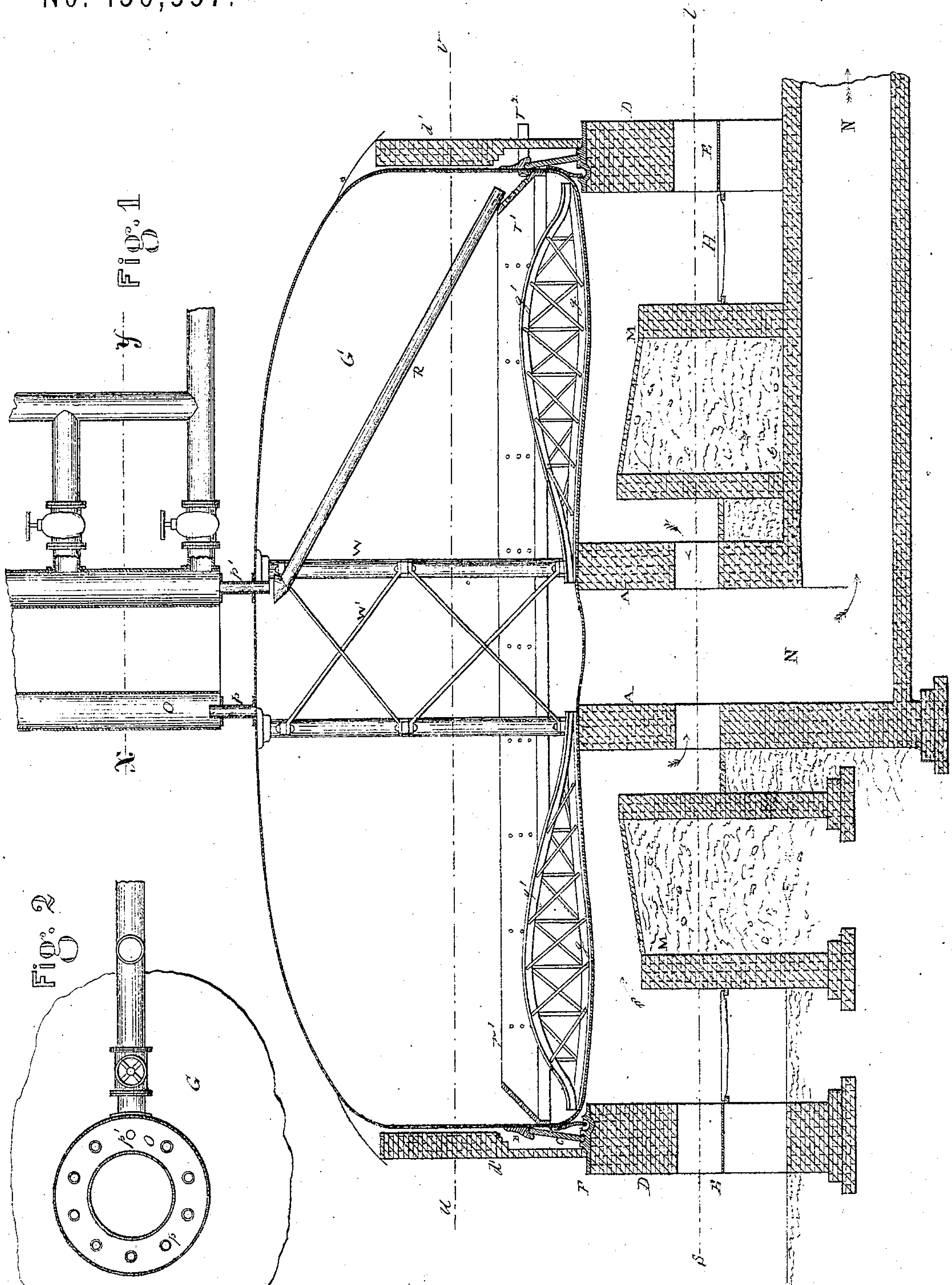
2 Sheets--Sheet 1.

J. L. STEWART & J. B. DUBLER.

Oil-Stills.

