

(No Model.)

E. BOLTON.
DISTILLING COLUMN.

No. 410,634.

Patented Sept. 10, 1889.

FIG. 1.

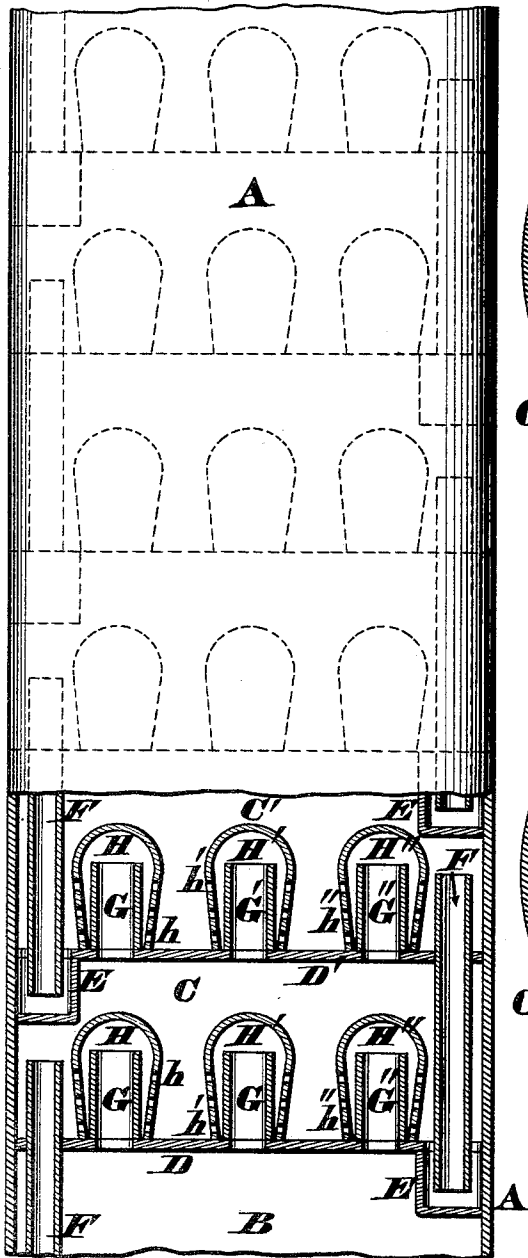


FIG. 2.

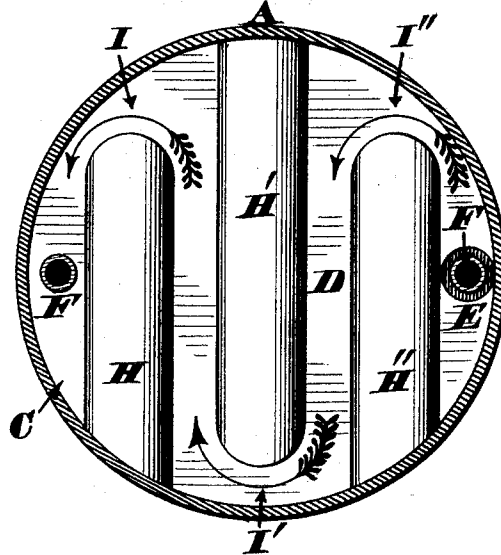
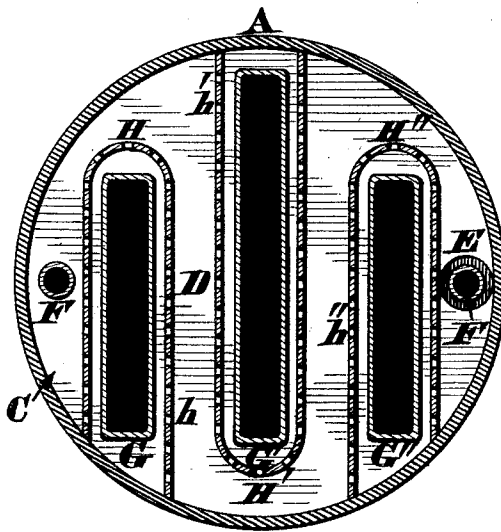


FIG. 3.



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UNITED STATES PATENT OFFICE.

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DISTILLING-COLUMN.

