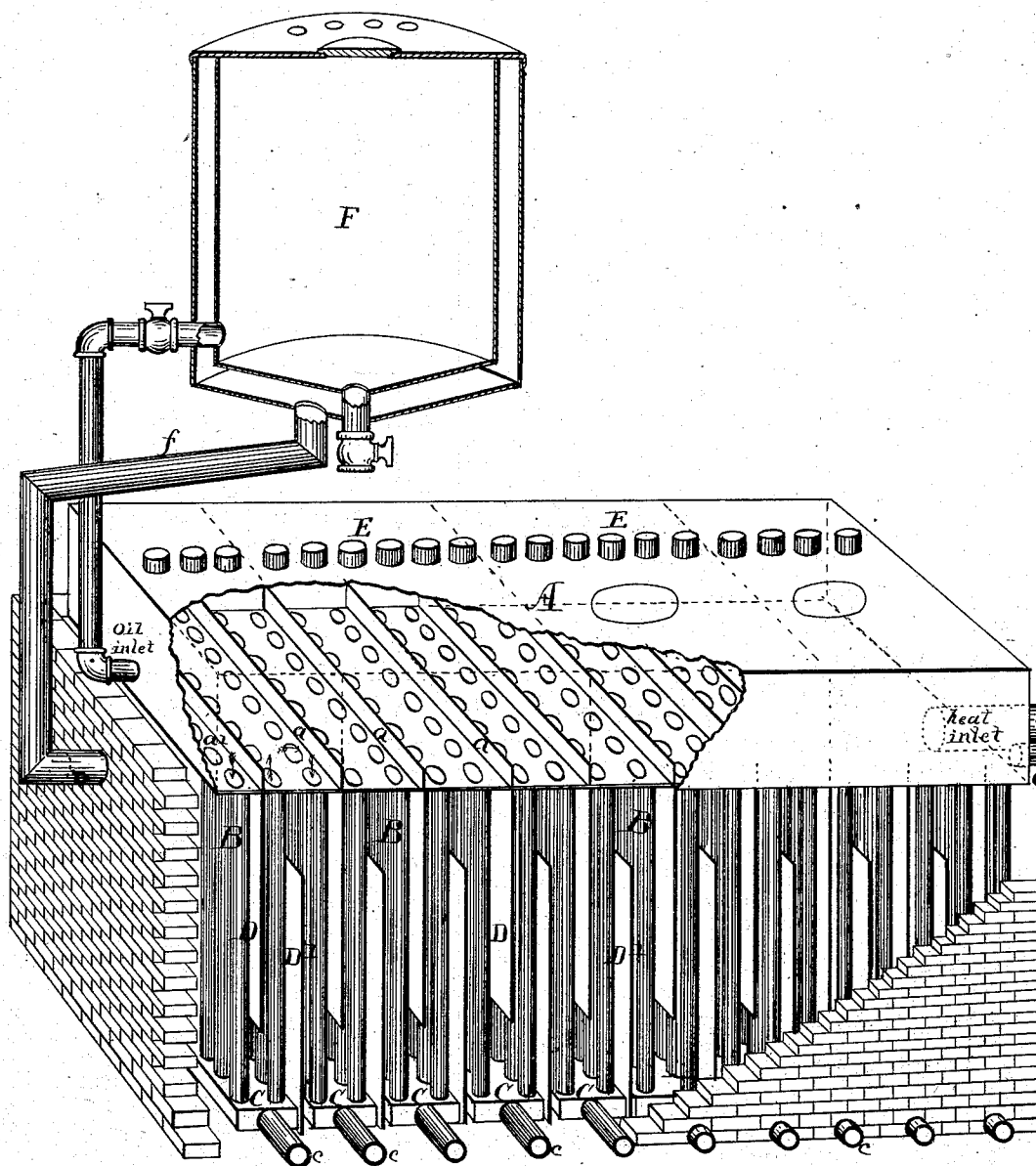


(No Model.)

J. THOMAS.
OIL STILL.

No. 282,239.

Patented July 31, 1883.



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UNITED STATES PATENT OFFICE.

JOSHUA THOMAS, OF CLEVELAND, OHIO.

OIL-STILL.

SPECIFICATION forming part of Letters Patent No. 282,239, dated July 31, 1883.

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To all whom it may concern:

Be it known that I, JOSHUA THOMAS, of Cleveland, in the county of Cuyahoga and State of Ohio, have invented new and useful Improvements in Oil-Stills, of which the following is a specification.

This invention relates to apparatus for distilling petroleum, and has for its object to provide a means for continuous distillation, in which there is a very large proportion of graduated heating-surface by which rapid and graduated continuous evaporation takes place.

