T. A. DUNGAN.

WOOD DISTILLING APPARATUS.

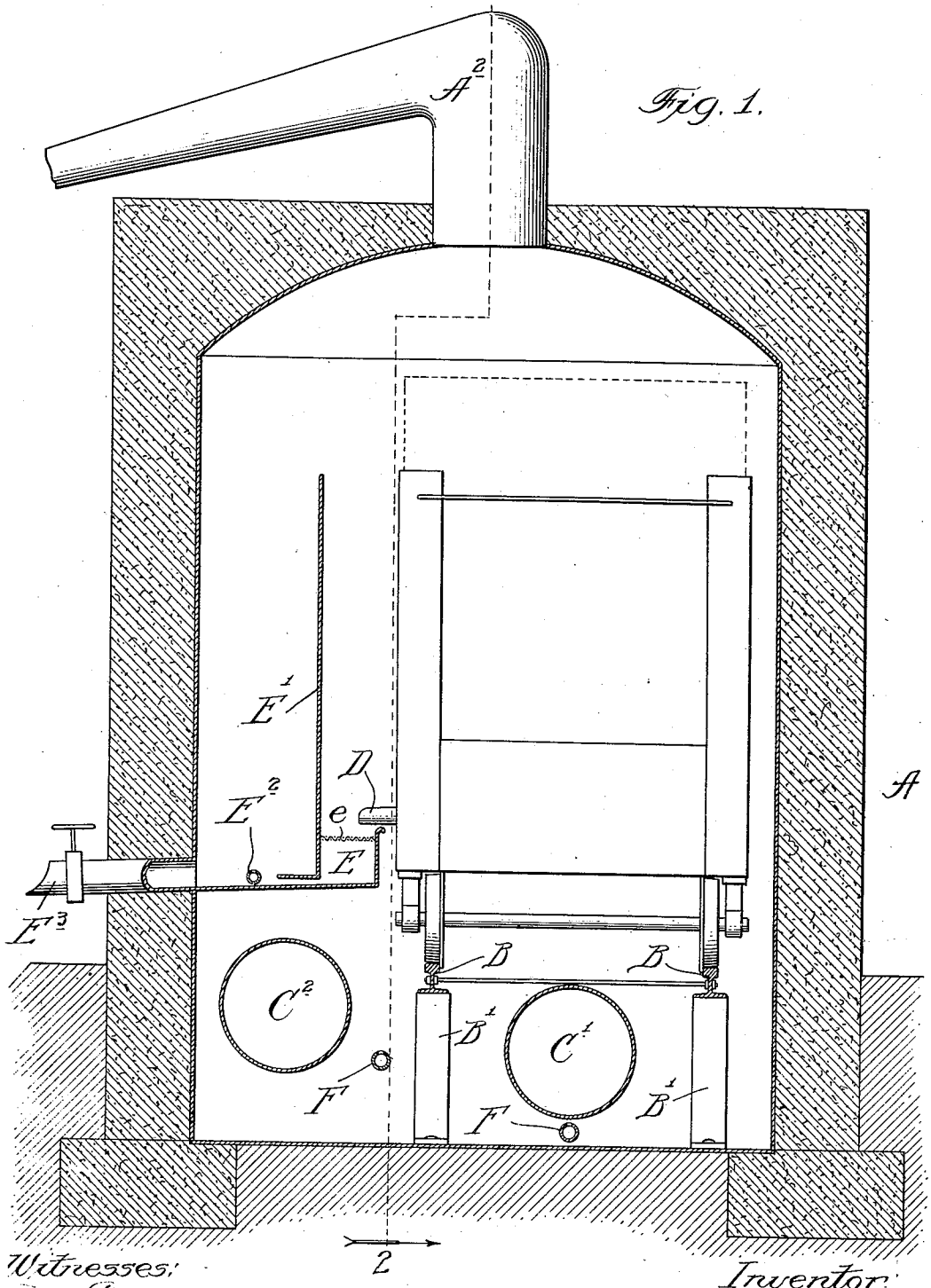
APPLICATION FILED APR. 10, 1911.

1,007,341.

Patented Oct. 31, 1911.

4 SHEETS—SHEET 1.

Fig. 1.



Witnesses:
C. E. Weyl.
Chas. H. Bull.

