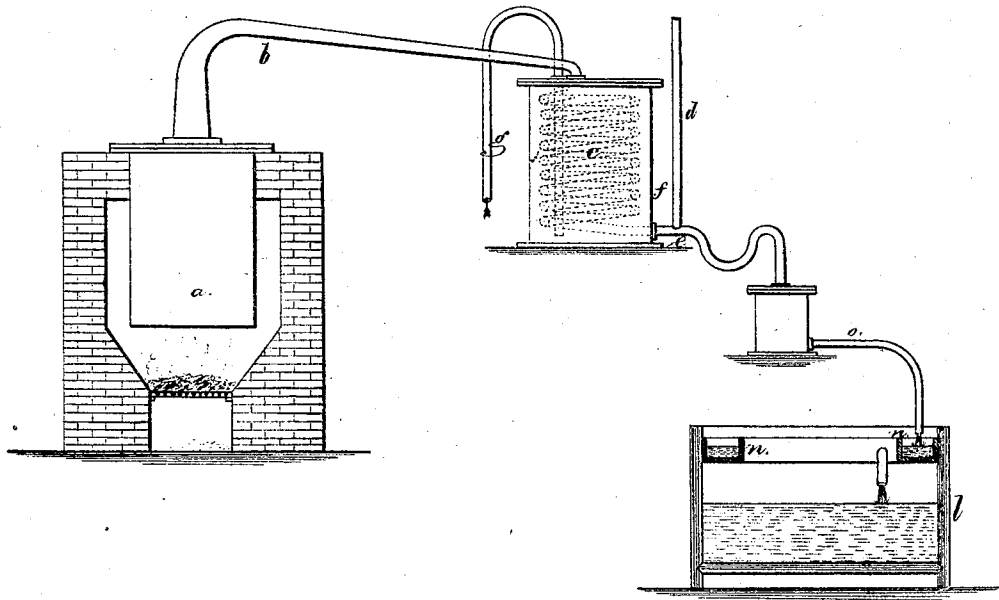


S. HUDSON.

Improvement in Distilling Coal Oils.

No. 123,907.

Patented Feb. 20, 1872.



Witnesses,

Chas. H. Smith
C. P. P. P.

Samuel Hudson

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att'y.

UNITED STATES PATENT OFFICE.

SAMUEL HUDSON, OF PLAINFIELD, NEW JERSEY.

IMPROVEMENT IN DISTILLING COAL-OILS.

Specification forming part of Letters Patent No. 123,907, dated February 20, 1872.

To all whom it may concern:

Be it known that I, SAMUEL HUDSON, of Plainfield, in the county of Union and State of New Jersey, have invented and made an Improvement in Distilling Coal-Oils; and I hereby declare the following to be a correct description thereof.

In distilling coal-oil, great difficulty has heretofore arisen from two causes. The first is in the condensing-worm, and the second is in the low fire-test that the oil will stand after it passes to the distillate-tank. My invention is for obviating these two difficulties by a peculiar process which I adopt in distilling.

The drawing illustrates the ordinary oil-distilling apparatus, except in the appliances which facilitate the execution of my improved process.

The still *a* is set in the usual manner, and the pipe *b* leads to the worm *c* in the condensing-tub *f*; and a pipe, *d*, rises from the delivery-neck *e* to convey away the uncondensed vapors. After the still has been started in the usual manner, the volatile hydrocarbons are evaporated, and the gasoline and similar oil condensed by cold water in the condenser-tub *f* around the worm *c*. After these volatile substances have been distilled, and the burning-oil is to be distilled, it frequently happens that the temperature of the still has to be greatly increased before said burning-oil will flow freely, and the oil distilled is almost always of a low fire-test, requiring subsequent refining to remove the volatile materials and increase the fire-test temperature. To obviate these difficulties, I apply heat to the water in the condenser *f* by blowing steam into the same by the pipe *g* or otherwise, so that the temperature is about 130° Fahrenheit, or from that to 200° Fahrenheit, according to the oil distilled or the product required. The effect of warming up the condenser is to cause the burning-oil to flow over freely from the still in the form of vapor, and the temperature of the condenser is such that the burning-oil will be condensed; but the inflammable impurities usually condensed are not condensed, but pass away by the escape-pipe *d*. Hence the burning-oil will not inflame at as low a temperature as heretofore usual in oil passing from the still, and the higher the temperature of the condenser, the higher will

be the fire-test of the oil; and I find in practice that by keeping the condenser warm the flow of oil will be much more free, and less fuel will be employed beneath the still. I furthermore remove from the oil the volatile substances that lessen the fire-test by exposing the warm oil that runs from the still to the atmosphere before it enters the distillate-tank. For this purpose the distillate-tank *l* is provided with a hollow trough, *n*, around the same, into which the burning-oil runs from the pipe *o*, and travels around or along such hollow trough previous to escaping into the tank *l*. Thereby there will be a large surface exposed to the atmosphere, which will cause most of the volatile matters to pass off from the oil, leaving it comparatively colorless, and of a high fire-test. The shallow trough *n* may pass twice around the distillate-trough, if desired, or extend in a straight line, or zigzag. This trough allows the liquid to cool as well as the volatile matters to pass off.

I do not claim distilling oils by the use of two condensers, the one nearest the still being heated, so that the easily-volatilized liquids will not be condensed therein, but pass on to the second condenser, and the more easily condensed liquid will run back to the still, as in the patent of C. M. Warren, April 11, 1865. Neither do I claim a column in which the vapors condense at varying temperatures, as these have been employed. In my apparatus the temperature of the condenser in distilling burning-oils is as high as the fire-test; therefore the vapors that would render the oil explosive are not condensed, but pass off by the pipe *d*.

In cases where the burning-oil is condensed in a warm condenser, and the uncondensed vapors are carried into a cooler condenser, the burning-oil is not of a high fire-test, and the liquid that is condensed is of little value. By confining the vapors to the condensers, instead of affording a free discharge to the atmosphere, the quality of the burning-oil is injured by the said vapors. I find it necessary, in order to produce the superior quality and high fire-test of the burning-oil, that the condenser shall be at a temperature as high as the fire-test of the oil, and that a free discharge be given of the uncondensed vapors to the atmosphere, and also that the burning-oils shall be

exposed to atmospheric action as they run from the still and before the volatile portions combine with the burning-oil, as they are liable to do if they remain together.

I claim as my invention—

1. In distilling burning-oil from petroleum, the use of a condenser of a temperature as high as the fire-test of the oil, and passing away the uncondensed vapors freely and directly to the atmosphere, for the purposes set forth.

2. And, in combination with the foregoing,

an open shallow trough, receiving the oil as it runs from the still, and exposing the same to the atmosphere, for the purposes set forth.

Signed by me this 21st day of October, A. D. 1871.

SAMUEL ^{his} × HUDSON.
mark.

Witnesses:

LEMUEL W. SERRELL,
NELSON RUNYON.