

J. M. RUMBAUGH.
DRIER.

APPLICATION FILED NOV. 6, 1903.

4 SHEETS—SHEET 1.

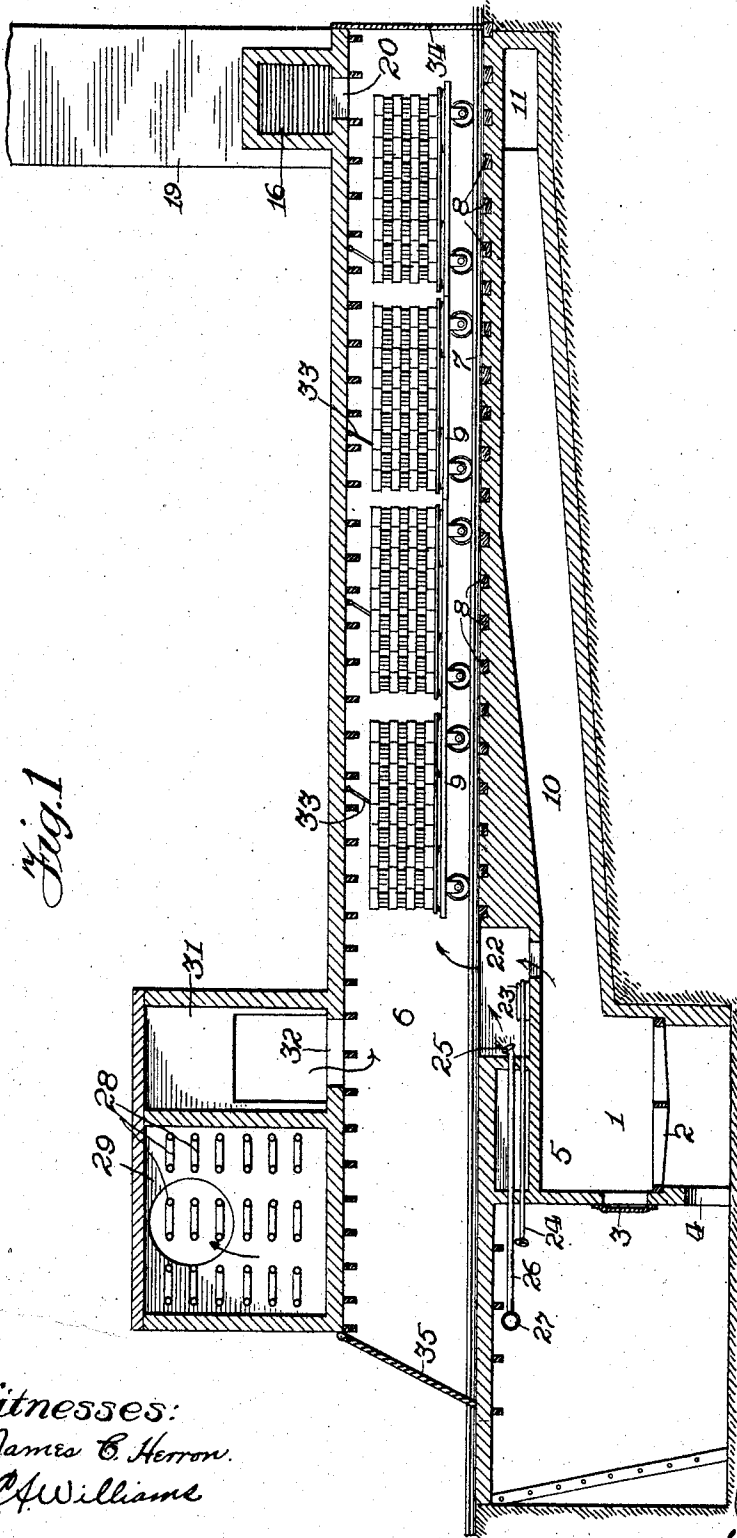


Fig. 1

Witnesses:
James C. Herron.
C. Williams

Inventor:
J. M. Rumbaugh
By J. M. Roney
his Attorney.

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4 SHEETS—SHEET 2.

