Stewart & Logan,

Oil Still.

No. 113,811. Patented Apr. 18. 1871.

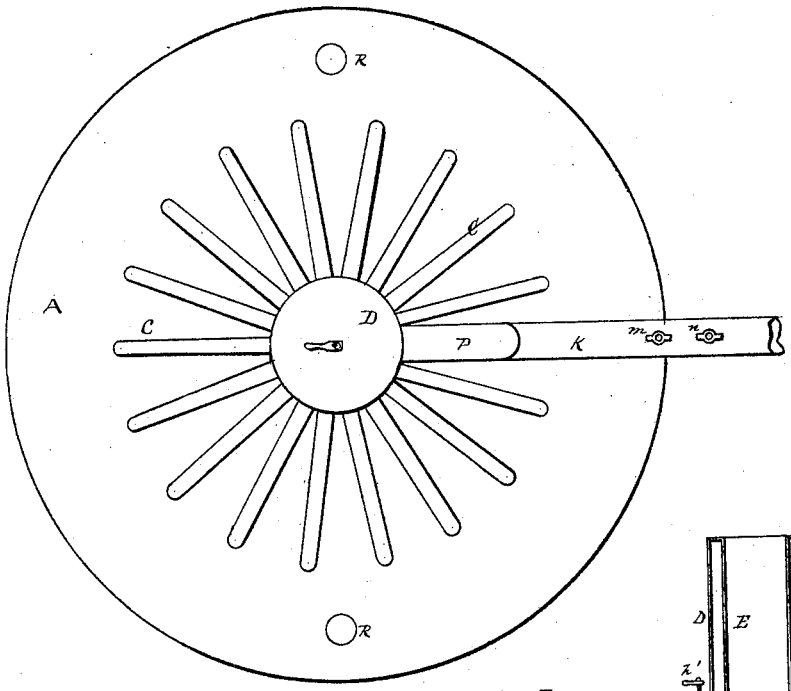


Fig. 3

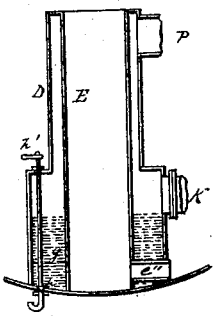
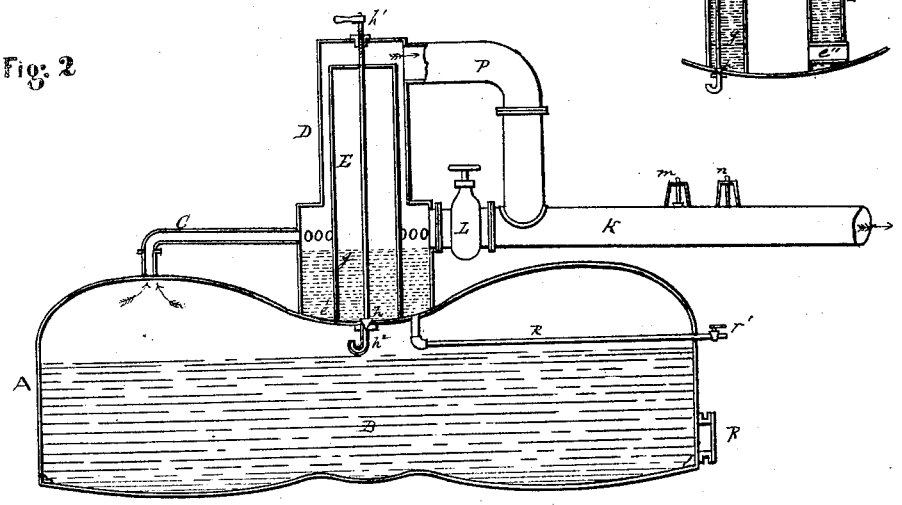


Fig. 2



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United States Patent Office.

JOHN L. STEWART AND JOHN P. LOGAN, OF PHILADELPHIA, PENNSYLVANIA.

Letters Patent No. 113,811, dated April 18, 1871.

IMPROVEMENT IN PETROLEUM-STILLS.

The Schedule referred to in these Letters Patent and making part of the same.

We, JOHN L. STEWART and JOHN P. LOGAN, of the city and county of Philadelphia and State of Pennsylvania, have invented an Improved "Petroleum-Still," of which the following is a specification.

The main features of our invention consist in the arrangement of the pipes leading from the still to the central dome; in the construction of a double-walled central dome, in which the vapor is partly condensed; and in the arrangement of the pipes and valve leading from the dome to the condenser.

