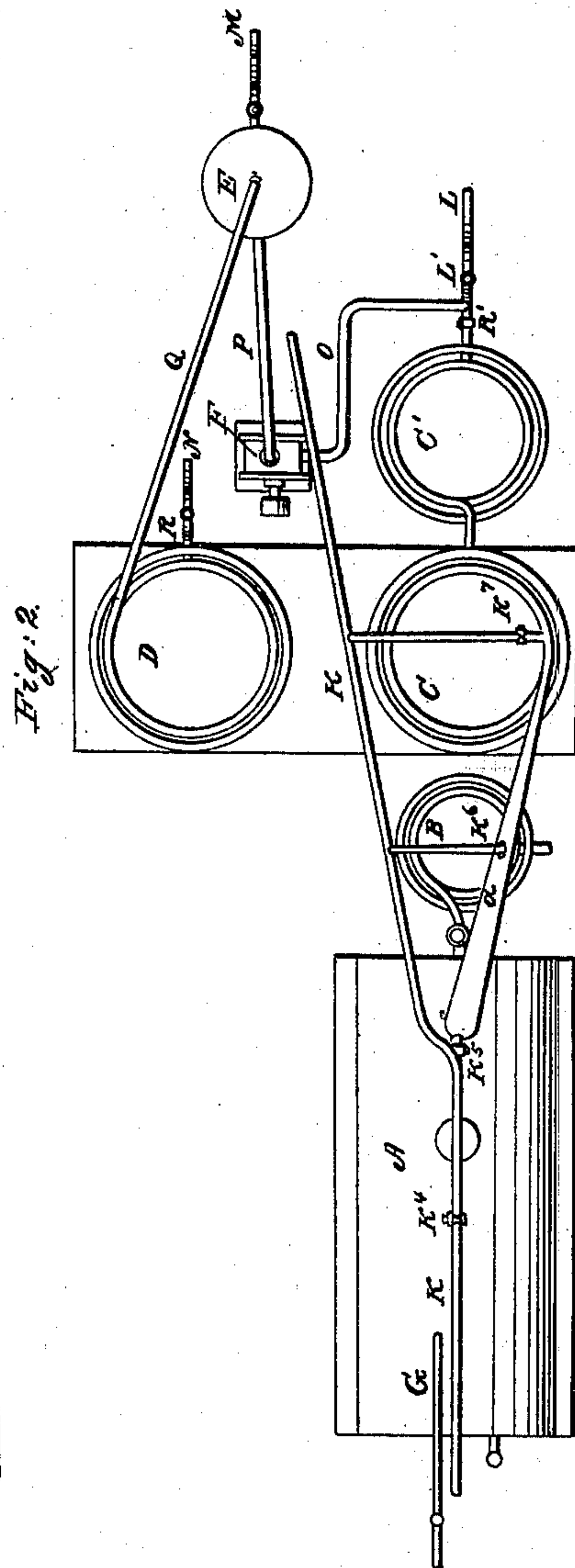
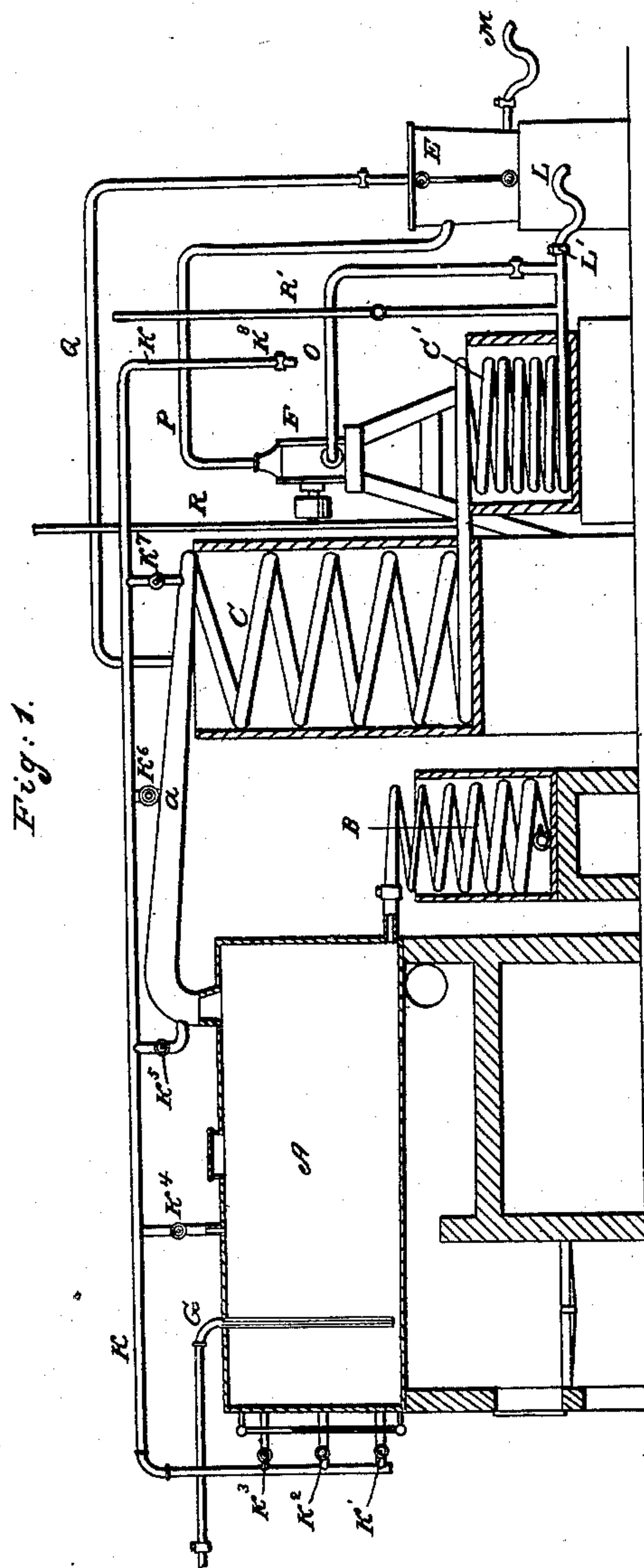


