J. B. GRANT.

Oil Still.

No. 57,311. Patented Aug. 21, 1866.

Fig. 1.

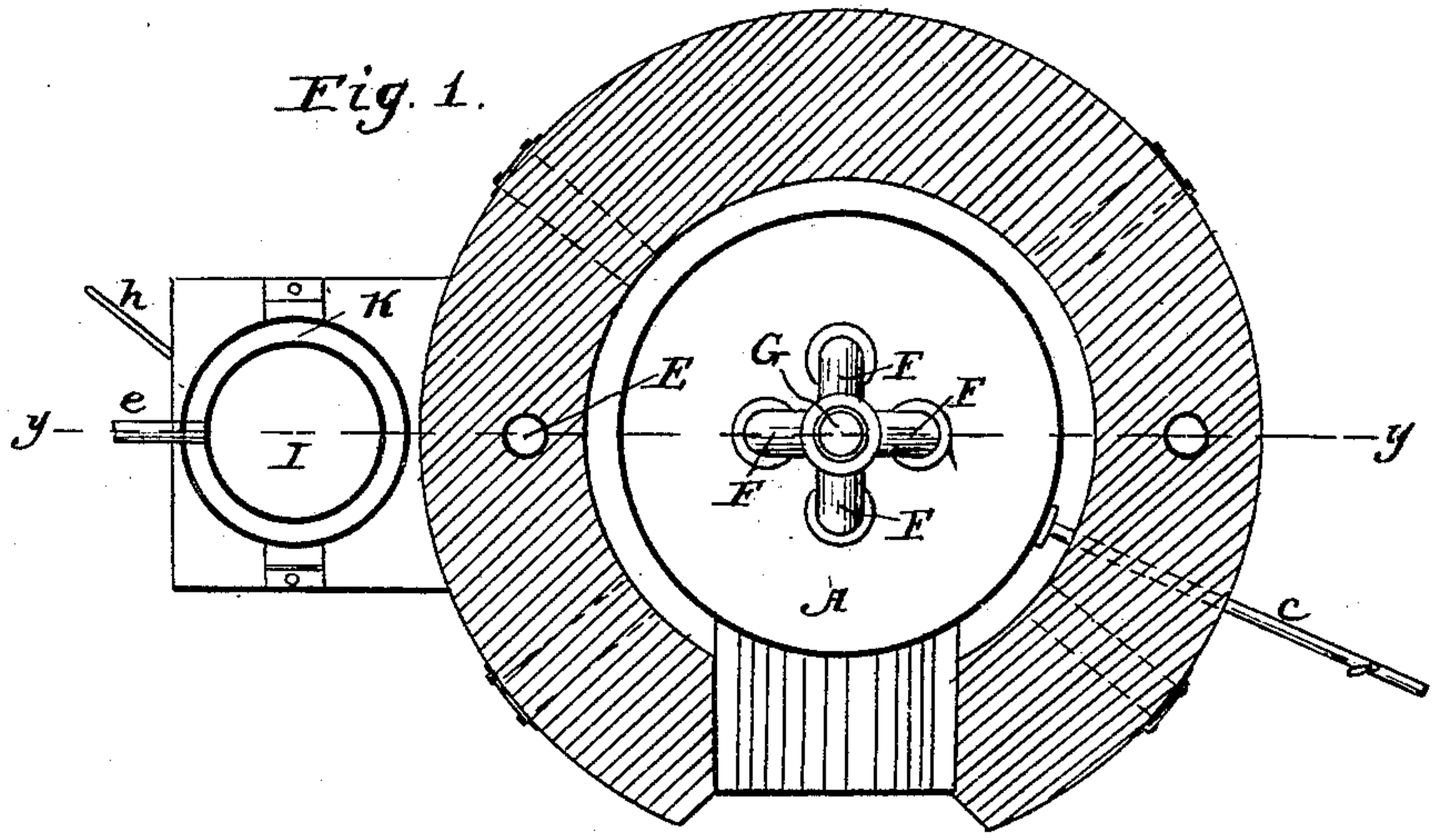
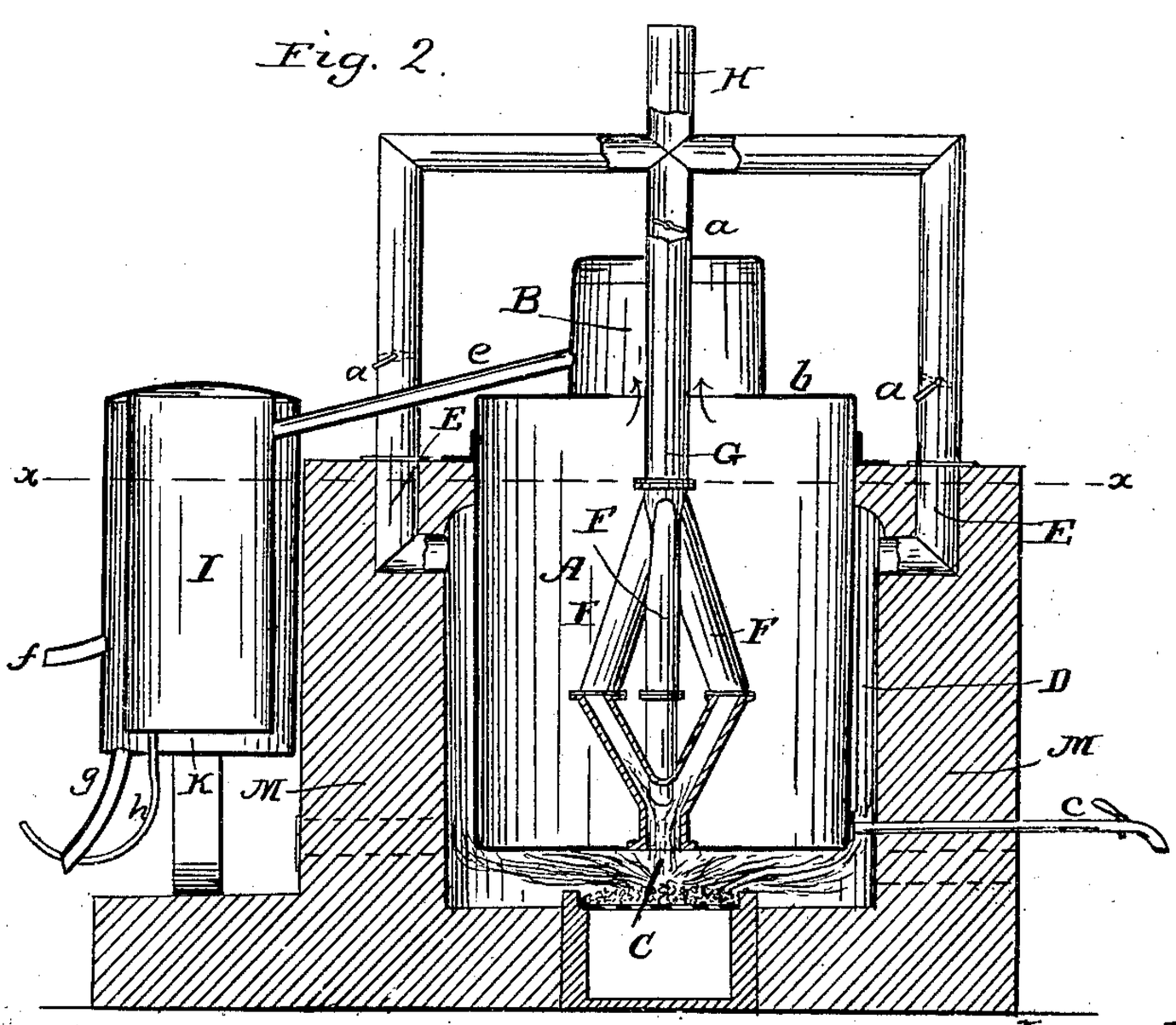


