GEORGE CLARK.

Improvement in Apparatus for Evaporating Liquids by Means of Air-Blasts.

No. 115,572. Patented June 6, 1871.

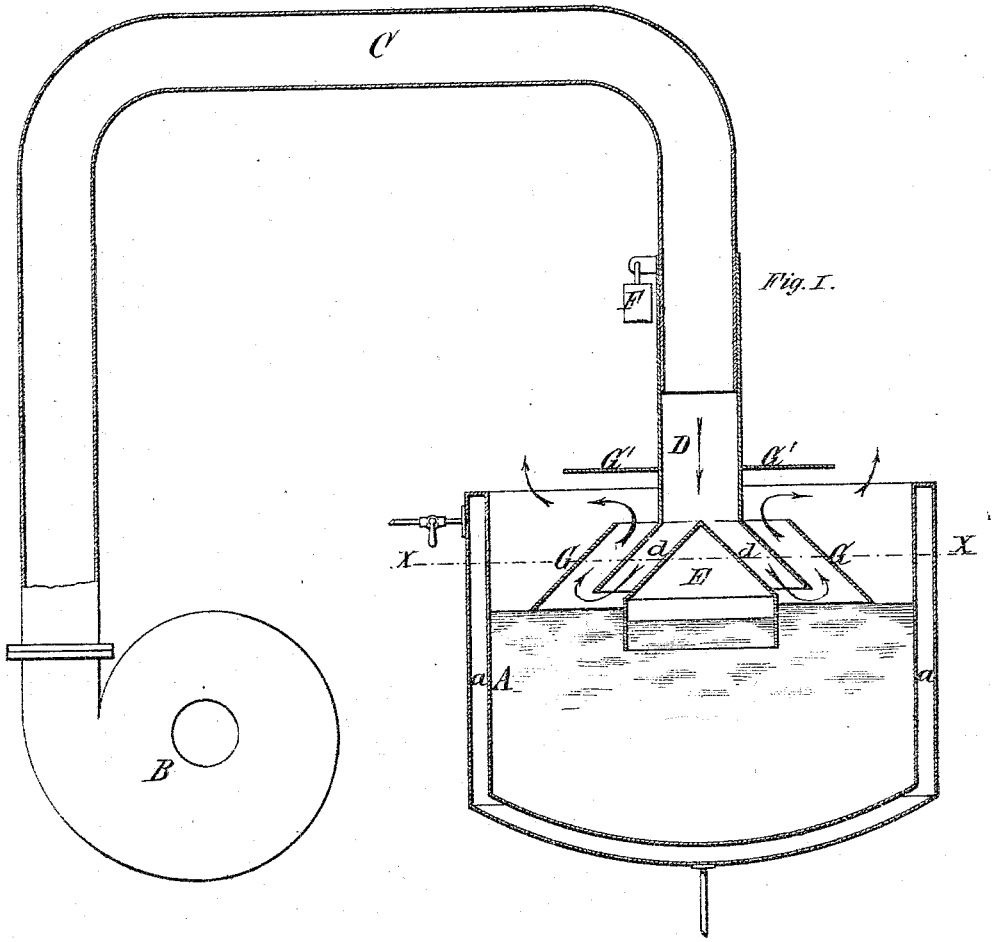
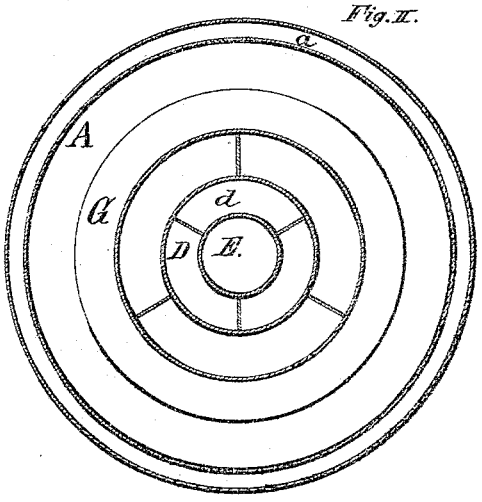


Fig. I.

Fig. II.



Witnesses

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GEORGE CLARK, OF BUFFALO, NEW YORK.

IMPROVEMENT IN APPARATUS FOR EVAPORATING LIQUIDS BY MEANS OF AIR-BLASTS.

Specification forming part of Letters Patent No. 115,572, dated June 6, 1871.