SPECIFICATION forming part of Letters Patent No. 410,634, dated September 10, 1889.

Application filed May 10, 1889. Serial No. 310,253. (No model.)

To all whom it may concern:

Be it known that I, EDWARD BOLTON, a citizen of the United States, residing in Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Distilling-Columns; and I do declare the following to be a full, clear, and exact description of the invention, reference being had to the accompanying drawings, which form a part of this specification.

This invention relates to those distilling-columns which consist of a series of chambers placed one above the other, and having one set of pipes for allowing steam to pass up through the column, and another set of pipes that permit the partial filling of each chamber with the liquid to be distilled, which liquid gradually descends and escapes at the base of the apparatus; and my improvement comprises a novel construction of the caps or hoods usually placed over the steam or boiling pipes of each chamber. The exposed or upper portions of these caps or hoods are closed; but their sides—or, in other words, the portions of said caps below the surface of the liquid—are pierced with numerous small holes for the escape of steam. Furthermore, these perforated portions are wider at top than at bottom, which peculiar shape causes the issuing jets of steam to be projected down into the liquid, thereby thoroughly permeating it with the hot vapor and increasing the efficiency of the columns accordingly, as hereinafter more fully described.

In the annexed drawings, Figure 1 is a sectional side elevation of a portion of a distilling-column embodying my improvements. Fig. 2 is a horizontal section of the same, taken directly above the hoods or caps of one of the chambers. Fig. 3 is a similar section taken through one of the lines of perforations of said hoods.

A represents the cylinder or shell of an ordinary distilling-column, and B is the lower chamber of the same, which chamber is separated from the first boiling-chamber C by a head D, and said chamber C has a head D' between it and the second boiling-chamber C', and so on throughout the entire apparatus.

Head D has at one side a pit E, and dia-

metrically opposite it an overflow-pipe F, a suitable number of steam or boiling pipes G G' G'' being located between said pit and overflow. These steam-pipes project up into chamber C a little farther than does the pipe F, and said steam-pipes are covered by hoods or caps H H' H'', which are preferably arched at top, while their sides slope inwardly. Furthermore, the hoods are closed at top; but their sides are pierced with small holes or slots or other perforations h h' h'', which are generally arranged in horizontal rows, one above the other. The steam pipes and hoods are arranged as seen in Figs. 2 and 3, the central hood H' extending from one side of the cylinder A almost over to the opposite side of the latter, so as to leave a passage I' only at one end of said hood; but the other hoods H H'' have their closed ends on the side of the cylinder where this passage I is left, and have passages I I'' on the opposite side of said cylinder.

The above-described arrangement of pits, overflow-pipe, steam-pipes, perforated hoods, and passages is repeated within every boiling-chamber of the column.

From the above description it is evident that the fluid to be distilled must descend through the overflow-pipe F of the uppermost chamber into the pit E of the chamber below. The fluid then ascends within this pit, flows through the passage I'' into the channel between the hoods H' H'', and thence around the passage I' into the channel between the hoods H and H', as indicated by the arrows in Fig. 2. The fluid finally escapes down the overflow-pipe F into the chamber below, and so on throughout the entire column. Now, as the fluid cannot escape from one boiling-chamber until said liquor reaches the level of the overflow-pipe F, and as the mouth of the latter is somewhat above the upper line of perforations of the various hoods H H' H'', it is evident that the fluid while describing its tortuous or circuitous route through said chamber is constantly and uniformly permeated by numerous fine jets of steam issuing from the perforations h h' h'' of said hoods. Consequently the liquid is continuously and thoroughly evaporated in the shortest possible

space of time and with the least consumption of fuel. By inclining the sides of the hoods the jets of steam are projected downward into the liquid, which act greatly assists the evaporating process.

I claim as my invention—

The combination, in a distilling-column, of a cap secured over the steam-pipe, said cap being closed at its upper end, but perforated at its sides, which perforated portions are wider

at top than at bottom, whereby the jets of steam issuing from said cap are projected down into the liquid, substantially as herein described.

In testimony whereof I affix my signature in presence of two witnesses.

EDWARD BOLTON.

Witnesses:

JAMES H. LAYMAN,
SAML. S. CARPENTER.