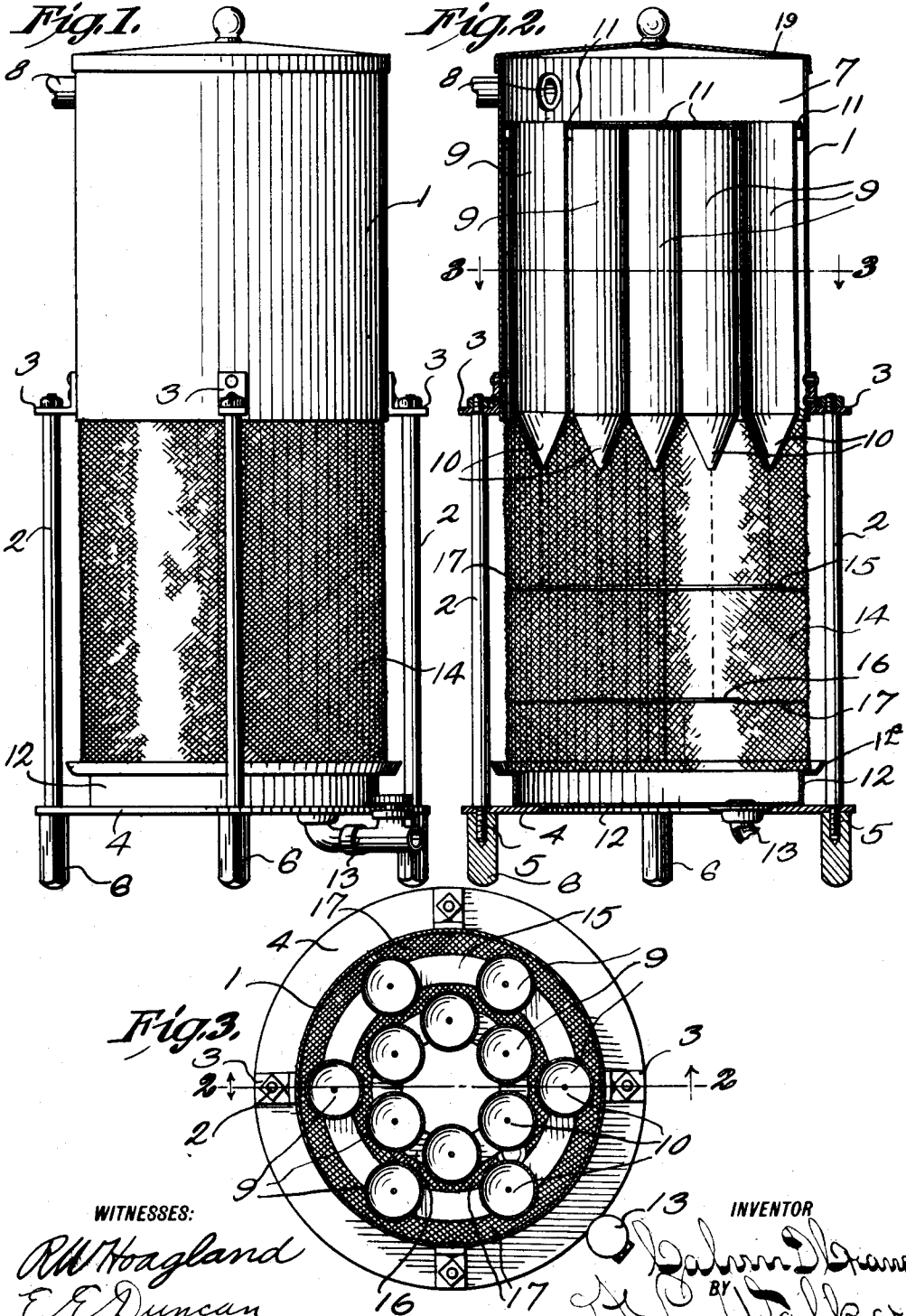


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LIQUID COOLING AND AERATING DEVICE.
APPLICATION FILED JULY 18, 1917.

1,384,938.

Patented July 19, 1921.



UNITED STATES PATENT OFFICE.

CALVIN D. CRANE, OF DAYTON, OHIO.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that CALVIN D. CRANE, citizen of the United States, residing at Dayton, in the county of Montgomery and State of Ohio, have invented certain new and useful Improvements in Liquid Cooling and Aerating Devices, of which the following is a specification.

My invention relates to distillation apparatus and more particularly to an aerator through which the distillate is finally discharged in order to incorporate or entrain a normal quantity of air therewith to replace the air eliminated from the liquid during the process of distillation.

While the invention is particularly applicable to water stills for aerating or restoring distilled water which is otherwise possessed of a flat disagreeable taste, it is also applicable to other distillates for similar purposes.

