No. 763,562. PATENTED JUNE 28, 1904.

W. HORSFALL.

CREMATING FURNACE.

APPLICATION FILED FEB. 5, 1901.

NO MODEL

2 SHEETS—SHEET 1.

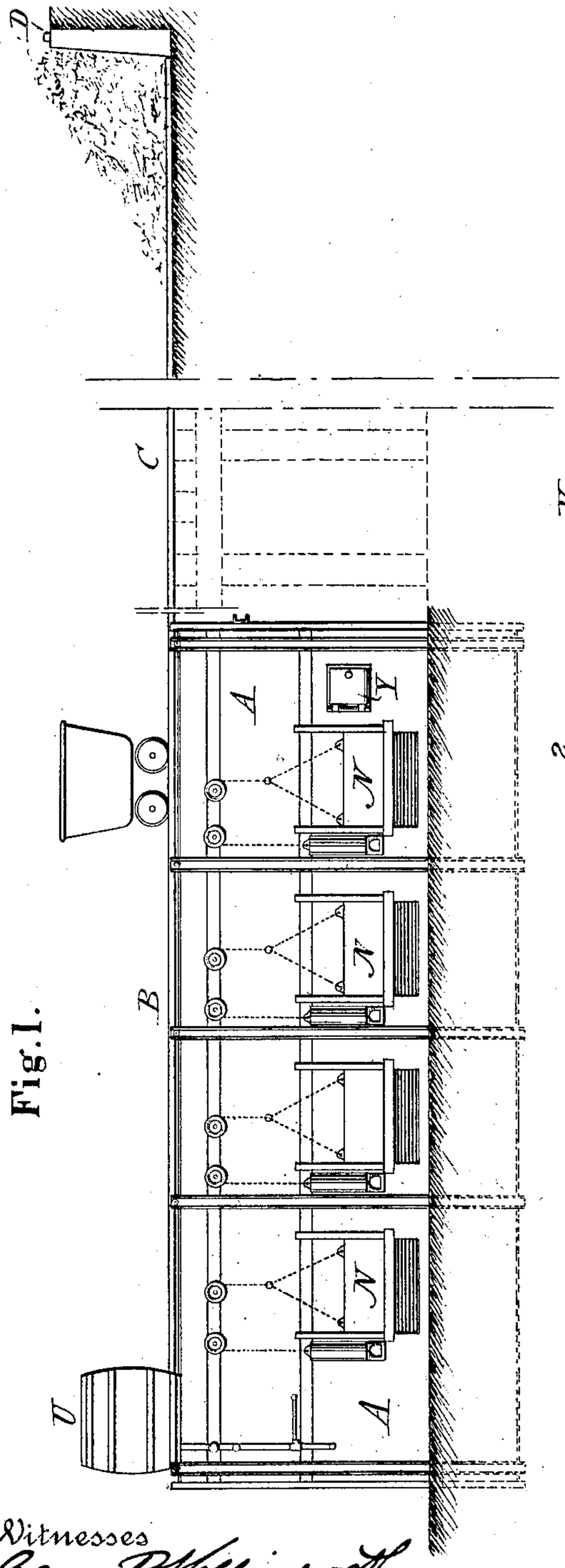

Fig. 1.

