said tube and an outlet for the filter D of any approved construction, preferably, however, of the construction shown and described in the application for Letters Patent Serial No. 427,662 filed by me of even date herewith. The filter D is provided with an inlet pipe E adapted to be connected with the casks, barrels, or tanks F, from which the liquid to be filtered is drawn. In the pipe E near the filter is arranged a tube G, connected by a small pipe G′ with the top of the cask F, the said pipe G′ also leading to a gas tank for supplying the said cask F with gas under pressure, so that the liquid circulates through the filter D and passes out of the pipe C into the tube B to rise in the latter and to finally pass into the receiving receptacle A. In the pipe G is arranged a suitable trap H for gathering any impurities which may rise from the tube G in that part of the pipe G′ leading from the tube to the cask F.

It is understood that by connecting the tube G with the same pressure pipe leading to the cask F, the bubbles arising in the tube can pass into the pipe G′ and dissolve therein at the level of the liquid, which level is of course the same as the one in the cask F as both the latter and pipe are under the same pressure.

The receptacle A is provided in its sides with outlet nozzles I, of any approved construction, and adapted to be connected with the bottles, kegs, barrels, or other receptacles to be filled, the said nozzles permitting the drawing of the liquid from the receptacle A after the same has been filtered and freed from all froth.

In one side of the receptacle A is arranged a vertically extending window J, for conveniently viewing the interior of the receptacle A so as to ascertain the level of the liquid in the said receptacle and also the froth accumulating in the upper part of the receptacle on top of the liquid. In the receptacle A is arranged a sieve A′ or a series of horizontally disposed sieves to retain the froth so as to condense the same back into liquid form.

The upper closed end of the receptacle A is provided with a pipe K connected at its outer end with a flexible hose L adapted to be passed into a keg, bottle, or other vessel, to charge the latter with gas arising in the upper part of the receptacle A.

In order to cool the liquid arising in the inverted cone-shaped tube B and also the liquid contained in the receptacle A, the said tube is surrounded by a pipe N connected at its lower end with a pipe O connected with a suitable source of ice water supply, so as to force ice water through the said pipe O into the pipe N and around the tube B, so as to cool the rising liquid therein. The upper end of the pipe N leads into a jacket P formed on the body of the receptacle A so as to cool the liquid contained in the receptacle. An outlet pipe Q leads from the jacket P and discharges into a tank R containing the bot-

tles to be cooled before the liquid drawn from the receptacle A is filled into said cooled bottles through the nozzles I.

The operation is as follows: The liquid passing through the supply pipe E from the casks F, circulates through the filter D, is freed therein of its impurities, so that the purified liquid is finally discharged through the pipe C into the lower end of the tube B in which the liquid rises and in so doing the pressure becomes less and less so that bubbles, froth, and the like, quickly separate from the liquid and rise with the same, their discharge upward being unobstructed owing to the increase in the size of the tube B and the consequent increase of volume of the liquid in the enlarged part of the pipe. The bubbles finally entering the receptacle A are under very little pressure, float easily to the surface of the liquid of the receptacle and the froth readily condenses back into the liquid form.

The liquid rising in the tube B accumulates in the receptacle A, while the froth formed by the bubbles accumulates on the top of the liquid between the latter and the sieve or sieves and readily condenses in the said receptacle. Now, when the nozzles I arranged in the lower part of the receptacle A are opened and bottles, kegs, or barrels are connected with the said nozzles, then the latter are filled with very pure liquid freed from all impurities and froth. It will be seen that the liquid rising in the tube B can be cooled to any desired degree by the ice-water circulating through the surrounding pipe N.

It is understood that in order to raise the liquid from the filter D into the receptacle A, pressure is necessary which is supplied by the gas or air forced through the pipe G′ and the tube G into the liquid passing through the supply pipe E. Usually the filter D and the casks F are located in the cellar, while the tube B extends through one or the several stories of the building, to finally discharge into the receptacle A located in one of the upper stories of the building.

It is understood that if a bottle is to be filled say with sixty pounds pressure, the pressure in the cask from which the liquid is drawn must have a pressure of the sixty plus the amount necessary for raising the liquid into the receptacle A.

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

1. In a froth and liquid separator the combination with a receiving receptacle provided with filling nozzles of a liquid supply tube having an inverted cone-shape form and connected at its base with the said receiving receptacle, a liquid supply cask connected with the small end of the said tube and a gas supply connected with the said cask for maintaining a pressure on the liquid therein corresponding to the hydrostatic pressure of the column of liquid in the said supply tube and the pressure desired in the vessels to be charged, substantially as shown and described.

2. In a froth and liquid separator the combination with a receiving receptacle provided with filling nozzles, of a liquid supply tube having an inverted cone-shape form and connected at its base with the said receiving receptacle, a filter connected with the small end of the said tube, a liquid supply cask connected with the said filter and a gas supply connected with the said cask for maintaining a pressure on the liquid therein, corresponding to the hydrostatic pressure of the column of liquid in the said tube and the pressure desired in the vessels to be filled, substantially as described.

AUGUST WERNER.

Witnesses:
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