The object of the invention is to improve the structure, as well as the means and mode of operation of such devices, whereby they will not only be cheapened in construction, but will be more efficient in operation, positive in action, automatic and unlikely to get out of repair.

A further object of the invention is to provide means for discharging the product of distillation in minute quantities and subsequently breaking or finely subdividing said minute quantities to effect a thorough aeration or entrainment of particles of air.

A further object of the invention is to provide means for confining the finely subdivided particles or mist produced by the breaking up or disintegration of the fluid body and again collecting these subdivided particles after aeration in a suitable reservoir or collector.

With the above primary and other incidental objects in view as will more fully appear in the specification, the invention consists of the features of construction, the parts and combinations thereof, and the mode of operation, or their equivalents as hereinafter described and set forth in the claims.

Referring to the drawings, Figure 1 is a side elevation of the assembled apparatus forming the subject matter hereof. Fig. 2 is a vertical sectional view thereof on line 2-2 of Fig. 3. Fig. 3 is a transverse sectional plan view on line 3-3 of Fig. 2.

Like parts are indicated by similar char-

acters of reference throughout the several views.

Referring to the drawings, 1 is a main housing supported upon legs or struts 2. The legs 2 are attached at their upper ends to brackets or angle supports 3 secured to the outer wall of the housing 1. At their lower ends, the legs or struts 2 are engaged in an annular base plate 4 and their screw threaded ends 5 which project through said base plate 4 are engaged by feet 6 upon which the device rests. Located in the upper portion of the housing 1 is a chamber or compartment 7 into which discharges an inlet conduit 8 leading from the distilling apparatus. The bottom of the compartment 7 is provided with a series of openings arranged preferably, though not necessarily, in concentric series. Suspended within the openings of the bottom of said compartment or chamber 7 are a plurality of pendant tubes 9 contracted or tapered at their lower ends as indicated at 10 and flanged as at 11 at their upper ends for engagement with the bottom of the chamber 7. As shown in Fig. 3 these pendant tubes are arranged in two concentric series. The lower tapered ends 10 of the tubes are provided with minute discharge orifices through which the distillate whether same be water or other fluid, will drip. The product of distillation discharged into the chamber 7 through the inlet conduit 8 fills said chamber 7 and the pendant tubes 9 which communicate with said chamber 7 and is fed slowly from said tubes through the minute perforations in the lower tapered ends thereof.

Resting upon the base plate 4 of the structure is a flanged receiving pan 12 having a discharge faucet 13. Interposed between the main housing 1 and the flange or shoulder of the flanged pan 12 is a sleeve or cylindrical inclosure 14 of perforate material preferably, although not necessarily, a finely woven wire mesh fabric. Positioned within the perforate inclosure 14 in perpendicular alinement with the discharge orifices of the respective series of pendant tubes 10 are imperforate baffles 15 and 16. These baffles 15 and 16 are preferably annular in form and are positioned to receive the drip or discharge from the perforated terminal ends of the pendant tubes 10. These annular baffles 15 and 16 may be supported upon radially disposed wires or spider arms secured to the perforate side walls 14 of the

inclosure or may be supported upon diaphragms 17 of similar perforate or mesh material. The water or other product of distillation discharged through the minute openings in the lower ends of the pendant tubes 10 falls by gravity upon the baffles 15 and 16 from the tubes of the respective series. The impact of the drops or stream of liquid, as the case may be, upon such baffles, causes the liquid to splash and is thus broken up or disintegrated into fine particles which in actual operation produce a variable mist. During the passage of the water from the discharge orifices of the pendant tubes to the baffles a quantity of air is entrained therewith. However, the breaking up of the liquid body by its impact upon the baffles and subsequent splashing in several directions further increases the entrainment of air particles. The splashing particles of liquid will be intercepted by the perforate walls of the inclosure 14 which, while permitting a free circulation of air, effectually intercepts the liquid particles. The liquid particles will be collected upon the perforate or mesh walls of the inclosure 14 and will trickle down said walls to the collecting pan 12. Other particles of water which fail to reach the exterior walls 14 of the inclosure will trickle through the perforate diaphragms 17 or will overflow the baffles 15 and 16 and in dripping from one baffle to the other or from the upper diaphragm to the lower and thence to the collecting pan 12, will become thoroughly aerated. The passage of the product of distillation in small quantities from the chamber 7 through the body of air contained in the perforate inclosure 14 to the receiving pan 12 not only aerates the liquid and facilitates the entrainment of air, but it also serves to cool the product of distillation, bringing each minute particle of the fluid into direct contact with the air body by which the entrained heat is dissipated.

