

No. 627,120.

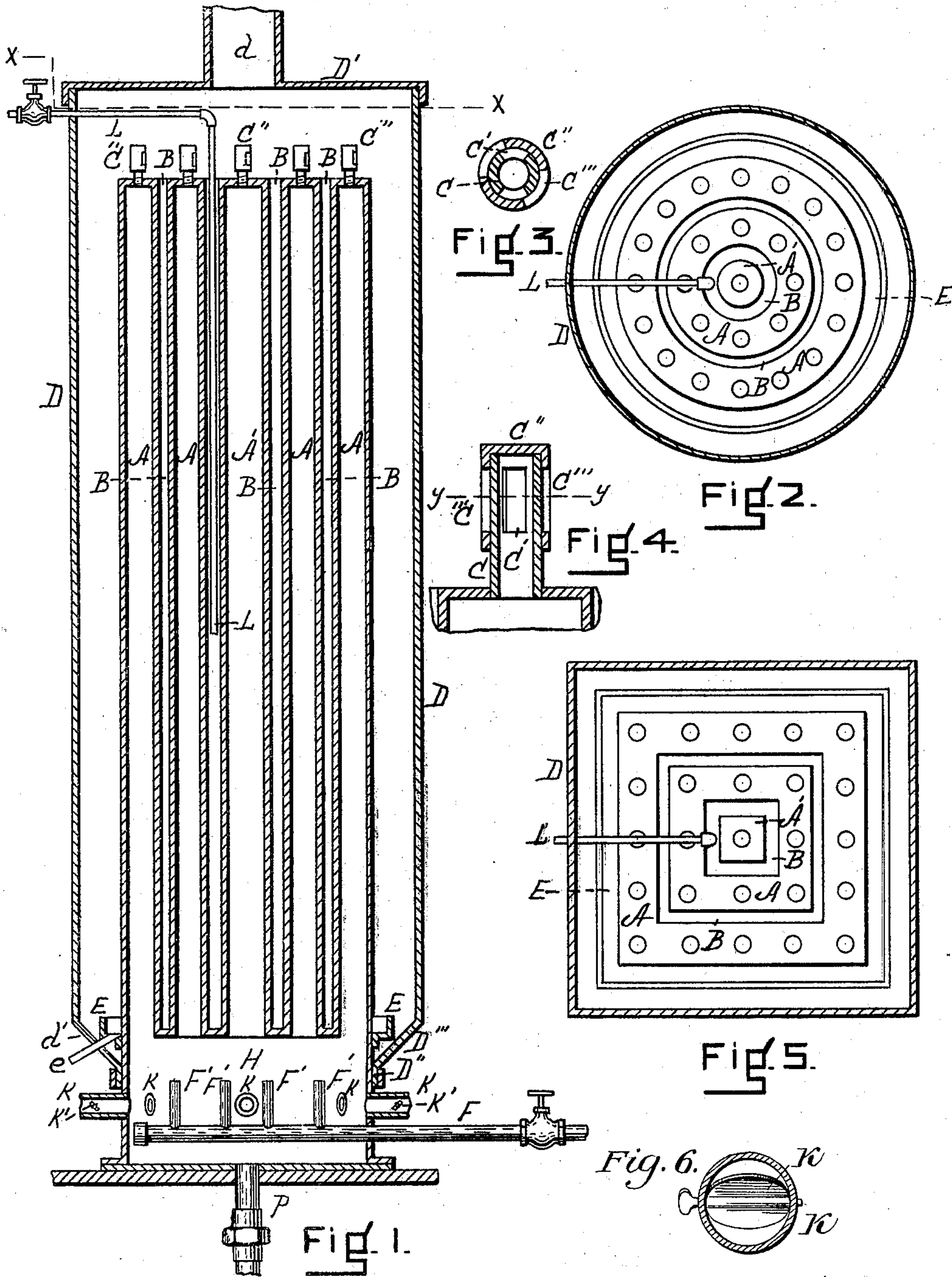
Patented June 20, 1899.