Inventor:
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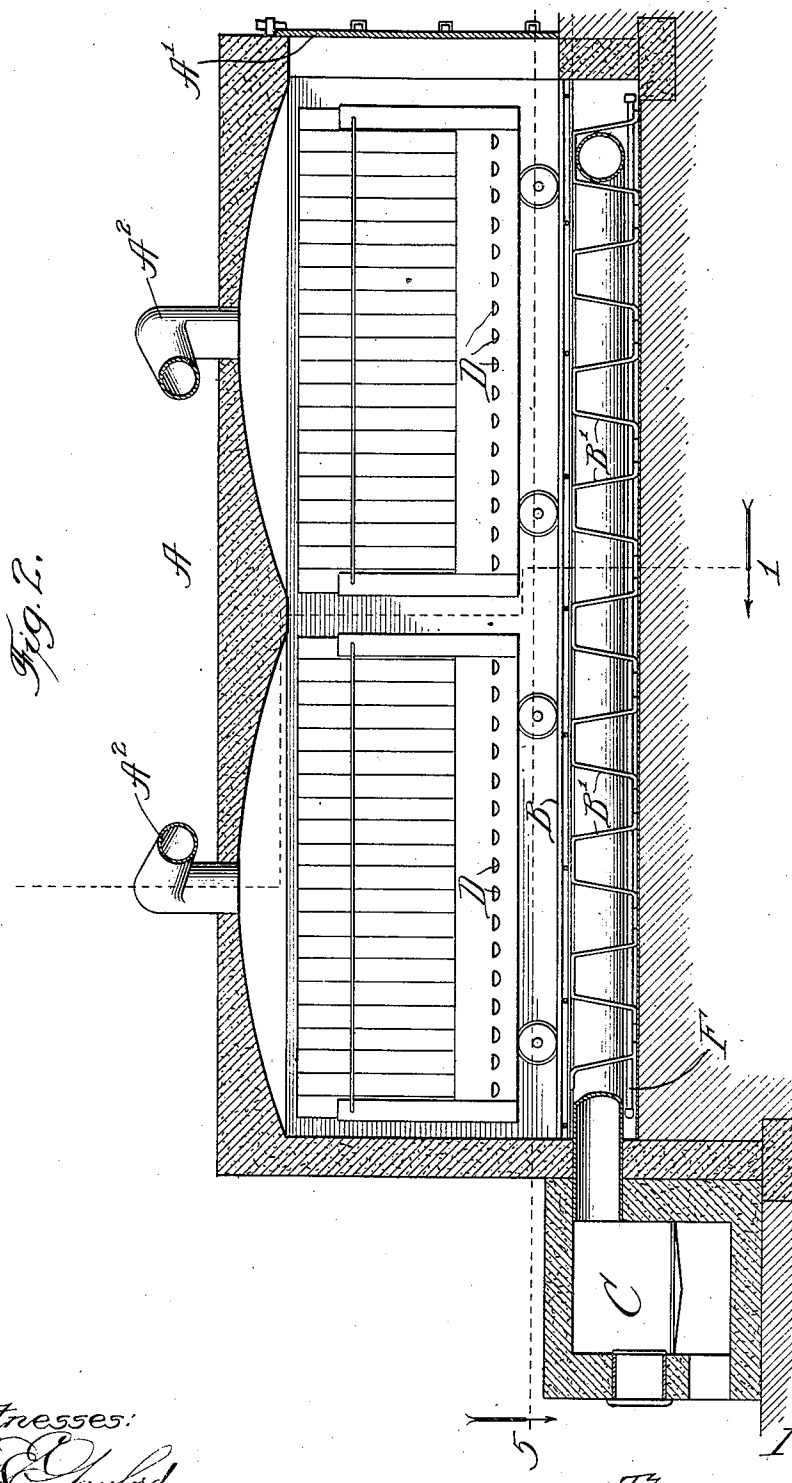

Fig. 2.

Witnesses:
E. E. Gaylord.
Chas. A. Buell.

