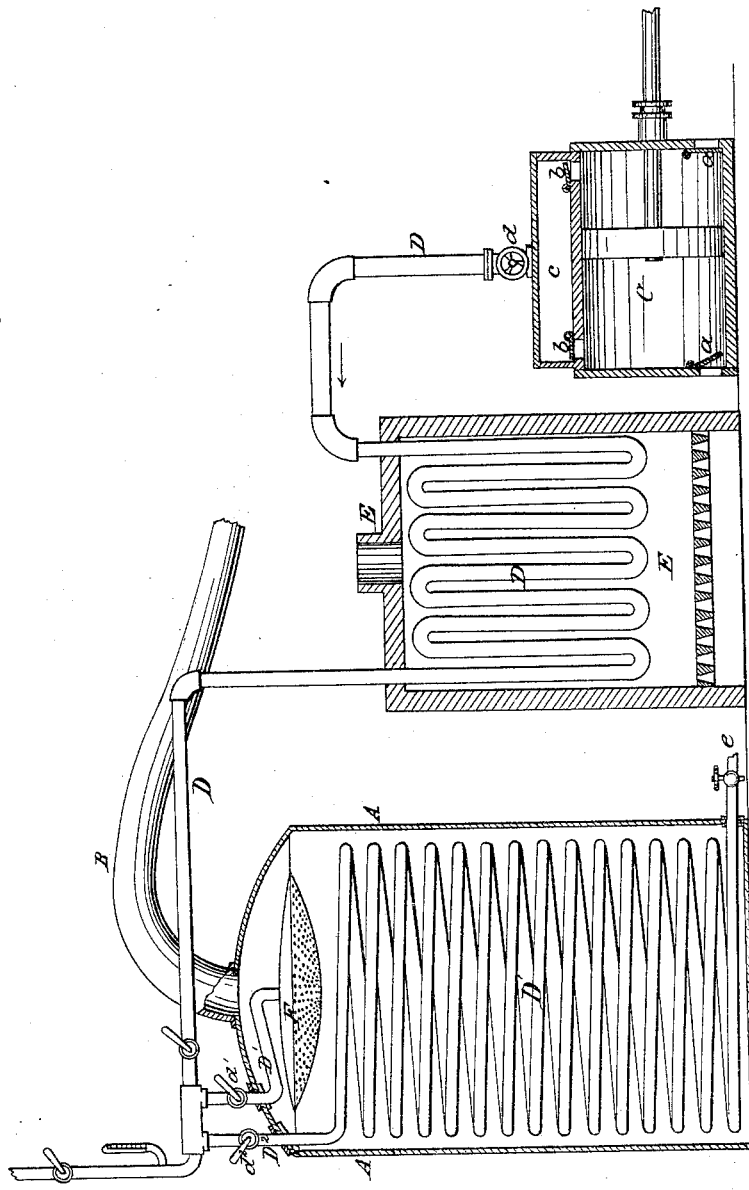


L. S. FALES.  
Oil Still.

No. 49,739,

Patented Sept. 5, 1865.



Witnesses:

*J. W. Coombs*  
*G. W. Reed*

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# UNITED STATES PATENT OFFICE.

LEVI S. FALES, OF BOSTON, MASSACHUSETTS.

## IMPROVED PROCESS OF DISTILLING PETROLEUM.

Specification forming part of Letters Patent No. 49,739, dated September 5, 1865.

*To all whom it may concern:*

Be it known that I, LEVI S. FALES, of Boston, in the county of Suffolk and State of Massachusetts, have invented a new and Improved Process of Distilling Petroleum and other Liquid Substances; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawing, forming part of this specification, said drawing representing a vertical section of an apparatus for performing my process.

This invention consists in the distillation of crude petroleum or other oils by heat applied above the surface through the medium of a current or currents of air, which, circulating through the upper part of a still, produce the evaporation of and absorb the volatile portions of the oil and carry them over to the condenser, in which the vapor is separated by condensation. By this process I avoid the carbonization and consequent production of tar which results from the direct application of fire to heat the still, and obtain in an economical manner an increased product of refined oil.

To enable others skilled in the art to make and use my invention, I will proceed to describe it with reference to the drawing.

A is the body of the still, made of cylindrical or other suitable form, and B the goose-neck leading to the condenser.

C is an air pump or blower, situated at a convenient distance from the still and driven by a steam-engine or other suitable motor. The inlet-valves *a a* of this pump or blower communicate with the atmosphere and the discharge-valves *b b* with a chamber, *c*, with which is connected a pipe, D, which passes through a heating-furnace, E, in the form of a coil, or in any other form which exposes a large surface to the heat of the furnace. At a point beyond the furnace this pipe has two branches, D' and D<sup>2</sup>, which enter the still at the top. The branch pipe D' terminates in a rose, F, or other perforated air-distributing device, situated in the upper part of the still and covering the greater portion of the surface of the oil therein. The other branch pipe, D<sup>2</sup>, is formed into a coil and extends to, or nearly to, the bottom of the still, passing out at *e*. The branch pipes D' and D<sup>2</sup> are provided with stop-cocks *d'* and *d<sup>2</sup>* outside of and near the still,

that the supply of air through either may be shut off, and the pipe D is furnished near the air-pump with a cock or valve to regulate or shut off the supply of air through the said pipe.

The operation of distilling petroleum by this process is as follows: The still having been charged with oil and fire having been made in the furnace, the cocks *d* and *d<sup>2</sup>* are opened and *d'* closed and the air pump or blower set in operation. The air forced through the pipe D is heated in passing through the furnace, and passing in its heated state through the branch pipe D<sup>2</sup>, which is coiled within the still, heats the oil to a suitable degree to evaporate the benzole and drive it off. When all the benzole has been expelled from the oil the cock *d<sup>2</sup>* is closed and *d'* opened. The heated air is then distributed through the rose F over the surface of the oil, which it heats to such a degree as to produce a rapid surface-distillation, taking up the vapors in suspension and carrying them off through the goose-neck B to the condenser, in which they are separated from the air by the condensation consequent upon their cooling, the air escaping to the atmosphere.

The temperature of the air employed in this process should not exceed 300° Fahrenheit, but should be kept near that point.

When the oil begins to come over, the current of air may be gradually increased during the process of distillation.

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

1. The distillation of crude petroleum or other oils by heat applied above the surface through the medium of a current or currents of air circulating through the upper part of the still, substantially as herein specified.

2. The combination, substantially as described, of a still, an air pump or blower, an air-heating furnace, a rose or other air-distributing device, and a pipe for conveying air from the said pump or blower through the said furnace to the said distributing device, the whole operating as and for the purpose herein specified.

LEVI S. FALES.

Witnesses:

F. CURLZE,  
FRANK BRAISTED.