

No. 693,195.

Patented Feb. 11, 1902.

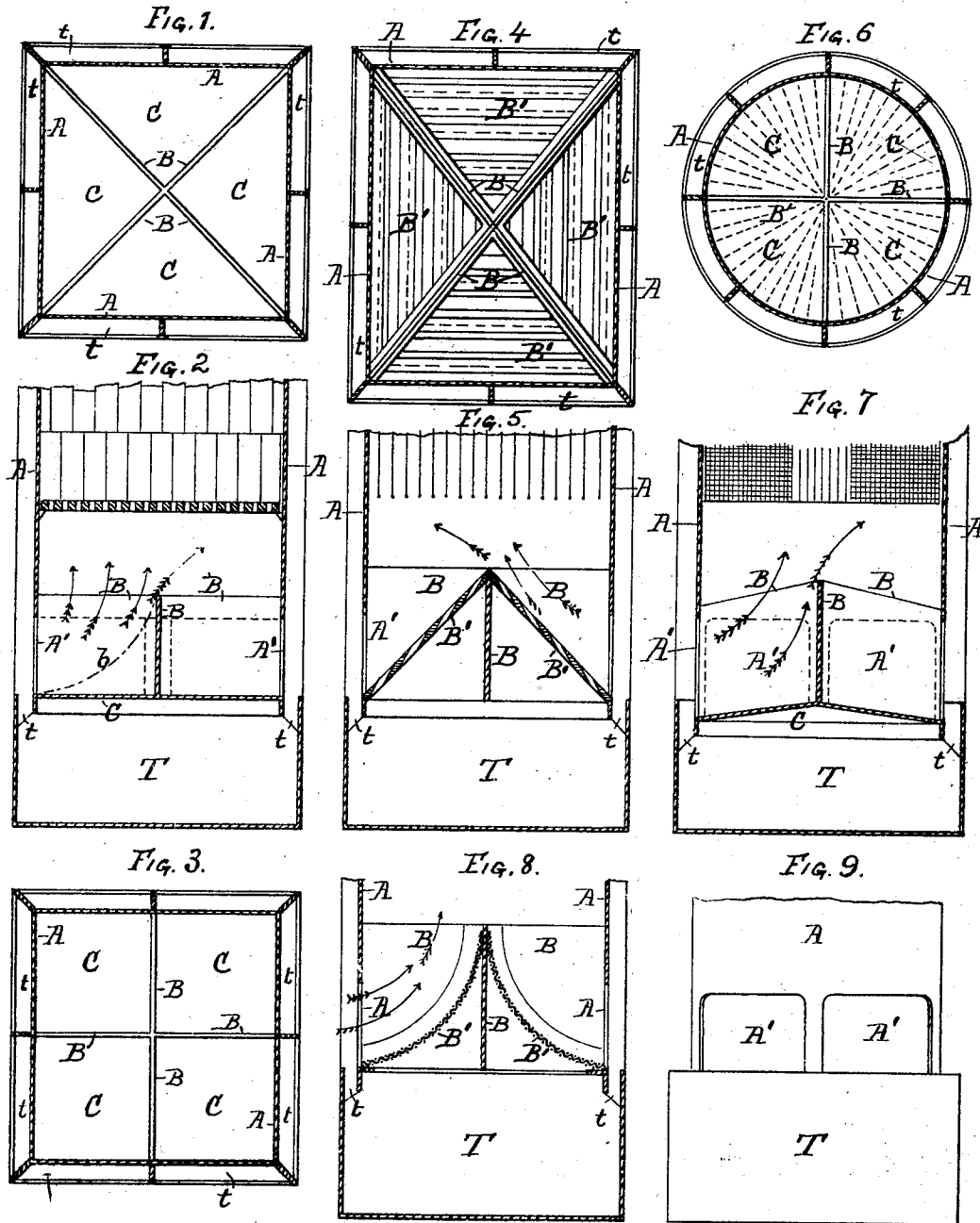
W. H. WEIGHTMAN.

AIR SUPPLY TO LIQUID VAPORIZING, COOLING, AND AERATING APPARATUS.

(Application filed July 17, 1900.)

(No Model.)

2 Sheets—Sheet 1.



WITNESSES:
W. B. Vaughan
W. H. E. Green

INVENTOR:
W. H. Weightman

No. 693,195.

Patented Feb. 11, 1902.