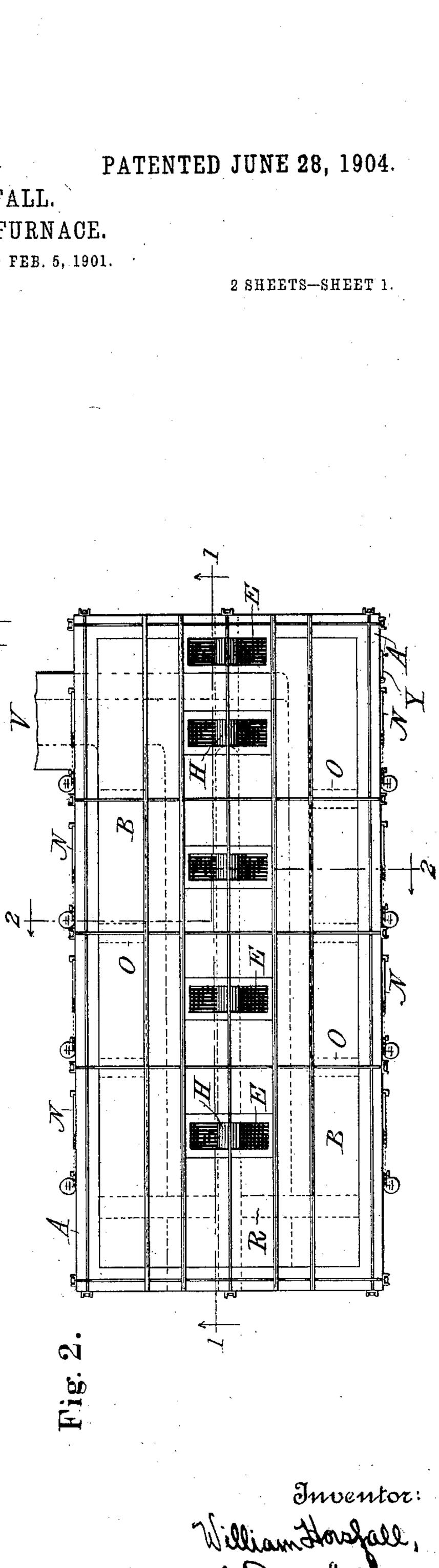

Fig. 2.

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NO MODEL. 2 SHEETS—SHEET 2.

Fig. 5.

