(No Model.)

3 Sheets—Sheet 1.

S. R. SMYTHE.

FURNACE.

No. 478,767. Patented July 12, 1892.

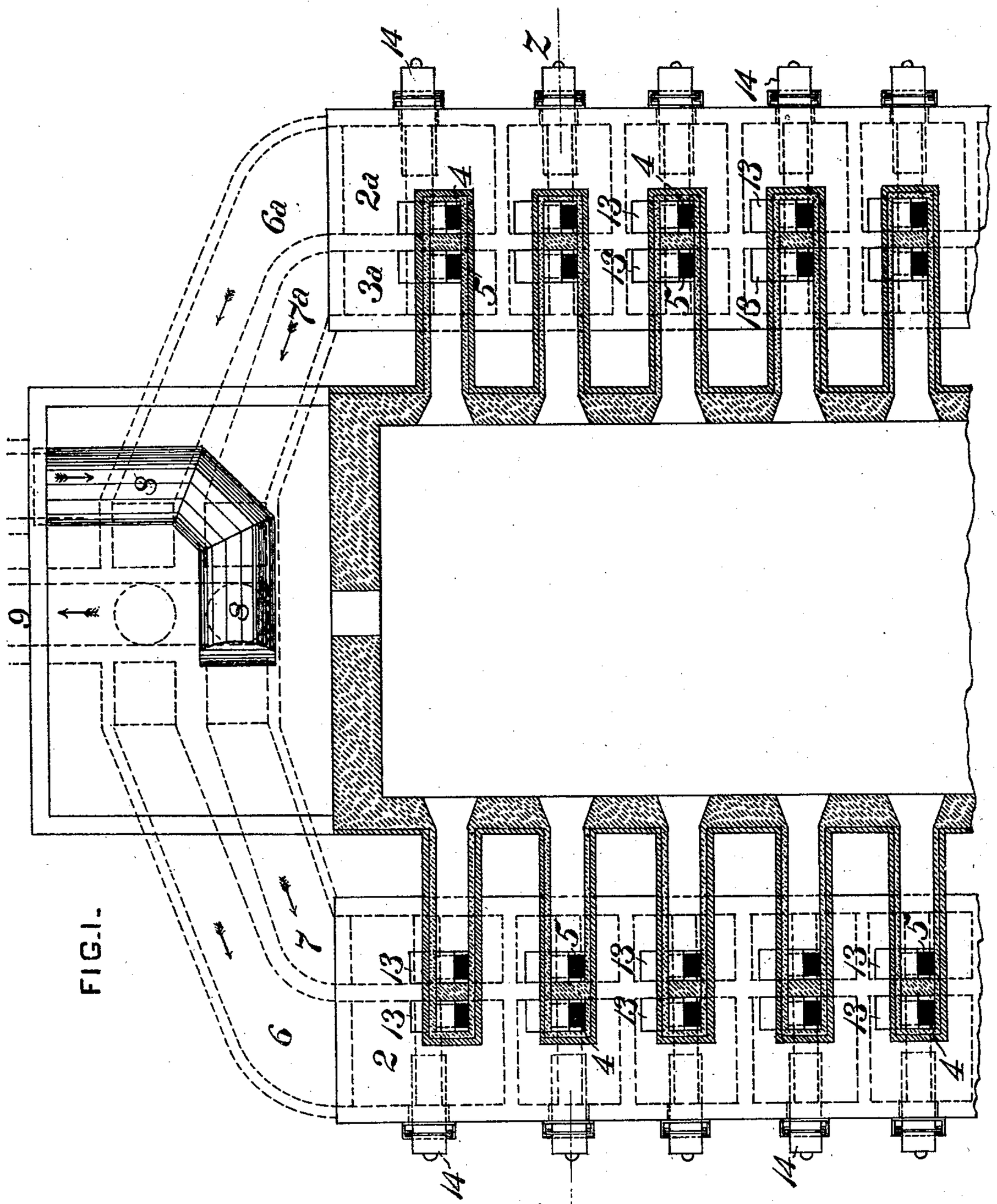

FIG. 1.