Fig. 2.



Witnesses:
F. A. Jackson.
W. Irwin.

Inventor:
J. B. Grant
Per Munn & Co
Attorneys.

UNITED STATES PATENT OFFICE.

JAS. B. GRANT, OF NEW YORK, N. Y.

IMPROVED APPARATUS FOR DISTILLING OIL.

Specification forming part of Letters Patent No. **57,311**, dated August 21, 1866.

To all whom it may concern:

Be it known that I, JAMES B. GRANT, of the city, county, and State of New York, have invented a new Improved Oil-Distilling Apparatus; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a horizontal section of the distilling apparatus, taken in the line *x x*, Fig. 2. Fig. 2 is a vertical section of the same, taken in the line *y y*, Fig. 1.

Similar letters of reference indicate like parts.

This invention relates to improvements in the distillation of petroleum and other similar substances for the extraction and refinement of oil therefrom; and it consists in the application of heating-pipes passing through the boiling or distilling vat, for the purpose of exposing a heating-surface within the body of the petroleum or other material, in addition to the exterior application of heat to the boiler, and also in the application of a condensing apparatus connected therewith, by which the vapors of distillation are rapidly and easily condensed.

A represents a still of ordinary construction, surmounted by a vapor-chamber, B, and set in mason-work M, as usual, with the furnace C beneath it. Around the still is a fire-space, D, between it and the masonry, from which lead exit-flues E E, for the products of combustion.

In the middle of the still A is built a system of pipes or fire-flues, F F F F, formed, by preference, like two cones united at their bases, the lower or inverted cone opening at its apex into the fire-chamber through the bottom of the still, and the upper cone uniting at its apex in one common flue, G, which leads up through the vapor-chamber B and connects with the exit-flues E E, forming a common escape-flue or chimney for the products of combustion.

On the pipes E E and G are dampers *a a a*, for regulating the draft and directing the products of combustion internally or externally upon the heating-surfaces of the still, as may be desired—that is to say, by closing the damper in the pipe G and opening one or both the dampers in the pipes E E, the products of combustion will be diverted from the interior of the still through the pipes F F F F, and be confined to the outside; but by opening the damper in pipe G and closing one or both of the dampers in the pipes E E, the heat will ascend through the pipes F F F F, so that by a little attention to the dampers the heat may be regulated and the distilling operation controlled perfectly.

In the top of the still is placed one or more man-holes, *b*, for the workmen to enter and clean out the residuum or repair the inside, as may be required. Leading from the still at the bottom is a pipe, *c*, for carrying off the residuum after every operation on a charge, or as required. Around the pipe G is a space, *d d*, for the vapor to ascend from the still A to the chamber B. Leading from the vapor-chamber B is a pipe, *e*, which conveys the vapors arising from the petroleum or other matter under distillation to the condensing apparatus, which I construct in the form of an internal cylinder, I, surmounted by an external cylinder, K. The space between the cylinders may be more or less, and is to be filled with cold water, which is introduced into it through the injection-pipe *f* and discharged from it through the ejection-pipe *g*. In the bottom of the internal cylinder, I, is a pipe, *h*, which conveys the oil to a suitable receiver. Three or four, more or less, ventilating holes or flues, provided with suitable dampers, pass through the mason-work to the under part of the still, as shown in red, for the purpose of admitting cold air from the outside and rapidly cooling the still when required.

The products of combustion proceeding from the furnace C, which pass through the pipes F F F F, act upon the material in the still A with great rapidity. The position, form, and arrangement of the pipes cause the heat to be diffused throughout the material in the still uniformly, no part being heated to excess, effecting thereby a rapid and regular distillation, and applying the heat economically. By the proper regulation of the dampers the heat

is so graduated that the oil-vapors are not scorched, and there is a larger yield of fine oil than can be had from the ordinary still.

The condensing apparatus works off the vapor and condenses the oil more rapidly than a worm, and is much cheaper and simpler in construction. By means of a force-pump the condensing-water may be used over frequently with a small constant addition of fresh cool water.

Having described the construction and operation of my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The employment, in apparatus or machinery for distilling and refining petroleum and other oils, of a series of heating-pipes set in the form of two cones, the bases of which meet, and through which the products of combustion from the furnace pass, all substantially as herein described.

2. The employment, in the same apparatus for condensing the vapors of petroleum and other oils, of a cylinder inclosed in another cylinder, with a space between them for the circulation of cool water, and suitable pipes for receiving and discharging the vapors and oils in and from the internal cylinder and the water in and from the external cylinder, all constructed substantially as herein described.

3. The general arrangement, combination, and method of operation of the apparatus or machinery, substantially as and for the purposes herein described.

The above specification of my invention signed by me this 2d day of July, 1866.

JAS. B. GRANT.

Witnesses:

WM. F. MCNAMARA,

ALEX. F. ROBERTS.