

No. 757,387.

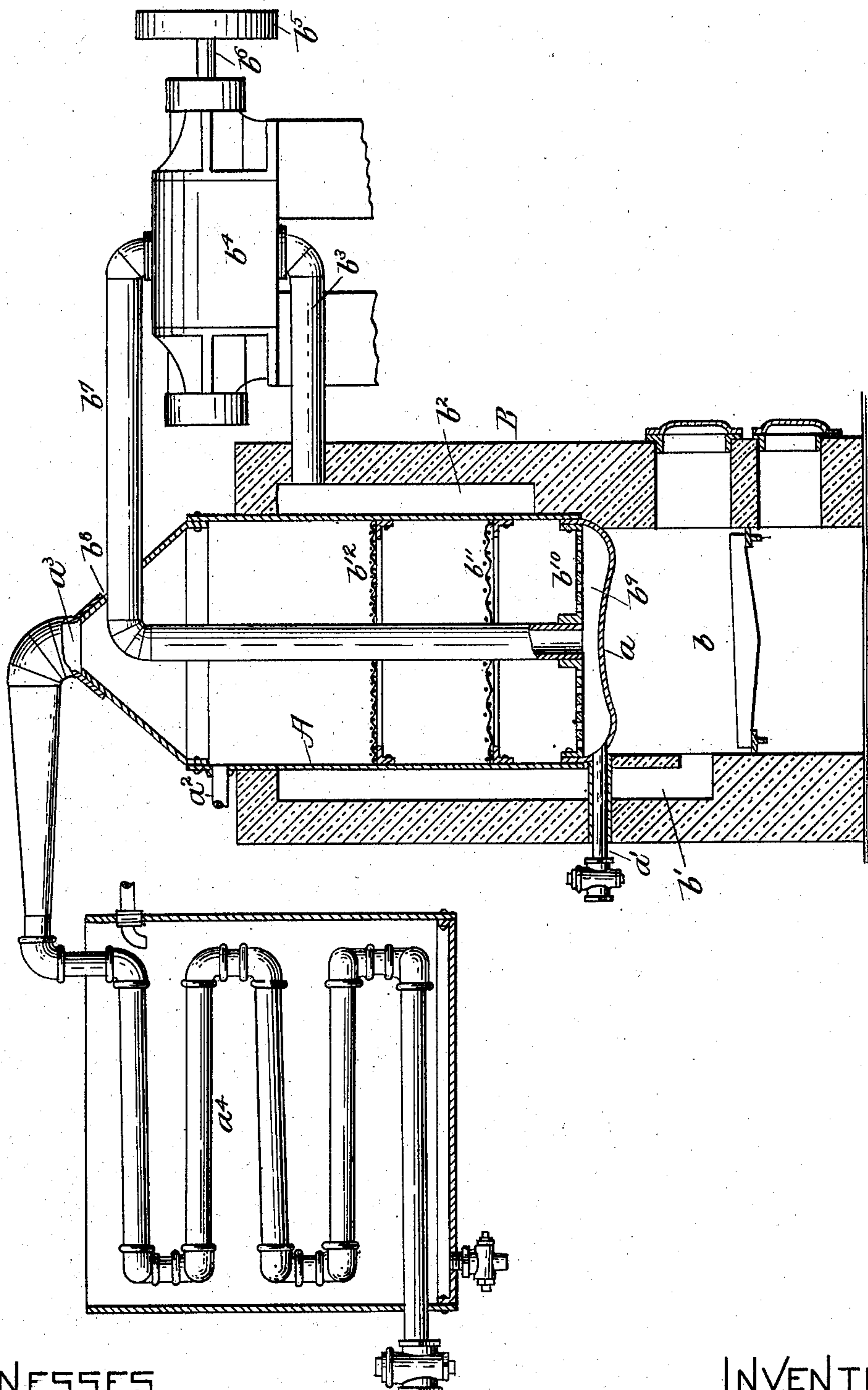
PATENTED APR. 12, 1904.

H. W. ASH.

STILL FOR CRUDE BITUMINOUS MATERIAL.

APPLICATION FILED JUNE 22, 1903.

NO MODEL.



WITNESSES.

Indolen  
Bauk-Lieferstein

INVENTOR

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 by his atty  
 J. H. Raymond &



# UNITED STATES PATENT OFFICE.

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## STILL FOR CRUDE BITUMINOUS MATERIAL.

SPECIFICATION forming part of Letters Patent No. 757,387, dated April 12, 1904.

Original application filed April 17, 1902, Serial No. 103,347. Divided and this application filed June 22, 1903. Serial No. 162,563.  
(No model.)

*To all whom it may concern:*

Be it known that I, HORACE W. ASH, a citizen of the United States, and a resident of Cambridge, in the county of Middlesex and State of Massachusetts, have invented a new and useful Improvement in Stills for Distilling Crude Bituminous Material, of which the following, being a division of my copending application, Serial No. 103,347, filed April 17, 1902, is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification, in explaining its nature.