To enable those skilled in the art to make and use our invention, we will proceed to describe its construction and operation, reference being had to the accompanying drawing and to the letters of reference marked thereon, in which—

Figure 1 is a plan of the still.

Figure 2 is a vertical section.

Figure 3 is a modified form of the interior dome.

A is the still, which is nearly filled with crude oil B.

The bottom of the still is formed in curved lines, as shown.

The top is formed of curved lines like a corrugated disk, the curve near the edge being convex, and having its highest point where the pipe C enters, about five feet from the edge of the still, the whole diameter of the still being thirty feet.

This form of the top causes all the vapor to rise into the pipes C, which, in the still here described, are seventeen in number, and eight inches diameter, each one being placed over a fire.

There are seventeen fires under the still.

The pipes C lead into a central dome, D, at a slight inclination downward, so that the condensed vapor will drain into the dome D.

The dome D is about twelve feet high; the upper part four feet in diameter; the lower part is widened to six feet, and secured tight to the top of the still.

Within the dome D is another dome, E, three feet in diameter, thus leaving a space of six inches between the two domes for the passage of the vapor.

The lower end of dome E is secured tight to the top of the still, a few small holes only being left at e' to permit the condensed vapor g to occupy the same level at the bottom of each dome.

The top of dome E is closed, and extends in height to within six inches of dome D.

At the bottom of the inside dome is a valve, h, operated by a screw and handle, h^1, projecting through the dome D.

The condensed vapor is returned to the still by this valve h through a trap, h^2, which trap prevents the passage of vapor. Or the condensed vapor g can be drawn off by pipe R and cock r'.

Fig. 3 shows another arrangement of the inside dome E, in which it is open to the atmosphere at the top, and has an air-passage, e'', at the bottom, so that a circulation of cold air is kept up within it. The valve h in this case is arranged between the two shells.

A large twenty-inch pipe, K, leads from the bottom of dome D, at a few inches below the level at which the pipe C enters.

This pipe K is on a slight incline to the condenser, and laid close to the top of the still.

A sluice-valve, L, or a Ludlow valve, is placed in the pipe close to the dome, and a safety-valve, m, and a vacuum-valve, n, are placed as shown.

A twenty-inch pipe, P, leads from the top of the dome D and enters the pipe K beyond the valve L.

R R are man-holes.

The operation of the still is in this way:

The valve L is first closed, the still is nearly filled with crude oil, and a series of fires applied below.

The gasoline and benzine pass up the pipes C and into the dome D, where the vapor passes up the annular passage formed between the two domes, and is thus all forced in contact with the cooling surface of the dome D. The gasoline and benzine then pass down pipes P and K to the condenser.

The vapor condensed in the pipes C and dome D collects at the bottom of the dome D and runs into the dome E by the openings e'. The valve h is open during this part of the operation, and the condensed vapor passes back to the still through trap h^2.

When all the benzine is evaporated the valve L is opened and the small one h closed, so that the condensed vapor is prevented from returning to the still, and passes along with the vapor through valve L and pipe K to the condenser.

This process is continued until the oil begins to be highly colored, at which time the valve h is opened and the condensation of the heavier hydrocarbon forms a liquid which returns to the still, the lighter vapor only passing off through valve L.

The advantage of this arrangement of the pipes and central dome D is that it gives great facility for the vapor to pass off from the still as soon as formed, and all the condensation runs down pipes C and is collected in the bottom of dome D; whereas, if the vapor had to pass beneath the top of the still a long distance previous to its escape by a central pipe considerable condensed vapor would fall back again into the still.

We claim—

1. The still A, with its top in the form of an annular corrugation, in combination with a series of pipes so arranged as to draw off the vapor from the still at the highest part of the said corrugation.

2. The central dome D arranged upon the still A in the manner shown, as a receptacle for the vapors that pass from the still by the collecting-pipes C.

3. The arrangement of the dome E within the dome D, so as to bring the uncondensed vapors in contact with the cooling surface of the dome D, as herein described.

4. The dome E, made with passages for the free circulation of the air, as in fig. 3, in combination with the dome D, for the purpose herein described.

5. The valve *h* arranged, in combination with the dome D, or its equivalent, and still A, for the purpose of returning the condensed vapor to the still, as herein described.

6. The combination and arrangement of the still A, pipes C, domes D and E, pipes P and K, and valve L, as herein shown and set forth.

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Witnesses:
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