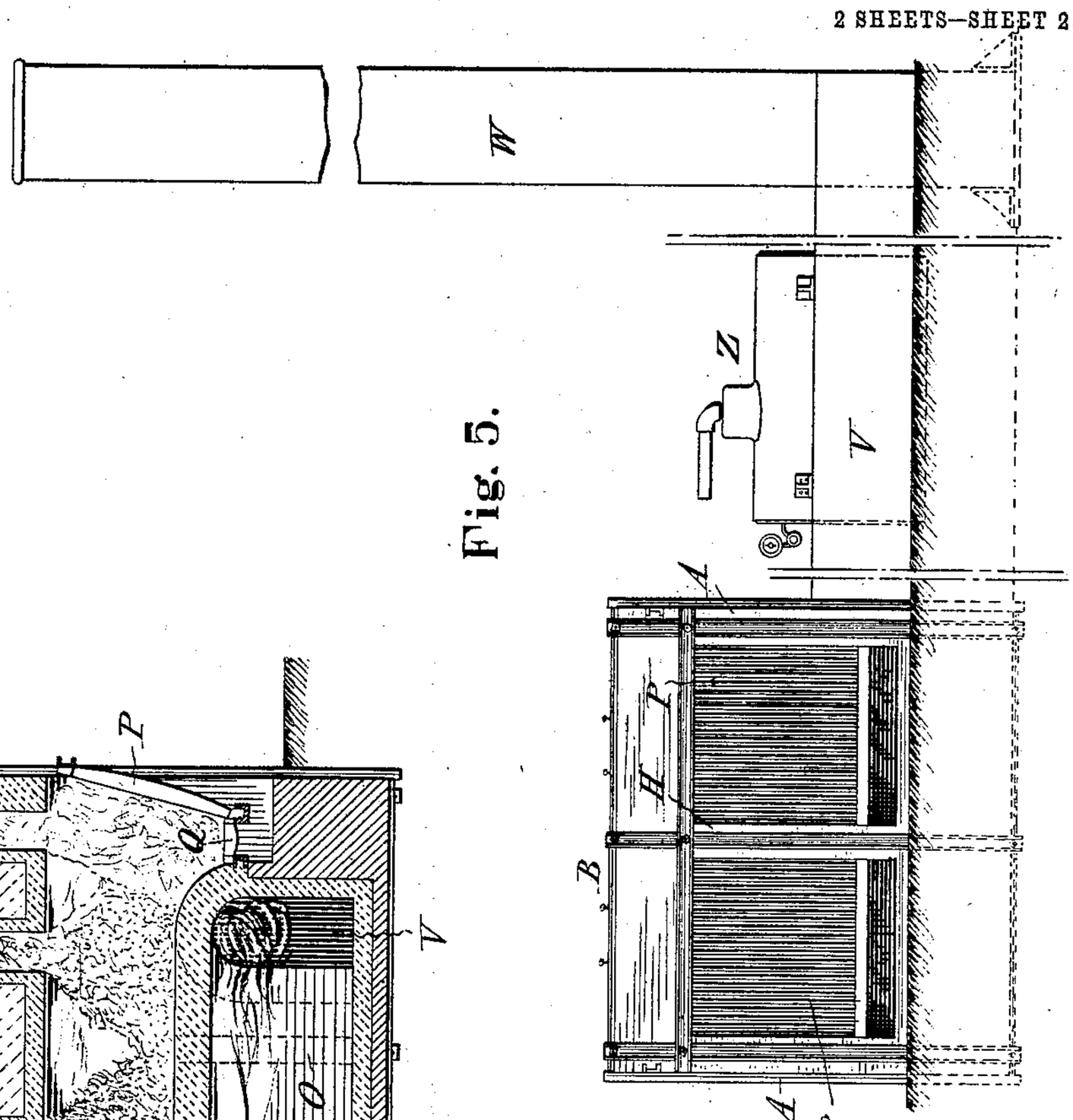


Fig. 3.