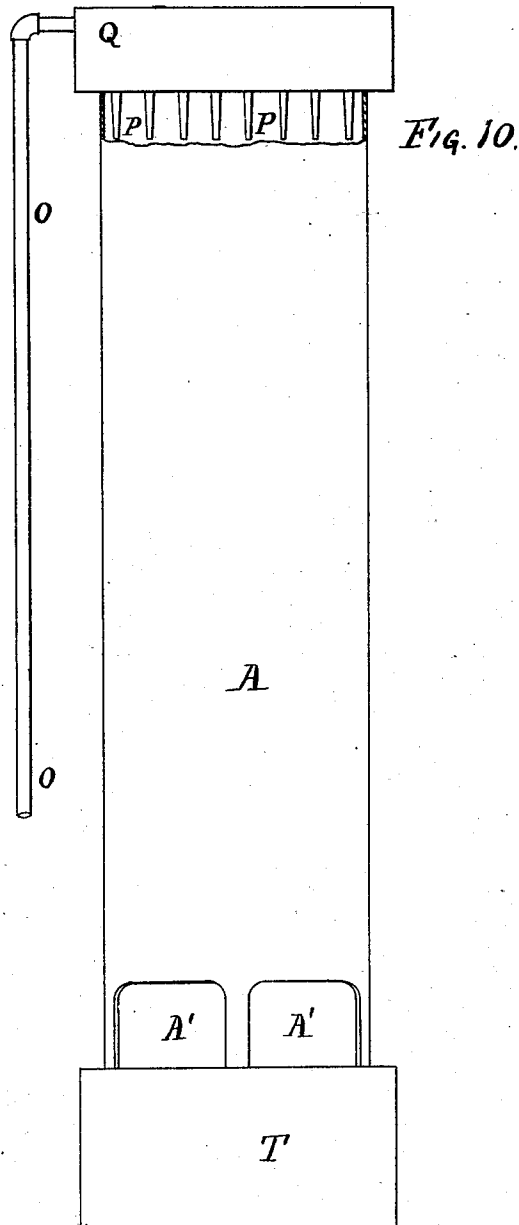
W. H. WEIGHTMAN.

AIR SUPPLY TO LIQUID VAPORIZING, COOLING, AND AERATING APPARATUS.

(Application filed July 17, 1900.)

(No Model.)

2 Sheets—Sheet 2.



WITNESSES:

W. H. Edgerley
J. H. Cook

INVENTOR
W. H. Weightman

UNITED STATES PATENT OFFICE.

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

AIR-SUPPLY TO LIQUID VAPORIZING, COOLING, AND AERATING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 693,195, dated February 11, 1902.

Application filed July 17, 1900. Serial No. 23,891. (No model.)

To all whom it may concern:

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

My present invention relates particularly to means for supplying air or like medium to apparatus for vaporizing, cooling, and aerating liquids, whereby a strictly natural draft of air or wind is made use of as the cooling, vaporizing, or aerating medium.

The object of my invention is to do away with fans or motive power of any kind as a means for introducing the air or cooling medium and to provide means by which the outside air or winds from any direction or from any point of the compass may be received, retained, and guided to an upward direction through the cooling apparatus.

Certain new and useful improvements consist specially in providing an internal upwardly-projecting air-receiver and guide centrally located and specially arranged and constructed to resist all possible passage of the air or wind directly across or horizontally through the open lower portion of the cooling-chamber as well as to turn or guide it in a desired upward direction through the cooling chamber or chambers, according to construction. Any style of liquid distribution, separation, sheeting, showering, or scattering apparatus may be made use of within the chamber or chambers to meet and mingle with the air or wind distribution.

Other improvements consist in the special construction, arrangement, and combination of the parts or portions of the air-guiding apparatus, as may be hereinafter described and claimed.

Certain other improvements consist in the combination, with a water-receiving reservoir at the base, of a shell elevated above said reservoir, between which an opening and radially-placed guides or baffle-plates are located extending across the elevated shell, the said guides or baffle-plates extending upwardly into the said elevated shell and down into the

reservoir to prevent the passage of through-currents of air.

Certain other improvements consist in the combination of an elevated upwardly-projecting shell, a water or fluid receiving reservoir at its base, between which there is an annular space communicating with the interior of the elevated shell or tower at its lower end, of means for conveying the circulating water to the said elevated shell or tower, means for distributing and ejecting said circulating water within and into the shell or tower, and stationary fixed means extending axially across the shell or tower for preventing said circulating water being diverted from the prescribed limits of the tower or shell during its descent through the open space between the lower part of the shell or tower and the top of the reservoir.

In the accompanying drawings, Figures 1, 2, and 3 represent sectional plan views and elevation of my improved apparatus applied to the lower open portion of a cooling or vaporizing chamber, wherein a perforated plate supports a filling of overlaid terra-cotta cups, tiling, &c., as a means for mingling the contained air and liquid. Figs. 4 and 5 represent section plan and elevation of my improved apparatus applied to the lower open portion of a cooling apparatus, wherein a series of vertically-suspended wire-gauze curtains or sheets are made use of for cooling or vaporizing purposes. Figs. 6 and 7 represent plan and vertical sections of my improved apparatus applied to the lower open portion of a cooling or vaporizing apparatus, made circular in cross-section and having vertically-suspended radial wire-gauze curtains or sheets as a means for sheeting the water or liquid for surface contact with the air for cooling. Fig. 8 represents a sectional elevation of the lower portion of a cooling or vaporizing apparatus, the air or wind guide being faced with wire-gauze formed into pockets or valleys between the guide-partitions. Fig. 9 represents an outside view of the lower portion of a cooling apparatus, showing the openings for air or wind admission. Fig. 10 represents an outline elevation of a cooling apparatus, illustrating means for conveying the circulating water to the upper portion of

the apparatus, and means for distributing and ejecting said circulating water.

