

(No Model.)

2 Sheets—Sheet 2.

L. F. HAUBTMAN.
EVAPORATING PAN.

No. 573,219.

Patented Dec. 15, 1896.

Fig 3

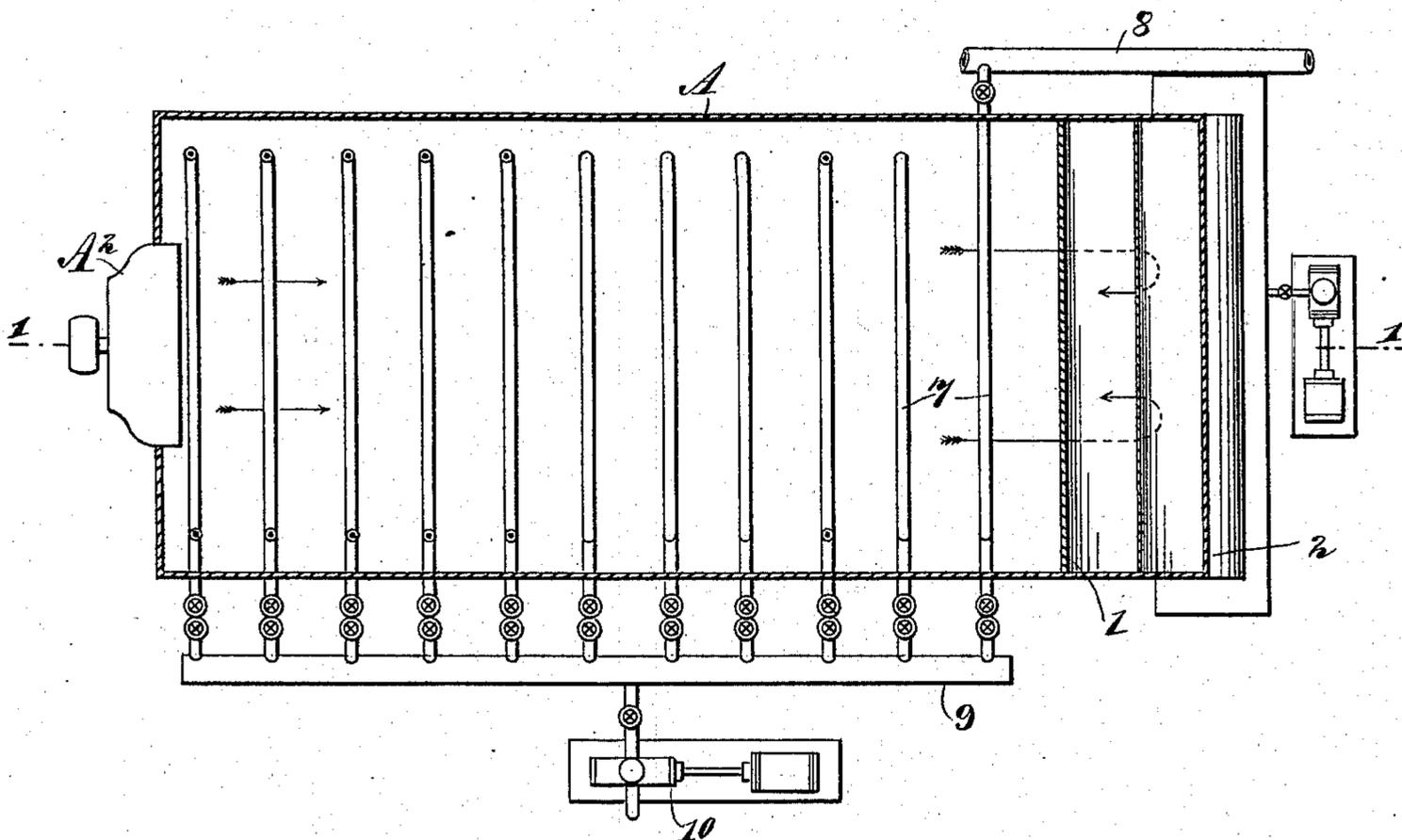
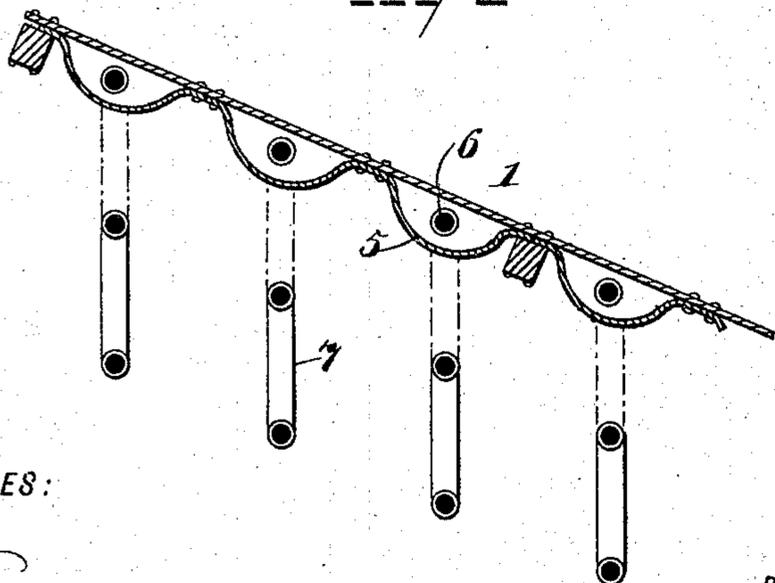


Fig 4



WITNESSES:

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LEON FRANCOIS HAUBTMAN, OF NEW ORLEANS, LOUISIANA.