No. 136,557. Patented March 4, 1873.



Wit: Edw. Brown, Sam McFarland

John L. Stewart.
John. B. Dubler

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2 Sheets--Sheet 2

J. L. STEWART & J. B. DUBLER.

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Fig: 3

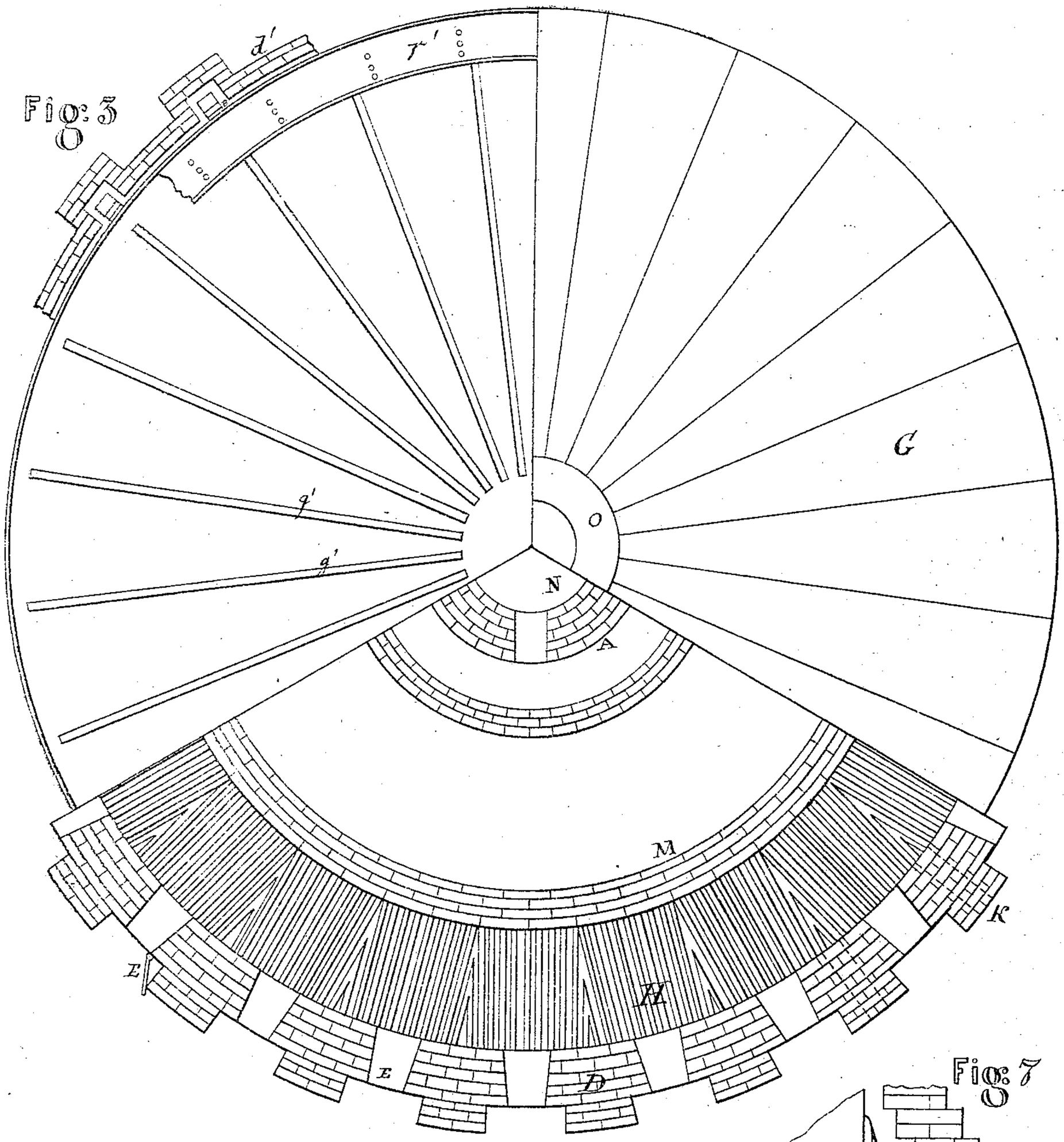


Fig: 4

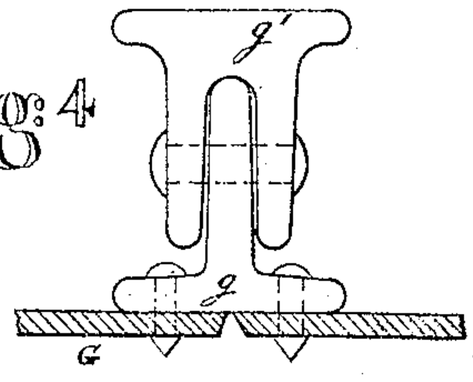


Fig: 5

Fig: 6

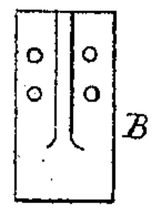
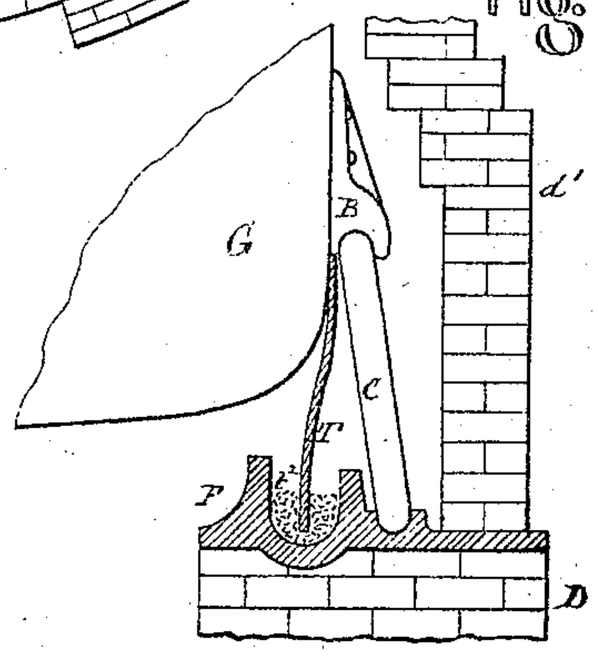


Fig: 7



Witnesses { Edw^d Brown
Park W^m Jordan

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AM. PHOTO-LITHOGRAPHIC CO. N.Y. (OSBORNE'S PROCESS.)

UNITED STATES PATENT OFFICE.

JOHN L. STEWART AND JOHN B. DUBLER, OF PHILADELPHIA, PA.

IMPROVEMENT IN OIL-STILLS.

Specification forming part of Letters Patent No. 136,557, dated March 4, 1873.

To all whom it may concern:

Be it known that we, JOHN L. STEWART and JOHN B. DUBLER, both of Philadelphia, Pennsylvania, have invented certain Improvements in Petroleum-Stills, of which the following is a specification:

Our invention consists chiefly in the mode of bracing the still, and supporting it over the fire; also in the device for returning the condensed oil back to the still; also, the construction and arrangement of the fire and brick-work.

Figure 1 is a vertical section through the still. Fig. 2 is a plan of the central collecting-chamber. Fig. 3 is a top view of the still, showing a section of the interior on the line *u v*, and also a section through the fire-place on the line *s t*. Figs. 4, 5, 6, and 7 are details on an enlarged scale.

Great difficulty is incurred in operating large circular stills which are set in the usual manner upon brick-work. It is caused by the expansion of the bottom of the still, thrusting out the side walls, and buckling up the bottom, and otherwise injuring and straining the iron-work of the still.

To avoid this injury, we support the still at the center by the circular wall A, which forms the chimney-flue for the fires. On the outside wall of the still we rivet the brackets B, (see Figs. 5 and 6,) twenty-four in number in the present instance, to correspond with the number of fire-doors. The brackets rest upon flat links or still-carriers C, about two feet long, two inches thick, and ten inches wide. The lower ends of these links rest upon cast-iron plates F, placed upon the front wall D of the fire-place. This construction permits of a free expansion of the bottom of the still by heat, and makes the whole surface of the bottom available for the action of the fire upon it.

