No. 662,612. Patented Nov. 27, 1900.

W. H. WEIGHTMAN.

LIQUID DISTRIBUTION FOR VAPORIZING, COOLING, AND AERATING APPARATUS.

(Application filed Mar. 5, 1900.

(No Model.)

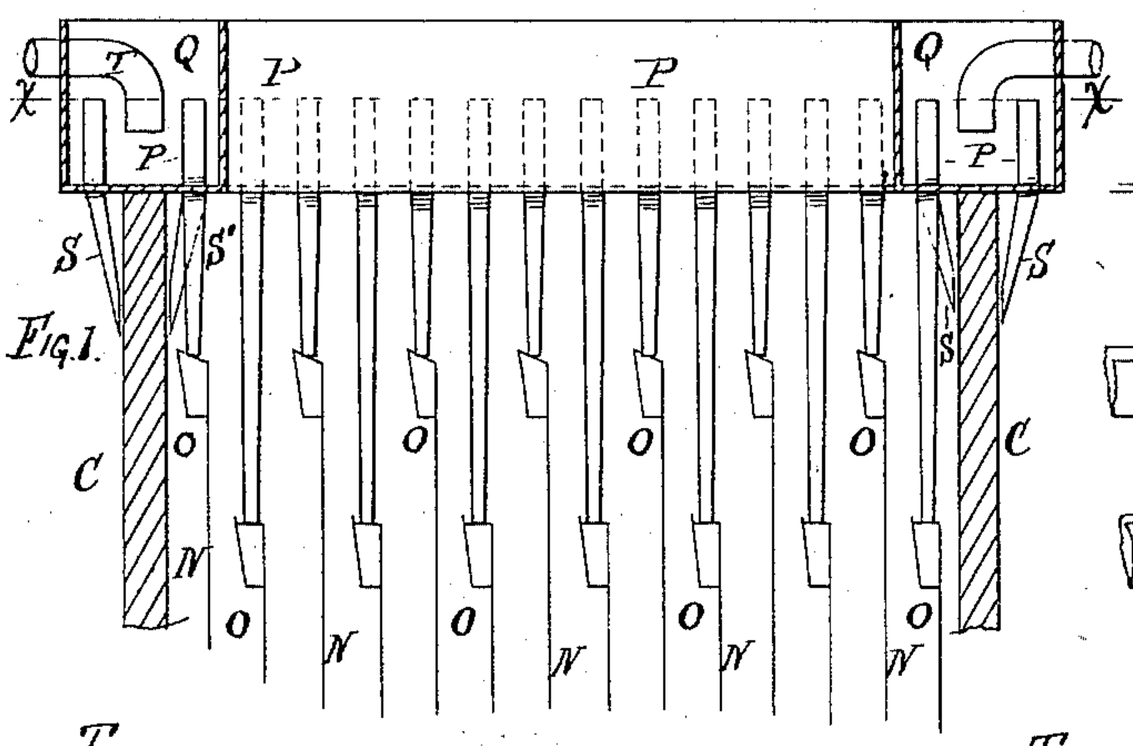

FIG. 1.

