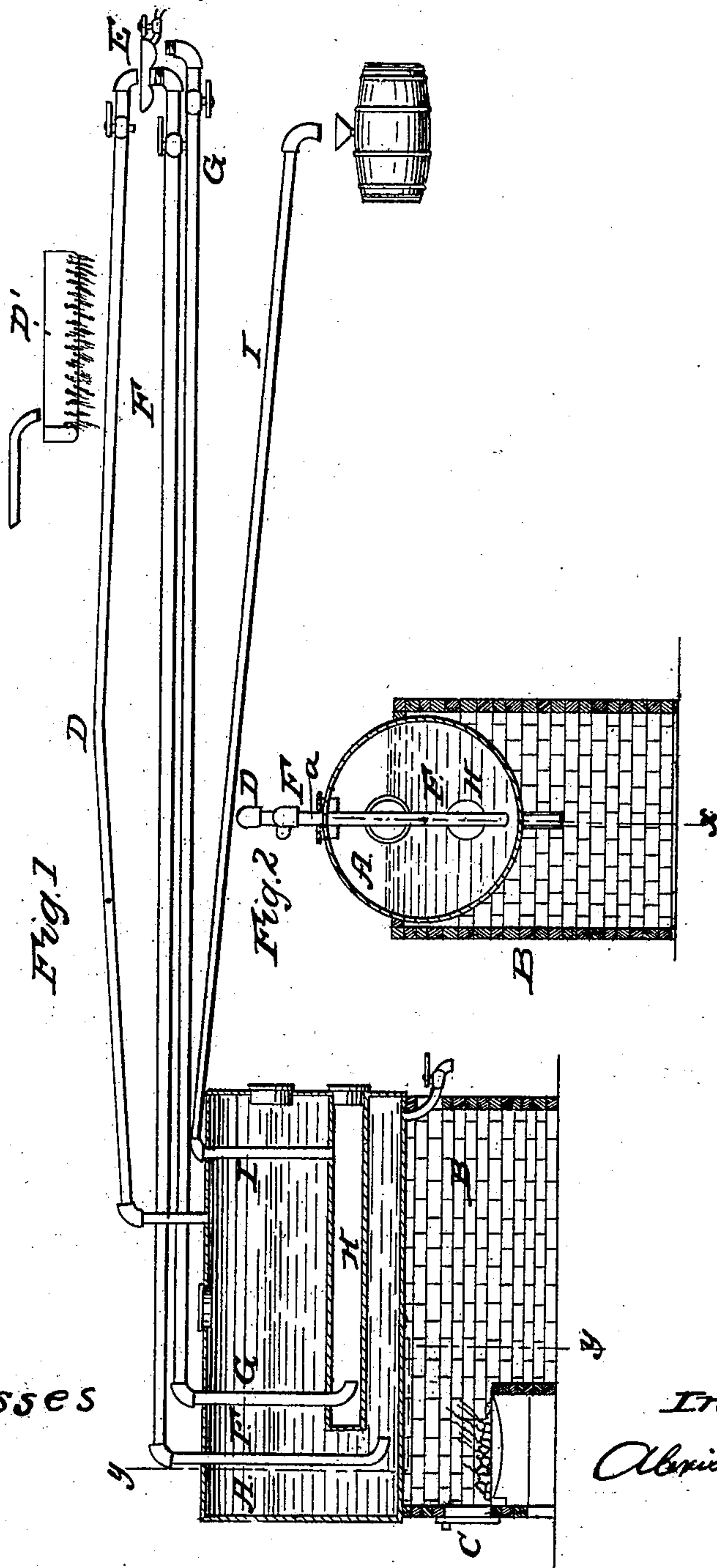


A. THIRAULT.
Distilling Rock Oil.

No. 41,871.

Patented March 8, 1864.



Witnesses
James O. Land
R. G. Hawley

Inventor.
Alexis Thirault

UNITED STATES PATENT OFFICE.

ALEXIS THIRAULT, OF NEW YORK, N. Y.

IMPROVEMENT IN DISTILLING ROCK-OIL.

Specification forming part of Letters Patent No. 41,871, dated March 8, 1864.

To all whom it may concern:

Be it known that I, ALEXIS THIRAULT, of the city, county, and State of New York, have invented a new and useful Improvement in the Distillation of Rock-Oil; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, in which—

Figure 1 represents a longitudinal vertical section of my invention, taken in the plane indicated by the line *xx*, Fig. 2. Fig. 2 is a transverse vertical section of the same, the plane of section being indicated by the line *yy*, Fig. 1.

Similar letters of reference indicate corresponding parts in the two figures.

The object of this invention is to combine, by cohobation and rectification, the explosive portions contained in rock-oil with the heavy oils, and to produce a safe, cheap, and good burning-fluid.

