

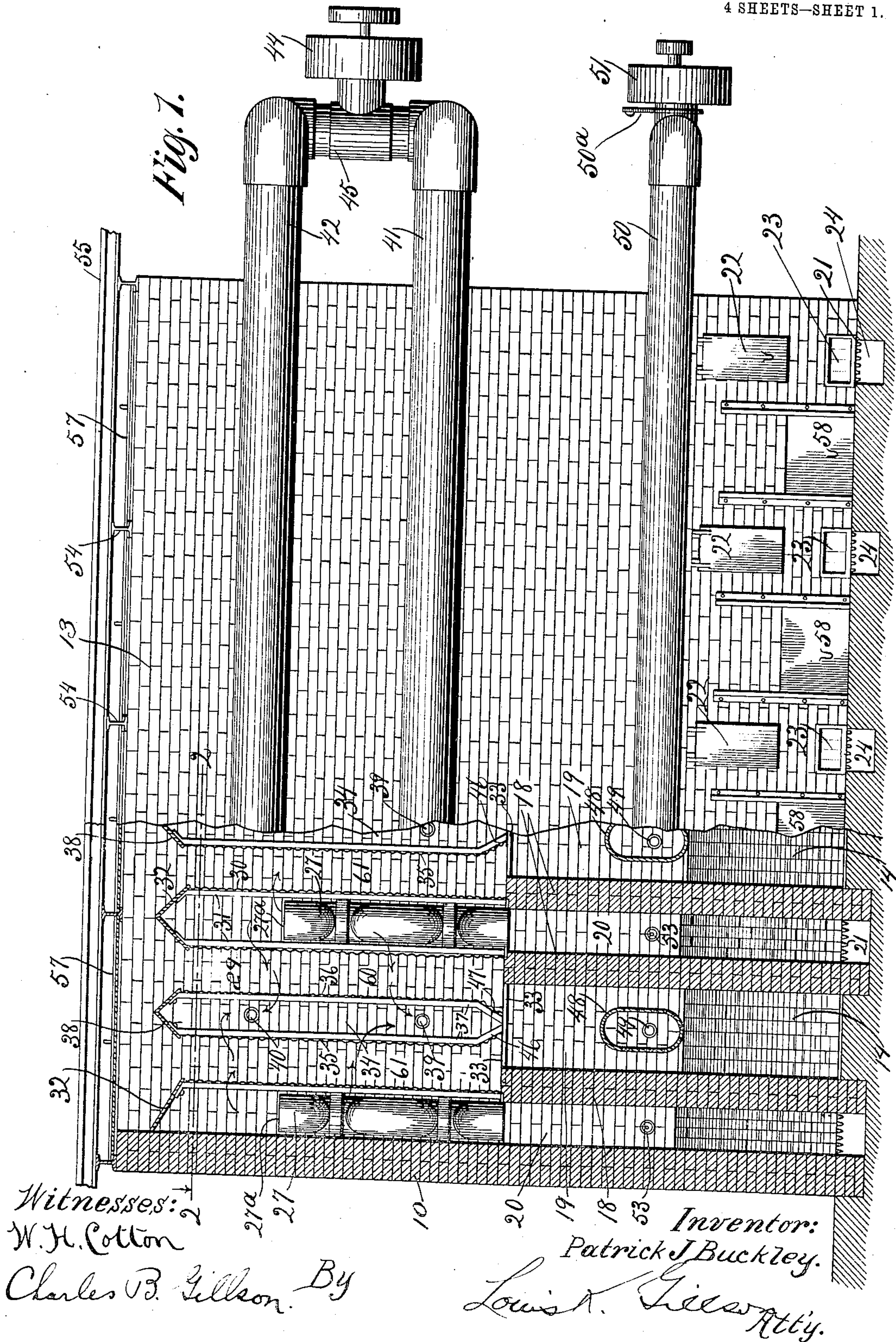
No. 816,214.

PATENTED MAR. 27, 1906.