In very large stills, such as the one here described, which is of thin sheet-iron and forty feet in diameter, this mode of supporting is not sufficient of itself, as the weight of the oil and the heat of the fire is certain to make the bottom sheets sag and settle out of shape. To prevent this, we truss the interior of the bottom of the still with truss-beams, each one being placed in a radial line with the still-carriers C, and between the fire-doors E. We make this truss of a lower flanged chord, *g*, riveted to the bottom of the still, and an upper cast-iron beam, *g'*, riveted at one end only to the lower chord, and free to expand at the other end. The space between the lower chord and the top beam is braced, as is usual, with truss-girders. In Fig. 4 will be seen an end view of the truss, showing the shape of the top beam and bottom chords.

We do not confine ourselves to the form of truss-beam here shown, as a single beam with pendent links and crow-feet would answer the purpose.

This construction of the bottom and mode of supporting the still permit us to dispense with the usual division-walls between the fires, and to make one continuous circular grate, H, beneath the still, as shown in Fig. 3. This arrangement gives a far more equal and uniform circulation of the heat beneath the still, and saves much heat which would be absorbed by the division-walls, and lost.

D is the outside wall; E, the fire-doors. Small circular holes, for inserting a poker between the fire-doors, are shown at K. The heat and gases from the fire pass over the bridge-wall M, in the direction of the arrows, and out through the flue N. On the plates F a circular brick wall, *d'*, is built up, leaving an air-space between it and the still, which can be opened or closed by doors in the brick-work, as may be necessary during the operation, for the purpose of keeping the iron sides of the still hot or cold. To prevent the heat from the fire passing out through the air-chamber above described, we rivet a wrought-iron flange, T, all around the lower corner of the still. This flange dips into a cup, t^2, which is cast in the plate F, and filled with dry sand. The expansion of the still does not disturb the position of the sand sufficiently to admit of the passage of a current of air. Upon the top of the still G is an annular chamber, O, into which the vapor rising from the still enters through the nine pipes *p*, which project a little above the bottom of the chamber. The other, *p'*, is flush with the bottom, so that any vapor condensed within the chamber O will run back into the still, down the pipe R, and into the circular trough or shelf *r'*, riveted to the side of the still. This trough has rows of holes in it, out of which the condensed vapor finds its way into the still after it rises above the level

of the lowest row of holes. By opening a cock in the pipe r^2, communicating with the bottom of this trough, the condensation may all be drawn off instead of running back into the still. This becomes necessary during certain periods of the operation, and of course after the level of the main body of the petroleum has fallen below the level of the trough r^1. For the support of the roof of the still and the weight of the iron-work above it, we place four cast-iron columns, W, between the floor and the roof of the still, and immediately over the brick-work A. These columns W are braced across by the stay-rods W′.

We do not claim the central hollow pier A, as that is previously in use.

What we claim as our invention is—

1. The still-carriers C, so arranged as to support the still by its exterior circumference, as and for the purpose herein described.

2. The radial trusses g', arranged within and upon the bottom of the still, as herein described.

3. The combination of the still-carriers C, the radial trusses g', and the central stationary support A, operating in conjunction to support the still, substantially as herein described.

4. The annular grate H, arranged as herein shown beneath the bottom of the still G, in combination with suitable firing-doors E, arranged at intervals around it.

5. The shelf r^1, arranged in combination with the outside shell of the still, for collecting and conducting off the condensed vapor, as herein shown and described.

6. The expansion joint formed by the flange T, the lower edge of which dips into a circular groove, t^2, as herein shown and described.

7. The trussed columns W, connecting the top and bottom of the still, arranged vertically over the circular wall of the central pier, as and for the purpose herein described.

JOHN L. STEWART.
JOHN B. DUBLER.

Witnesses:
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PARK MCFARLAND.