The flanged upper ends of the tubes 10 are fixedly united to the bottom of the chamber 7 by soldering, electric welding, brazing or other suitable means. The pendant tubes 10 thus become for all practical purposes, integral parts of the chamber 7. The main housing 1 is provided with a removable cover 19 to facilitate the examination and cleansing of the chamber 7 and the pendant tubes 10. The projecting flange 12^a of the collecting pan 12 serves to collect any particles of fluid which may pass through the perforate or mesh inclosure 14 and trickle down the outside of said perforate walls. The fluid so collected is returned to the collecting pan 12.

From the above description it will be apparent that there is thus provided a device of the character described, possessing the particular features of advantage before enu-

merated as desirable but which obviously is susceptible of modification in its form, proportion, detail construction or arrangement of parts, without departing from the principle involved or sacrificing any of its advantages.

While in order to comply with the statutes, the invention has been described in language more or less specific as to certain structural features, it is to be understood that the invention is not limited to any specific details, but that the means and construction herein described comprise but one mode of putting the invention into effect, and the invention is therefore claimed broadly in any of its possible forms or modifications within the scope of the appended claims.

Having thus described my invention, I claim:—

1. In an aerator of the character described, a supply chamber and a receiving chamber, a perforate inclosure connecting the supply and receiving chambers, and a substantially flat baffle intermediate the supply and receiving chambers.

2. In an aerator of the character described, a receiver, a supply reservoir located in separate spaced relation above the receiver having a discharge orifice for the fluid to be aerated, a perforate inclosure intermediate the supply reservoir and the receiver within which the liquid is discharged, and a substantially flat baffle plate within the perforate inclosure intercepting the liquid in its passage from the reservoir to the receiver.

3. In an aerator, means for discharging the liquid in small quantity, a circular baffle intercepting the discharge from which the fluid is caused to splash, an inclosure spaced from the baffle confining the splashed liquid, and a collector for said splashed liquid extending beyond the inclosure substantially as specified.

4. In an aerator of the character described, a reservoir having an annular series of discharge orifices, a receiver positioned beneath the reservoir, and an annular flat baffle interposed between the reservoir and receiver and adapted to intercept the flow of liquid from the reservoir to the receiver causing said liquid to splash beyond which the receiver projects.

5. In an aerator of the character described, a compartment having perforate walls permitting the circulation of air therethrough, a supply reservoir above said compartment, a receiver beneath said compartment, and a substantially flat baffle plate within said compartment intermediate the reservoir and the receiver adapted to intercept the flow of liquid from the reservoir to the receiver, substantially as specified.

6. In an aerator, a supply reservoir, a pendant discharge tube communicating with

the reservoir having a tapered conical terminal and a terminal discharge orifice at the apex of said conical terminal, a splash member intercepting the flow of liquid, and means for collecting the splashed liquid.

7. In a portable aerator of the character described, a receiving tray, a reservoir arranged in spaced relation with the tray and thereabove, struts rigidly connecting the receiving tray and reservoir, a sleeve of screen material interposed between the receiving tray and reservoir beyond which the said tray extends, said reservoir having therein a plurality of series of discharge orifices arranged in concentric circular formation, and a plurality of flat circular baffle plates, one for each series of discharge orifices positioned at different levels within the sleeve of screen material, and in vertical alinement with the corresponding series of orifices.

8. In an aerator of the character described, a supply reservoir, a plurality of pendant discharge tubes arranged in concentric series communicating therewith, concentric baffles located in different planes and in vertical alinement with the said concentric series of discharge tubes, and means for collecting the fluid discharged upon said baffles.

9. In a portable aerator of the character described, a reservoir and a receiver arranged in spaced relation with the reservoir above the receiver, a plurality of series of pendant tubes carried by the reservoir and arranged in circular formation, each tube having a terminal discharge orifice, and a plurality of circular baffles offset in relation one with the other one for each series

of pendant tubes with which the corresponding baffles are vertically alined, and means for supporting the baffles in fixed relation intermediate the reservoir and receiver, substantially as specified.

10. In a portable aerator of the character described, a reservoir having in the bottom thereof a plurality of series of discharge orifices concentrically arranged, a receiver in spaced relation beneath the reservoir, and a plurality of concentrically arranged flat baffle plates of circular form positioned at different levels between the receiver and reservoir, and means for supporting said baffles in fixed relation with the reservoir and receiver.

11. In an aerator of the character described, a circular housing having a transverse diaphragm therein, a plurality of tubular dependent members carried by the diaphragm within said circular housing, a receiving tray having a peripheral lip, struts rigidly connecting the receiving tray and the circular housing, a sleeve of screen material interposed between said housing and the receiving tray and resting upon said peripheral lip thereof, and a series of baffles within the sleeve registering with said dependent tubular members, said members having liquid discharge orifices in the ends thereof, substantially as specified.

In testimony whereof I have hereunto set my hand this 13th day of July, A. D. 1917.

CALVIN D. CRANE.

Witnesses:

EDW. E. DUNCAN,
MARVEL HOAGLAND.