P. J. BUCKLEY.
PEAT OVEN.

APPLICATION FILED MAY 27, 1905.

4 SHEETS—SHEET 1.



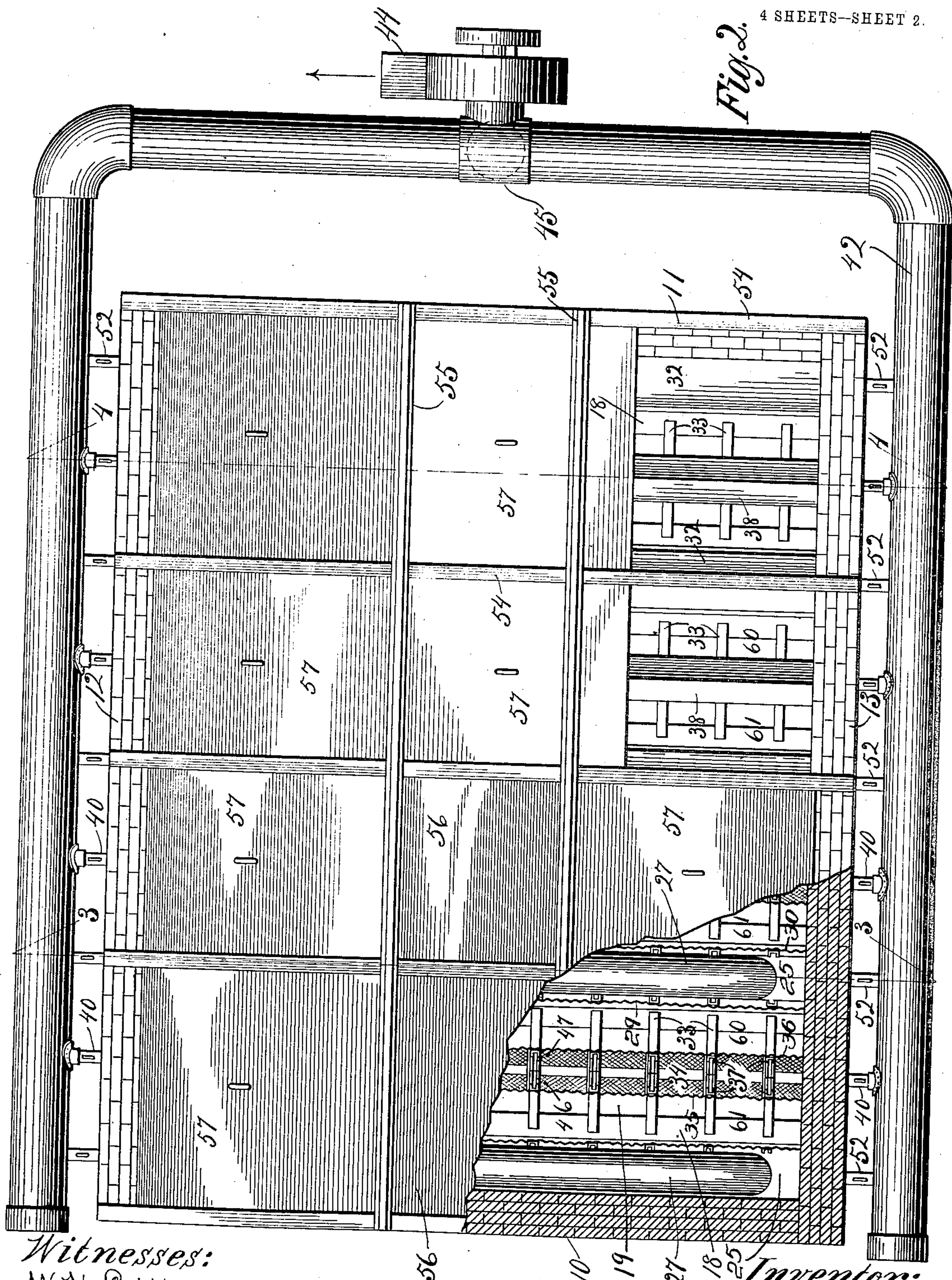
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Witnesses:

W. H. Cotton

Charles B. Gillson.

