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H. C. AMINOFF.

APPARATUS FOR CONTINUAL CHARRING AND DRY DISTILLATION
OF ORGANIC SUBSTANCES.

APPLICATION FILED APR. 21, 1903.

NO MODEL

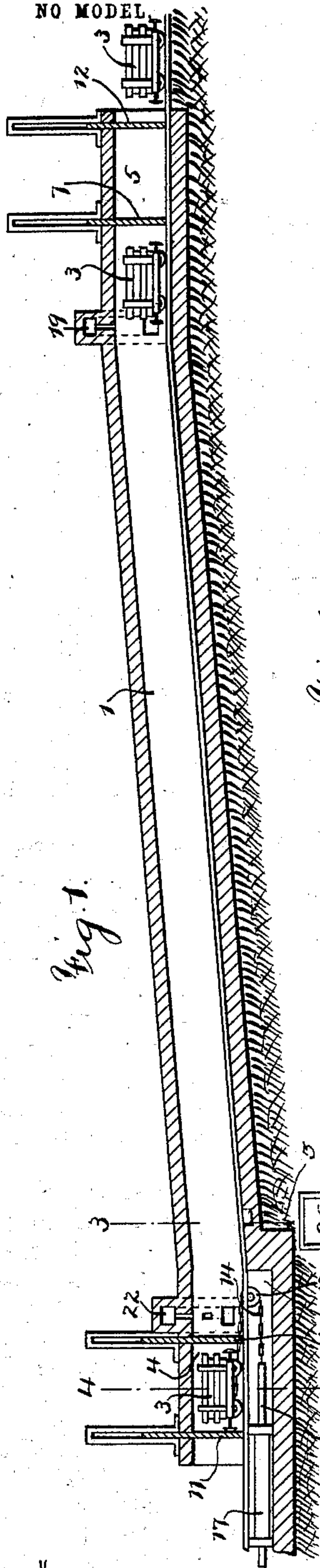


Fig. 1.

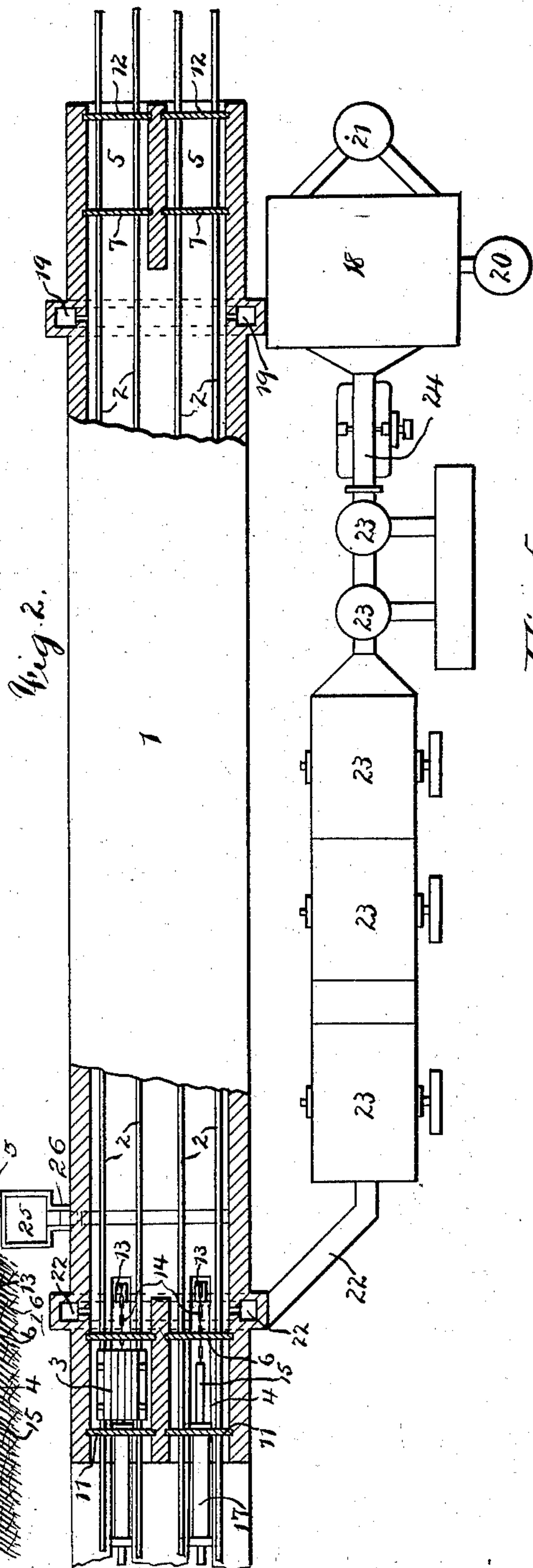


Fig. 2.

