

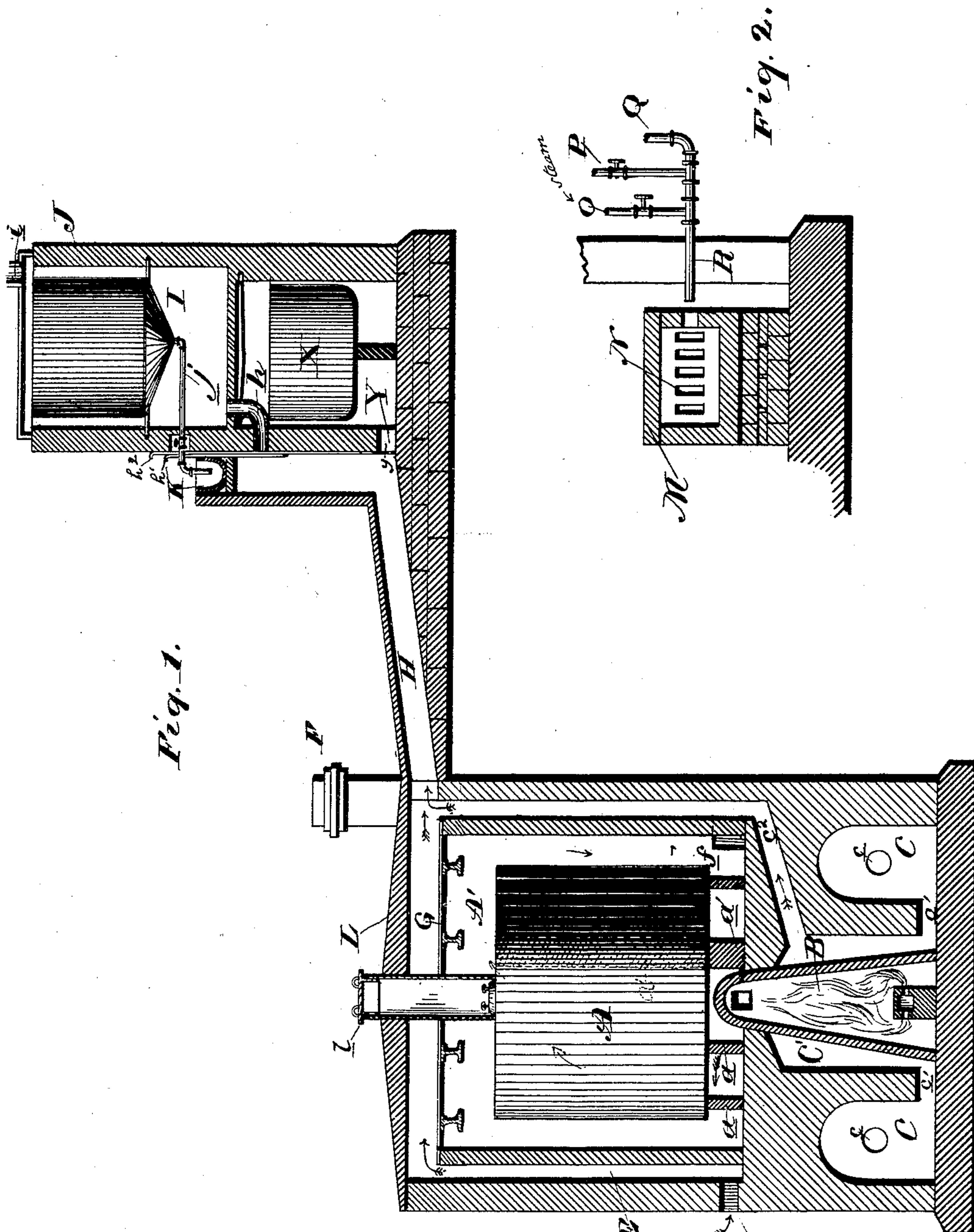
(No Model.)

R. C. CLARK & M. H. WARREN.

STILL AND FILTER.

No. 318,698.

Patented May 26, 1885.



WITNESSES

W. Engel
Geo. W. Kim

Rollin C. Clark INVENTOR
Murray H. Warren
by Leggett & Leggett ATTORNEYS

UNITED STATES PATENT OFFICE.

ROLLIN C. CLARK AND MURRAY H. WARREN, OF CORRY, PENNSYLVANIA.

STILL AND FILTER.

SPECIFICATION forming part of Letters Patent No. 318,698, dated May 26, 1885.

Application filed December 26, 1883. (No model.)

To all whom it may concern:

Be it known that we, ROLLIN C. CLARK and MURRAY H. WARREN, of Corry, in the county of Erie and State of Pennsylvania, have invented certain new and useful Improvements in Stills and Filters; and we 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.

Our invention relates to an improvement in stills and filters, designed more especially for the reduction or refining of hydrocarbon oil, and is adapted more especially to the use of crude petroleum-oil or light hydrocarbon for fuel.

Our invention consists in the parts and combinations of parts, as will be more fully described, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a vertical section of a heat-generator and the plant in which are located the still and filter, shown in elevation. Fig. 2 is a vertical section of a breaker, and in elevation the pipes constituting an apparatus for burning crude petroleum-oil.

A represents a still located in the chamber A', and resting upon the supports *a*, that elevate the still some distance above the floor of the said chamber. A bridge-wall, *a'*, extends under the still and up the sides thereof, and closes the opening between the still and the walls of the chamber, and divides the chamber into two parts, so that the heat in passing from one part of the chamber to the other part must pass up around one side and over the top of the still and down the other side of the still in its route to the chimney F.