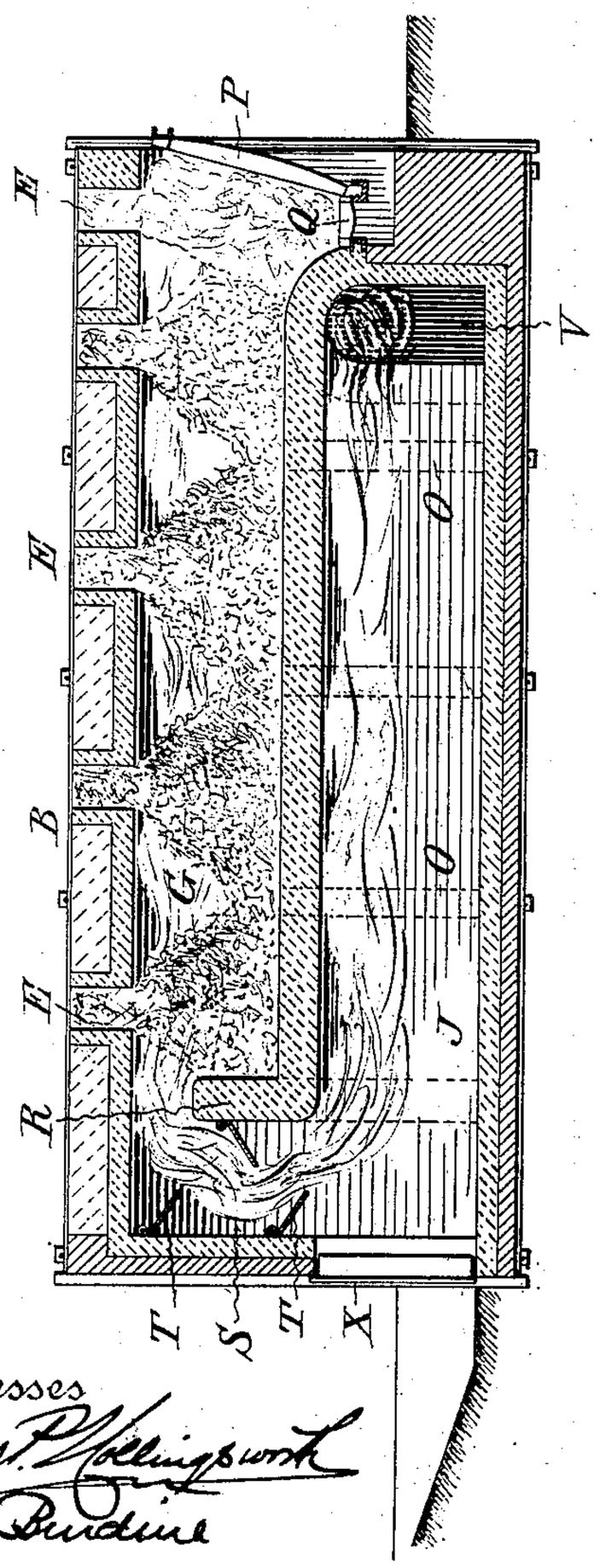
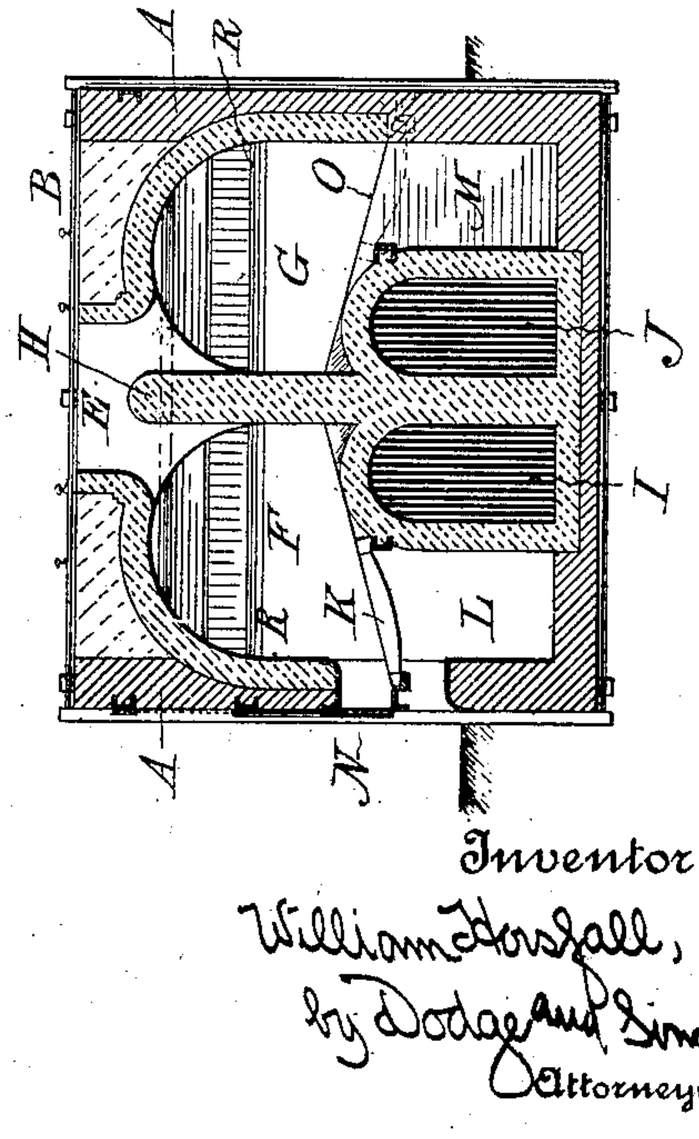


Fig. 4.



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UNITED STATES PATENT OFFICE.

WILLIAM HORSFALL, OF LEEDS, ENGLAND, ASSIGNOR TO JOHN WILLIAM HORSFALL, OF SING SING, NEW YORK, AND EVANGELINE CURTIS, OF FRYSTON, ENGLAND.

CREMATING-FURNACE.

SPECIFICATION forming part of Letters Patent No. 763,562, dated June 28, 1904.

Application filed February 5, 1901. Serial No. 46,088. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM HORSFALL, a citizen of the United States, residing at Leeds, in the county of York, England, have invented certain new and useful Improvements in Cremating-Furnaces, of which the following is a specification.

My present invention relates to improvements in cremating-furnaces, and is designed more particularly for the handling of garbage and the like.

The invention is illustrated in the accompanying drawings, wherein—

Figure 1 is a side elevation showing a stack of four furnaces; Fig. 2, a top plan view of the same; Fig. 3, a longitudinal vertical section taken on the line 1 1 of Fig. 2; Fig. 4, a transverse vertical section taken on the line 2 2 of Fig. 2, and Fig. 5 an end elevation showing the grates of the front or initial combustion-chambers.