By

Louise Gillson

Inventor:
Patrick J. Buckley.

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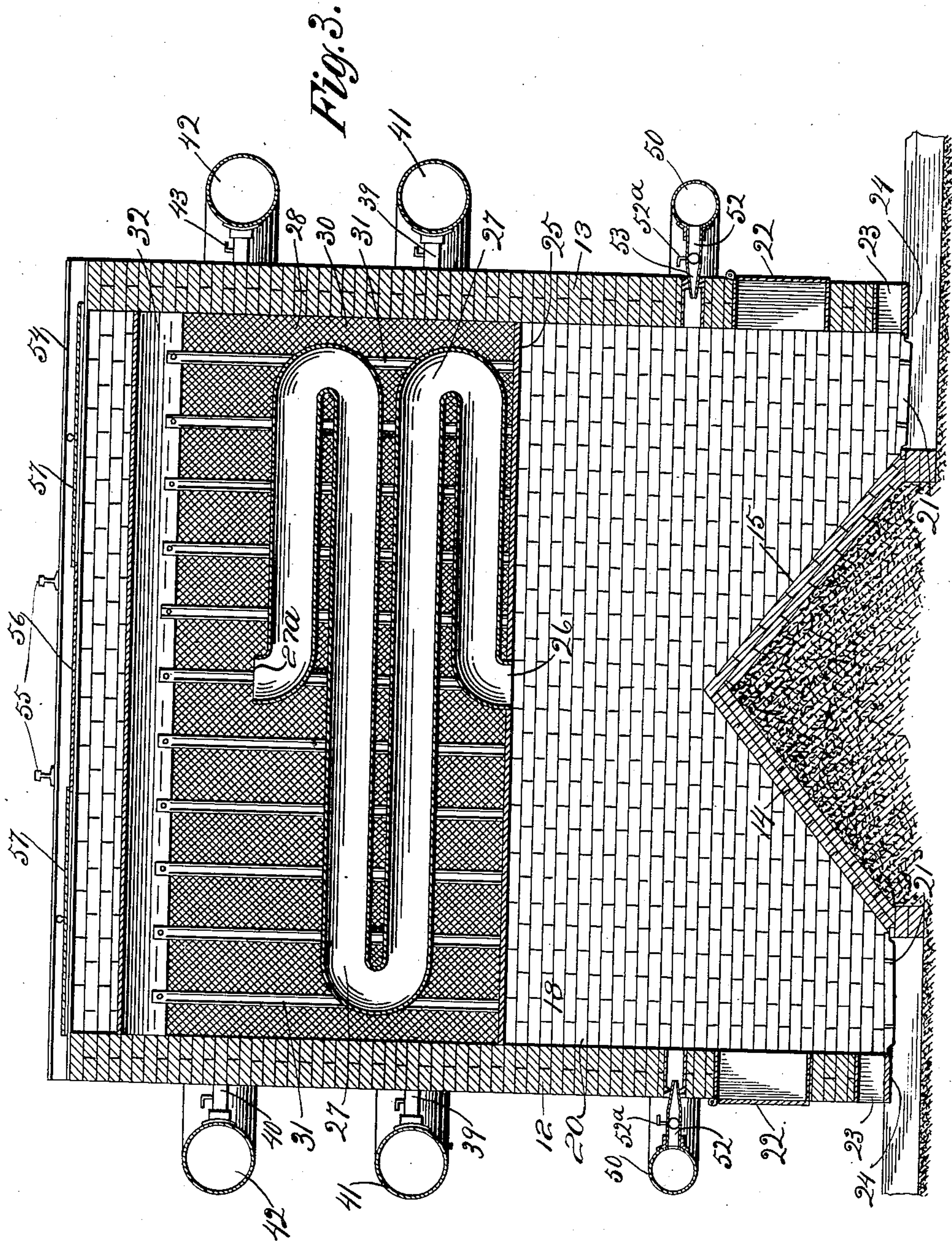
