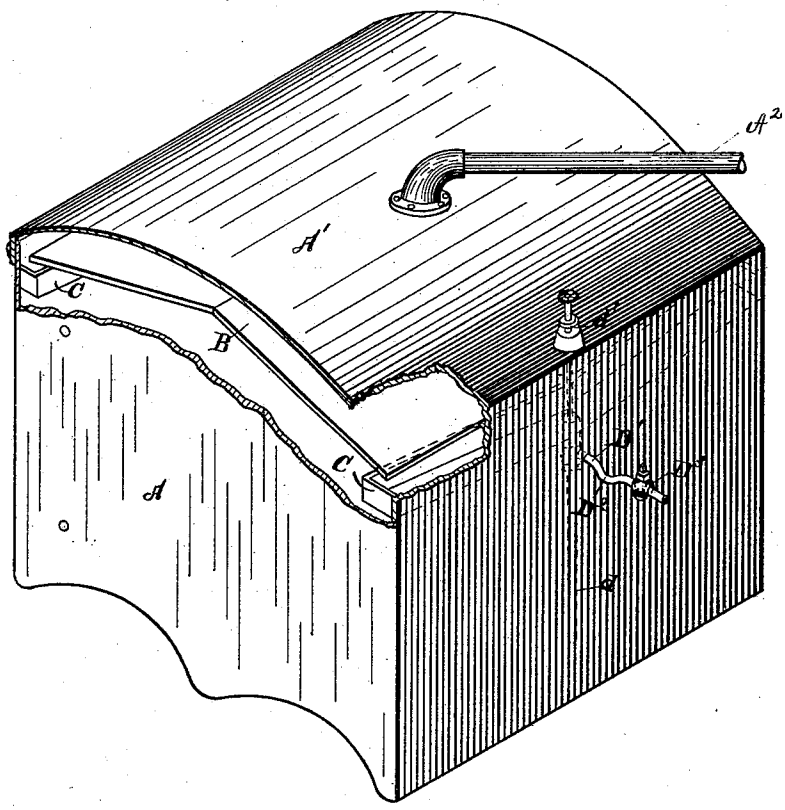
(No Model.)

T. McGOWAN.

APPARATUS FOR DISTILLING HYDROCARBONS.

No. 443,328. Patented Dec. 23, 1890.

Fig. 1



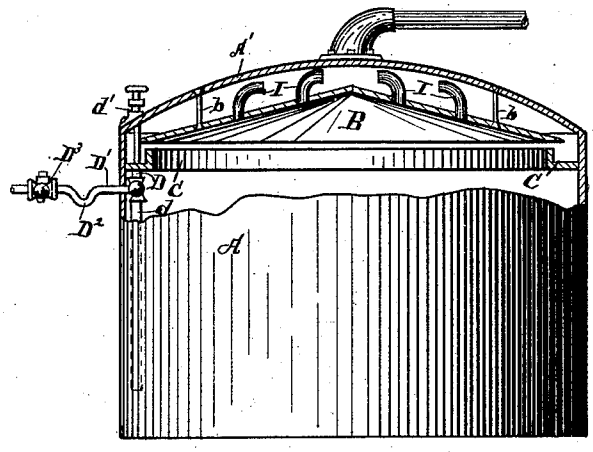


Fig. 2

Witnesses.
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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

THOMSON McGOWAN, OF CLEVELAND, OHIO.

APPARATUS FOR DISTILLING HYDROCARBONS.

SPECIFICATION forming part of Letters Patent No. 443,328, dated December 23, 1890.

Application filed January 13, 1890. Serial No. 336,825. (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 Hydrocarbons; 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 apparatus designed more especially for distilling hydrocarbon oil; and it consists in certain features of construction and in combination of parts hereinafter described, and pointed out in the claims.

Stills for such purpose are of various forms, the top walls whereof are usually provided with one or more discharge-pipes, through which the vapor escapes to a condenser. Owing more especially to the top of the still and to the discharge-pipe being exposed to the air, more or less of the oil-vapor is condensed by contact therewith, such condensed vapor falling back into the body of material in the still. This is objectionable for various reasons, among which may be mentioned the extra heat required to revaporize this returned oil, and, second, the revaporizing thereof is likely to deteriorate the oil.