The apparatus consists of a large number of perpendicular pipes arranged in continuous rows, all depending from one common evaporating-chamber. The said pipes are coupled in rows at the bottom in such a manner that the petroleum is conveyed alternately up and down continuously through from the first to the last series of pipes, also through divided spaces in the evaporating-chambers successively and alternately between each downward set of pipes, whereby in its long continuous course it is brought into contact with a very large amount of heating-surface, resulting in a rapid progressive distillation. Between the said rows of pipes are placed thin partitions, open alternately at top and bottom, so as to make a long zigzag circuit for the heating element to pass through. The heat is introduced at the opposite end of the series of pipes to that in which the petroleum is introduced, thus applying the heat so as to operate to eliminate the lighter gravities at a point most distant from point of introducing heat, and the heaviest at said hottest point, thereby obtaining all the grades of product in one continuous process. The several grades are conveyed from the evaporating-chamber by pipes for condensation in the usual manner.

In the drawing the figure is a perspective view, partly in section and partly broken away to show internal construction.

A is an evaporating-chamber, made preferably of sheet metal, of such proportions and dimensions as may be most convenient. To the bottom of said chamber is attached a set of pipes, B B, all opening into said chamber and having free communication therewith. They are grouped in close order and in straight rows across the bottom, and are coupled at their lower ends, forming two ranks or double rows

by connecting every two rows at the bottom with narrow cross-pipes or chambers C C, thus making every odd-numbered row a downward and every even-numbered row an upward flue.

The chamber A is divided into four or as many compartments as may be required for obtaining the various products, and also has low partitions *a a* placed crosswise and between the openings of each odd-numbered pipe and its even-numbered mate, so that the flow from the even-numbered pipe-openings in the evaporating is into the even-numbered pipes, and so on successively up and down throughout the whole. The said combination of pipes is inclosed in chamber composed, preferably, of brick walls, which also supports the chamber A. Between the said rows of pipes are placed thin partitions D D, reaching across from side wall to side wall. Every other partition is attached to the bottom of chamber A and depending therefrom to about one-third the distance from the bottom of lower chamber. The other or each alternate partition, D', reaches from the bottom of said lower chamber to within about one-third the distance from the top, or within that distance from the bottom of said chamber A. This arrangement of partitions is for the purpose of conveying the heat alternately up and down between said pipes, thus dividing the heat from its inlet to its outlet in such a manner that all the gravities of product are the result.

The chamber-connections C C are provided with necks or pipes *c c*, which project out through the side walls, having suitable plugs or caps for closing them. These are provided for the purpose of enabling said chambers to be cleaned, and also for the purpose of introducing a vapor to assist in the evaporation and to deodorize the oils as distillation progresses. To the top of chamber A are provided a number of pipes, E E, for the escape or discharge of the several vapors as they are generated in said chamber, from whence they are conveyed to condensers.

F is a reservoir for containing the crude petroleum. It consists of a vessel having an outer jacket for providing a surrounding space, into which the exhaust-heat from the pipe-chamber is conveyed, it being connected therewith by a pipe, *f*, for that purpose. The said reservoir is connected by pipe I to the evaporating-

chamber A, near its bottom, so as to lead the material into the first space, *a'*. Thence it must pass down the first row of pipes, B, as the low partition *a* prevents its flow over the bottom of chamber A. It must next pass up the second row of pipes and again into the chamber A, thence down the third row and up the fourth, and so on until it reaches the discharge O at the farther end. The material is thus conveyed successively through the several evaporating-chambers in one direction while the heat is passing in the pipe-chamber in the opposite direction. By this means the material is brought into contact with the lesser heat first, and so on to the greatest heat last. The heat for this purpose may be superheated steam, vapor, or hot air, as may be desired, and produced by any of the well-known means.

From the foregoing the operation of this device is obviously as follows: The petroleum being introduced as described, the lighter products are eliminated first and the heavier gravities in rapid succession down to the residuum without the danger of scorching or discoloration. With the jacketed reservoir heated at a proper temperature, the lightest product—

naphtha—might be obtained. In the first compartment of chamber A is eliminated gasoline; the next is a fine burning-oil; the third is paraffine or wax, and from the fourth is obtained a fine lubricating oil.

Having described my invention, I claim—

An apparatus for distilling or reducing petroleum by a continuous operation, consisting of a divided evaporating-chamber, A, having low partitions *a* and vapor-outlets E, a series of coupled pipes, B, arranged beneath said chamber and in an inclosed heating-chamber provided with thin partitions D D', arranged to convey the heat alternately up and down between said pipes, a jacketed reservoir, F, connected by pipe *f* to said heating-chamber, and a pipe, I, leading to chamber A, whereby the material to be treated is conveyed into said evaporating-chamber and through the heated pipes in one direction, while the heat is conveyed in the opposite direction, substantially as described.

JOSHUA THOMAS.

Witnesses:

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