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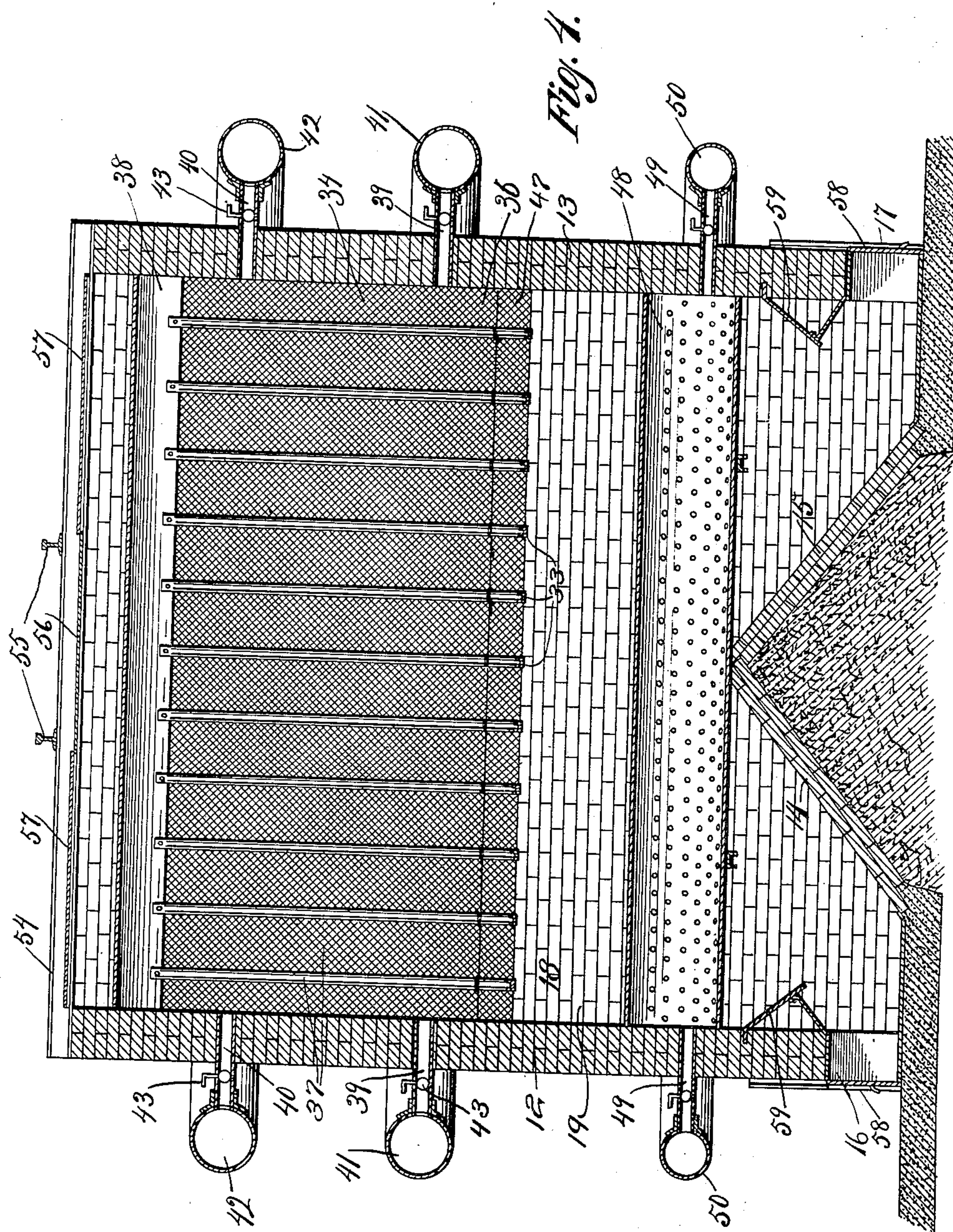
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UNITED STATES PATENT OFFICE.