O. LUGO.
Oil Still.

No. 58,113.

Patented Sept. 18, 1866.



Witnesses:
J. W. Coombs.
A. Sellers.

Inventor:
Charles Lugo

UNITED STATES PATENT OFFICE.

ORAZIO LUGO, OF NEW YORK, N. Y.

IMPROVEMENT IN APPARATUS FOR DISTILLING PETROLEUM, &c.

Specification forming part of Letters Patent No. 58,113, dated September 18, 1866.

To all whom it may concern:

Be it known that I, ORAZIO LUGO, of the city, county, and State of New York, have invented certain new and useful Improvements in the Process of Distilling Petroleum and other Oils; 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 part of this specification, in which—

Figure 1 is an elevation, mainly in section, of a distilling apparatus, illustrating my invention. Fig. 2 is a plan of the same.

Similar letters of reference indicate corresponding parts in both figures.

This invention relates to the introduction of atmospheric air or other gaseous substances during the distilling process among the vapors eliminated from petroleum or other oils by the heat applied to the still, for the purpose of expediting the distilling process and improving the quality of the distilled oils.

In my Letters Patent dated January 2, 1866, I have described the admission of air into the still. Subsequent experiments have, however, led to the discovery that after the vapors of the lighter oils have passed over from the still and the temperature of the still is raised to evolve the vapors of heavier oils, it is desirable to introduce the air or gas into the goose-neck or exit-pipe of the still, in order that it may not become, by passing too great a distance in contact with the hot vapors, so highly heated as to combine with the hydrocarbon vapors in such manner as to generate or form ammoniacal gases, and the point of admission of the air or gas requires to be varied as the increase of temperature is continued in order to shorten the distance between such point and the condensing apparatus.

This invention therefore consists in the admission of the air or gas into the goose-neck or exit-pipe of the still, and in varying the point of admission to the still and goose-neck or exit-pipe as the distilling process progresses.

To enable others skilled in the art to carry out my invention, I will proceed to describe it with reference to the drawings.