B is the heat-generating furnace, extending up through the floor of the chamber A', and arched at the top, as shown, and provided with openings on opposite sides for discharging the air in lateral directions into the chamber A'.

In the position of parts as shown the products of combustion enter the said chamber on the left-hand side of the bridge-wall *a'*, and must first pass up around the sides and over the top of the still, then down around the other side of the still on the right-hand side of the bridge-wall, then through an orifice, *f*, into the chimney F.

C are air-chambers provided with openings *c* and passage-ways *c'*, leading into the chamber C', that surrounds all but the upper portion of the generator B. Air admitted through the opening *c* passes to the chamber C', and is then heated by radiation from the generator, and passes on through the duct *c'*, at the upper end of which it is joined by a current of air admitted by a damper through the orifice *e* into the passages E. From thence it passes over the iron floor G, that covers the chamber A', and is then heated by the radiation of heat transmitted through the floor from the said chamber below. The united currents of heated air pass through the duct H, and by means of a damper, *h'*, and the tube or passage-way *h* into the chamber I, that surrounds the filter J. This filter is provided with discharge-pipe, *j*, leading into the trough K, that, being located over the end of the duct H, is heated, therefore, sufficiently for the purpose for which it is used. There is also an opening, *i*, at the top of the chamber, provided with a damper, by means of which surplus heat may be discharged. Other openings provided with dampers may be had to admit air to cool the filter when required. Thus it will be seen that by raising the damper *h'* communication between the chamber inclosing the filter and the hot-air flue or duct H is opened and the hot air permitted to enter said chamber and heat the filter to the desired degree. After the proper temperature is reached it can be maintained by opening one or more dampers for the escape of any excess of hot air entering the chamber.

X is a tank set in the heating-chamber Y, into which the filtered oil may be drawn and kept warm by means of heated air admitted in the said chamber through the duct or passage-way *y*, which can be closed by slide or damper *h''*, when it is desired to exclude the hot air.

L is a casing extending from the outside of the structure to the top of the still, and inclosing the man-hole *l*, by means of which access may be had to the inside of the still.

The walls of the entire structure are made preferably of brick.

When the products of combustion are admitted directly into the chamber surrounding the still, it is essential that fuel be used

that will produce little smoke, soot, or other refuse, as this would soon clog the said chamber and adhere to the still, so that the device would become inoperative. We have therefore invented what is known as a "breaker," by means of which we are enabled to use crude petroleum-oil for fuel.

O, P, and Q are pipes, each provided with a valve, and respectively for steam, oil, and air, that join the pipe R in such a manner that the current of steam through the pipe O draws with it the oil and air that are ignited at the mouth of the pipe R, the flame of which is projected into the breaker M, when the jet of flame impinging against the walls thereof is broken and discharged through the side openings, N. By means of breaking the flame and changing the direction thereof, as aforesaid, a large amount of air is commingled with the flame, greatly increasing the degrees of heat, and thereby lessening the amount of oil required. The breaker is built preferably of fire-brick, and closed on top and at the ends, except the orifice where the flame enters. With this arrangement for supplying heat little or no smoke or soot passes beyond the generator B. Such impurities as there may be in the oil are discharged at the mouth of the tube R, or in or about the said breaker.

The supply of steam, oil, or air may, any or all of them, be regulated at pleasure and the heat instantly increased or diminished.

The fire may be started at a moment's notice and extinguished as quickly, and a moment after extinguishing the fire a current of air may be admitted into the generator, and will, falling in the route, travel by the heat to the chimney F, and soon cool the still, so that it may be entered if required.

We make no claims to construction or arrangement of the pipes O, P, Q, and R, or to a still or filter inclosed respectively by air-chambers and heated with air.

What we claim is—

1. In an oil-still, the combination, with a heating-chamber and a still located therein, of a heat-generator located within an air-chamber and communicating directly with said heating-chamber, a hot-air flue leading from said air-chamber, and a chimney in open relation with the heating-chamber, substantially as set forth.

2. The combination, with a heat-generator located within an air-chamber and communicating with an upper chamber, and a still situated in said upper chamber over the generator, of a hot-air flue leading from the air-chamber upwardly alongside of the upper chamber, and a flue or chamber opening into the outer air and communicating with the hot-air flue, substantially as set forth.

3. The combination, with a heat-generator, a heating-chamber located over said generator and in communication therewith, and a metal cover or top for said chamber, of a filter and the flues c^2 and E, leading from around the heating-chamber to the filter, substantially as set forth.

4. The combination, with a still inclosed within a heating-chamber, a metal floor constituting the top of said chamber, and a filter, of a passage-way for conducting air over said metal floor to the filter, whereby the air is heated on its passage to the filter, substantially as set forth.

5. The combination, with a still inclosed within a heating-chamber, an air-chamber located below said heating-chamber, and a chimney communicating with the heating-chamber, of a heat-generator located partly within the air-chamber and terminating within the heating-chamber, and a hydrocarbon-burner constructed substantially as described and located within said generator, substantially as set forth.

6. The combination, with a heating-chamber, a still located therein, and a heat-generator located below said heating-chamber, of a filter inclosed within a chamber, a flue, E, passing directly over the heating-chamber, a flue connecting the heat-generator and filter-inclosing chamber and connecting with the flue E, and a damper for closing the opening between the flues and filter-inclosing chamber, substantially as set forth.

In testimony whereof we sign this specification, in the presence of two witnesses, this 11th day of December, 1883.

ROLLIN C. CLARK.
MURRAY H. WARREN.

Witnesses:

G. G. USHER,
B. D. CHADWICK.