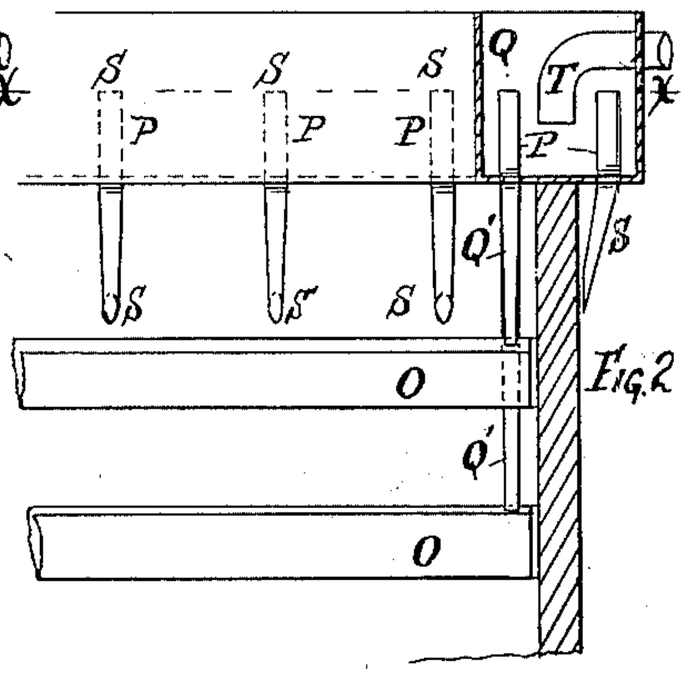

FIG. 2.