W. H. JONES.

STILL.

(Application filed Feb. 17, 1899.)

(No Model.)



WITNESSES  
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# UNITED STATES PATENT OFFICE.

WILLIAM H. JONES, OF CAMBRIDGE, MASSACHUSETTS, ASSIGNOR OF ONE-HALF TO NATHANIEL M. JONES, OF SAME PLACE.

## STILL.

SPECIFICATION forming part of Letters Patent No. 627,120, dated June 20, 1899.

Application filed February 17, 1899. Serial No. 705,753. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM H. JONES, a citizen of the United States, residing at Cambridge, in the county of Middlesex and State of Massachusetts, have invented new and useful Improvements in Stills, of which the following is a specification.

This invention relates to certain improvements in stills for condensing and distilling water; and it relates to that class of stills in which steam is conducted into the still and air conveyed therein from the outside and mixed with the steam immediately before it passes into the condensing-chambers.

The invention consists in the novel construction and arrangement of parts herein-after described whereby the aeration and distillation of the steam entering the still are rendered more perfect and the process regulated with exactness and rendered practicable, more especially on a somewhat-extended scale, all as illustrated in the accompanying drawings, in which—

Figure 1 is a central vertical section of a still and portions of its connections embodying my invention. Fig. 2 is a section taken on line X, Fig. 1. Fig. 3 is an enlarged horizontal section taken on line Y, Fig. 4. Fig. 4 is an enlarged vertical section in detail of the regulating mechanism at the upper end of one of the steam-chambers. Fig. 5 is a horizontal section, similar to that indicated in Fig. 2, of a modification. Fig. 6 is an enlarged cross-section of the air-duct, showing the regulating valve or damper.

Similar letters of reference indicate corresponding parts.

A A represent two vertical annular steam-chambers arranged concentrically, the inner one inclosing a central vertical cylindrical steam-chamber A'. These chambers are of equal height and are so arranged that the annular spaces B between them are equal in width and constitute water-chambers. These annular chambers A and A' are condensing-chambers and are closed at their upper ends except for regulating exhaust-valves, below described. The water-chambers B are open at the top and closed at the bottom by means of the horizontal walls B', connecting the chambers A A'. The outer wall of the outer annu-

lar condensing or steam chamber is extended downward and bolted at its lower end to the contracted portion or ring D' of the cylindrical case D, which surrounds and incloses the steam-chambers and is provided with a top D', furnished with a suitable outlet d. The outer wall of the annular chamber A has secured to its outer side the horizontal annular trough E, which is set at about the same height as the lower ends B' of the water-chambers B, and a small tube e extends from the bottom of said trough downward and out through the part d' of the portion D''.

The regulating-valves at the upper ends of the steam or condensing chambers A A' consist of the vertical tubes C, each provided with opposite openings or ports C', said tubes connecting with the interior of the chambers A A' and the caps C'', provided with the opposite ports C'''. By rotating the caps the ports C''' and C' may of course be made to coincide or not, as desired.

F is the pipe through which steam supplied from a suitable boiler enters the still. The portion of this pipe F which is inside the still is provided with a number of vertical branch pipes F', which extend from the upper side of the pipe F and open into the chamber H below the annular chambers A A' B. A number of pipes K lead into the same chamber above the steam-pipe F, but below the upper ends of the pipes F', each of said pipes K being provided with a suitable regulating valve or damper K'. A water-pipe L extends into the casing near its upper end and thence down into one of the water-chambers B. A pipe P leads through the bottom of the still and enables the distillate to be drawn off.