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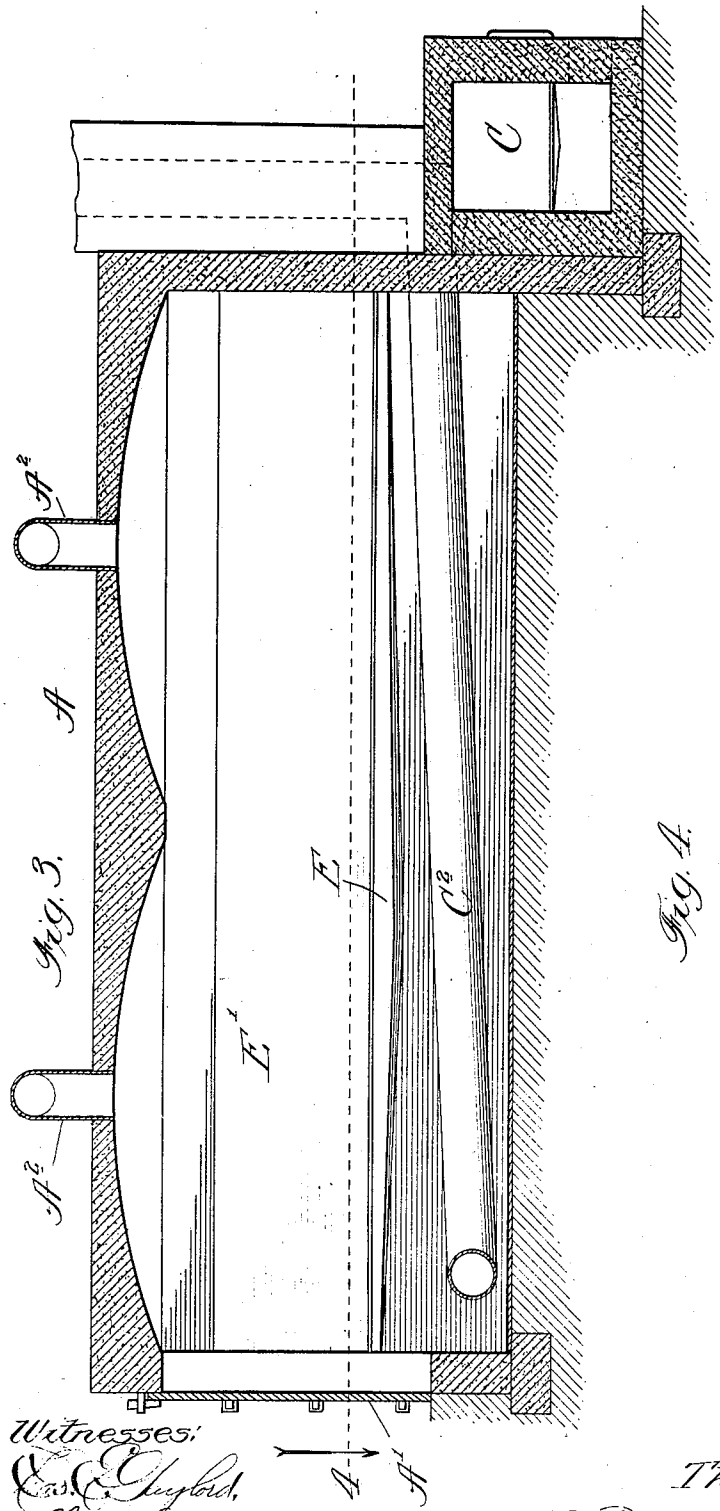

Fig. 3.

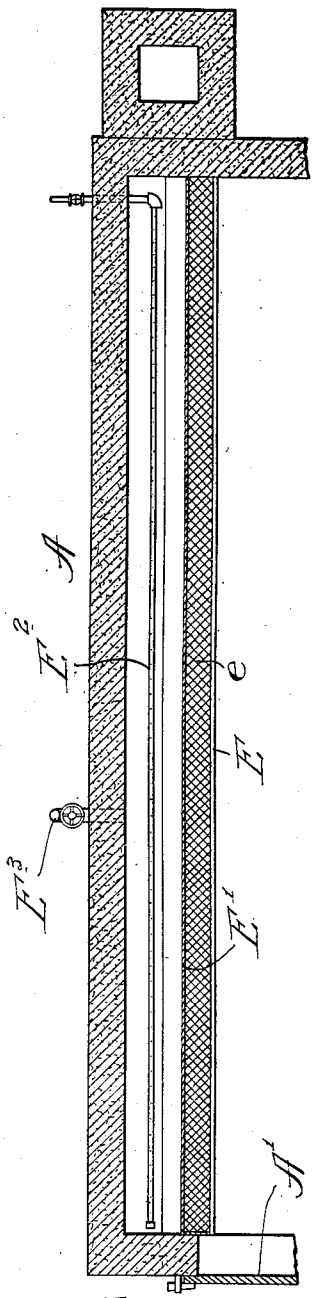

Fig. 4.