The invention is in some respects an improvement upon that described in my application Serial No. 162,562 for Letters Patent of the United States of even date herewith. In the present case, as in the distillery of my said application, the furnace products of combustion are injected into the still. In this invention, however, the heat of said products of combustion is not relied upon entirely to constitute all the heat necessary for the distillation.

In my present invention the still is adapted to be heated in a furnace by direct application of heat to its shell, and which is further adapted to have the products of combustion which escape from said furnace introduced into the still under pressure and for the purpose of assisting in the process of distillation, the said products of combustion thus supplied to the distilling material introducing therein a liberating aerating agency which serves to very much increase the distilling capacity of the still, helping to shorten the time of distillation and to economize the cost.

I will now describe the invention in conjunction with the drawing, where the figure illustrates in a somewhat conventional way a still provided with my improvements.

Referring to the drawing, A is the still. It is in the shape of a long upright cylinder, made of iron, and has the upwardly-curved bottom  $a$ , the discharge-outlet  $a'$ , the filling-inlet  $a''$ , and the thermometer and the gage-cocks usually provided such stills, which are

not shown. It has the usual outlet  $a^3$  at the top connecting with the condenser  $a^4$ .

The still is built in a brick or other furnace B, which surrounds it for nearly its entire height. The combustion-chamber  $b$  of the furnace is below the still, and there extends from it the flue  $b'$ , which connects it with the heating-chamber  $b^2$ , which surrounds the still. From this heating-chamber, near its top, extends a flue  $b^3$  to a forcing-chamber  $b^4$ . In this chamber is a fan-blower operated by the pulley  $b^5$  on the shaft  $b^6$ , which serves to induce the draft in the furnace and also to force the products of combustion received from it through the flue  $b^3$  into the pipe  $b^7$ , which extends from the forcing-chamber  $b^4$  through the top of the still at  $b^8$  downward through its center to the chamber  $b^9$  at the bottom of the still beneath the perforated diaphragm  $b^{10}$ . Above this diaphragm, extending across the still, are the perforated diaphragms  $b^{11}$   $b^{12}$  at convenient distances apart.

Instead of a fan-blower or similar apparatus I may use suitable suction or other means for causing the gases to pass through the still, and such apparatus may be located wherever desirable.

The contents of the still are heated first by the direct application of heat from the furnace to the outer surface of bottom of the still and to the outer surface of the sides thereof. The contents are also heated and aerated, whereby distillation is hastened, and likewise, when desired, combined with lamp-black by means of the flue connection with the furnace and the blower, the products of combustion drawn from the furnace being forced through the supply-pipe  $b^7$  into the bottom of the still under such heat and pressure as may be desired. The heated air entering the bottom of the still under pressure is divided and subdivided by the various perforated diaphragms through which it passes into numerous minute bubbles or globules and brought into intimate association with the entire mass, so that there is constantly streaming through it a current of air, which frees or assists in freeing the



distilling material beneath its upper surface from the products which it is desired to distil off and which escape in the form of gases, which are subsequently condensed in a condenser.

By using in the furnace a fuel which is rich in carbon lampblack may be formed in the furnaces and fed into the still, and when desired the combustion may be so modified as to produce lampblack in quantity.

The air-forcing apparatus may also be used for cooling the distilled product and the still after it has been distilled sufficiently, as indicated in my said application.

In use the exterior of the still is heated by the products of combustion provided by the furnace, thereby heating the material in the still, and at the same time the products of combustion drawn from the heating-chamber  $b^2$  are forced into the still to further heat its contents and to also subject it to an aerating influence by which the gases from its interior are collected and discharged, and the process of distillation thus materially quickened.

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

1. The combination of a still for distilling crude bituminous material, a furnace below said still having a heating-chamber surrounding said still, a flue extending from said heating-chamber to a blower, said blower and a connection between the blower and the interior of the still whereby the products of com-

bustion after acting against the exterior of the still are then introduced into the interior of the still and caused to be forced through the material therein.

2. The combination of a still for distilling crude bituminous material, a compartment at the exterior of the still, a furnace so located as to heat the exterior of the still, the interior of the furnace being in communication with the aforesaid compartment, the compartment being in communication with the interior of the still, whereby the products of combustion may pass from the furnace to the compartment and there heat the exterior of the still, and then pass on and be injected into the interior of the still.

3. The combination of a still for distilling crude bituminous material, a chamber in which the still is located, a furnace beneath the still, communicating passages between the furnace and the chamber and the interior of the still.

4. The combination of a still for distilling crude bituminous material, a chamber in which the still is located, a furnace beneath the still, communicating passages between furnace and the chamber and the interior of the still and means for causing the products of combustion to pass into the distilling material in the still.

HORACE W. ASH.

Witnesses:

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SAUL SIPPERSTEIN.