PATRICK J. BUCKLEY, OF WAUKESHA, WISCONSIN.

PEAT-OVEN.

No. 816,214.

Specification of Letters Patent.

Patented March 27, 1906.

Application filed May 27, 1905. Serial No. 262,563.

To all whom it may concern:

Be it known that I, PATRICK J. BUCKLEY, a citizen of the United States, and a resident of Waukesha, county of Waukesha, and State of Wisconsin, have invented certain new and useful Improvements in Peat-Ovens, of which the following is a specification, and which are illustrated in the accompanying drawings, forming a part thereof.

10 The invention relates to an apparatus for treating peat, preferably after it has been reduced to lump form, by compression and a partial elimination of its moisture and entrained air.

15 The invention has for its object to afford a simple and efficient means for drying and charring the material in order to adapt it for use as a commercial fuel and contemplates an inclosure for receiving the peat and in which it may be heated to a sufficient temperature to drive out substantially all of its moisture and a part of its other volatile constituents.

25 In the preferred construction of the apparatus this inclosure is provided with furnace-chambers adapted for employing the combustible gases emitted from the material within the inclosure supplemental to other fuel and for heating the material both by the circulation through it of the products of combustion from such chambers and by the radiation from their walls.

30 A further detail of the invention contemplates means for collecting the combustible gases emitted from the heated material, so that they may be consumed in the furnace-chambers or led away to convenient storage tanks.

40 The invention consists in the structure to be hereinafter described and which is illustrated in the accompanying drawings, in which—

45 Figure 1 is a side elevation of the device with some of the parts broken away and showing the interior construction in vertical longitudinal section. Fig. 2 is a plan view of the same, partly in horizontal section, on the line 2 2 of Fig. 1. Figs. 3 and 4 are vertical cross-sections on the lines 3 3 and 4 4, respectively, of Fig. 2.

50 The device is provided with side and end walls of refractory material, such as masonry, (shown in the drawings at 10, 11, 12, and 13,) and the space inclosed within these walls has a double-inclined floor 14 15 for directing the

material contained within the inclosure toward the discharge-openings 16 17 in its walls. The lower part of the inclosure is crossed by a plurality of partition-walls 18, rising from the floor to a height somewhat less than half that of the side and end walls and providing a number of interspaces 19 20, a part of which, as the alternate spaces 20, are adapted to be used as furnace-chambers. To this end the flooring of these spaces is partly cut away and is replaced by grate-bars 21, and there are provided in the walls at each end of these spaces fire and clinker doors 22 and 23 and ash-pit openings 24. Each of these furnace-chambers is closed at the top, as by means of a metal plate 25, resting on the partition-walls 18 and having a flue-opening 26, communicating with a flue 27, intended to provide a circuitous passage for the products of combustion and opening into the interior of the structure at 27^a. A housing or hood 28, having perforated side walls 29 30 and preferably extending from side to side of the structure, incloses the flue 27 and covers the entire area of the plate 25. The side walls 29 30 are supported by suitable uprights 31, rising from the plate 25, and the hood is closed at the top by a suitable roof 32.

85 The interspaces 19 take the form of bins open at the top to the interior of the structure and communicating below with the discharge-openings 16 17. These bins are made narrow for the purpose of retaining the material in thin layers between the heated walls of the furnace-chambers 20 in order that it may be raised to a charring temperature throughout. In the upper part of the structure, and preferably directly over each of these bins, is provided an exhaust-chamber 34, similar in construction to that of the hoods 28 and having perforated side walls 35 36, which are so disposed in relation to the walls of the adjacent hoods 28 that only such a body of material may be contained in the intervening spaces 60 61 as will permit a free passage of the vapors of combustion from the hood into the exhaust-chamber. The side walls 35 36 are secured to suitable uprights 37, rising from beams 33, resting upon the partition-walls 18, and the top of the exhaust-chamber is closed by a cover-plate 38.

