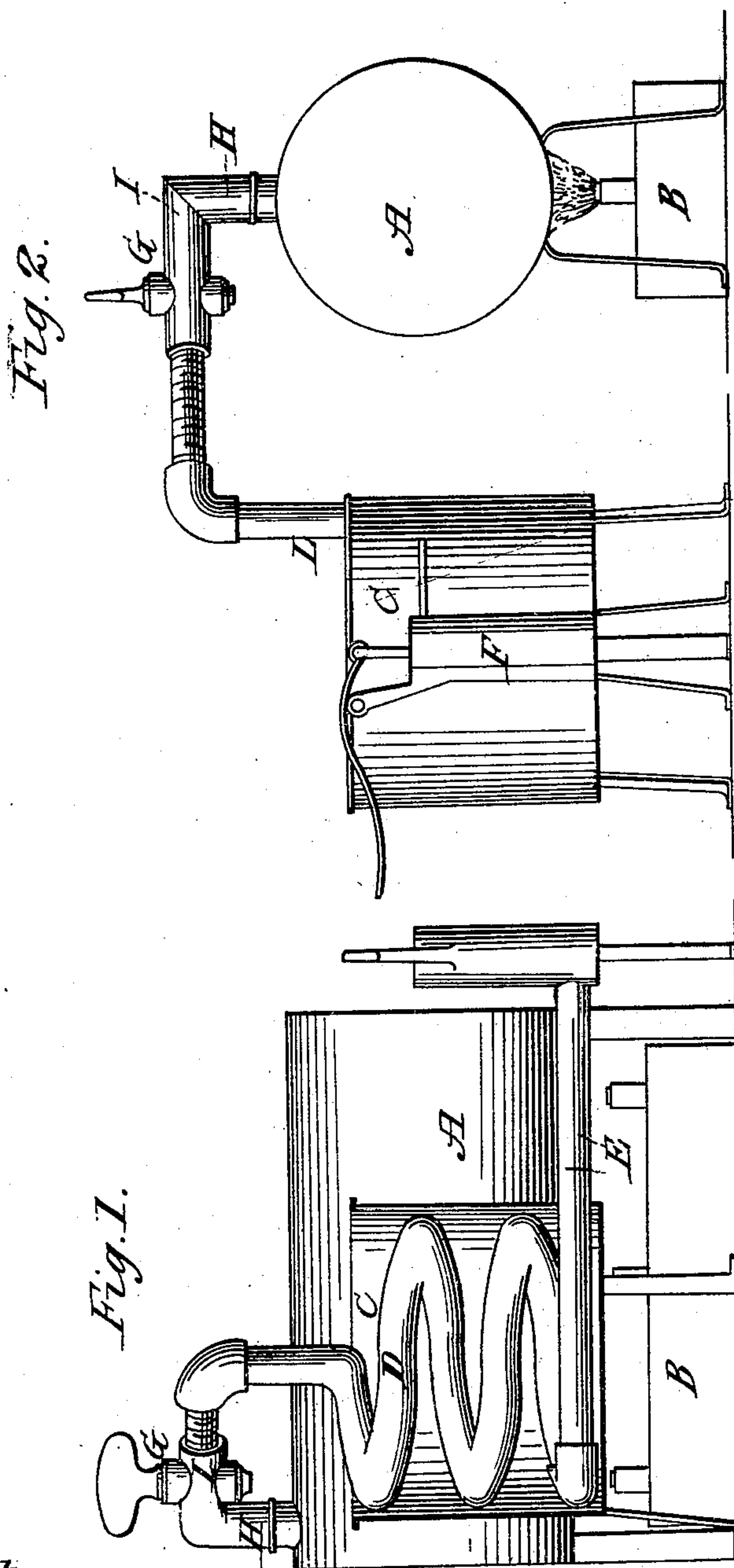


A. D. HIGHAM.

Oil Still.

No. 54,157.

Patented April 24, 1866.



Witnesses:

*J. B. Langdon*  
*Wm. F. Brown*

*At &*  
*Per*

Inventor:  
*A. D. Higham*  
*Murray*  
*Attorney*

# UNITED STATES PATENT OFFICE.

ABRAM D. HIGHAM, OF JERSEY CITY, NEW JERSEY.