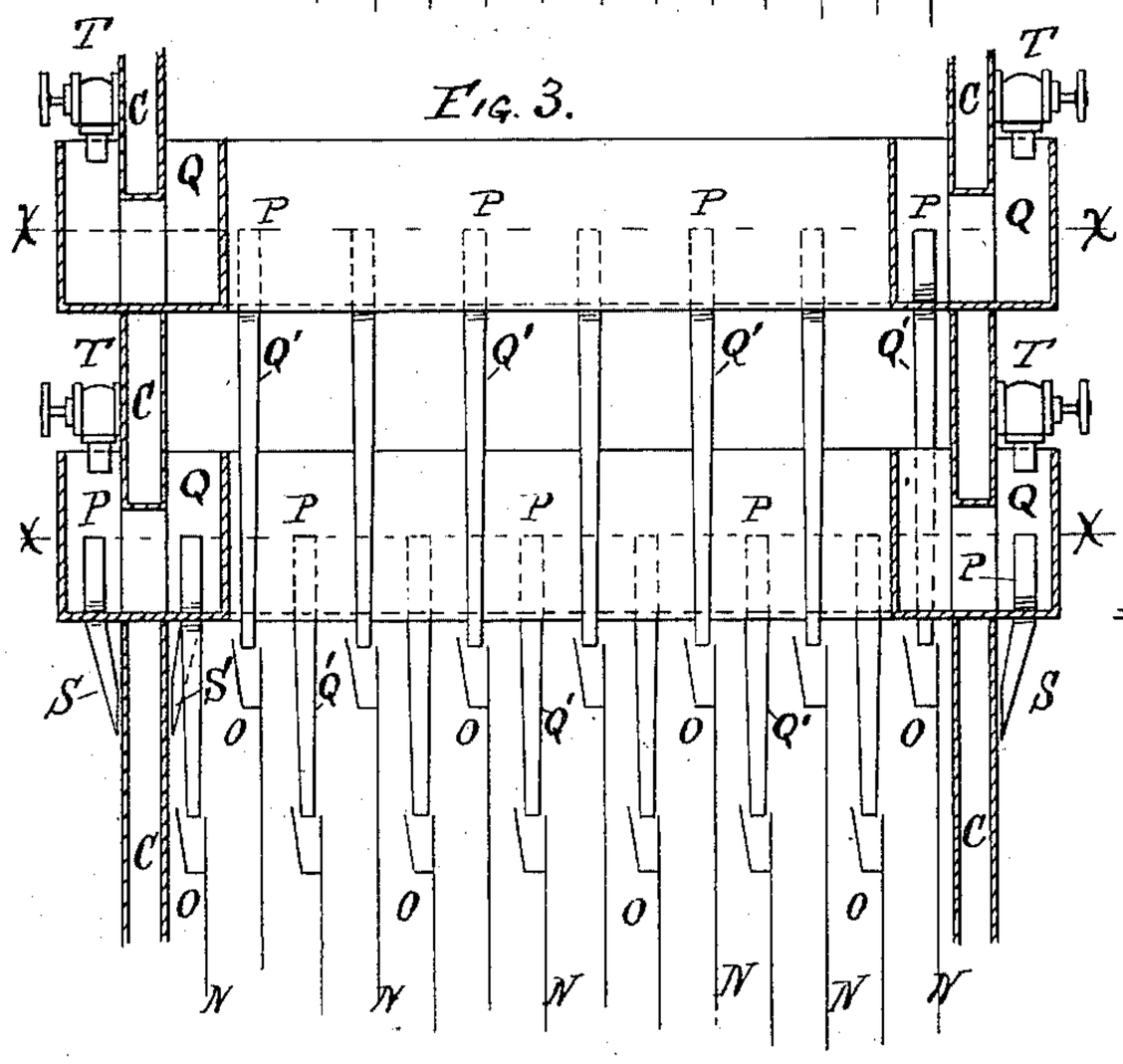

FIG. 3.

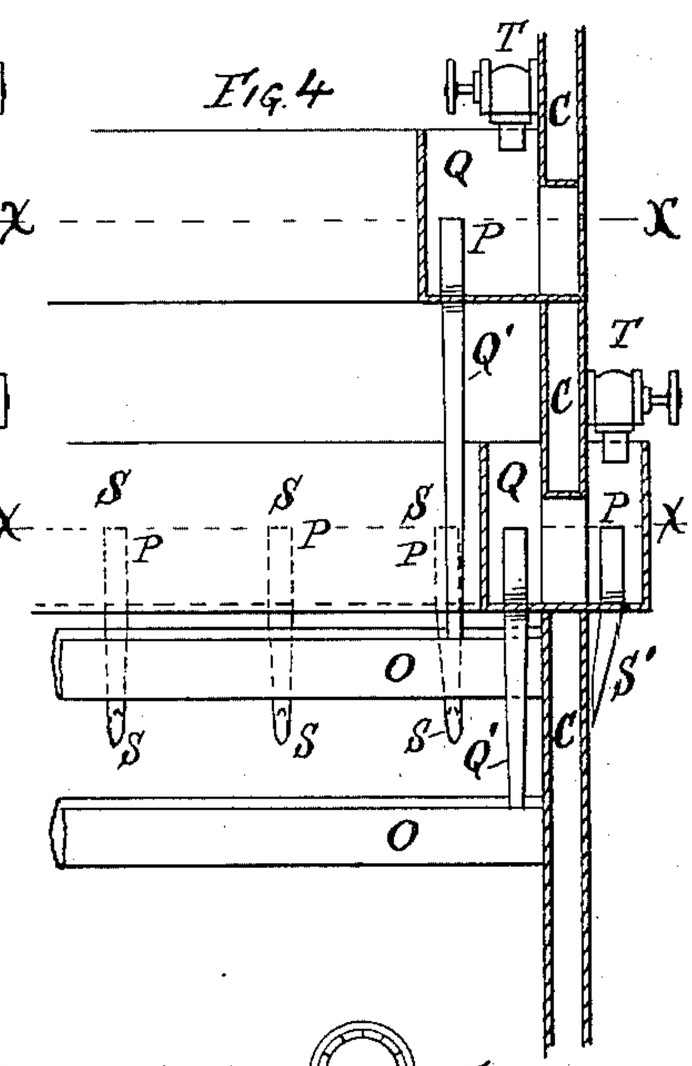

FIG. 4.

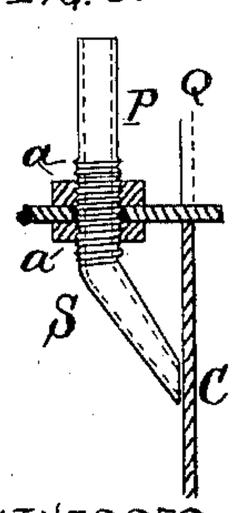

FIG. 5.

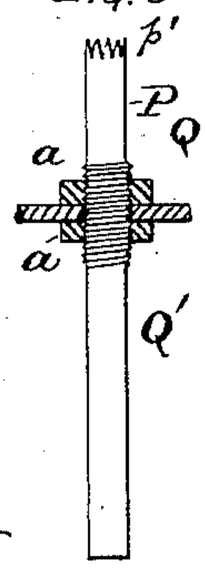

FIG. 6.