Exhaust-ports 39 40 lead out of the chambers 34 through the side walls of the inclosure and communicate with the pipes 41 42, 110

extending the entire length of the inclosure at either side and connecting at the end thereof with a cross-pipe 45, to which is applied an exhaust-fan 44. In each of the exhaust-ports 39 40 there is provided a valve 43, so that the exhaust from the several chambers may be apportioned as may be desired.

The side walls 35 36 of the exhaust-chambers 34 are inclined inwardly at their lower edges, as indicated at 46 and 47, Fig. 1, to provide a free passage from the spaces 60 61 into the bins 19. In each of the bins is a gas-receiver 48, preferably extending the entire length of the bin and of elliptical cross-section to provide a large capacity without obstructing the descent of the material through the bin. The side and lower walls of this receiver are freely perforated, as is most clearly shown in Fig. 4, and at either end there is provided an exhaust-port 49 leading through the side walls 12 13 of the inclosure and connecting with a pipe 50, running the entire length of the inclosure and joined near one end thereof with an exhaust-fan 51.

The pipe 50 is designed to draw the combustible gases emitted from the heated material contained in the bins 19 from the gas-receiver 48, and, if desired, this gas may be delivered, by means of the exhaust-fan 51, to a suitable storage-tank. (Not shown in the drawings.) In the preferred method of using the device, however, it is intended to burn this gas in the furnace-chambers 20, and for this purpose there is provided a by-pass 52, leading out of the pipe 50, preferably adjacent each of the fire-doors 22 and terminating in a burner 53 of ordinary construction, directed through the wall of the inclosure into the furnace-chamber. In order that the combustible gases emitted from the material may be directed in either of the ways just described, valves 50^a and 52^a are provided in the pipe 50 adjacent the exhaust-fan 51 and in each of the by-passes 52, respectively.

The top of the structure is crossed by a plurality of beams 54, bearing upon the side walls 12 and 13 and adapted to support the rails 55 of a track and suitable cars (not shown) loaded with the material to be treated in the device, which may be run on the track. The space between these beams is closed by cover-plates 56, some of which may be made removable, as at 57, to provide openings through which the material may be dumped from the cars into the interior of the inclosure.

The openings 16 17, near the base of the structure, are preferably provided with vertically-sliding doors 58, so that the discharge of material through these openings may be interrupted whenever desired and an inflow of air to the charring material is prevented, and there is secured to the interior walls of

the inclosure adjacent each of these openings a guide-plate 59, intended to prevent the jamming of the material as it descends in the bin toward the opening.

The device is continuous in operation, a quantity of material being always maintained within the structure, small amounts of which are drawn from the several discharge-openings 16 17 at short intervals and additions of fresh material being made from time to time. These additions are made at the top of the structure from cars loaded with the material and drawn upon the track 55, the contents of which may be thrown or dumped into the interior of the structure by removing the cover-plates 57, preferably enough material being always maintained within the structure to entirely cover the hoods 28 and exhaust-chambers 34.

Fires are kept in each of the furnace-chambers 20, and a draft is induced by means of the exhaust-fan 44. The products of combustion from these fires enter the hoods 28 from the flues 27 and passing through the perforated walls of these hoods cross the intervening spaces 60 61 to the exhaust-chambers 34 and out of the structure through the exhaust-ports 39 40, as indicated by the arrows in Fig. 1. The material occupying the spaces 60 61 is permeated by the products of combustion from the fires and is heated and dried thereby, and as it is allowed to descend toward the bins 19 by the occasional withdrawal of material from the discharge-openings 16 17 its temperature is raised by the radiation of heat from the furnace-walls.