In view of the foregoing I have devised the apparatus illustrated in the accompanying drawings.

Figure 1 is a view in perspeetive of a rectangular still. Fig. 2 is a front elevation of an upright cylindrical still. In either figure portions are broken away to show the internal construction.

For the purpose of applying my invention the still may be of any desired form. Hence two well-known varieties are shown.

A represents the sides of the still, and A′ the top wall thereof, the latter being provided with one or more discharge-pipes A^2, leading to a condenser. (Not shown.)

For illustrating my invention it is only necessary to show the top section of the still, and hence the bottom section and various other devices are omitted, as they have no bearing on the case. Inside the still, and located a few inches below the top wall thereof, is a diaphragm or so-called "drip-roof" B, usually of sheet or plate metal, the same being suspended, preferably, by rods *b*, depending from the top (wall) of the still. However, the means of support is not material. The drip-roof should not come in such close proximity to the side walls of the still as to prevent the free passage of the oil-vapor up past the edges of the roof—say an inch space, more or less, according to the size of still. Between the edges of roof B the side walls of the still will usually be found ample for the purpose.

C is a trough, or, if need be, a series of troughs arranged along the inside of the side walls of the still just below roof B and in position to catch the drip from this roof.

One or more outlets, according to circumstances, are provided for discharging the contents of the trough or troughs, such outlets being preferably arranged substantially as shown, to wit: From the lowest point of a trough an opening is made through the bottom thereof, this opening being preferably screw-threaded for attaching pipe D. This pipe has a branch D′, leading outside the still, where it is provided with trap D^2 and valve D^3. By opening this valve the contents of the trough or troughs may be drawn off from time to time, or the valve may be left partially open, so that the discharge may be continuous, in which case the trap is supposed to prevent the escape of vapor from the still; also, is provided a branch pipe *d*, leading down inside the still to near the bottom thereof. The upper end of this pipe is closed by means of plug-valve *d′*, the stem whereof extends outside the still, as shown, where it is provided with a suitable hand-wheel or device of some kind for manipulating the same. The pipe *d* is always closed and remains so during the distillation, and this pipe is only opened at the end of the distillation to draw off a heavy dark-colored distillate that in small quantities will be found remaining in the trough, in order that this residuum may be discharged into the crude oil of the next charge. In case it is desired to discharge any or all the contents of the trough or troughs into the still, valve *d′* is opened, and by means of pipe *d* any splashing of the oil is prevented. With such construction the oil-vapor con-

densed above the line of roof B may be all gathered in the troughs and discharged outside of the still.

In some instances the top wall or roof of the still may have such inclination or pitch that the drip will adhere to and run down the same; also, where it is desired, the drip-roof may have other openings than that at the periphery thereof. In Fig. 2 the drip-roof is shown having a series of openings, each provided with a bent tube I, the functions of the bent tube being to prevent the drip from returning through the opening in the drip-roof. Any openings through the drip-roof so arranged that the drip will not return through such openings will answer the purpose, and to this end the drip-roof may be made in overlapping sections shingle-fashioned.

What I claim is—

1. In a distilling apparatus, the combination, with a still and a trough on the inside wall or walls of the still, of a diaphragm located between the trough and the dome of the still, pipes in said diaphragm for the upward passage of vapor, and a discharge opening or pipe leading from the trough outside of the still for conducting off the products of distillation, substantially as set forth.

2. The combination, with a still and a trough on the inside wall of the latter, of a diaphragm located between the trough and the dome of the still, pipes in said diaphragm for the upward passage of vapor, discharge-pipes leading from the trough outside of the still, and a pipe leading from the trough into the still for the removal of residuum, substantially as set forth.

In testimony whereof I sign this specification, in the presence of two witnesses, this 29th day of November, 1889.

THOMSON McGOWAN.

Witnesses:

CHAS. H. DORER,

WILL B. SAGE.