I, GEORGE CLARK, of the city of Buffalo, in the county of Erie and State of New York, have invented certain Improvements in Pneumatic Apparatus for Evaporating Liquids, of which the following is a specification:

The invention relates to the apparatus employed for evaporating liquids by the absorptive action of a current of air; and it consists, first, in arranging the nozzle of the blast-pipe for conducting such air-current at an angle to the surface of the liquid, and with its discharge-orifice above, but in close proximity to, such surface, so that the air-current will be made to impinge thereon, and thereby absorb and carry off the liquid; second, in combining with such blast-pipe, so arranged, means, such as hereinafter described, or their equivalents, for maintaining a uniform and definite distance between the discharge orifice of the blast-pipe and the surface of the liquid, so as to secure a uniform and efficacious action of the air-current; third, in the arrangement of a shield to the discharge-nozzle, as hereinafter described, to prevent the scattering of the liquid by the force of the blast.

In the accompanying drawing, Figure I represents a sectional elevation of my improved apparatus; and Fig. II, a horizontal section of the evaporating-vessel in line *x x*, Fig. I.

Like letters refer to like parts in both of the figures.

A is the vessel containing the brine or other liquid to be evaporated. It may be of any ordinary construction, but it should be provided with a steam-jacket, *a*, or other suitable means for heating the liquid and maintaining the temperature thereof, when required, for facilitating the evaporating process. B represents a fan or other equivalent apparatus for supplying air to the surface of the liquid in the vessel A. C is the pipe conducting the air from the fan to the evaporating-vessel. D is the nozzle at the end of said pipe, represented as fitting thereon by a sliding or telescopic joint. The lower end or mouth of said nozzle is shown enlarged like an inverted funnel, and receiving the upper and conical end of a buoy, E, arranged and secured so as to project upward therein and form a deflector for the air which is discharged from the nozzle through the annular space *d*, in a divergent direction corresponding with the direction of the sides of mouth of the nozzle. The vessel E may be open at the lower end, which, being immersed, is closed by the liquid so as to confine the air in the upper portion, and thus form a buoy or float to sustain the edge of the nozzle at a uniform height above the surface of the liquid, the sliding joint of the nozzle and pipe C permitting the requisite adjustment of the nozzle to the varying height of the liquid in the vessel. The edge of the mouth of the nozzle should be maintained at a position a little above the surface of the liquid so as to cause the air as it escapes to impinge in a thin sheet on the surface of the liquid. This relative arrangement is effected by the attachment of weights F to the nozzle till the latter is depressed to the required extent, when the buoy E will maintain it in that relative position. Other and equivalent means from that described may be employed in place of the buoy E and adjustable nozzle for maintaining this relative arrangement of the latter—for instance, the liquid in the vessel A can be maintained at a uniform height by means of a supply-cock, which is opened and closed by a lever actuated by a float on the surface of the liquid; or an overflow may be employed to prevent the liquid rising above the required point. I arrange the mouth of the nozzle above the surface of the liquid instead of immersing it therein, so as to enable the air to be employed in as rarefied a state as possible, as the compression of the air required in order to force it through the liquid greatly reduces its absorbtive power and consequently its evaporative effect. G is a shield attached to the nozzle and arranged outside of the same, as shown, for the purpose of preventing the liquid being blown or forced by the air over the top of the vessel. G′ is a horizontal plate attached to the upper portion of the nozzle for the same purpose, the air as it leaves the surface of the liquid being deflected by said shields in the directions shown by the arrows in Fig. I.

If desired, suitable heating apparatus may be interposed between the fan and evaporating-vessel so as to heat the air before it comes in contact with the liquid.

It is evident that the air-discharge nozzle may be made with apertures of different form from that of the annular one shown in the drawing, such, for instance, as a series of ra-

diating or branching tubes, having round, square, or rectangular discharge-apertures, the shield being constructed and arranged accordingly; the main feature of my invention being such an arrangement of the air-nozzle as will cause the air to act on the surface of the liquid instead of being forced through the same.

What I claim is—

1. With a liquid-evaporating vessel, the arrangement of the nozzle of an air-blast pipe at an angle to the surface of the liquid, and in such close proximity thereto as to cause the air as it is discharged therefrom to impinge the surface of the liquid, substantially as and for the purpose hereinbefore set forth.

2. In combination with an air-blast pipe and evaporating-vessel arranged as specified in the foregoing claim, the buoy E and sliding joint of the nozzle or equivalent means, for maintaining a uniform and definite distance between the mouth of the air-discharge aperture and the surface of the liquid, substantially as and for the purpose hereinbefore set forth.

3. The arrangement, with an air-blast nozzle, E, and evaporating-vessel A, of a shield, G, as and for the purpose hereinbefore set forth.

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Witnesses:

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