

W. J. BRUNDRED.
Oil-Stills.

No. 148,806.

Patented March 24, 1874.

Fig. 1.

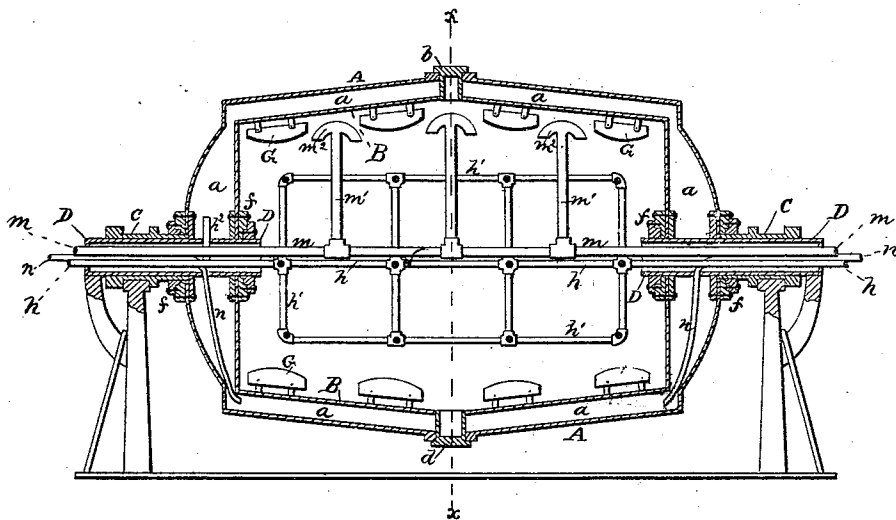


Fig. 2.

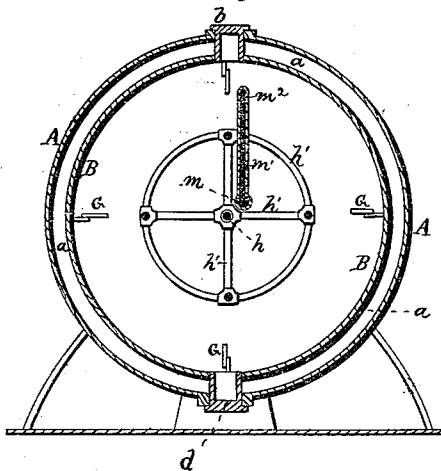


Fig. 3.



Witnesses:

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UNITED STATES PATENT OFFICE

WILLIAM J. BRUNDRED, OF OIL CITY, PENNSYLVANIA.

IMPROVEMENT IN OIL-STILLS.

Specification forming part of Letters Patent No. **148,806**, dated March 24, 1874; application filed January 29, 1874.

To all whom it may concern:

Be it known that I, WILLIAM J. BRUNDRED, of Oil City, county of Venango and State of Pennsylvania, have invented certain new and useful Improvements in Stills for Refining Petroleum and other crude oils, of which the following is a specification:

The nature of my invention consists in the construction and arrangement of a still for refining petroleum and other distillable substances, as will be hereinafter more fully set forth.

In order to enable others skilled in the art to which my invention appertains to make and use the same, I will now proceed to describe its construction and operation, referring to the annexed drawing, in which—

Figure 1 is a longitudinal section of my still. Fig. 2 is a transverse section of the same, and Fig. 3 is a cross-section through one of the journals or gudgeons.

The still proper consists of two cylindrical shells, A and B, placed one within the other, and a suitable distance apart, so as to leave a space or chamber, *a*, all around the interior shell B, as well as at the ends thereof.