The invention has for its object the construction of a cremating-furnace which may be used continuously and one in which the products of combustion will pass over and around the material under treatment and back beneath the support therefor, so that all or practically all of the heat resulting from the products of combustion will be abstracted.

The invention has for its further object the construction of a furnace wherein those light and readily-combustible portions of the garbage or like material may be used to bring about the initial combustion, so that the heat and products of combustion arising therefrom may be passed around and about the other charges which are placed in the furnace, drying them out to a greater or less extent and rendering them the more readily combustible.

Referring to the drawings, it will be seen that the body of the furnace as a whole is preferably rectangular in form, the outer walls A being built up of suitable masonry and strengthened as required. The top B is by preference and for the sake of economy in alinement with a track or way C, which extends out to a dump D, over which the refuse is thrown. From this point the material may be readily transferred by suitable cars or trucks and fed into the furnace through openings E, formed in the upper side or top thereof, as is clearly shown in Figs. 2, 3, and 4.

The combustion-chambers F and G of the furnace are in the upper portion thereof beneath the openings, and are divided from each other by a vertical wall or partition H, Fig. 4, the bottom of the chambers being formed by the upper portion of the masonry-work of the return-flues I J and suitable grates K, which extend out from the walls of the flues to a suitable support formed in the outer walls of the furnace. As will be seen upon reference to Fig. 4, the flues I J are located centrally and do not extend the entire width of the furnace, thus leaving chambers L M beneath the grates and next to the outer walls of the furnace.

Openings are provided both above and below the grates K in the side walls of the furnace, the upper openings being preferably closed by counterbalanced doors N. The openings below the grates afford access to the chambers L and M, which are subdivided by cross walls or partitions O, which extend up to the height of the walls of the flues I and J. Thus it will be seen there is formed an independent chamber beneath each of the grate-sections K, so that, in effect, there are four furnaces upon each side of the central division-wall H, making eight furnaces in all.

At the forward end of the combustion-chambers F and G and at the head of the furnace there are placed grates P, which, as will be seen upon reference to Fig. 3, stand in a substantially vertical position, while at the lower end of said grates there is placed a horizontally-disposed grate Q. The highly-combustible material is fed through the first opening down into the combustion-chambers F and G and rests upon the grates P and Q. It is at this point that the initial combustion takes place, so that the products of combustion and the heat arising from the burning of this fine material must traverse the entire length of the combustion-chambers F and G, pass over the upright or end wall R, and into the flues or

passages S, which connect, respectively, with the flues I and J.

In the flues or passages S there is, by preference, mounted a series of downwardly-inclined plates T, to which liquid fuel may be fed from a suitably-elevated reservoir U, the feed of the fuel being regulated by suitable valves placed in the supply-pipes, as indicated in Fig. 1. It is only necessary to employ this liquid fuel when the furnace is first started and the fumes and products of combusion are somewhat heavy and the draft through the flues I and J to the common flue V and stack W is sluggish.

Suitable doors X are placed in the wall of the furnace and lead into the flues I and J and flues or passages S. Doors Y are also placed in the side walls of the furnace in line with the initial combustion-chambers or the grates P and Q in the head of the furnace.

A boiler Z may be placed in flue V, as indicated in Fig. 5, for the purpose of abstracting any heat which may remain in the products of combustion as they pass from the furnace. In this manner steam may be generated for power purposes and steam-jets, if required.

The operation of the furnace is as follows: The highly-combustible material is fed in through openings E at the head of the furnace and falls down upon the grates P and Q. The chambers F and G are likewise charged through openings E and combustion started in the initial combustion-chamber at the head of the furnace. The products of combustion and heat generated by the burning of the inflammable charge will pass over and around the charges which are fed in through the openings E, thence down through flues or passages S into the horizontal flues or chambers I J, out through the common flue V, and up through the stack W. As the garbage becomes sufficiently dry it is consumed, and once the fire is well started the furnace will operate continuously, garbage being fed in as required and the ashes dropping down into the pits or chambers formed beneath the grates K. Air will of course pass up through grates K, through the openings below the same, and also through the grates P and Q. The products of combustion as they pass through flues I and J heat the walls thereof, and the garbage resting on the upper face thereof is more or less dried thereby. Upon reference to Fig. 4 it will be observed that the upper walls of flues I and J are inclined, so that any water contained in the material to be treated may drain out. The intersecting walls O also tend to absorb heat from the side walls of the flues I and J, and as the air passes in through the openings in the side walls of the furnace it must of necessity to a greater or less extent come in contact with said walls before it passes up through the grates. Any hot ashes which may drop through the grates K will also come in contact with said cross partitions or walls O, and consequently heat the same. In this way much of the heat of the products of combustion will be abstracted and utilized in drying garbage and in heating the air fed in to support combustion.