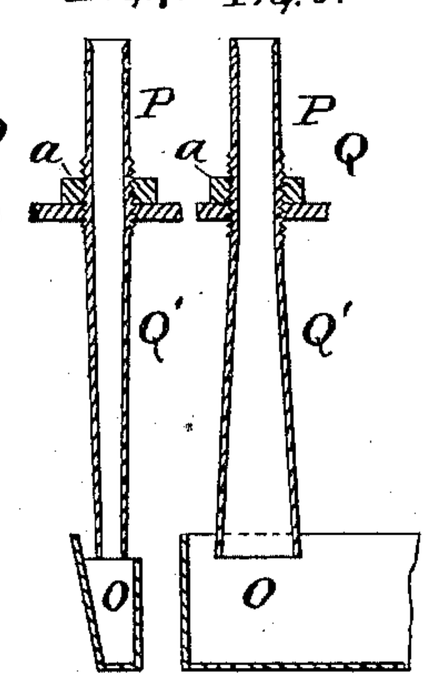

FIG. 7.

FIG. 8.

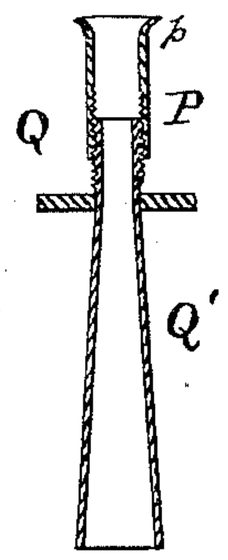

FIG. 9.

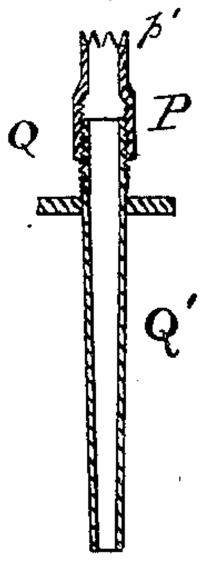

FIG. 10.

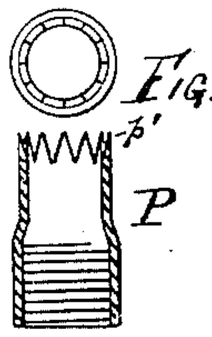

FIG. 11.

WITNESSES:-
A. W. P. Cramer
Henry J. Stehle

INVENTOR:-
Wm. H. Weightman

UNITED STATES PATENT OFFICE.

WILLIAM HENRY WEIGHTMAN, OF NEW YORK, N. Y.

LIQUID DISTRIBUTION FOR VAPORIZING, COOLING, AND AERATING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 662,612, dated November 27, 1900.

Application filed March 5, 1900. Serial No. 7,326. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM HENRY WEIGHTMAN, a citizen of the United States, residing in the city and State of New York, have invented certain new and useful Improvements in Liquid Distribution for Vaporizing, Cooling, and Aerating Apparatus, of which the following is a specification, reference being had to the accompanying drawings.

My invention relates to and has for its object an improvement in liquid distribution, apportionment, and separation in apparatus for vaporizing, cooling, refining, and aerating or like purposes, and more particularly an improved mechanism for the careful distribution, division, and apportionment of the treated liquid in apparatus of the character described in my application for patent, Serial No. 711,669, of April 4, 1899.

The particular aim and object of my invention is to overcome and remedy a troublesome difficulty continually met in such apparatus of an unequal distribution, scattering or sheeting of the liquid under treatment, and secure a constant overflow-level for the liquid at all portions of the fluid-surface independent of all settlement or twist of the apparatus as a whole or of inequalities of the bottom surface of the fluid-distributing chambers or compartments; also, to do away with all head-pressure of the liquids treated and provide for an equable and closely-apportioned supply and passage of the liquid to overflow from the distributing chamber or compartment to the several distributing ways or channels for overflow and treatment.