Witnesses:
Chas. E. Taylor.
Chas. H. Buell.

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4 SHEETS—SHEET 4.

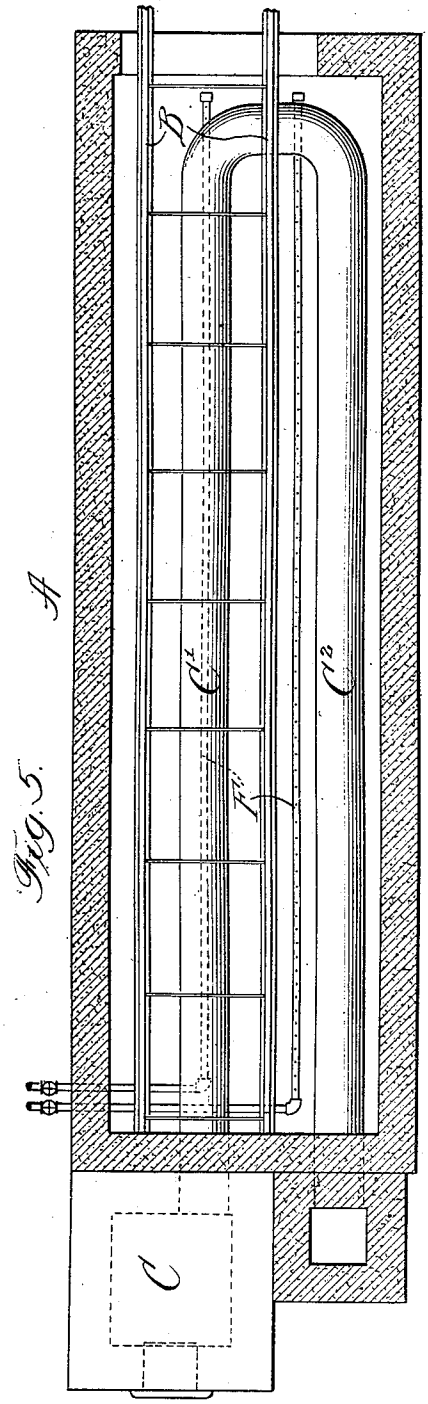

Fig. 5.

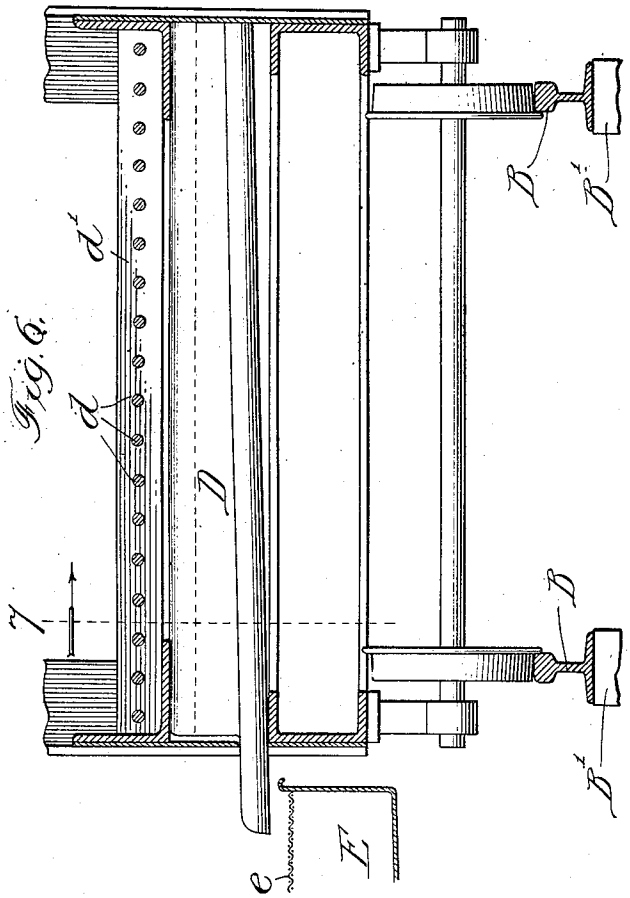

Fig. 6.

