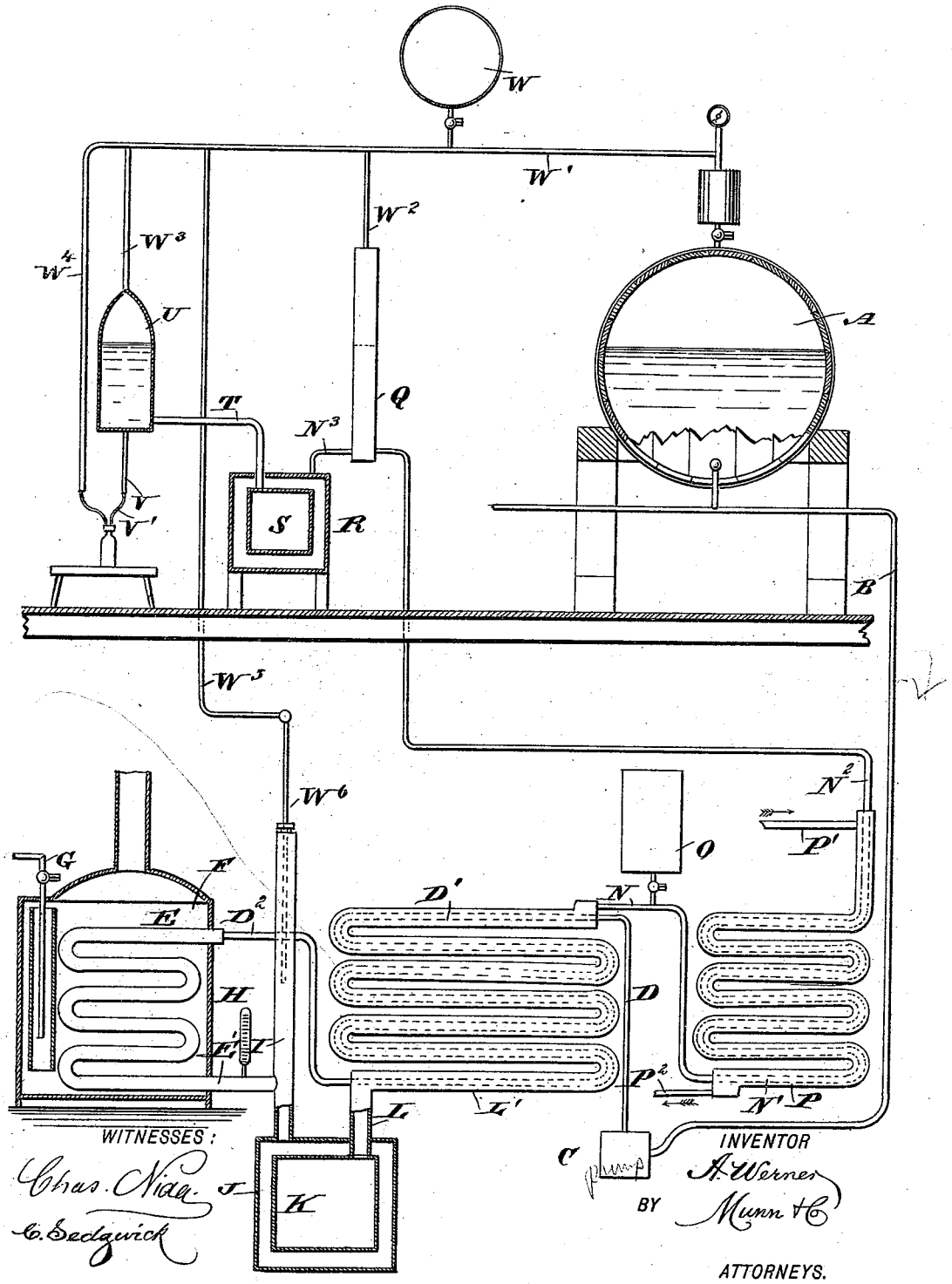
(No Model.)

A. WERNER.

METHOD OF STEAMING LIQUIDS.

No. 490,523. Patented Jan. 24, 1893.



UNITED STATES PATENT OFFICE.

AUGUST WERNER, OF BROOKLYN, NEW YORK.

METHOD OF STEAMING LIQUIDS.

SPECIFICATION forming part of Letters Patent No. 490,523, dated January 24, 1893.

Application filed May 19, 1892. Serial No. 433,548. (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 Method of Steaming Liquids, of which the following is a full, clear, and exact description.

The object of the invention is to provide a new and improved method for continuously steaming liquids, such as wine, beer, &c., preparatory to filling the liquids into suitable receptacles, such as casks, kegs, or bottles, the method preventing the loss of any valuable properties contained in the liquid and while undergoing the steaming process, and further preventing fermentation and consequent spoiling of the liquid after it is filled into the receptacles.

The improved method consists of first forming a moving column of liquid and subjecting the column of liquid to the action of heat at or near the base of said column under the hydrostatic pressure of the column and then discharging the heated liquid into a receiving vessel at the initial pressure of the liquid at the upper end of the column. In order to carry this method into effect, I prefer the apparatus shown in the accompanying drawing which forms part of this specification, and in which

The figure is a sectional side elevation of the apparatus.

The liquid to be treated is contained in a large storage cask A, from which the liquid is conducted through a pipe B, extending downward to a pump C, located a suitable distance below the storage cask, preferably one or more stories below the cask, so that the liquid flows, under its own specific weight, through the pipe B into the pump, to be discharged from the latter into a pipe D, formed into a coil of pipe D′, the end D^2 of which leads into a coil of pipe E, extending in a suitable steaming vessel F, connected with a suitable source of heat supply, preferably water heated by steam, discharged into the said vessel, so that the liquid flowing through the pipe E is heated or steamed to a high degree of temperature.