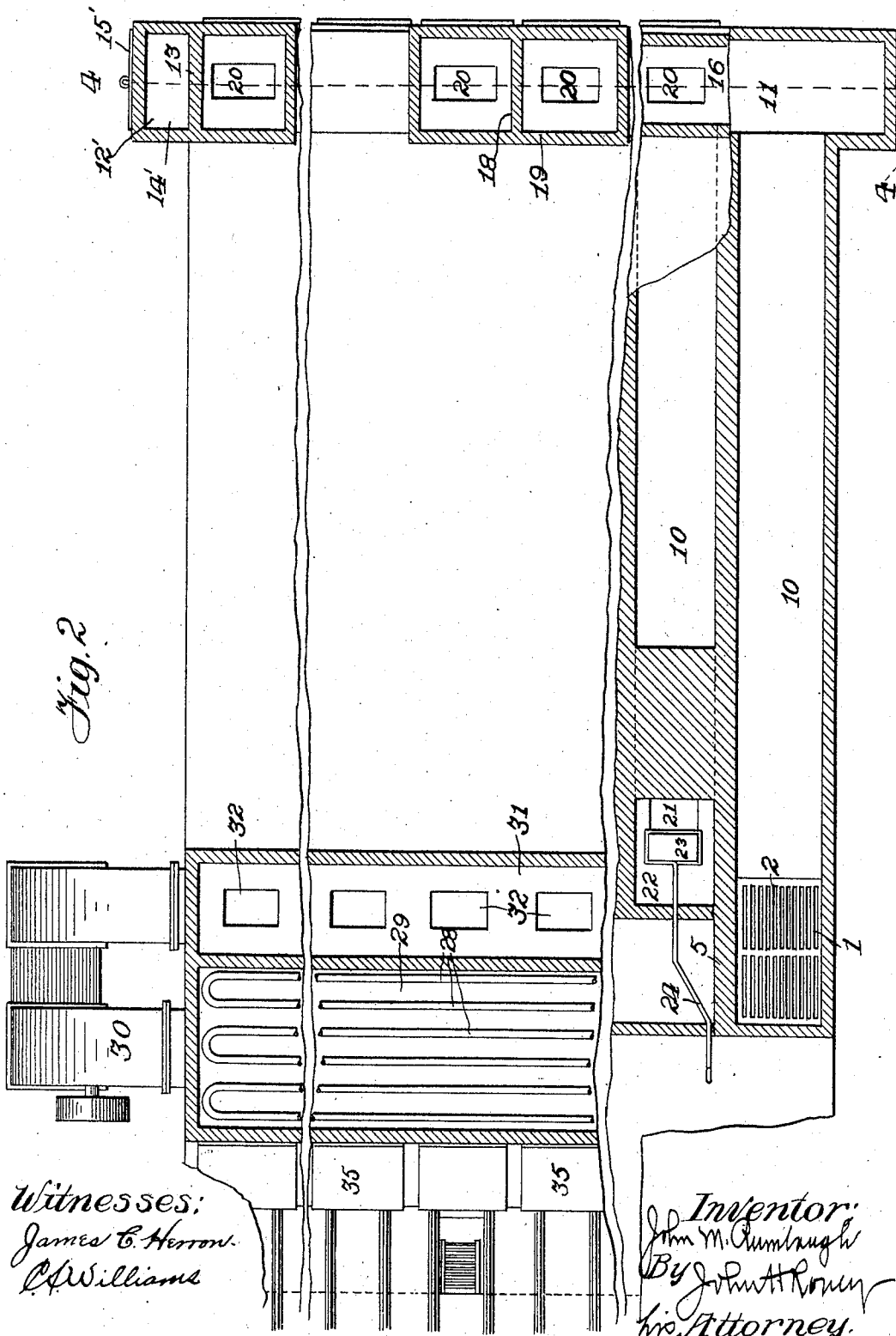


Fig. 2

Witnesses:
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4 SHEETS—SHEET 3.