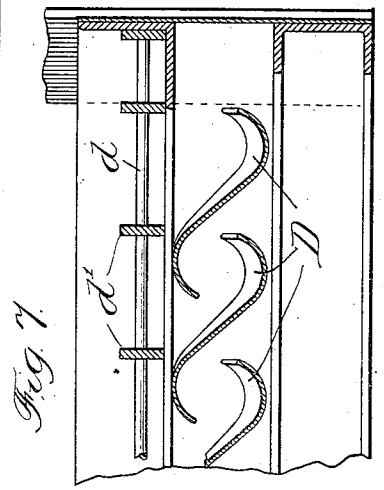

Fig. 7.

Witnesses:
Chas. A. Bull.

Inventor:
Thomas A. Dungan.
By Dyrenforth, Lee, Chritton & Wiles.
Attys.

UNITED STATES PATENT OFFICE.

THOMAS A. DUNGAN, OF CHICAGO, ILLINOIS.

WOOD-DISTILLING APPARATUS.

1,007,341. Specification of Letters Patent. Patented Oct. 31, 1911.

Application filed April 10, 1911. Serial No. 620,094.

To all whom it may concern:

Be it known that I, THOMAS A. DUNGAN, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Wood-Distilling Apparatus, of which the following is a specification.

My invention relates to certain new and useful improvements in wood distilling apparatus, and is fully described and explained in the specification and shown in the accompanying drawings, in which:

Figure 1 is a transverse section through a device embodying the invention; Fig. 2 is a longitudinal section on the line 2 of Fig. 1; Fig. 3 is a section similar to Fig. 1 on the plane indicated by the line 1 in Fig. 2, looking in the opposite direction from Fig. 1; Fig. 4 is a section on the line 4 of Fig. 3; Fig. 5 is a section on the line 5 of Fig. 2; Fig. 6 is a detailed transverse section through one of the cars on the plane indicated by the line 6 in Fig. 2, and Fig. 7 is a longitudinal section on the line 7 of Fig. 6.

Referring to the drawings, A is chamber, closed at one end by a door A^1, having in its top pipes A^2 by means of which the products of distillation may be drawn off to a still. The chamber A is preferably built of cement or concrete and it is lined or coated on its interior with an acid resisting compound, such as zinc fluates. In this way, a retort suitable for the distillation of wood is provided at a very low cost and with the maximum of strength and durability.

B are rails forming a track upon which the cars containing the wood to be operated upon can be run into and out of the retort. The rails B are carried by supports B^1 so that they lie a considerable distance above the bottom of the chamber A, the purpose being to afford a space beneath the cars for the heating pipes.

The retort is heated by direct radiation from a flue in the following manner: C is a furnace, the smoke-pipe or exit-pipe thereof running horizontally underneath the plane of the rails B and between the supports thereof B^1, as shown at C^1 in the drawings, and being then curved and brought back at C^2 along the side of the chamber, the extreme end of the pipe being turned upwardly to a stack. The products of combustion are drawn through this long flue thus composed, in any approved manner, either by a forced draft, a suction-device or by the use of a tall chimney, as may be desired.

The cars, upon which the wood to be treated is placed, may have running gears and frame-work of any desired sort. Each has, however, a reticulated floor made in the form of a horizontal grate consisting of longitudinal rods *d* and transverse flat bars d^1 set on edge and through perforations in which the rods *d* pass. There is thus provided in each car a reticulated surface upon which the wood may rest and through which the heated air may rise. It is thought desirable to place the wood on end, that is, with its grain running vertically, and this reticulated floor provides means for supporting the wood in that position. Underneath this reticulated floor in each car is a series of transversely extending troughs D, each of which is made in the form of an S or reverse curve, the troughs being so arranged that one edge of each overhangs the adjacent edge of the next, in the manner illustrated in Fig. 7, and all the troughs project beyond the side of the car on one side and have their opposite ends elevated so as to form inclines down which fluid will flow. There is thus provided underneath the floor in each car a series of troughs which can catch pitch and other fluid products of the wood and direct them into proper channels, and at the same time the said troughs are so disposed as to provide free upward passage for the heated air.