Within the bins 19 a high temperature is maintained, and the material contained therein is divested of the last traces of its moisture and of a portion of its other volatile constituents, which pass as a vapor into the gas-receivers 48, their escape by way of the mouth of the bin into the exhaust-chamber 34 being practically cut off by the crowding of the material as it descends to the bin from the spaces 60 61. When the valves 52^a, controlling the burners 53, are open, the draft induced by the exhaust-fan 44 will afford means for drawing these vapors from the gas-receivers 48 by way of the exhaust-ports 49, the pipes 50, and the burners 53 into the furnace-chambers 20, where they may be employed as a supplement to other fuel. If it is desired to collect and store these vapors, it will be necessary to employ the exhaust-fan 51 to draw them from the gas-receivers 48, the valves 52^a being then closed.

The material drawn from the discharge-openings 16 17 is in the form of lumps, substantially the same as before treatment in the device, the lumps being, however, contracted in size by the drying and charring process and having assumed a hard dry consistency adapted for transportation and use as a fuel. Moreover, the treatment in the device in-

creases the heating efficiency of the material by expelling all of its moisture and by a partial carbonization.

While the apparatus is intended particularly for the treatment of peat, it is obvious that it may be employed for other purposes.

I claim as my invention—

1. In a peat-oven, in combination, a closed structure, a furnace, a flue leading from the furnace into the chamber of the structure, a duct leading from the chamber of the structure, and a screen interposed between the mouth of the flue and the duct.

2. In a peat-oven, in combination, a closed structure, a furnace, a flue leading from the furnace into the chamber of the structure, a duct leading from the chamber of the structure, and a hood having perforated walls for the mouth of the flue.

3. In a peat-oven, in combination, a closed structure, a furnace, a flue leading from the furnace into the chamber of the structure, a duct leading from the chamber of the structure, a hood having perforated walls for the mouth of the flue, and means for inducing a circulation of heated gases from the furnace through the chamber of the structure to the duct.

4. In a peat-oven, in combination, a closed structure, a furnace, a flue leading from the furnace into the chamber of the structure, a duct leading from the chamber of the structure, a hood having perforated walls for the mouth of the flue, a gas-receiver within the structure, and a duct leading from the receiver.

5. In a peat-oven, in combination, an inclosure for holding the material, a furnace within the inclosure, a housing for the furnace, a flue-opening in the housing, a hood for the opening having perforated walls, a duct leading from the inclosure, and a screen for the opening of the duct.

6. In a peat-oven, in combination, an inclosure for holding the material, a plurality of independent furnace-housings within the inclosure, a flue-opening in each of the housings, a gas-receiver having foraminous walls

adjacent the heated walls of the furnace-housings, a duct leading from the receiver, and a duct leading from the chamber of the inclosure.

7. In a peat-oven, in combination, a furnace; a drying-chamber adjacent thereto; a gas-conduit leading from the lower part of the drying-chamber to the combustion-chamber of the furnace; a flue leading from the combustion-chamber and discharging into the drying-chamber above the receiving end of the conduit; and a discharge-flue leading from the drying-chamber.

8. In a peat-oven, in combination, an inclosure divided into a plurality of drying-bins and furnace-chambers located between the lower portions of the bins; a gas-receiver within each bin and between the walls of adjacent furnace-chambers; a conduit leading from each gas-receiver to a furnace-chamber; smoke-flues leading from the furnace-chamber to the bins and opening into the upper part thereof; a perforated hood inclosing the delivery end of each flue; and eduction-flues leading from the bins.

9. In a peat-oven, in combination, a furnace-chamber; a drying-bin adjacent thereto; a gas-receiver within the lower part of the bin; a perforated smoke-receiver within the bin and above the gas-receiver; a conduit leading from the gas-receiver to the furnace-chamber; a flue leading from the furnace-chamber to the smoke-receiver; and an eduction-flue leading from the bin.

10. In a peat-oven, in combination, a furnace-chamber; a bin adjacent thereto; a gas-receiver within the bin; a pair of hoods within the bin above the gas-receiver; a conduit leading from the gas-receiver to the furnace-chamber; a smoke-flue leading from the furnace-chamber to one of the hoods; an eduction-passage leading from the other hood to the exterior of the oven; and means for applying suction to the passage.

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Witnesses:

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