The particular form of the shells A B is immaterial, but I prefer substantially the form shown in Fig. 1, they being made of larger diameter in the center than at the ends for the purpose of facilitating the removal of the residuum. On one side of the still in the center is an ordinary man-hole, *b*, for filling the still, and on the opposite side is another man-hole, *d*, through which to discharge the sediment of the distillation. These man-holes are, of course, to be closed by any suitable devices for that purpose. In the center of each of the heads of the outer shell A is attached a sleeve or hollow journal, C, through which, at one or both ends of the still, passes a stationary hollow gudgeon, D. This gudgeon may extend through one or both shells of the still, as may be desired, and the still is provided with suitable stuffing-boxes *ff* to form tight joints around said stationary gudgeon or gudgeons, and yet allow it to be revolved on the same. Longitudinally through the still and through the hollow gudgeons D passes a stationary steam-pipe, *h*, provided with suitable branches *h'*, substantially as shown in the drawing, or in

any other desired manner, and with a branch, *h*², extending into the chamber *a*. *m* is a stationary vapor-pipe, also passing longitudinally through the still and gudgeons, and which is provided with a series of vertical pipes or branches, *m'*, extending upward. Each vertical pipe or branch *m'* is, at its upper end, provided with a cap or pipe, *m*², bent in such a manner as to prevent any particles of oil or solid matter falling into the vapor-pipe. On the inside of the inner shell B are fastened paddles or wings G G, which may be constructed in any desired form or shape, only so that they do not interfere with the upright pipes *m'* when the still is revolved. *n* is the exhaust-pipe, for steam from the steam-space *a*, through one or both of the hollow gudgeons D to the outside of the end of the still.

The still is placed in a horizontal position, and, after the desired quantity of oil or petroleum has been placed therein, steam is admitted in the space or chamber *a*, completely enveloping the inner shell B, within which the oil has been placed. Steam may also, if so desired, be allowed to pass through the steam-pipes *h'*. The still is kept revolving at about the speed of, say, fifteen revolutions per minute, more or less. The oil in the still becomes vaporized from the effects of the heat caused by the steam surrounding it, and as rapidly as it is vaporized the vapor is carried off through the pipes *m'* *m*. The paddles or wings G G assist in displacing the liquid while rotating the still. The liquid is rapidly distilled on account of the large amount of heating-surface, as every portion of the still, except the man-holes *b* *d*, is heating-surface, coming in contact with the liquid while the still is revolving, which it should continue to do during the entire process of distillation. The agitation of the liquid by means of the paddles G G keeps up a constant displacement, so that all parts of the liquid are brought in contact with the heated surface during distillation.

This still dispenses with the use of fire-heat entirely, thus removing the great cause of fire and explosions in oil-refineries, rendering the process perfectly safe.

The oil distilled is uniform both in color and gravity. By the usual process of distilling crude petroleum, the oil is more or less burned

after the lighter portions have been vaporized, and a large percentage of it converted into tar, and the distillate becomes of dark color, which requires a large amount of acid to precipitate the coloring matter.

In my still and by my process of surrounding the oil with steam, using no fire-heat, the oil is not burned, and hence no tar formed. The oil not being burned, the distillate will be correspondingly lighter in color, and a great saving will be effected in the use of acids.

Furthermore, my still may be cooled, cleaned, and recharged in half an hour, whereas in the ordinary stills used it takes from half a day to a whole day. If desired to cool off still more rapidly, a stream of cold water may be turned into the space *a* and pipes *h h*¹ as soon as the steam is shut off.

The small particles of earthy matter contained in the crude oil, which, in my still, will be the only residuum left, can be washed out in a moment by a stream of water introduced at the man-hole *b* and emptying at the man-hole *d*.

This still costs considerably less to manufacture than the ordinary still now used, and there is nothing in it to get out of order, hence will save the usual annual expense for repairs.

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

1. The double revolving still *A B*, with steam-chamber *a*, in combination with the stationary steam-pipes *h h*¹, substantially as and for the purposes herein set forth.

2. The stationary vapor-pipe *m*, with vertical branches *m*¹ and caps *m*², in combination with the double revolving still *A B*, substantially as and for the purposes herein set forth.

3. The wings or paddles *G G*, attached upon the inside of the double revolving still *A B*, substantially for the purposes herein set forth.

4. The combination of the double still *A B*, with steam-chamber *a*, sleeves *C*, gudgeons *D*, steam-pipes *h h*¹, vapor-pipes *m m*¹, exhaust *n*, and paddles *G*, all constructed substantially as and for the purposes herein set forth.

In testimony that I claim the foregoing as my invention I hereunto affix my signature this 26th day of January, 1874.

W. J. BRUNDRED.

Witnesses:

DAVID KELTIE,
E. A. KEENE.