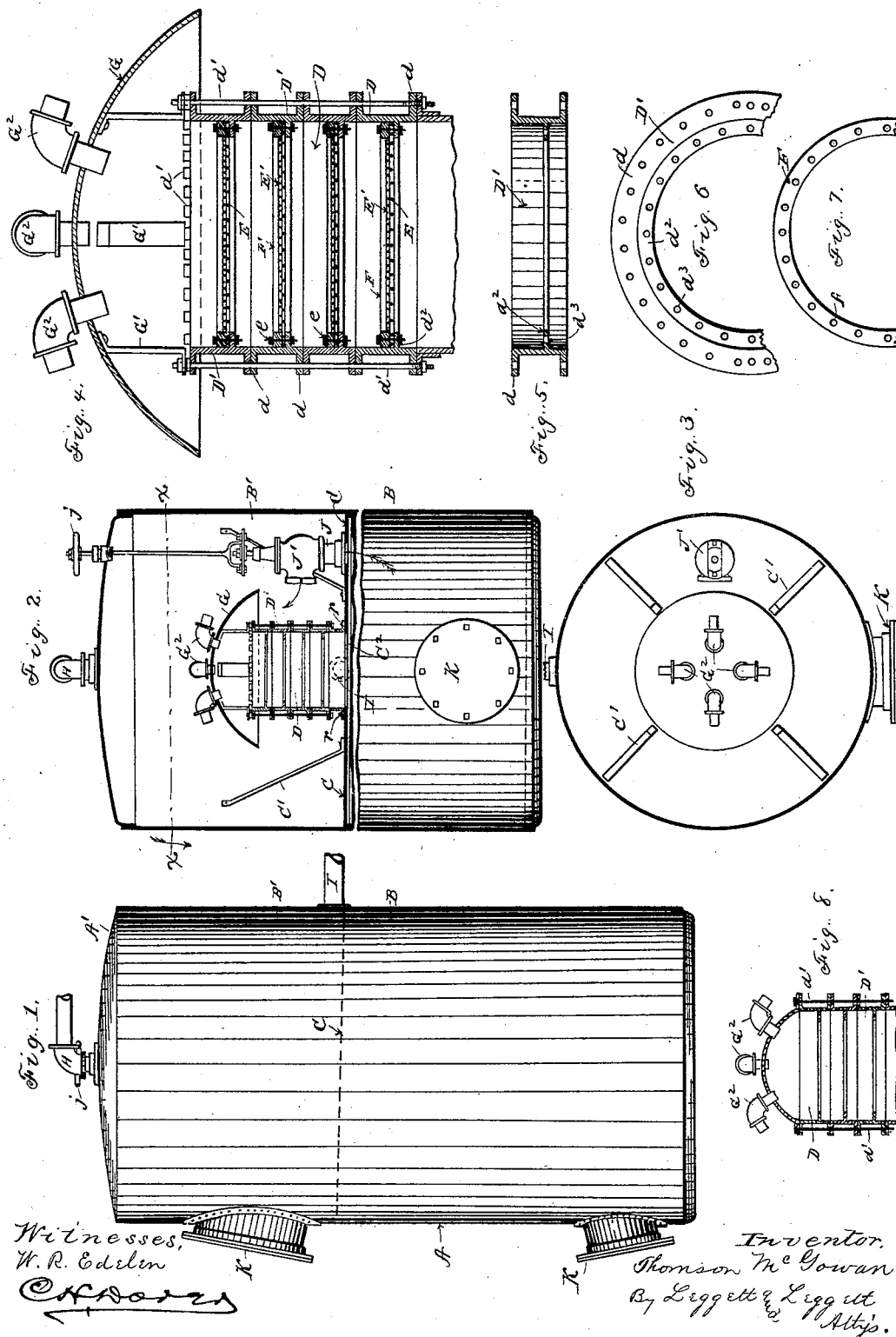


(No Model.)

T. MCGOWAN.  
APPARATUS FOR DISTILLING.

No. 454,061.

Patented June 16, 1891.



# UNITED STATES PATENT OFFICE.

THOMSON MCGOWAN, OF CLEVELAND, OHIO.

## APPARATUS FOR DISTILLING.

SPECIFICATION forming part of Letters Patent No. 454,061, dated June 16, 1891.

Application filed August 8, 1890. Serial No. 361,458. (No model.)

*To all whom it may concern:*

Be it known that I, THOMSON MCGOWAN, of Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Apparatus for Distilling; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use the same.

My invention relates to improvements in distilling and purifying apparatus, more especially for treating hydrocarbons; and it consists in certain features of construction and in combination of parts hereinafter described, and pointed out in the claims.

In the accompanying drawings, Figure 1 is an elevation of an upright cylindrical still. Fig. 2 is a central vertical section of the upper portion of the still, the lower portion of the still being shown in elevation. Fig. 3 is a section on line *xx*, Fig. 2. Fig. 4 is an enlarged view in vertical section of the cylinder and attachments for holding the purifying material. Fig. 5 is a transverse section of one of the sectional castings or rings of the cylinder. Fig. 6 is a plan of a portion of one of the sectional rings or castings, showing the annular internal and external flanges thereof. Fig. 7 is a plan of the ring that retains in place the screen for supporting the purifying material. Fig. 8 is a modification in vertical section of the cylinder. The still of course may be of any desired form; but I prefer the cylindrical form shown.