My improvements consist, first, in the application of a plurality of overflow pipes or ducts to the bottom of the fluid-distributing chamber or compartment and extending the same in an upward direction to a predetermined height and fluid-level, whereby equal quantities of the treated fluid or liquid are received by the several overflow pipes or ducts and transmitted to the several distributing ways or channels below for overflow to the vaporizing, cooling, or aerating chamber for desired treatment; secondly, in the adaptation and combination of the said main receiving and distributing chamber or compartment and its contained upwardly-extending overflow pipes or ducts with a plurality of distributing ways or channels set at two or more levels beneath the said distributing chamber or compartment; thirdly, in the special adaptation and combination of a plurality of the main receiving and distributing chambers or compartments each having its plurality of upwardly-extending overflow pipes or ducts with a plurality of distributing ways or channels located beneath at a single or a plurality of levels, and, fourthly, in means for securing any desired or predetermined overflow-levels or for adjusting the height of the individual pipes or ducts above the bottom of said main receiving and distributing chamber, so that they shall all receive and deliver equal overflows of the liquid to be treated.

Referring to the drawings, Figure 1 represents a sectional elevation of my improved mechanism for the reception and equable distribution of the liquid in a vaporizing, cooling, refining, and aerating apparatus. Fig. 2 represents a sectional view of the same at right angles to the view in Fig. 1. Figs. 3 and 4 represent similar sectional views of my improved mechanism in which the liquid to be treated is overflowed from a pair of main receiving and distributing chambers into upwardly-extending pipes or ducts and thence to associate distributing ways or channels. Figs. 5, 6, 7, 8, 9, 10, and 11 are detailed representations of methods of applying the upwardly-extending overflow pipes or ducts to the bottom of the main receiving and distributing chambers or compartments.

Similar letters of reference designate like parts, portions, or details in all the figures.

Letter Q designates the main receiving and distributing chambers or compartments of a vaporizing, cooling, aerating, or refining apparatus. These chambers or compartments receive their supply of liquid to be treated through inlet nozzles or valves T, the valves T in Fig. 3 receiving their liquid from the surrounding hollow walls C C. (Shown and described in application Serial No. 711,669, already mentioned.) From the bottom of the chamber or compartment Q the overflow pipes or ducts P are projected to a fixed or predetermined fluid-level, as designated at *x x* in Figs. 1, 2, 3, and 4. The hollow liquid-holding walls C may extend to any height

desired above the compartments Q, the valves T, as shown in Figs. 3 and 4, being made use of to control the passage of the liquid to be treated and its depth within compartments Q to the overflow-level X and the tops of the upwardly-projecting pipes or ducts P. The portions Q' extend down to and deliver the liquid to be treated to the distributing ways or channels O, and these overflowing deliver the liquid to the curtains, gauze, or drops N.

In Figs. 1 and 2 the walls C are shown solid, while the inlet of liquid to be treated is through the nozzle T, the admission being controlled by valve, cock, or any desired means.

In addition to the use of the ways or channels O as a means for treating the fluid inclined outlets S are shown in Figs. 1, 2, 3, and 4, whereby the liquid is spurted against the outer surfaces of the walls of the apparatus to secure a maximum of sheet-like exposure while moving down the said walls. By the same means S' a like spurting against the inner walls may be effected. In Fig. 5 a detail of this wall-surface spurt is shown, its adjustability to predetermined liquid-level being accomplished by the adjusting and jam nuts *a*, raising or lowering the pipe or duct to the proper liquid-level for overflow. In case a specially-strong force of liquid be desired to pass against the wall-surfaces through these pipes or ducts P S their height above the bottom of the main overflow-compartment may be gaged lower than the overflows to the ways or channels O or lower than the predetermined water-level, the delivery being more or less near to the wall-surface.

In Fig. 6 the overflow pipes or ducts are represented as provided with a saw-tooth edge to prevent any chance intermittent rise, fall, and overflow of the fluid through capillary attraction.

Figs. 7 and 8 show the overflow pipes or ducts as screwed into the bottom of main compartment Q and secured for adjustment by the jam-nuts *a*.