It is to be noted that each grate-section may be cleaned independent of the others and that by opening one of the doors N the draft of the furnace is but slightly affected, if at all.

The ash chambers or pits below the grates may also be readily cleaned, and the flues I J, as well as the connecting chambers or flues S, may likewise be cleaned by opening the doors X.

The grates P and Q may also be kept clear through doors Y, said doors, as will be seen upon reference to Fig. 3, being opened from without.

Having thus described my invention, what I claim is—

1. In a cremating-furnace, the combination of two parallel, main combustion-chambers extending longitudinally of the furnace; a dividing-wall between the same; means for feeding a charge of material to said chambers; initial combustion-chambers located at the head of said main chambers; independent flues one for each of said main combustion-chambers extending back beneath the same; and ash-pits located to one side of the flues and independent thereof, said pits being accessible from without the furnace, substantially as described.

2. In a crematory-furnace, the combination of two parallel horizontally-disposed combustion-chambers extending longitudinally of the furnace; a division-wall intermediate the same; means for feeding garbage or the like to said chambers; a return-flue located beneath each of said combustion-chambers, said flues occupying a position centrally of the furnace; grates extending from the upper portions of the walls of said flues to the outer walls of the furnace and thereby forming ash-pits below the grates intermediate the return-flues and the outer walls; and a passage, located at one end of the furnace, connecting said main combustion-chambers and the flues.

3. In a cremating-furnace, the combination of two horizontally-disposed combustion-chambers; a division-wall extending between the same; means for feeding garbage or the like to said chambers; flues extending beneath said chambers, adjacent to said division-wall; grates extending from the walls of said flues to the outer walls of the furnaces; a passage connecting said combustion-chambers and the flues; and a series of independent ash-pits located beneath said grates.

4. In a cremating-furnace, the combination of two horizontally-disposed combustion-chambers; a division-wall intermediate the same; means for feeding garbage to said chambers; an initial combustion-chamber formed

at the head of each of said main combustion-chambers; flues extending beneath said combustion-chambers and in communication therewith; grates for said main combustion-chambers; and a series of cross-walls extending from the walls of the flues to the outer walls of the furnace beneath the grates, whereby a series of independent ash-pits is formed beneath the grates and accessible from without the furnace, substantially as described.

5. In a cremating-furnace, the combination of two horizontally-disposed main combustion-chambers; an initial combustion-chamber formed at the head of each of said chambers; flues extending beneath said main combustion-chambers and in communication therewith; and an inclined surface for the bottom of said main combustion-chambers, formed by the upper portion of the masonry-work of the flues; inclined grate-sections extending from said masonry-work to the outer walls of the furnace; and a series of ash-pits located to one side of the flues directly beneath the grate-sections and accessible from without the furnace, substantially as described.

6. In a cremating-furnace, the combination with the walls A; longitudinal flues I, J placed centrally therein; grate-sections K extending from the walls of said flues to the outer walls of the furnace; a division-wall H extending lengthwise of the furnace; combustion-chambers F, G, formed above said grate-surfaces, upon opposite sides of the division-wall; means for feeding garbage to said chambers; and cross-walls O extending from the walls A of the furnace to the outer walls of the flues, I, J; and up to the grate whereby a series of independent ash-pits is formed beneath the grates, substantially as described.

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

WILLIAM HORSFALL.

Witnesses:

CHAS. GILLIARD,

ALFRED STANLEY HOUGHTON.