EVAPORATING-PAN.

SPECIFICATION forming part of Letters Patent No. 573,219, dated December 15, 1896.

Application filed June 8, 1896. Serial No. 594,702. (No model.)

To all whom it may concern:

Be it known that I, LEON FRANCOIS HAUBTMAN, of New Orleans, in the parish of Orleans and State of Louisiana, have invented a new and Improved Apparatus for Evaporating Liquids, of which the following is a full, clear, and exact description.

This invention comprises what may be termed a "hydroabsorber," inasmuch as it is designed to absorb the moisture, by means of heated or superheated air, from a liquor flowing over a bed-plate in a thin sheet or film, the object being to provide an apparatus which is comparatively simple in its construction and with which the moisture may be quickly evaporated.

I will describe an apparatus embodying my invention and then point out the novel features in the appended claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views.

Figure 1 is vertical section, on the line 1 1 of Fig. 3, of an apparatus embodying my invention. Fig. 2 is a section on the line 2 2 of Fig. 1. Fig. 3 is a horizontal section on the line 3 3 of Fig. 1; and Fig. 4 is a sectional view, on an enlarged scale, of a portion of the apparatus.

The apparatus comprises a metal casing A, having its top wall 1 inclined downwardly from the rear end of the casing to its forward end. The upper surface of this top wall 1 serves as a bed upon which the liquor to be concentrated flows downward. Arranged above the bed 1 is a top cover 2. This top cover 2 and bed 1 therefore form a conductor for a current of air designed to absorb the moisture from the liquor flowing down the bed-plate 1. This conductor terminates in a chimney 3, by which the vapors may be carried off.

Arranged on the inner side of the top cover 2 is a wave-like plate 4, against which the heated air in its upward course will strike, and the wave-like projections of this plate 4 will have a tendency to somewhat compress the air as it passes and also to allow of its expansion.

To the lower side of the plate 1 is secured a transversely-corrugated plate 5, forming a series of chambers with which steam-pipes 6

connect, the several steam-pipes being connected so as to form a sinuous passage for steam beneath said plate 1. In the casing A, below the plate 1, is a chamber A', within which is arranged a series of coiled pipes 7, which communicate at one end with a steam-inlet pipe 8 and at the other end with an exhaust-pipe 9, from which the water of condensation may be pumped back into the boiler by means of a pump 10.

A fan A² is located at the rear portion of the casing A, and its chamber communicates with the chamber A' in said casing, and there is a space 11 between the lower end of the plate 1 and the bottom of the casing up through which air may be forced by means of the blower or fan A². Adjacent to this opening is an opening 12 through the bottom of the casing, which allows the passage of concentrated liquor into a receiver 13, from which it may be pumped to any desired receptacle.

At the upper portion of the casing A is arranged a liquor-tank A³, having a series of steam heating-tubes 14 arranged in it and also having pipe connections 15, provided with suitable valves, with a pipe 16 extended across the upper end of the plate 1 and having a series of small outlets or perforations through which the liquor discharges onto said plate 1.

In operation the liquid, which is previously heated in the tank A³, will flow down the plate 1 in a thin sheet or film, and while this flow of liquid is taking place the blower or fan A² will force air around the several heating-pipes 7, through the opening 11, and upward over the thin film or sheet of liquid running down the plate 1, and in its course this heated air will absorb or take up the water or moisture from the liquor.

The amount of liquid flowing over the plate 1 may be regulated by the valves in the pipes 15, and obviously this plate 1, or, as it may be termed, the "absorbing-chamber" plate, may be of any desired length, or that several of the devices may be connected one with another.

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

1. An apparatus of the class described, comprising a casing, an evaporating-plate ar-

ranged within said casing and inclined downward and forward, a plate secured to the under side of said evaporating-plate and forming chambers to receive steam-pipes, a wave-like plate arranged over the evaporating-plate, an air-blower for forcing air over said evaporating-plate, means for heating said air, and a liquor-tank at the upper end of and having communication with the evaporating-plate, substantially as specified.

2. In an apparatus of the class described, a casing, the top wall of which is inclined downward and forward to form an evaporating-plate, a wave-like top plate arranged over the same, heating-pipes arranged transversely against the under side of said evaporating-plate, coiled pipes below the heating-pipes, means for forcing air over said plate, means for heating said air, and means for supplying liquor at the upper end of said evaporating-plate, substantially as specified.

3. An apparatus of the class described,

comprising a casing having a chamber in its lower portion, a series of coiled pipes arranged therein, a steam-pipe communicating with said coiled pipes, a blower arranged in the rear end of the casing and adapted to force air over the coiled pipes, a downwardly and forwardly inclined evaporating-plate forming a top for said casing, a transversely-corrugated plate secured to the under side of said evaporating-plate, steam-pipes leading to the chambers formed by said corrugations, a liquor-tank, steam heating-pipes arranged in said tank, a pipe arranged transversely at the upper end of the evaporating-plate and having perforations, and a communication between said transverse pipe and the liquor-tank, substantially as specified.

LEON FRANCOIS HAUBTMAN.

Witnesses:

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