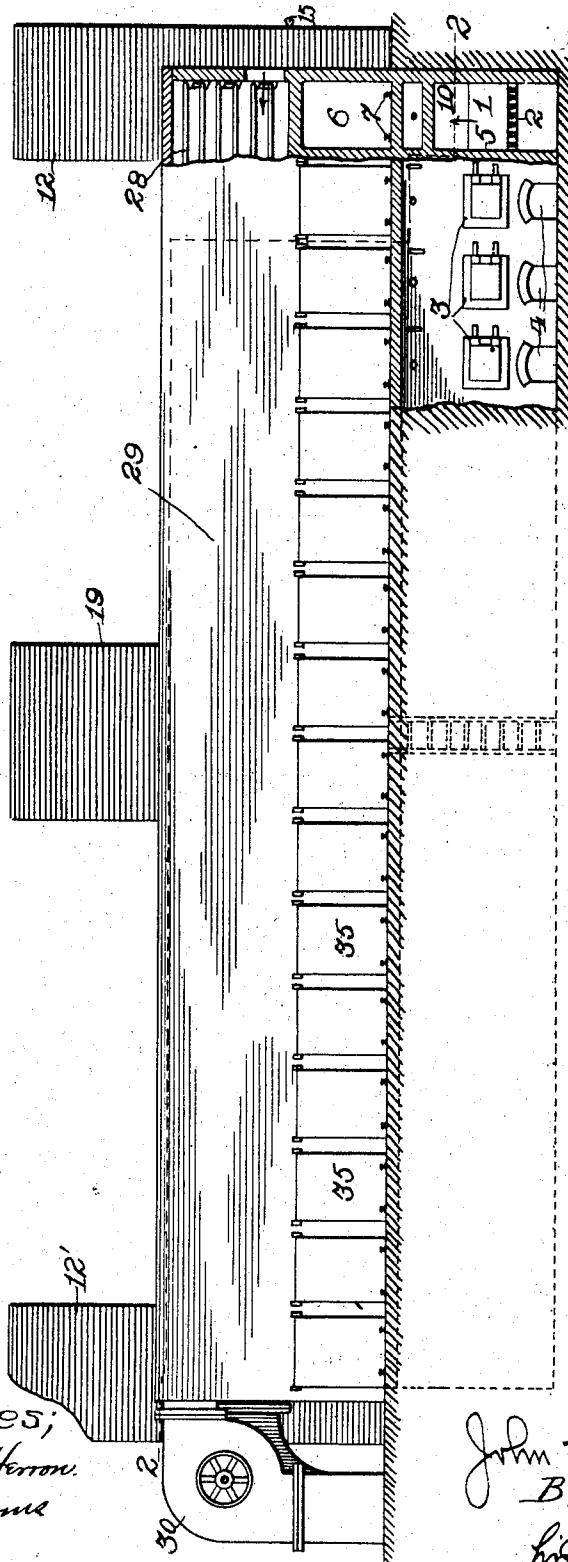


Fig. 3

Witnesses;
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4 SHEETS—SHEET 4.

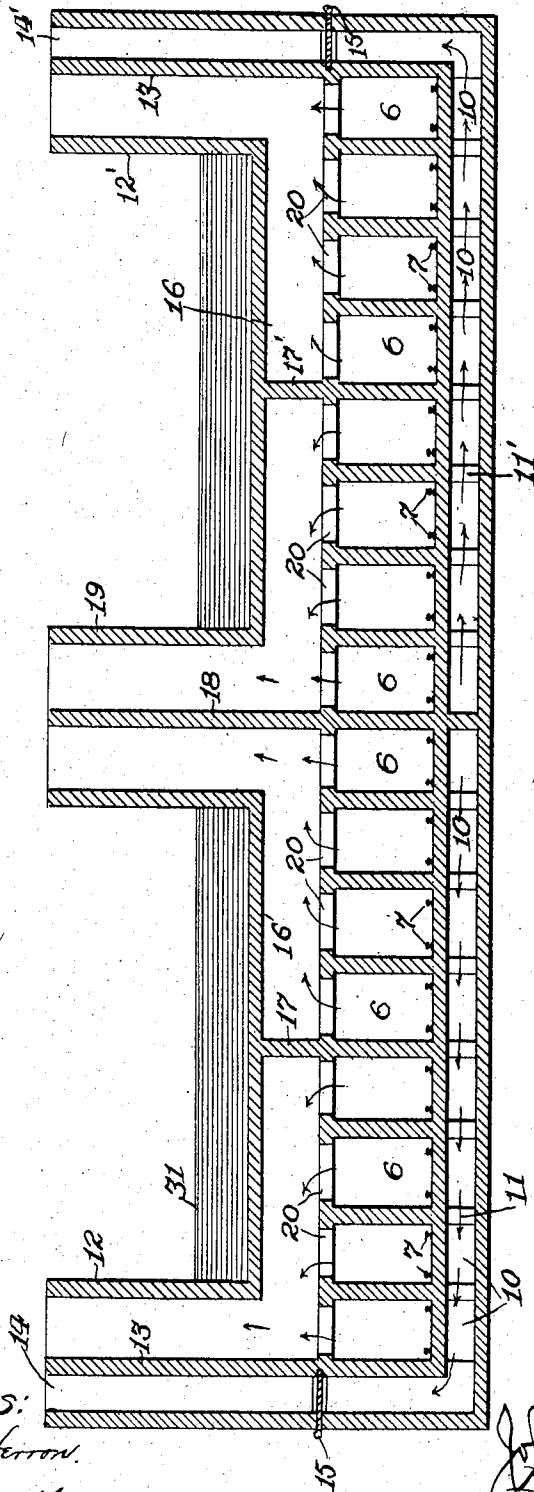


Fig. 4

Witnesses:
James C. Herron.
C. Williams.

