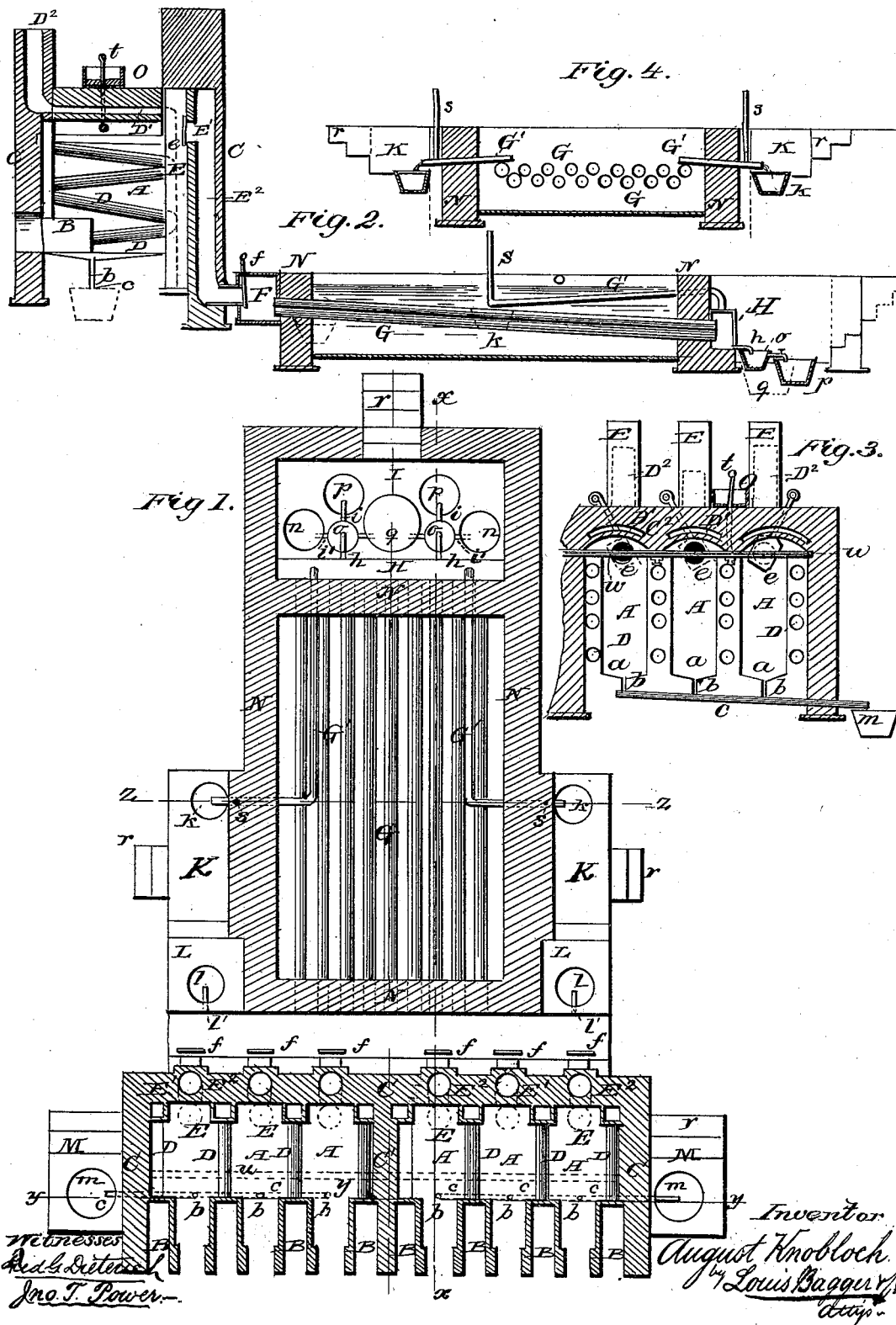


A. KNOBLOCH.  
Apparatus for Distilling Wood.

No. 215,940.

Patented May 27, 1879.



# UNITED STATES PATENT OFFICE

AUGUST KNOBLOCH, OF WASHINGTON, DISTRICT OF COLUMBIA.

## IMPROVEMENT IN APPARATUS FOR DISTILLING WOOD.

Specification forming part of Letters Patent No. **215,940**, dated May 27, 1879; application filed April 16, 1879.

### *To all whom it may concern:*

Be it known that I, AUGUST KNOBLOCH, of the city of Washington, in the county of Washington and District of Columbia, have invented certain new and useful Improvements in Apparatus for the Distillation of Wood; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

This invention has relation to the manufacture of tar, turpentine, and oil of different grades from wood (preferably pine) by the process technically known as "dry distillation."

It consists in the combination of a series of retorts and intermediate furnaces with a series of receivers and with a condensing apparatus, and in the detailed construction of the same, substantially as hereinafter more fully described.

My said improvement has for its object to economize raw material and fuel, as well as time and labor.

In the annexed drawings, Figure 1 is a plan of my improved apparatus. Fig. 2 is a longitudinal vertical section on line *x x*, Fig. 1. Fig. 3 is a transverse vertical section on line *y y*, Fig. 1; and Fig. 4 is a similar section on line *z z* in the same figure.

