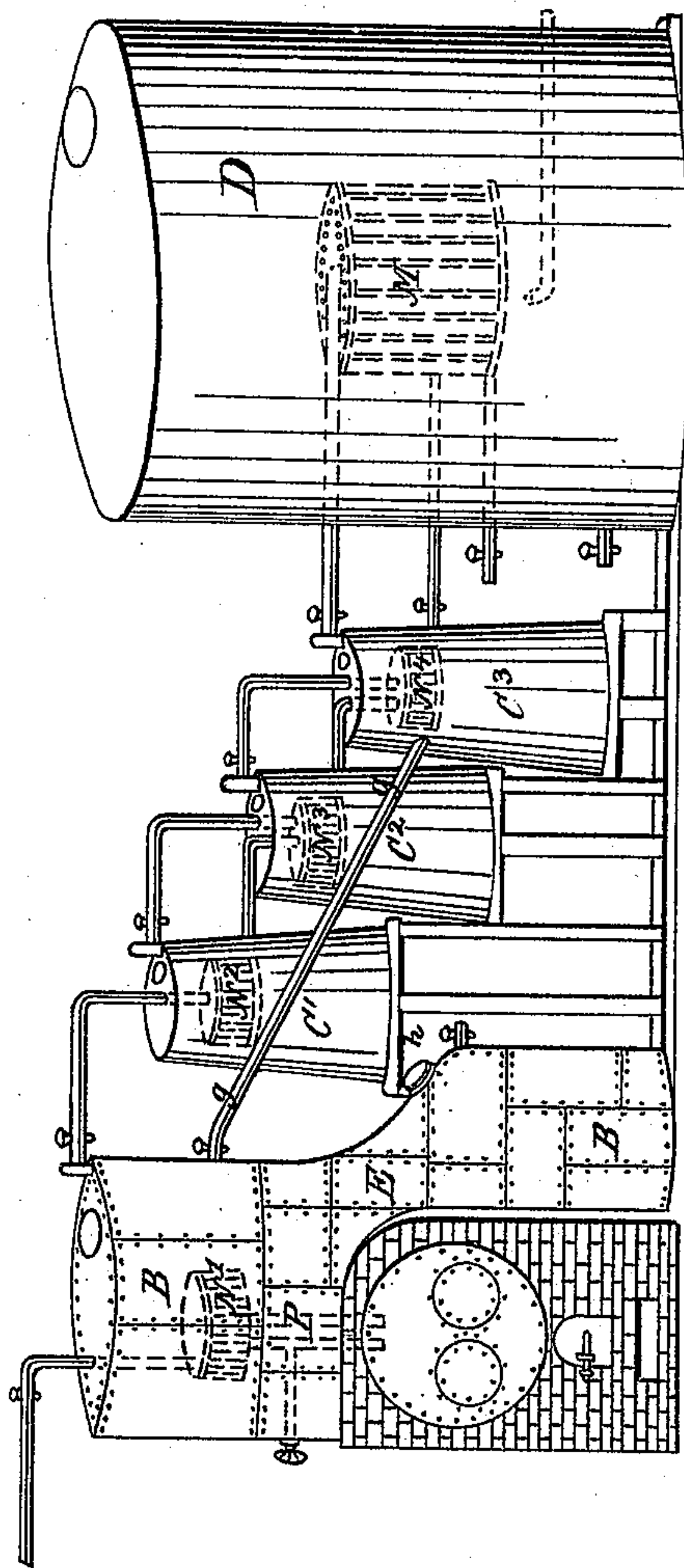


D. BRIGHAM.
Evaporating Pan.

No. 20,034.

Patented Apr. 27, 1858.

Fig. 1.



UNITED STATES PATENT OFFICE.

DENNIS BRIGHAM, OF NEW YORK, N. Y.

IMPROVEMENT IN APPARATUS FOR EVAPORATING BRINE.

Specification forming part of Letters Patent No. 20,034, dated April 27, 1858.

To all whom it may concern:

Be it known that I, DENNIS BRIGHAM, of the city, county, and State of New York, have invented certain new and useful Improvements in Apparatus for Evaporating and Purifying Salt-Brine; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

In order that others may be able to construct and use my invention, I will describe it as follows:

The evaporating and purifying (depressed at the center) boiler B B' is filled to about ten or twelve inches over the top of the heater N' with pure strong brine, which is set to boiling by the steam from the generator through the connecting-pipe P to the heater N'. As the exhalation of the water takes place, the brine becomes stronger in the boiler B B', which is replenished from the cistern of crude brine D by means of a force-pump, which forces the crude brine through pipe o into the lower section of the depressed boiler B B', where it becomes mixed with the strong brine. This causes a separation or crystallization of the impurities—such as muriates of lime, magnesia, &c.—which fall to the bottom of boiler B'. After the lower section of the boiler B B' is filled with the impurities up to or near the depressed neck e, it is taken out through the man-hole h. When the brine in the upper part of boiler B attains the strength of 19° to 20° Baumé, it is drawn or forced through a pipe or spout, g, into pans c' c' c'. The liquor in the pan c' is boiled rapidly under a strong pressure by means of the escaping steam from the boiler B, which passes through pipe L' into the heater (and not the pan) which is placed in the first pan, c', where the salt becomes crystallized and deposited at the bottom thereof. There being in a quiescent state, it forms in large pure crystals, after which it is removed through the man-hole at the top of the pan c'. The second pan is filled with pure brine from the depressed boiler B B', similar to the first pan, c', and the evaporated steam from pan c' is let into the heater of c', together with the steam which has been used in the heater of c', which passes out at the bot-

tom of the heater in c' through pipe K' into the top of the heater in c'', and so on to condenser M, which is placed in the crude-brine cistern D. The great desideratum is to pass the evaporated steam through the heaters very rapidly by means of the powerful condenser M, to which is attached a small steam pump to discharge the condensed steam and keep up a perfect vacuum in the condenser while it, (the condenser,) by means of the vacuum, draws the evaporated steam rapidly through the heaters, at the same time heating the brine in cistern D. After the salt is removed from the pans c' c' c', it is taken away to dry.

The use of tubular heaters for evaporating purposes is not new, when combined with the mode of conveying the escape-steam from the pans to the condenser and for heating buildings, &c.; but the arrangement of a set of tubular heaters so that each heater will discharge its evaporated steam into the next heater at the top, which is below the level of the bottom of the first heater, the third is below the level of the bottom of the second and so on, in combination with a boiler fashioned or formed with a depression at its center e, for the ostensible purpose of purifying salt, I believe to be novel and useful.

I do not confine myself to any specific form of boiler B B', excepting the depression e when employed as above set forth.

I disclaim all these separate parts of the above described apparatus; but

What I claim as novel, and what I wish to secure by Letters Patent of the United States is—

The arrangement of the steam-heaters N' N² N³ N⁴ with the boiler B B', pans c' c' c', and cistern D, respectively, in the manner set forth and for the purpose specified, as shown in the drawings, so that the pans and cistern may be heated by one steam-pipe, K' K² K³, substantially as described.

In testimony whereof I hereunto subscribe my name in the presence of two witnesses.

DENNIS BRIGHAM.

Witnesses:

ROBERT GRANT,
JAMES P. MCLEAN.