A represents the still, and A' the dome of the still. C represents a tight diaphragm that divides the still into two compartments B B'. The substance to be distilled and purified is placed in the lower compartment B. Diaphragm C is supported from beneath in any suitable manner, and is also braced from above—for instance, as shown at C'—to prevent sagging. The diaphragm has a central opening C<sup>2</sup>, connecting with a cylinder or container D, the latter being supported by the diaphragm and being in open relation at the upper end with compartment B'. Cylinder or container D is composed of hollow castings or rings D' of the same diameter, and preferably three or four in number, placed one above the other, as shown more clearly

in Fig. 4. Each section or ring D' has an annular external flange top and bottom *dd*, provided with holes, as shown more clearly in Figs. 4 and 6, for the reception of assembling-bolts *d'*, that secure the rings or sections D' together, the bottom section or ring being also secured to the diaphragm, preferably by riveting, as shown at *r* in Fig. 2. One or more of sections D' (or all, as shown in the drawings) have also an annular internal flange *d*<sup>2</sup> for supporting a coarse-wire screen E, the latter being retained in place by a ring F, flange *d*<sup>2</sup> and ring F being provided with holes *d*<sup>3</sup> and *f*, respectively, for the reception of bolts *e*, that secure these parts together. A screen E may also be provided directly over the opening in the diaphragm and supported by the latter. Upon the coarse screens E is preferably placed a fine screen of wire-gauze E', and upon the latter is placed the purifying material.

G is a hood, usually of sheet or plate metal, located directly over the cylinder and supported in any suitable manner, preferably by brackets G', the latter being secured at one end to the upper end of cylinder D and at the other end to the inner or under surface of hood G, as shown more clearly in Fig. 4. Hood G is preferably provided with a series of openings, in which are secured bent tubes G<sup>2</sup>, discharging into the upper compartment of the still. The function of the hood is to prevent any drippings or condensed vapor that has resulted from condensation in compartment B' from re-entering cylinder D. With the construction shown more clearly in Fig. 4 the openings and bent tubes in the hood might be dispensed with, as the openings between brackets G' would be sufficiently ample for the escape of vapor from cylinder or container D. Of course with the construction shown in Fig. 8, wherein hood G rests directly upon the cylinder D, the holes and bent tubes in the hood would be necessary.

H and I represent pipes for conducting off vapor and liquid, respectively, from the upper compartment of the still to condensers. (Not shown.) The vapor from the substance undergoing distillation passes into cylinder or container D, wherein it is thoroughly purified, and thence passes up through the cylinder and through the bent tubes G<sup>2</sup> and the

openings between brackets G' into the upper compartment of the still.

Diaphragm C, as shown more clearly in dotted lines, Fig. 1, is inclined toward discharge-pipe I, so that any drippings or liquid resulting from condensation in the upper compartment of the still will flow toward pipe I and there be discharged.

In the distillation of a substance the vapor of which cannot readily be purified during the distillation the purifying material and screens in cylinder D can be removed and the vapor allowed to pass up through the cylinder into the upper compartment B'.

It will be observed that the construction of cylinder D and its attachments is such that the component parts thereof can be readily separated for cleaning, repairs, and other purposes.

J represents a pipe leading from the lower to the upper compartment of the still, through which pipe the vapor may pass when it is unnecessary for its purification to pass the vapor through cylinder D, a cock or valve J', that opens into the upper compartment being provided. Cock or valve J' has connected therewith suitable attachments and a rod leading outside the still, where a wheel or other suitable device is provided, by manipulating which the valve or cock may be closed or opened.

Each compartment of the still is provided with a man-hole K, whereby access may be had to the respective compartments for cleaning, repairs, and other purposes.

What I claim is—

1. The combination, with a still and a diaphragm for dividing the still into two compartments, of a cylinder or container located over an opening in the diaphragm and supported by the latter, said cylinder or container having one or more screens supported thereby, and having a perforated hood with bent tubes, substantially as and for the purpose set forth.

2. The combination, with a still, of a diaphragm dividing the still into two compartments, said diaphragm having an opening, a cylinder or container located over said open-

ing, said cylinder or container supporting one or more screens and a hood, and openings between the hood and cylinder, substantially as and for the purpose set forth.

3. The combination, with a still, of a diaphragm dividing the still into two compartments, of a cylinder or container located over an opening in the diaphragm and supported by the latter, and a screen located directly over said opening, the cylinder or container having a hood connected therewith and being in open relation with the two compartments of the still, substantially as and for the purpose set forth.

4. The combination, with a still, of an inclined diaphragm located between the dome and bottom of the still, the diaphragm having an opening, a cylinder or container located over the hole in the diaphragm, said container or cylinder having one or more screens connected therewith, and discharge-pipes leading from the still for conducting off the products of distillation, substantially as and for the purpose set forth.

5. The combination, with a still, of an inclined diaphragm dividing the still into two compartments, a cylinder or container for holding purifying material located over said opening, said cylinder or container having a hood connected therewith and being in open relation with the two compartments of the still, a discharge-pipe leading from the upper compartment at a point just above the lower end of the inclining bottom and one located above this pipe for conducting off the products of distillation, and a pipe for conducting vapor directly from the lower into the upper compartment of the still, said pipe having connected therewith a cock or valve, the latter having suitable attachments for operating said cock or valve from without the still, substantially as set forth.

In testimony whereof I sign this specification, in the presence of two witnesses, this 16th day of July, 1890.

THOMSON MCGOWAN.

Witnesses:

CHAS. H. DORER,  
WARD HOOVER.