A is the still, which, for the purpose of varying and regulating the distance from the condensing apparatus at which the air is admitted,

I prefer to make of horizontally elongated form. It is heated by a furnace below, and filled through a pipe, G.

a is the goose-neck or exit-pipe, which is continued through the cooling-tanks of two condensers, C C', of ordinary construction. Beyond the second condenser, C', the pipe is continued upward, as shown at O, to the induction-opening of a rotary or other pump, F, the eduction-pipe F' of which leads to the receiver E for the condensed products. The pump F draws the vapors from the still and the oil from the condensers C C', and at the same time draws air or gas into and through the still or exit-pipe through a pipe, K, at the inlet end of which there is a stop-cock, K¹ to shut off or regulate the supply. The said pipe K is connected with the end of the still farthest from the exit-pipe a at different heights by means of stop-cocks K¹ K² K³, also with the top of the still by a stop-cock, K⁴, and with the exit-pipe a by stop-cocks K⁵ and K⁶ at different distances from the still.

From the reservoir E a pipe, Q, leads to a third condenser, D, to convey thereinto such condensable volatile products as may arrive in the receiver E and be not condensed therein, and this pipe is continued in the form of a coil through the said condenser, with an exit at N for the condensed volatile liquid substances.

M is an exit-pipe for the distilled oil from the receiver E. R is an exit-pipe for the uncondensable vapors or gases from the third condenser, D, and R' is an exit-pipe leading from a trap in the exit-pipe outside of the second condenser, C', for the escape of gas or light vapors when the distilling process is conducted in the ordinary manner with the pump and air-pipe K shut off, as may be temporarily necessary in case of the pump being out of order, or for any other cause. L is the exit for the oil from the still when the pump is not in operation and the air shut off, furnished with a stop-cock, L', which is closed when the pump is in operation and air is admitted among the vapors. Other stop-cocks, not necessary to mention, but the necessity of which will suggest itself to the practical distiller, may be used in the various pipes.

I will now describe the operation as I have practically conducted it on a large scale.

The still is filled to within about three inches from the stop-cock K^3 , the fire applied, and as soon as the distillation commences the stop-cock L' is closed, and communication of the exit-pipe with the pump F and the cock K^7 are opened, and the pump is set in motion; and at the same time the stop-cock K^3 is opened to admit air into the still—first, for the purpose of creating a current in connection with the pump F , to counterbalance the diminishing pressure of the gases inside of the still, which, if not counterbalanced, would force the formation of vapors to such a degree as to carry them undistilled into the condensers.

The temperature of the vapors may be supposed at this stage of the distillation to be about 150° , and the gravity of the product about 80° . Stop-cock K^3 may be kept open until the gravity of the product has fallen to about 70° , by which time, the temperature having increased, I open the stop-cock K^4 , shutting K^3 , in order to shorten the distance which the admitted air will have to travel before reaching the condensers, for if K^3 had remained open and K^4 remained shut the distillation must have stopped, or nearly so, on account of the air getting overheated and combining with the hydrocarbon vapors, thus generating ammoniacal gases.

I keep open K^4 until the gravity of the dis-

tilled products falls to about 62° , when, the heat having again increased with the gravity of the oil, it again becomes necessary to shorten the distance which the air has to travel in order to prevent its becoming overheated; and giving rise again to the formation of ammoniacal gases; and proceeding on this principle I open K^5 until the gravity falls to 55° ; then, for the reasons already given, I open K^6 , either alone or with K^5 , until the gravity of the product falls to about 49° ; then I open K^7 , shut all the other stop-cocks but K^8 , and keep K^7 open until nothing remains but the tar, which is then run off from the bottom of the still into the condenser B .

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

1. The admission of air or gas into the goose-neck or exit-pipe of the still, substantially as and for the purpose herein specified.

2. Varying the point of admission of the air or gas B into the still and goose-neck or exit-pipe as the process of distillation progresses, substantially as and for the purpose herein set forth.

ORAZIO LUGO.

Witnesses:

HENRY T. BROWN,
A. LE CLERC.