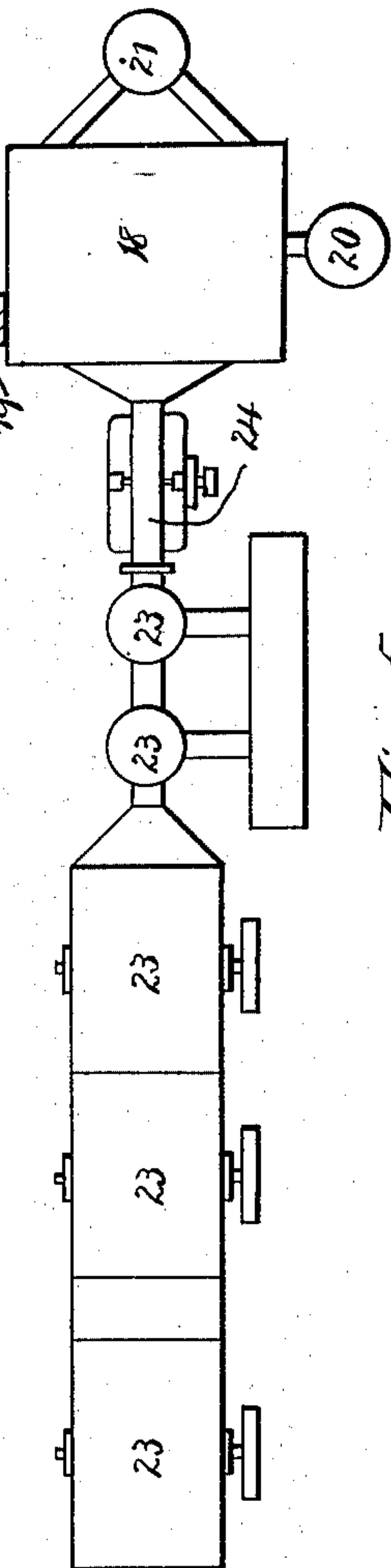


Fig. 3.