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

- 5 Letter A designates the several walls inclosing the cooling-chamber.

A' designates the openings for free air or wind admission to the lower portion of the cooling or vaporizing chamber. Air may be
10 admitted from any direction or from all the points of the compass.

Letter B designates the several vertical partitions forming the air or wind guide.

- 15 B' designates special drain-guides attached to the several upright partitions B for assisting in the upward guiding of the admitted air or wind.

At the admission of air or wind to the apparatus a certain quantity will locate itself
20 and become stagnant in the corners or pockets formed between the several upright partitions and the base-drain C until the incoming air travels outside of a line, as indicated at *b* in Fig. 2, the arrows indicating the general movement of the air. Where it is desired
25 to abolish these air-pockets, the special drain-guides B' in the shape of angular or curved plates perforated, if desired, or of curved wire-gauze may be inserted, securely
30 held in position against the uprights B for support.

In Fig. 5, B' designates a straight drain set at an angle to the perpendicular and provided with slots or openings for the passage of
35 the treated liquid into the receiving-tank T below.

In Fig. 4 is shown a plan view of drain-guides B', the slots, slats, or openings set longitudinally on the four sides.

- 40 In Fig. 8, B' designates drain-guides curved and of wire-gauze bent to the line of pocketed air, as indicated in Fig. 2.

When the guides B' are imperforate, the treated water rolls down and enters receiving-tank T at outer spaces *t*. When they are
45 finely perforated or are of wire-gauze, they are through capillary attraction covered with a thin layer or film of the treated liquid moving downward, the balance percolating
50 through, and while the admitted air or wind is moving upward a portion of it comes regularly in contact with the surface of the liquid moving downward for a final heat extraction before passing to the compartment
55 T below. With the special guides B' omitted the treated water or liquid drops to the base-drain C and thence overflows into receiving-tank T through spaces *t* or through perforations in said base-drain C. It is preferable
60 for best results in air or wind admission and control that the radial partitions B should extend above the top of the air or wind admission openings A', so that no air or wind shall pass horizontally through.

- 65 No matter what direction or from what point of the compass the air or wind shall come some portion of the guide-partitions B

or when used the special drain-guides B' will receive it and divert or guide it in the desired upward direction for use in the cooling apparatus. 70

In Fig. 10, letter O designates a pipe means for conveying or elevating the circulating water to the upper portion of the apparatus, and letters Q and P designate means for distributing and ejecting the same for treatment,
75 Q designating a reservoir for containing the water and P a series of distributing-outlets for the same.

What I claim as new, and desire to secure by Letters Patent, is— 80

1. The combination with a cooling-tower open at the top and provided at its upper end with a liquid distributing or spraying apparatus, of a lower compartment open on all
85 sides for the admission of air from without, and through which the liquid passes after treatment; a plurality of radial partitions extending outwardly from the center of said lower compartment; and a liquid-drain connecting said partitions, through or along
90 which the treated liquid passes to a receiving-compartment below.

2. The combination with a cooling-tower open at the top and provided at its upper end with a liquid distributing or spraying apparatus, of a lower compartment open on all
95 sides for the admission of air from without, and through which the liquid passes after treatment, and a plurality of radial partitions extending outwardly from the center of said lower compartment and rising vertically from the connecting liquid-drain to a height above the top of the surrounding air-openings, substantially as set forth. 100

3. The combination with a cooling-tower open at the top and provided at its upper end with a liquid distributing or spraying apparatus, of a lower compartment open on all
105 sides for the admission of air from without, and through which the liquid passes after treatment, a plurality of radial partitions extending outwardly from the center of said lower compartment and a plurality of inclined liquid-drains down or through which the
115 treated liquid passes to the receiving-compartment below and up which the air or wind passes to reach the apparatus above as and for the purposes set forth.

4. In a water-cooling tower, the combination with a reservoir at the base, of an inclosing shell elevated above the reservoir and between which parts there is an opening and radially-placed baffle-plates extending across the tower, the said baffle-plates extending up
120 into the shell and down into the reservoir to prevent the passage of through-currents of air, substantially as specified. 125

5. In a water-cooling tower, the combination with an inclosing shell and a reservoir
130 beneath and below the same and between which there is an annular space communicating with the interior of the shell at its lower end, of means for conveying the circulating

water to the tower, means for distributing and ejecting said circulating water within and into the tower and stationary fixed means extending axially across the tower for preventing said circulating water being diverted from the prescribed limits of the tower during its descent through the open space between the lower part of the shell and top of the reservoir, substantially as set forth.

WILLIAM H. WEIGHTMAN.

Witnesses:

M. E. VAUGHAN,
W. H. EDGERLEY.