

UNITED STATES PATENT OFFICE.

CHARLES W. GRANNIS, OF GOWANDA, NEW YORK.

IMPROVED CONDENSER FOR COAL-OIL STILL.

Specification forming part of Letters Patent No. 36,403, dated September 9, 1862.

to all whom it may concern:

Be it known that I, CHARLES W. GRANNIS, of Gowanda, in the county of Erie and State of New York, have invented a new and improved condenser for use in the distillation of petroleum or rock oil, coal-oils, and other distillation; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure I is a longitudinal vertical section of my improved condenser in combination with a caldron. Fig. II is a transverse vertical section of the same.

The nature of my invention relates to the construction and use of a condenser in the form of a roof or cover to sit on and over a caldron (or kettle) containing oil for distillation, which condenser is provided with an internal flange or trough for conducting off the condensed vapors to an external conductor; also, in providing an apparatus for throwing jets or streams of cold water upon the outer surface of the condenser.

Letters of like name and kind refer to like parts in each of the figures.

A represents a large cast-iron caldron or kettle, or still, eight feet in length, three feet in depth, and seven feet in breadth, (more or less,) having a horizontal flange or rim, as shown at *a'*, for supporting the condenser, and a vertical flange or rim, *a''*, for the purpose of a trough to collect and conduct off the water which is thrown upon the outside of the condenser. This caldron is suitably set in an arch or furnace of brick-work, as shown at A'.

B represents the condenser. It is made of metal in the form of a roof or cover to sit upon and over the caldron. It has two sloping sides.

The essential feature of making an internal trough to catch and conduct the condensed vapors and of giving sufficient inclination to the sides of the condenser to insure the condensed vapor to run down the internal surface to the trough must in all cases be observed, whatever may be the configuration of the condenser or cover. It has a flange at its base, as shown at *b'*, which sits on the horizontal flange or rim of the caldron and inside of the vertical rim. It is bolted or otherwise securely and tightly fastened to the horizontal flange of the caldron, making a steam-tight

and water-tight joint thereon. Upon the inside, and near the bottom, is formed a trough, as shown at *c*, for catching and conducting away the vapors which are condensed upon the broad internal surface of the condenser. This trough connects with the external spout, D.

At E is represented a water-pipe placed over the condenser and lengthwise thereof, having small apertures *e'* for spurting cold water upon the outer surface of the condenser.

F is a supply-pipe connecting with a reservoir of cold water and supplying the pipe E with sufficient water for cooling the condenser.

As a modification I have contemplated carrying the vertical rim of the caldron up sufficiently high to form a large water-tank, so that the outside of the condenser will be immersed in cold water, in which case the pipes E and F would be dispensed with.

G represents a waste-water pipe for carrying off the water from the trough after it has fallen upon the condenser. The spout or pipe D conducts the distilled oils from the condenser to the worm or cooler. A trough, H, is placed around the pipe D, which contains cold water for cooling the pipe.

I represents a spout for carrying off the sediment which accumulates in the bottom of the caldron.

J represents a man-hole, and which may also be used for admitting oil into the caldron.

Operation: The caldron is filled nearly full of petroleum or rock oil (or other oil, as the case may be) and a hot fire made in the furnace under the caldron. When the temperature is sufficiently high, the vapors arising from the boiling oil will impinge upon the internal inclined sides of the condenser and become condensed thereon and run down into the trough *c*, from whence they are conducted through the pipe D to a worm or cooler. The condenser being placed over and upon the caldron and in such close proximity to the boiling oil that it acts with great efficiency, all the vapors arising from the boiling oil are caught by its broad cold inclined surfaces, and the condensation and conduction are so rapid and complete that nearly twice the quantity of oil can be distilled in a given time than can be done in an ordinary distillery. The jets or streams of cold water thrown upon the outer surface will keep the condenser sufficiently cold for effective and rapid work.

I claim as my invention—

A condenser which combines the following features, to wit: first, sloping sides; second, an internal trough to catch and conduct the condensed vapors to an external conductor; third, an external spout or conductor passing through or in a trough of cold water to conduct the condensed vapors to the worm or cooler; fourth, jets of water or a body of cold water upon its outside, in combination with

a caldron or still having a broad open top, upon which the condenser is fitted, forming a cover thereto, so that the vapors arising from the entire surface of the oil in the still may pass directly to the condenser, substantially as described.

CHAS. W. GRANNIS.

Witnesses:

W. H. FORBUSH,
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