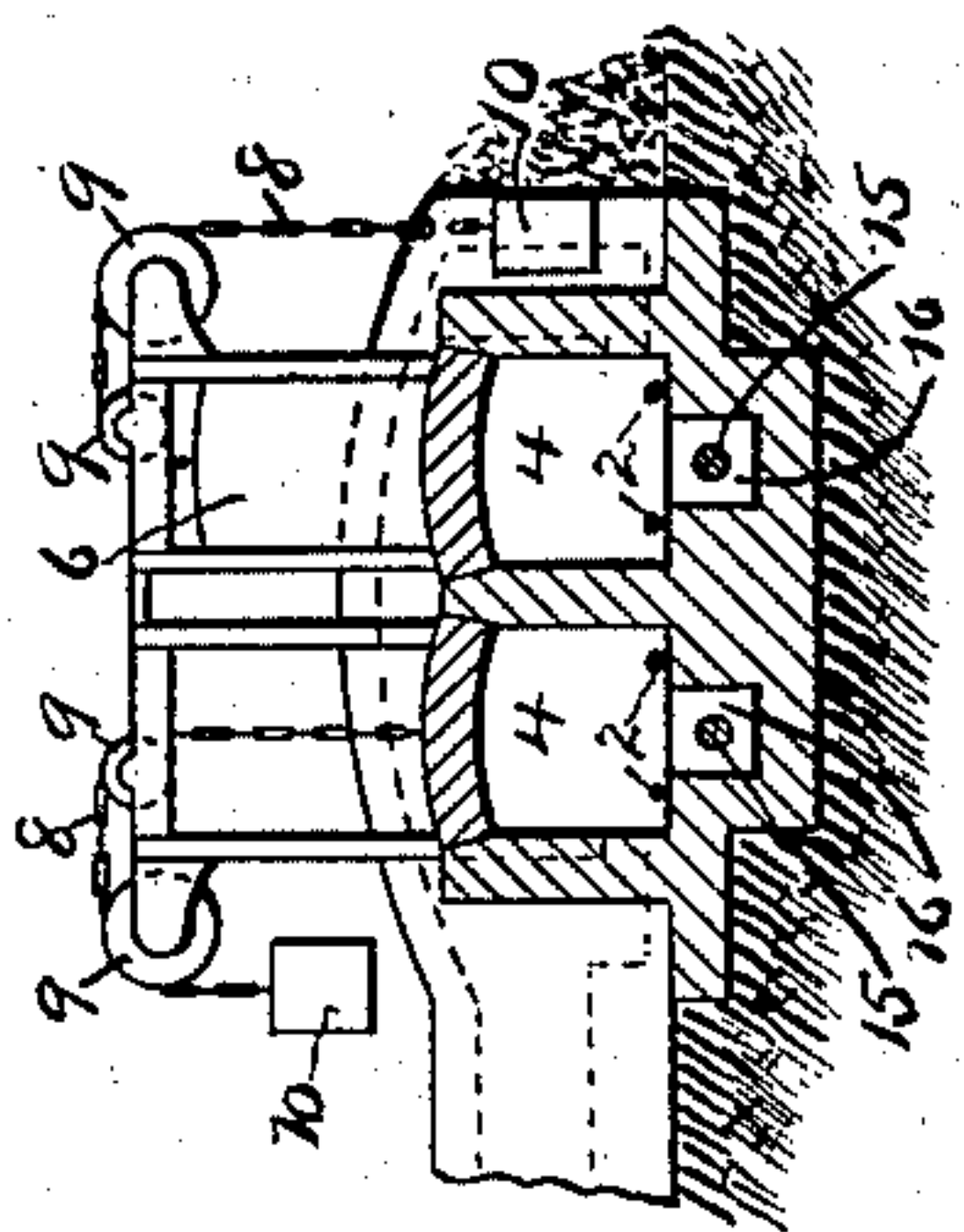


Fig. 4.

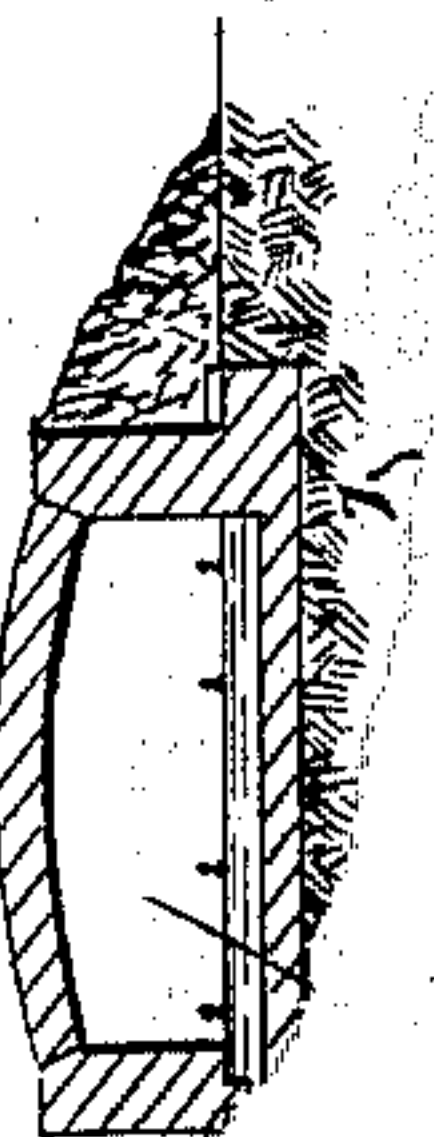


Fig. 5.

WITNESSES
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HINRIK CONSTANTIN AMINOFF, OF DOMNARFVET, SWEDEN, ASSIGNOR
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APPARATUS FOR CONTINUAL CHARRING AND DRY DISTILLATION OF ORGANIC SUBSTANCES.

SPECIFICATION forming part of Letters Patent No. 748,457, dated December 29, 1903.

Application filed April 21, 1903. Serial No. 153,590. (No model.)

To all whom it may concern:

Be it known that I, HINRIK CONSTANTIN AMINOFF, a subject of the King of Sweden and Norway, and a resident of Domnarfvet, in the Kingdom of Sweden, have invented certain new and useful Improvements in Apparatus for Continual Charring and Dry Distillation of Organic Substances, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to an apparatus for continual charring or, generally speaking, for dry distillation of organic substances; and the object of the invention is to provide an apparatus in which the charring process is effected in the same manner as in charcoal piles—i. e., in vertical direction from the top to the bottom.

In the accompanying drawings, which serve to illustrate the invention, Figure 1 is a vertical sectional view of the distilling chamber or furnace. Fig. 2 is a top view of the entire apparatus, partly in section. Fig. 3 is a section on the line 3 3 of Fig. 1. Fig. 4 is a section on the line 4 4 of Fig. 1, and Fig. 5 is a cross-section of the apparatus through the passage for leading away the products of the condensed gases.