The invention consists, first, in subjecting crude petroleum or rock-oil to repeated evaporations by condensing the vaporous products in one and returning the condensed liquid to the still through another pipe in such a manner that the density of the product of evaporation gradually increases until the same attains the required density to render it fit for a safe and non-explosive burning-fluid.

It consists, second, in the arrangement of two pipes, one being provided with or passing through a condensing medium, and extending from the top, and the other from the bottom, of the still, in combination with a funnel-shaped conductor, which receives the condensed liquid from the first pipe and transmits it to the second in such a manner that the vapors of small specific gravity rising first from the material in the still pass through the first or condensing pipe, and thence, in the liquid state, through the conductor and through the second pipe back to the bottom of the still, where they are mixed with the less volatile parts of the material, and that this operation can be continued until the liquid emanating from the first pipe has assumed the desired density.

The invention consists, third, in the arrangement of a rectifier in the interior of the still, in combination with a pipe leading from said rectifier to the funnel-shaped conductor

in such a manner that the liquid emanating from the first or condensing pipe, on having reached the desired density, can be conducted in the rectifier, and the distillation finished at one operation.

To enable those skilled in the art to make and use my invention, I will proceed to describe its construction and operation with reference to the drawings.

A represents the still, which is made of sheet metal or of cast-iron, and which is placed on a furnace, B, built up of brick or other suitable material, and provided with a fire-door, C, and with a suitable grate, for the purpose of building and maintaining a fire to heat the still.

D is a pipe, which extends from the upper part of the still to a funnel-shaped conductor, E, and this pipe is either made so long that the vapors in passing through it are condensed by the action of the air, or it may be arranged under a condenser, D', through which a continuous spray of cold water is thrown on said pipe, or it may pass through a vessel containing cold water or some other condensing medium. The vapors, after having been condensed in the pipe D, are discharged into the funnel-shaped conductor E, which connects either with the pipe F or with the pipe G. The pipe F leads back to the still and nearly down to its bottom, and the liquid which has been condensed in the pipe D, and which is discharged from this pipe into the conductor E, runs back into the still through the pipe F.

It is obvious that in distilling petroleum or other similar liquid the light and explosive oils are first vaporized. By the action of the pipes D F these oils, after having been condensed in the pipe D, are returned to the still and mixed again with the liquid contained in the same, and this operation is continued until the liquid emanating from the pipe D shows the desired density, rendering the same fit and safe for illuminating purposes. If this point has been reached, the pipe F is unscrewed from the conductor E and replaced by the pipe G. This pipe extends from the conductor through the still into the rectifier H, which consists of a cylindrical vessel situated in the interior of the still and in its lower part, where the same is brought to a high temperature by the action of the fire

heating the still. In this rectifier the liquid introduced into it by the pipe G undergoes the final distillation, and the vapors formed in the rectifier pass off through the pipe I, and after they have been condensed the rectified liquid is collected in a suitable barrel or other vessel.

By the action of my apparatus the light oils contained in petroleum are mixed with the heavy oils in a permanent manner, and a burning-fluid is produced which is perfectly safe and non-explosive.

The manner in which the light and heavy oils are united by my apparatus so as to constitute an oil of the desired density for burning will be understood from the following explanation: In the ordinary distillation of petroleum the first product of distillation up to a certain density constitutes the light oils. The balance up to another density forms good burning-oil, and the remainder, which is distilled as long as possible, forms the heavy oils.

The quantity of good burning-oil obtained by one distillation is not more than from forty to fifty per cent. The remainder, being not fit for burning, is sometimes mixed until it has the required density, and in this state it constitutes a dangerous and explosive fluid. Sometimes the mixture of light and heavy oils is subjected to a redistillation, and thereby an intimate combination of the light and heavy oils is effected, rendering the same fit for burning. This fact is well known to distillers of petroleum, and the redistillation of the light and heavy oils would be in common use but

for the want of a proper apparatus to carry the same into effect. By my apparatus this want is fully supplied, and the distillation of the petroleum is repeated until all the burning-oil that can possibly be obtained from the same is extracted. A small percentage of the oil which is too volatile to combine with the heavy oils evaporates in the open air, and another small portion remains as tar in the retort. The balance forms good burning-oil.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. Subjecting petroleum or rock-oil to repeated evaporations by condensing the vaporous products in one and returning the condensed liquid to the still through another pipe, substantially as and for the purpose specified.

2. The arrangement of the condensing-pipe D, funnel-shaped conductor E, and return-pipe F, in combination with the still A, constructing and operating substantially as and for the purpose described.

3. The arrangement of the rectifier H in the interior of the still A, in combination with the condensing-pipe D, funnel-shaped conductor E, return-pipe G, and condensing-pipe I, all constructed and operating substantially in the manner and for the purpose herein specified.

ALEXIS THIRAUULT.

Witnesses:

JAMES LAIRD,
R. GAWLEY.