

1,258,562.

Fig. 1.

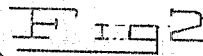


Fig. 3.

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EVAPORATING APPARATUS.

1,258,562.

Specification of Letters Patent.

Patented Mar. 5, 1918.

Application filed May 4, 1917. Serial No. 166,450.

To all whom it may concern:

Be it known that I, CHARLES R. HARRIS, a citizen of the United States of America, residing at Los Angeles, in the county of Los Angeles and State of California, have invented certain new and useful Improvements in Evaporating Apparatus, of which the following is a specification.

This invention relates to apparatus for dealcoholizing, condensing, evaporating or distilling liquids that foam during ebullition, and the object is to provide an evaporating apparatus arranged to reduce foaming of the liquid while undergoing ebullition, and thus prevent the liquid from passing out of the apparatus.

A further object is to provide means between the outlet of the upper chamber and the condenser for straining out the excess moisture, this apparatus consisting of a plurality of air-chambers having interposed therebetween suitable chambers filled with a fibrous, porous or granular material to separate the excess vapors, in order that the moisture may not be drawn through by capillary attraction, but will have to pass through the air-chambers after emerging from one section of the filtering material before it enters another.

In the accompanying drawings:

Figure 1 is a vertical section through the apparatus;

Fig. 2 is a horizontal section on the line 2-2 of Fig. 1; and

Fig. 3 is a modified form of the retarding or filtering portion of the apparatus.

The evaporating apparatus consists of a jacketed container A, the lower portion of which is provided with an inlet 1 and an outlet 2, whereby the beer or other liquid undergoing treatment to be dealcoholized, condensed, evaporated or distilled is received and discharged therefrom. Immediately above the inlet 1 is arranged, transversely of the container, a diaphragm B. This diaphragm comprises a ring 3, to which is fastened a coarse woven material 4. This ring is preferably supported on clips 5 arranged on the wall portion of the container. Bow-rods 6 are inserted between the ring and the woven material to keep same under tension, the latter preferably assuming an upwardly convex position.

Arranged in the upper part of the container is a spider 7. This spider is preferably circular in general outline, and is pro-

vided with a plurality of radial spokes 8, to which are secured sheets of porous material 9. This material is adapted to hang vertically, and placed at such a height that the lower edges thereof may or may not touch the diaphragm B, as may be found best, depending on the liquid to be treated. This web is supported by a suitable support arranged centrally of the roof of the container, and connected thereto by chains or other suitable means 11. Leading from the upper portion of the container is a worm or coil 12, the outer end 13 of which is connected to a vacuum producing device 20, having interposed therebetween a condenser 21. This coil preferably consists of a chamber extending upwardly at a slight angle, and provided at the outer end thereof with a pocket or air chamber 14 projecting vertically and connecting to a similar chamber 15, which is inclined upwardly and adapted to extend back over the first-named chamber and connect with a similar air-chamber 16, which projects vertically therefrom, and connects with a third chamber 17, which also extends upwardly at a slight incline, the last-mentioned chamber being connected to the outlet pipe 13.

As noted, these slightly inclined chambers are provided with a fibrous, porous or granular material 19, which washes water from the alcohol. The pockets or air chambers 14 and 16 serve to separate the straining material, in order that the moisture may not be drawn through by capillary attraction, but will have to pass through the air-chambers after emerging from one section of the filtering material before entering another, thus causing the entrained vapors to drop to the bottom of the inclined pipes and thence to the distilling vessel leaving the filtering material always free.

In Fig. 3, I have shown a modified form, wherein the pockets 14 and 16 are provided with outlet pipes 17 and 18, which lead directly to the lower portion of the container, thereby eliminating the necessity of the entrained water passing through different pockets of the fibrous material by gravitation to the container.

It will thus be seen that I have provided a simple and efficient device for dealcoholizing, condensing, evaporating or distilling liquids, and have produced an apparatus which very effectively washes the entrained water from the alcohol, after they have left

the vaporizing tank, the alcohol passing to the condenser, and the water returning to the container by gravity.

I claim:

- 5 1. An evaporating apparatus comprising a tank, and an outlet connected to the upper part thereof, comprising a plurality of inclined chambers having interposed therebetween vertically arranged air chambers, 25
10 said inclined chambers being provided with a fibrous, porous or granular material which is adapted to wash the entrained water from the alcohol as the latter is drawn through the outlet.
- 15 2. An evaporating apparatus comprising an evaporating vessel adapted to contain a liquid to be evaporated, a diaphragm arranged transversely of the container approximately centrally thereof, an outlet connected to the upper part of the chamber 20 comprised of a plurality of inclined chambers having interposed therebetween air-chambers, said chambers being provided with a fibrous, porous, or granular material which is adapted to wash the entrained water from the alcohol as the latter is drawn up through the chambers.
3. An evaporating apparatus comprising an evaporating vessel adapted to contain a liquid to be evaporated, a diaphragm arranged transversely of the container approximately centrally thereof, an outlet comprising an inclined chamber having at the outer end thereof an air-chamber, and a similar inclined chamber leading therefrom at a slight incline to another air-chamber, whereby the water is washed from the alcohol the alcohol passing out in a comparatively dry state, and the water returning to the container by gravity. 30
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In testimony whereof I affix my signature.

CHARLES R. HARRIS.