1 is the distilling-furnace consisting of an inclined extended chamber made of bricks or other suitable material. The outsides of the walls are preferably covered with sand or other insulating substance. 2 2 are tracks extending along the chamber and supporting trucks 3, which carry the substance to be charred. The said chamber 1 is at both ends divided into two compartments 4 4 and 5 5, respectively, separated from the chamber proper by means of gates 6 6 and 7 7, suspended in chains 8, passing over pulleys 9 and provided with counterweights 10. The outer ends of the said compartments are closed by gates 11 11 and 12 12. In Fig. 4 one of the gates 6 is closed and the other opened. At the lower end of the chamber means are provided for bringing the trucks into the chamber. In the drawings the said means consist of chains 14, passing round pulleys 13, suitably journaled under the chamber. One end of the chain is fixed to a rod 15, mounted in a channel 16 and passing through

a tube 17. When a truck is to be brought into the chamber, the gate 11 is opened and the truck pushed into the compartment 4. The said chain 14 is then connected with the rear end of the truck and the gate 11 is closed. When the gate 6 has been opened, the truck is advanced by pulling in the rod 16, which is connected with a winch or the like. (Not shown in the drawings.) Finally the gate 6 is closed. In this manner the tracks are successively filled with trucks so that when a new truck is drawn into the chamber at the lower end of the same the truck at the top end of the chamber will be pushed out simultaneously by the following trucks. The gates 7 and 12 are successively opened and closed in order to permit the top truck being brought out of the chamber.

The top end of the chamber 1 is connected with a regenerator 18 by means of a channel 19. The said regenerator consists of two chambers and is arranged in usual manner. 20 is a furnace, and 21 is a chimney, which is connected with the said chambers alternately. The lower end of the chamber 1 is connected with condensers 23 by means of a channel 22. The said condensers may be of any suitable construction and are therefore not described. 24 is a fan connected with the said condensers and the regenerator.

The heat necessary for the charring process is effected by the gas generated in the furnace 20, which is burned in one of the chambers of the regenerator 18 and then passes to the chimney 21. Gases generated in the chamber 1 during the charring process are drawn by the fan 24 from the lower end of the said chamber through the channel 22 and into the condensers 23. At the same time the non-condensable part of the said gases, which consists of carbonic acid, carbonic oxid, and some hydrocarbons, is forced by the fan 24 through the other chamber of the regenerator 18, which chamber has previously been heated in the same manner as the chamber first mentioned. The gases last mentioned enter the top end of the chamber 1 through the channel 19 and pass through the entire chamber, the greater part of their heat being successively transmitted during the said passage to the substance to be charred. They

are then again, together with gases generated during the charring process, sucked through the condensers and circulated in the said manner until the temperature of the gases when leaving the regenerator is insufficient for the charring process. The gas-current is then led through the other heated chamber of the regenerator, and the first chamber of the same is heated by means of gas from the generator 20. The excess of combustible non-condensable gases generated during the charring process is led into the chamber of the regenerator which is being heated and is burned in the same. The products resulting from the condensation of gases in the chamber 1 may be led away from said chamber to a suitable receptacle 25 by the way of a passage 26. In consequence of the said circulation the substance situated in the top end of the chamber 1 will be subjected to the comparatively highest temperature. In this manner the substance is thoroughly charred in the top part of the chamber while being successively and preparatively heated in the lower part of the chamber, the charring process being thus continuous and executed in the same manner as in piles.

Having now described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a charring and distilling apparatus the combination of an extended, inclined chamber, means for transporting the sub-

stance to be charred from the lower end of the chamber to its top end, means for introducing heated gas into the said top end, and outlet-openings for the gas at the lower end substantially as described. 35

2. In a charring and distilling apparatus the combination of an extended, inclined chamber, means for transporting the substance to be charred from the lower end of the chamber to its top end, means outside the chamber for conveying gases from the said lower end into the top end and means for heating the said gases before entering the chamber, substantially as described. 40 45

3. In a charring and distilling apparatus the combination of an extended, inclined chamber, means for successively transporting the substance to be charred from the lower end of the chamber to its top end, a passage leading gases generated in the chamber from its lower end to the top end, and condensers, a fan and a heating device mounted in the said passage between the said lower end and the top end, substantially as described. 50 55

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses. 60

HINRIK CONSTANTIN AMINOFF.

Witnesses:

ROBERT APALZREN,
AUG SORCERSEN.