## IMPROVEMENT IN DISTILLING PETROLEUM.

Specification forming part of Letters Patent No. 54,157, dated April 24, 1866.

*To all whom it may concern:*

Be it known that I, ABRAM D. HIGHAM, of Jersey City, in the county of Hudson and State of New Jersey, have invented a new and useful Improvement in Distilling Petroleum and other Hydrocarbons; 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 drawing, forming a part of this specification, in which—

The drawing shows a side view, and also an end view, of an apparatus made and arranged for the purpose of illustrating my invention.

This invention consists in a new method of distilling hydrocarbons, whereby a larger percentage of illuminating-oil is obtained from a charge than is obtained by the method hitherto known or used, the quantity of residuum being diminished, and the light oils which are commonly run off separately from the illuminating-oils being, by my method, made into good illuminating-oil.

The letter A designates a still, beneath which is placed a heating apparatus of any suitable character, which should be regulated to maintain a uniform, steady heat, so as not to burn the oil or its vapors. The still is to have the usual man-hole, (not here shown,) through which access may be had to the interior of the still. Its goose-neck H is connected to a pipe that communicates with a worm, D, which is carried through a condensing-tank, C, to a pipe, E, which connects said worm to a pump, F, placed at any convenient distance from the condenser. A stop-cock, G, is placed in the pipe I, which connects the goose-neck with the worm.

The spout of the pump is connected with the usual trap and gas-pipe (not shown) commonly used in distilling hydrocarbons, and which are familiar to distillers.

In distilling hydrocarbons by my method, I charge the still in the usual manner and supply the condensing-tank with a condensing medium in any suitable way. When the fires are started the pump is operated so as to draw away the vapors generated in the still without allowing them to be subjected to the pressure of the atmosphere. I continue to draw off the vapors in this manner *in vacuo* so long as the

distillate runs of a sufficiently-light color and of the proper gravity. When its gravity becomes too great or its color too dark I remove the pump and run off the rest of the charge under pressure from the atmosphere, using either the natural pressure or a greater pressure, according to the character of the crude oil, the usual trap and gas-escape pipe being then applied to the discharge-pipe E. If the distillate now becomes too dark in color or too heavy the pressure on the charge is increased by means of the cock G, which intersects the pipe I, leading from the goose-neck to the worm, said cock being turned more or less so as to obstruct the discharge of vapors and thereby increase the pressure under which the vapors are formed. When the charge has been run off the residuum, if any, is removed from the still in the usual way.

The light oils, in distillations conducted in the way now generally followed, are run off in the early stages of the process and are kept separate from the illuminating-oils, which come off afterward, because such light oils will not stand the requisite fire-test; and if such light oils are mixed with illuminating-oils after distillation the latter lose their safe character and will not stand the required test; but by means of my invention those volatile portions of the charge which in ordinary distillations produce benzine or other light and explosive oils are caused to become good illuminating-oil, which will stand the required test, so that the first part of the distillate does not require to be kept separate from the latter distillates.

This method of conducting the distillation of hydrocarbons enables me to effect the distillation at a lower temperature than is commonly employed, and consequently the tarry and residuous matters are much less in quantity because the oil and vapors are less liable to become charred and burned. I also greatly increase the relative amount of good illuminating-oil obtained from the charge, the increase being from five to fifteen per cent., according to the character of the crude oil. This increase results from the amount of benzine (when distilling petroleum) which is saved by mixing all, or nearly all, of it with the illuminating-oil, their vapors being brought over together, and from the fact that the amount of residuum is greatly diminished by running off



the charge or most of the charge at a low temperature.

It will be observed that I do not maintain a vacuum in the still during the whole time of distilling a charge, nor do I claim such a method of conducting distillations.

What I claim as new, and desire to secure by Letters Patent, is—

The method, substantially as above de-

scribed, for conducting distillations of hydrocarbons—that is to say, distilling the lighter portions of the charge *in vacuo* and the heavier portions under pressure, as and for the purpose set forth.

ABRAM D. HIGHAM.

Witnesses:

M. M. LIVINGSTON,  
ALEX. F. ROBERTS.