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

The apparatus consists, essentially, of three parts or sections—viz., a series of retorts with their furnaces, a condenser, and several receiving-chambers for the different classes of products evolved by heat.

The retorts *A* are arranged in a row, of any suitable number, within a rectangular brick wall or casing, *C*, which may be subdivided into two or more sections by perpendicular partitions *C'*.

The apparatus shown in the drawings comprises six retorts and eight furnaces, *B*, there being one furnace on each side of each of the retorts.

*D* are the furnace-flues, which are placed zigzag transversely between the front and back walls, as shown more clearly in Fig. 2, and

open up into an arched flue or passage, *D'*, made in the arched roof over each of the retorts *A*, and which again communicates with a chimney, *D''*, provided with a suitably-arranged damper to regulate the draft.

The retorts are made with double-inclined bottoms *a*, forming a central longitudinal gutter, terminating at the lowest point in a short vertical pipe, *b*, which opens into a larger inclined pipe, *c*, on each side of the central dividing-wall, *C'*, as shown in Fig. 3. Through these pipes *b* and *c* the fluid which, at an early stage of the process, exudes from the wood piled in the retorts (chiefly yellow tar) is collected upon the inclined bottoms *a*, and finds its way to the receivers *m*, which are placed in excavations *M*, to which access may readily be had by the steps *r*.

The gaseous products of distillation find their way up through vertical passages *E* in perpendicular extensions of the rear wall of the inclosure *C*, and down through a parallel passage, *E''*, (see Fig. 2,) which conducts them to the receiver *F*. After the process of distillation has proceeded some time, (to be determined by the quality and nature of the raw material in the retorts,) a valve, *e*, by which the passage *E'* between the flues *E* and *E''* has been closed, is opened, so as to permit the gases to make a short cut through *E''* down into the receiver.

If all the retorts in the apparatus are not in simultaneous operation. Such of them as are unused are cut off from the receiver *F* by valves *f*.

While contained in this receiver some of the heavier gases will become condensed, and, collecting in the bottom of the receiver, will escape in fluid form through pipes *l l* into the reservoirs *l*, which, in like manner as the receptacles *m*, are placed in excavations *L L*. The product collected in these reservoirs I call "Oil No. 3."

The vapors now pass from the receiver *F* into the condensing apparatus *G*, which consists of a double row of parallel pipes placed in the bottom of a rectangular brick or wooden casing, *N*, which is filled with water. The other end of the pipes *G* are inserted into the receiver *H*, into the top of which are inserted two smaller pipes, *G' G'*, one on each side,

which reach back through the condenser about half-way, where they are bent at right angles, and, passing through the casing N, open up into receivers *k k*, placed in excavations K K, to which access is had by the steps *r r*. The product collected here I call "Oil No. 0," and it is, essentially, spirits of turpentine.

The condensed or fluid contents of the receiver H escapes through two pipes, *h h*, into vessels *o o*, which connect, through branch pipes *i i'*, with the receivers *n p g*, as shown more clearly in Figs. 1 and 2. These several receivers are placed in a deep excavation, I, to which access is had by a flight of steps, *r*, and are so arranged relative to each other that the water, which forms one of the products of distillation, will be collected in the central receiver or tank, *g*, (water and oil, mixed, entering *oo*.) while oil No. 1 overflows, through pipes *i*, into the receivers *p p*, and the heavier oil, No. 2, is collected in the receivers *n n* through the branch pipes *i' i'*. The gaseous products of distillation, not capable of condensation into a fluid form, will escape from the receiver H by way of the pipes *G' G'* and outlets *s s*, which branch off vertically from the said pipes.

To facilitate the process of distillation, it is sometimes desirable to admit water in an atomized state into the retorts to expedite the precipitation of the vapors; and this I accomplish in the following manner: Upon the roof C<sup>2</sup> of the structure containing the furnaces and retorts I place one or more tanks, O, each of which is provided with a valve, *t*, through which water contained in the tank or

tanks may be admitted into a sprinkler-pipe, *u*, which passes transversely through the several retorts, as shown more clearly in Fig. 3, close under the roof. By opening the valve *t* a spray of water falls down into the retort, which precipitates the heavier of the gases, and, being vaporized, escapes with the gaseous products of distillation in the manner described, until finally condensed in the receiver H and drawn off into the tank *g*.

Having thus described my invention and its mode of operation, I claim and desire to secure by Letters Patent of the United States—

1. The combination of the retorts A, provided with the parallel vertical gas-flues E E<sup>2</sup>, having opening E' and valve *e*, and the receiver F, provided with the gates *f*, substantially as and for the purpose set forth.

2. The combination of the receiver F, having gates *f*, condenser G, receiver H, and return-pipes G' G', provided with the gas-outlets *s s*, substantially as and for the purpose set forth.

3. The combination of the condensing apparatus N G G', intermediate receiver, H, having pipes *h h*, receivers *o o*, provided with the branch pipes *i i' i i'*, receivers *n p n p*, and the centrally-arranged tank *g*, substantially as and for the purpose herein shown and set forth.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

AUGUST KNOBLOCH.

Witnesses:

LOUIS BAGGER,  
AUGUST PETERSOHN.