Inventor:
John M. Rumbaugh
By John A. Roney
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UNITED STATES PATENT OFFICE.

JOHN M. RUMBAUGH, OF WILKINSBURG, PENNSYLVANIA.

DRIER.

SPECIFICATION forming part of Letters Patent No. 780,914, dated January 24, 1905.

Application filed November 6, 1903. Serial No. 180,017.

To all whom it may concern:

Be it known that I, JOHN M. RUMBAUGH, a citizen of the United States, residing at Wilkinsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Driers, of which improvement the following is a specification.

My invention relates to improvements in brick-driers; and the object of my invention is to produce a drier capable of drying brick in a very much shorter period of time than is now required and to reduce the quantity of fuel used, and thus reduce the cost of manufacture.

To accomplish these purposes, my invention comprises a series of parallel chambers, channels, or passage-ways adapted to receive a number of cars or carriers containing brick to be dried, the said channels being adapted to be heated by heat radiated from a corresponding number of underlying flues and also from heat directly conveyed thereto through series of ports or ducts opening from said flues and communicating directly with the combustion or fire chambers and by heated air discharged therein from an air duct or ducts connected with the hot-air radiator; and it consists in other novel features of construction hereinafter more specifically described and pointed out, reference being had to the accompanying drawings, which form a part of this specification, in which—

Figure 1 is a longitudinal section of my improved brick-drier. Fig. 2 is a sectional plan view on the line 2 2 of Fig. 3, a portion of the same being broken out. Fig. 3 is a front elevation of the same, partly in section, on a reduced scale. Fig. 4 is a sectional end view taken on the line 4 4 of Fig. 2.

Like reference characters indicate like parts wherever they occur throughout the several views.

Referring to the drawings, 1 indicates a plurality of combustion-chambers provided with grate-bars 2, the said chambers being provided with the usual fuel-charging doors 3 and openings 4 in the front wall of the furnace below the grate-bars for the purpose of permitting air to enter the combustion-chambers and for the removal of the ashes. The

said combustion-chambers are separated by the partition-walls 5 and are respectively located, as shown in the drawings, beneath one end of a corresponding number of drying-tunnels 6, in which tracks 7, suitably supported on cross-beams 8, are located and on which the cars 9, which carry the brick or other material to be dried, are adapted to run. The said tracks may be slightly inclined toward the exit of the drier to facilitate the movement of the cars through the tunnel, if so desired. The said combustion-chambers 1 are connected with flues 10, which extend longitudinally of the drier beneath the drying-tunnels 6, and the said flues are connected at their rear ends to the transverse flues 11 and 11', one half of the total number of the flues 10 connecting with the flue 11 and the other half connecting with the flue 11'. Stacks 12 and 12' are located at the sides of the drier adjacent to the flues 11 and 11', and the said stacks are divided by the partition-wall 13, the chambers 14 and 14', formed thereby, communicating with the flues 11 and 11', respectively. Dampers 15 and 15' are provided in said chambers for a purpose to be hereinafter more fully described.

Located above the entrance end to the tunnels is a transverse flue 16, which is divided into four chambers by the walls 17 and 17' and walls 18, which also divides a centrally-disposed vapor-stack 19, and parts 20 connect the several tunnels with the flue 16.

Referring to Fig. 4, it will be seen that one-fourth the total number of tunnels communicates with an independent vapor-stack. At or near the ends adjacent to the combustion-chambers each of the flues 10 are provided with a port 21, which communicates with a space 22, located beneath and communicating with the several drying-tunnels 10, and a valve or damper 23 is adapted to close the port, the same being actuated by the rod 24, connected therewith, the said rod extending to the face of the combustion-chamber.

The space 22 has provided therein the gas-burner 25, which is supplied by the pipe 26, which connects with the feed-pipe 27, the said burner being for the purpose of supplying additional heat to the drying-tunnels.

A radiator 28 is provided in the chamber 29, preferably located above the drying-tunnels, and a fan 30 is adapted to draw the heated air from this chamber and force the same into the chamber 31, which is connected with the several drying-tunnels 10 by the parts 32. The said radiator is formed of a plurality of pipes through which live or exhaust steam or hot water may be forced for the purpose of heating the air within the chamber 29.