In practical operation steam from a boiler is injected into the chamber H through the pipe F and the series of pipes F', the latter dividing the blast and directing it upward into the steam-chambers A A'. At the same time air is introduced into the chamber H through the air-ducts K. The air and steam are thus mixed in said chamber H and pass up into the steam-chambers A A'. At or about the same time cold water is introduced through the pipe L into one of the annular water-chambers B and, overflowing it, flows into the other chambers, which are also over-



flowed, so that the water finally overflows all the chambers B and runs down the outer wall of the chamber A into the trough E and is carried off by the pipe e. This continuous  
 5 flow of water keeps the walls of the steam-chambers comparatively cool, so that the aerated steam which is forced up thereinto from the pipes F' condenses on the inner walls of said chambers A A' and runs down said walls  
 10 into the chamber H, from which the distillate is drawn off by means of the pipe P. During this process the ports in the valves C C'' are usually about one-third open, as shown in Figs. 1 and 3, for the purpose of allowing the  
 15 surplus steam or the steam containing gases brought with it into the still to pass off at the upper ends of the condensing-chambers and out through the pipe d. In practice the regulation by means of the valves K' of the air  
 20 passing through the ducts K is attended to with great care and said valves K' and the valves C C'' are adjusted with exact relation to each other. Moreover, the amount of steam in the blast and the amount of air entering through the ducts are regulated with  
 25 relation to each other and with due regard to the capacity of the steam for receiving and the condensed steam for retaining the air, so that the aeration may be as complete as possible.  
 30

In practice the steam is usually filtered before it is introduced into the still, and the distillate is filtered and cooled after it leaves the still, the pipe P leading to a suitable coil  
 35 and filter.

By means of the construction of this still, especially by means of the arrangement of alternate water-chambers and steam-chambers concentrically, I provide large areas of con-  
 40 densing-surfaces in a small space. It is not necessary, however, that the chambers which surround the central chamber A' should be annular, nor that said central chamber should be round, as indicated in Figs. 1 and 2.

45 In Fig. 5 the chambers and also the central chamber are square and are alternately steam and water chambers, and the case corresponds to them in shape. The principle and operation, however, are exactly the same as where the chambers are annular. There are certain  
 50 places, as in ships and vessels of a certain description, where a square still is desirable, and hence I do not wish to confine myself to the circular shape of the chambers or still.

The number of steam or condensing cham- 55  
 bers and water-chambers alternately arranged, as shown, may be varied according to circumstances.

Having thus fully described my invention, what I claim, and desire to secure by Letters 60  
 Patent, is—

1. In a still of the character described, the series of concentrically-arranged steam or condensing chambers A, A' closed at their upper ends and provided at said ends with 65  
 means for allowing and regulating the escape of steam and air, said condensing-chambers opening at their lower ends into the chamber H; the concentrically-arranged water-cham- 70  
 bers B arranged alternately with the condensing-chambers and open at their upper and closed at their lower ends, the walls between said condensing and water chambers being common to both; the case D inclosing the said chambers; the steam-inlet tube F 75  
 opening into the chamber H; the air-ducts K opening into said chamber H near the level of the steam-tube, and provided with suitable regulators; and means for admitting water into and circulating it within the wa- 80  
 ter-chambers B, substantially as described.

2. In a still of the character described, the series of concentrically-arranged steam or condensing chambers A, A' closed at their upper ends and provided at said ends with 85  
 means for allowing and regulating the escape of steam and air, said condensing-chambers opening at their lower ends into the chamber H; the concentrically-arranged water-cham- 90  
 bers B arranged alternately with the condensing-chambers and open at their upper and closed at their lower ends, the walls between said condensing and water chambers being common to both; the case D inclosing the said chambers; the steam-inlet tube F 95  
 opening into the chamber H; the branch pipes F' extending from the tube F toward the lower ends of the condensing-chambers and dividing and directing the blast of steam; the air-ducts K opening into said chamber H 100  
 near the level of the steam-tube, and provided with regulators; and means for admitting water into and circulating it within the water-chambers B, substantially as set forth.

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Witnesses:

HENRY W. WILLIAMS,  
 A. N. BONNEY.