The outlet E′ of the coil of pipe E carries a thermometer H, indicating the degree of temperature the liquid has on leaving the steaming device. The outlet E′ connects with a vertically arranged tube I, connected at its lower end with a casing J, containing a filter K, preferably of the construction shown and described in the application for Letters Patent Serial No. 427,862 filed by me under date of April 4, 1892.

The outlet pipe L, of the filter K is formed with a coil of pipe L′, through which passes the coil of pipe D′, so that the liquid passing from the filter K through the pipe L flows in an inverse direction to that of the flow of the liquid in the coil of pipe D′. The end of the coil of pipe L′ is connected with a pipe N, in which the liquid is charged with a suitable gas, preferably in liquid form, held in a vessel O, and connected with the said pipe N, as shown in the drawing.

It is understood that the gas with which the liquid is charged is under such pressure as to be in liquid form, and when discharged into the pipe N again attains its gaseous form to mix with and charge the liquid. The liquid, after being charged with gas, is gradually cooled, and for this purpose the pipe N is formed with a coil of pipe N′, passing through a coil of pipe P, connected at its upper end with a pipe P′, leading from a source of cooling agent such as iced water, to pass the water through the coil of pipe P to finally discharge the same through an outlet pipe P^2. The cooling agent passing through the coil of pipe P cools the charged steamed liquid, so that the latter finally passes in a cooled state through a pipe N^2 to a tube Q, from which a pipe N^3, leads to a receptacle R, containing a filter S, similar in construction to the filter K previously described.

The outlet pipe T, of the filter S connects with a buffer receptacle U, provided with an outlet pipe V, connected by a flexible hose V′, with the vessel to be filled. A gas supply tank W, is connected by a pipe W′, with the top of the storage cask A and by a branch pipe W^2, with the tube Q, by a branch pipe W^3, with the buffer receptacle U and by a like pipe W^4, with the vessel to be filled. A branch pipe W^5, also leads from the pipe W′ and carries a pipe W^6, extending into the tube I and having its lower end immersed at all times in the liquid passing into the tube so as to prevent the escape of gas at a point where the liquid is most heated and liable to escape.

It is understood that the connection of the gas tank W with the storage cask A, the tube Q, the buffer receptacle U, and the filling receptacle, is similar to the one described in the application for Letters Patent, for filtering process, Serial No. 431,676, filed by me on May 3, 1892, so that further description of the same is not deemed necessary.

It will be seen that the liquid to be treated flows from the storage cask A under its own specific weight and pressure, through the several pipes to finally pass into the receiving vessel, in which the same pressure is maintained as that of the storage cask A. The liquid, in flowing down the pipe B and passing through the pump C, finally enters the coil D′ and flows through the same into the pipe E wherein the liquid is subjected to the heat of the steaming device F, so that the liquid is heated to a considerable degree of temperature and finally passes through the filter K in which the impurities contained in the liquid are retained, and finally the steamed and filtered liquid flows through the coil of pipe L′ in the inverse direction to the inflowing liquid, so that the outflowing liquid gradually gives off its heat to the inflowing liquid for the double purpose of gradually heating the inflowing liquid, and in a like manner, gradually cooling the outflowing liquid, so that the latter will be ready to receive the gas charge from the gas tank O. The liquid is then further cooled in the coil of pipe N′ by the cooling agent passing through the coil of pipe P. The liquid then receives a second filtering in the filter S from which it passes to the buffer receptacle U to be finally filled into the receptacle, under the exclusion of air and under the same pressure as that of the cask A, and to be at once ready for the market.

Now it will be seen that by this process of steaming the liquid while in motion and flowing under its own specific weight, all air is excluded during the time the liquid is gradually and temporarily heated, then steamed, then filtered then gradually cooled, then charged with gas, and then cooled to a low temperature and again filtered, before it is finally filled into the receiving vessel, so that no valuable properties contained in the liquid, whatever, can be lost while undergoing the various stages of the method. As the steaming device is located below the storage cask and filling device, the liquid is subjected to considerable pressure while undergoing the steaming process, but no gas or flavor can separate from the liquid.

The pump C is mainly used to regulate the speed or flow of the liquid through the several pipes and principally through the steamer so as to maintain a uniform flow, temperature and pressure of the liquid.

The tube I serves as a buffer to check the action of the pump before the liquid enters the filter.

It is understood that the gas from the gas supply tank maintains an equalizing pressure on the liquid so that the latter flows from the storage cask to the filling receptacle through the various devices above described, under its own specific gravity, and under exclusion of all air.

The filter K is preferably placed as near to the steaming device as possible, as the liquid after leaving the steaming device is in its most expanded state, and the impurities are likewise expanded so as to be readily retained in the filter and consequently the latter is more effective.

It will be seen that although the liquid is kept constantly in motion, all inlet of air is prevented, so that the valuable properties of the liquid, the gases, &c., are retained. Thus the liquid is taken in one continuous process from the storage cask and treated as described, to be finally filled into the receiving vessels, to be ready for the market. The liquid treated in the manner above described, will keep for a very long time, and is not liable to spoil, as no further fermentation can take place, owing to the previous steaming and filtering as described.

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

The herein described method for steaming liquids consisting of first forming a moving column of liquid and subjecting the column of liquid to the action of heat at or near the base of said column under the hydrostatic pressure of the column, and then discharging the heated liquid into a receiving vessel at the initial pressure of the liquid at the upper end of the column, substantially as shown and described.

AUGUST WERNER.

Witnesses:
THEO. G. HOSTER,
C. SEDGWICK.