The bricks to be dried are placed upon the cars 9 in such a manner that the hot air and gases may pass through the same, and a plurality of heat-retarders 33 are located in the tunnels in such a manner that no loss of hot air and gas will take place due to the same passing through the tunnel without passing through the bricks. The said retarders consist of transversely-disposed plates, which are suitably hinged to the roof of the tunnel where the bricks may pass beneath the same.

The entrance to and exit from the several tunnels are closed by hinged doors 34 and 35 in such a manner that the cars may readily pass into and from the several tunnels.

One of the principal features of novelty of my construction, and to which I attribute the utmost importance and advantage, is the admission of heat from the incandescent fuel into the drying-chamber direct from the furnace, as by this feature of construction I am enabled to dry a larger quantity or number of bricks in a given time than is at present possible and at a saving of at least fifty per cent. of fuel in the operation, thus increasing the product and cheapening the manufacture thereof.

The operation of my improved drier is as follows, viz: The different combustion-chambers being charged with the necessary fuel and the direct-heat ports 21 being closed by the damper 23 and the dampers 15 and 15' in the combustion-stacks 12 12' opened, initial combustion is produced and the draft through said combustion-stacks maintained until the smoke has been burned off. The combustion-flues are then closed by the dampers 15 15' and the ports 21 opened, thereby enabling the heat arising from the incandescent fuel to pass directly into the drying chambers or tunnels 6, in which one or more cars containing brick are slowly and progressively moved from the rear or stack end of the drier to the front or furnace end thereof, the brick in transit through said channels or drying-chambers being completely dried. The draft through the vapor-stacks, into which the vapor arising from the drying brick is drawn, serves to maintain the fuel in the furnace in an incandescent condition during the time the draft through the combustion-stack is closed, thus drawing or carrying heat direct from the furnaces and free from smoke through the drying-chambers for the purpose of more quickly and effectually drying the brick therein and utiliz-

ing all the heat and saving fuel in said operation. The heat obtained by initial combustion is radiated into the drying chambers or tunnels from the flues 10, through which it passes, in conjunction with the hot air discharged into the drying-chambers through the hot-air ducts and radiators materially assists in the drying operation, and the gas-burner 25 may also be utilized to materially add to the heated air passing through the said tunnels 6.

I claim as my invention and desire to secure by Letters Patent--

1. In a drier, the combination of a furnace, a drying-chamber adjacent thereto, a flue leading from said furnace to a stack and adapted to heat said drying-chamber by radiation, means to close the draft through said flue, a vapor stack or flue for the drying-chamber, a flue or port to convey the heat from said furnace direct to said drying-chamber during the time the draft is cut off through the combustion-flue, a valve or damper for the last-named flue or port, and means for controlling said valve or damper from the exterior of the drier.

2. In a drier, the combination of a series of independent furnaces, arranged in battery, a corresponding series of independent drying-chambers above said furnaces, combustion-flues leading from each of said furnaces, a flue, common to all of said last-mentioned flues, connected with the draft-stack, means to control the draft through said stack, means to admit heat from each of said furnaces to its corresponding drying-chamber during the time the draft through said combustion-stack is closed, and an auxiliary or vapor stack independent of the combustion-flues adapted to produce sufficient draft to maintain combustion in the furnace during the time the draft through the combustion-stack is closed.

3. In a drier, the combination of a plurality of independent furnaces, arranged in battery, a corresponding number of closed drying-chambers, located above said furnaces, a combustion-flue leading from each of said furnaces, a flue connected to the opposite end of said combustion-flues, common to all of said flues, a combustion-stack connected therewith, means to control the draft through said stack, a vapor-stack, means to admit heat direct from each of said furnaces to each of said drying-chambers, one or more heat retarders or deflectors dependent from the roof of said drying-chambers, a track or way located in each of said chambers, in combination with cars adapted to carry the brick.

4. In a drier, the combination with a furnace, of a drying-chamber, a combustion-stack, a combustion-flue leading from said furnace to said stack, means for cutting off the draft to said flue, a flue or port to convey the heat from said furnace direct to said drying-chamber during the time the draft is cut off

through the combustion-flue, means controlling said flue or port, and an auxiliary or vapor stack for the drying-chamber and independent of the combustion-flue and adapted
5 to produce sufficient draft to maintain combustion in the furnace during the time the draft through the combustion-stack is cut off.

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

JOHN M. RUMBAUGH.

In presence of—

CLARENCE A. WILLIAMS,
JOHN H. RONEY.