Along one side of the chamber, in which the cars pass, is a trough E over which the ends of the car troughs D project to discharge their contents therein, a strainer or grating *e* being provided for the purpose of catching and retaining any wood chips which may enter with the fluid products. The trough E is intersected by a partition E^1 which comes nearly to the bottom of the trough and a pipe E^2 extends longitudinally of the trough on the opposite side of the partition E^1 from that on which the liquid enters. This pipe contains a series of perforations through which either air or steam may be blown through the fluid in the trough for the purpose of volatilizing as completely as possible any of the lighter products contained in the fluid. The use of air or steam for this purpose, or both in alternation, may produce certain chemical effects of a desirable character, and the present apparatus is designed to afford means

for producing such agitation of the fluid by direct contact with heated or unheated gas as the case may be. The partition E^1, it will be seen, operates as a dash-plate to prevent the fluid from being blown, in its agitation, out of the trough entirely. A valve E^3 is provided through which the treated fluid may be drawn off.

It will thus be seen that my improved apparatus provides a simple and convenient structure in which the distillation of wood can readily be performed. The heating apparatus is of a peculiarly simple and convenient kind, and its action may, if desired, be accelerated by blowing air or steam directly into the chamber through pipes F, which air or steam so blown in will assist convection in producing a uniform heat. The heating apparatus is also so arranged as to supply heat to the fluid contained in the stationary trough. The car construction is of a simple and cheap character and has the desirable features already pointed out.

I am aware that considerable variation is possible in the details of the construction herein shown and described, and I therefore do not intend to limit myself to such construction specifically; my intention being, in the claims hereinafter set forth to specify all the novelty which is inherent in the construction illustrated.

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

1. In a wood distilling apparatus a car having beneath its contents a series of troughs each overhanging the next in the series and spaced therefrom whereby the fluid falling from the wood will be caught by the troughs, while space is provided for the upward passage of heated air.

2. In a wood distilling apparatus a car having beneath its contents a series of troughs each overhanging the next in the series and spaced therefrom whereby the fluid falling from the wood will be caught by the troughs, while space is provided for the upward passage of heated air, and a reticulated floor above the troughs adapted to support the contents of the car.

3. In a wood distilling apparatus a car having beneath its contents a series of troughs each overhanging the next in the series and spaced therefrom whereby the fluid falling from the wood will be caught by the troughs, while space is provided for the upward passage of heated air, the troughs projecting from and being inclined toward one side of the car to discharge their contents.

4. In a wood distilling apparatus a car having beneath its contents a series of troughs each overhanging the next in the series and spaced therefrom whereby the fluid falling from the wood will be caught by the troughs, while space is provided for the upward passage of heated air, the troughs projecting from and being inclined toward one side of the car to discharge their contents, and a reticulated floor above the troughs for supporting the contents of the car.

5. In a wood distilling apparatus a car having beneath its contents a series of troughs each overhanging the next in the series and spaced therefrom whereby the fluid falling from the wood will be caught by the troughs, while space is provided for the upward passage of heated air, and a collecting trough into which all the car troughs discharge.

6. In a wood distilling apparatus a car having beneath its contents a series of troughs each overhanging the next in the series and spaced therefrom whereby the fluid falling from the wood will be caught by the troughs, while space is provided for the upward passage of heated air, the troughs projecting from and being inclined toward one side of the car to discharge their contents, and a longitudinal collecting trough beneath the discharge ends of the car troughs.

7. In combination a chamber, a trough on one side thereof, a car for wood, means on the car to convey the fluid exuding from the wood to the troughs, a partition in the trough, and a pipe in the trough on the opposite side of the partition from the car, for the purpose set forth.

8. In combination a chamber, a trough on one side thereof, a car for wood, means on the car to convey the fluid exuding from the wood to the trough, a partition in the trough, and a pipe in the trough on the opposite side of the partition from the car, and a strainer covering the intake side of the trough.

9. In combination a chamber, a furnace, a track, cars adapted to run upon the track, a collecting trough along one side of the chamber, means on the car to convey the fluid exuding from the wood thereon into the collecting trough, a flue running from the furnace underneath the track and returning underneath the collecting trough, whereby both the contents of the car and of the collecting trough are heated.

In testimony whereof I have hereunto set my hand this 5th day of April, 1911.

THOMAS A. DUNGAN.

In the presence of two subscribing witnesses:

L. HEISLAR,
R. SCHAEFER.