In Figs. 9 and 10 the adjustment is secured by means of the screw-nozzles P P, that of Fig. 9 being provided with a bell-mouth *p* and that of Fig. 10 with saw-teeth *p'* at its overflow-top.

Fig. 11 shows an enlarged view in section of screw-nozzle for overflow, with plan view and saw-teeth *p'*. By the higher or lower adjustment of the saw-teeth overflow edges a greater or less admission of liquid from the same level may be obtained.

By the use of the plurality of main receiving and distributing chambers or compartments Q a control of the operation of the plant or apparatus as a whole is gained—as, for instance, by closing the inlet-valves of either compartment Q the overflow of liquid in that compartment is stopped and only one-half of the overflow ways or channels O are fed and made use of, putting the apparatus on half duty. By the use of the upwardly-projecting overflow pipes or ducts P, the same extending to a predetermined liquid-level, all head-pressure is done away with and the feed to the several distributing ways or channels O is the same in quantity and time, no matter how far below or how close to the bottom of compartment Q the several distributing ways or channels be located for service.

While the accompanying drawings show only two rows of the liquid-distributing ways or channels O and only two discharge-levels for the overflow pipes or ducts, any desired number of rows of liquid-distributing channels or ways may be made use of or any desired number of discharge levels or localities for the overflow pipes or ducts may be adopted to accord with the size, capacity, or method of operation desired for the apparatus.

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

1. In a liquid-cooling apparatus of the character herein set forth, the combination of a receiving-compartment for the liquid to be treated, a plurality of distributing-channels, and a plurality of overflow-outlets, each of which is adjustable to a height of overflow-level independent of any inequalities of level of the bottom of said compartment and extends downward to deliver the liquid-overflow into associate distributing-channels.

2. In a liquid-cooling apparatus of the character herein set forth, the combination of a receiving-compartment for the liquid to be treated, and a plurality of overflow-outlets, each of which is adjustable to a height of overflow-level independent of any inequalities of level of the bottom of said compartment and extends downward to a close proximity with the walls of the apparatus, substantially as set forth.

3. In a liquid-cooling apparatus of the character herein set forth, the combination of a receiving-compartment for the liquid to be treated, a plurality of rows or tiers of distributing-channels, said channels being so staggered that no one channel shall be directly beneath or can receive the overflow of the channels at higher levels, and a plurality of overflow-outlets, each of which is adjustable to a height of overflow-level independent of any inequalities of level of the bottom of said compartment, and extends downward to deliver the liquid-overflow into associate distributing-channels substantially as set forth.

4. In a liquid-cooling apparatus of the character herein set forth, the combination of a plurality of receiving-compartments for the liquid to be treated set at different levels, a plurality of rows or tiers of distributing-channels, said channels being so staggered that no one channel shall be directly beneath or can receive the overflow of the channels at higher levels, and a plurality of over-

flow-outlets, each of which is adjustable to a height of overflow-level independent of any inequalities of level of the bottom of said compartments, the outlets of any one receiving-compartment extending downward to deliver the liquid-overflow to any single row or tier of the said distributing-channels substantially as set forth.

5. In a liquid-cooling apparatus of the character herein set forth, the combination of the hollow liquid-transmitting walls, a plurality of attached receiving-compartments for the liquid to be treated, said compartments being set at different levels, and a plurality of overflow-outlets, each of which is adjustable to a height of overflow-level independent of any inequalities of level of the bottoms of said compartments substantially as and for the purposes set forth.

6. In a liquid-cooling apparatus of the character herein set forth, the combination of a receiving-compartment for the liquid to be treated, and a plurality of inclosed overflow-outlets, each of which is adjustable to a height of overflow-level independent of any inequalities of level of the bottom of said receiving-compartment and provided with serrated overflow edges substantially as set forth.

WILLIAM HENRY WEIGHTMAN.

Witnesses:
A. W. T. CRAMER,
HENRY J. WEHLE.