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(No Model.) 3 Sheets—Sheet 2.

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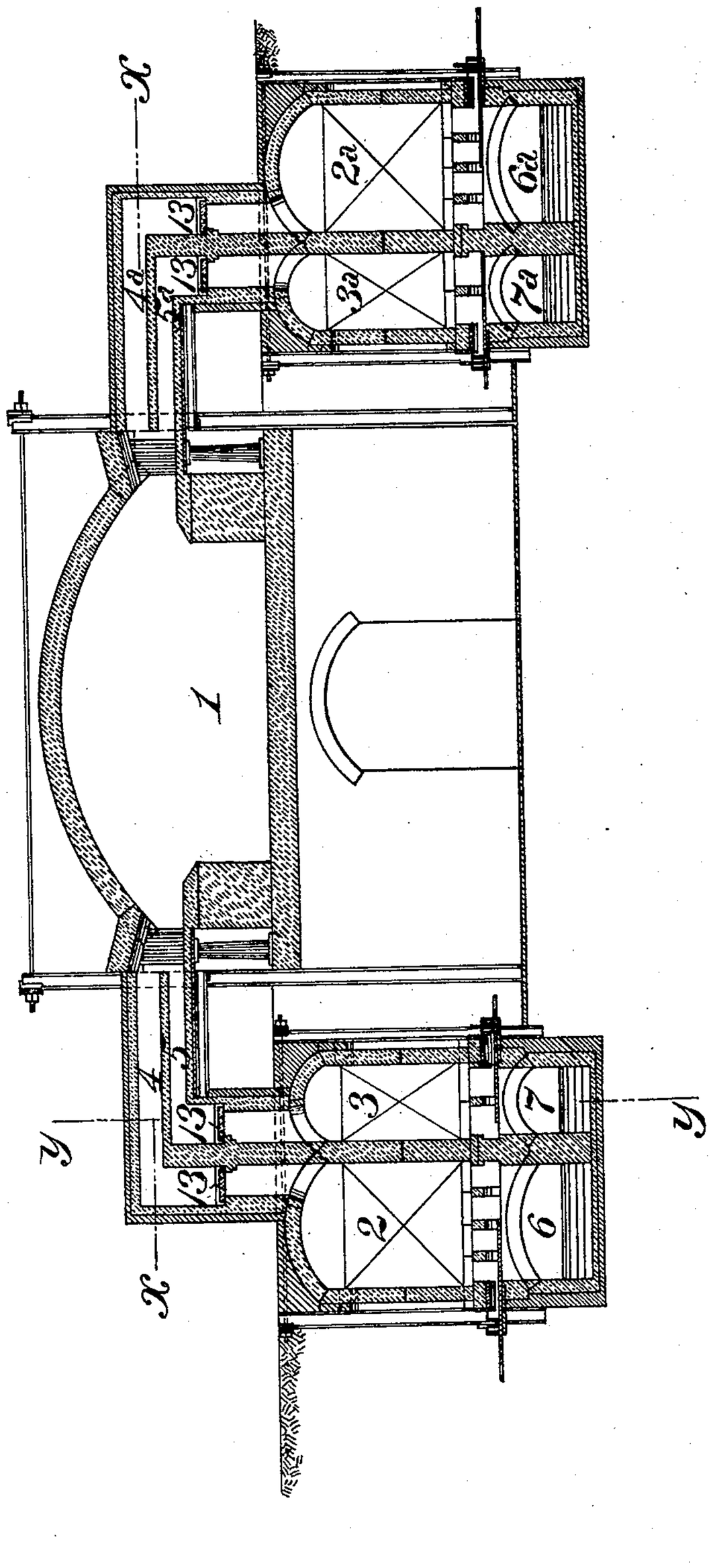
FIG. 2.



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3 Sheets—Sheet 3.

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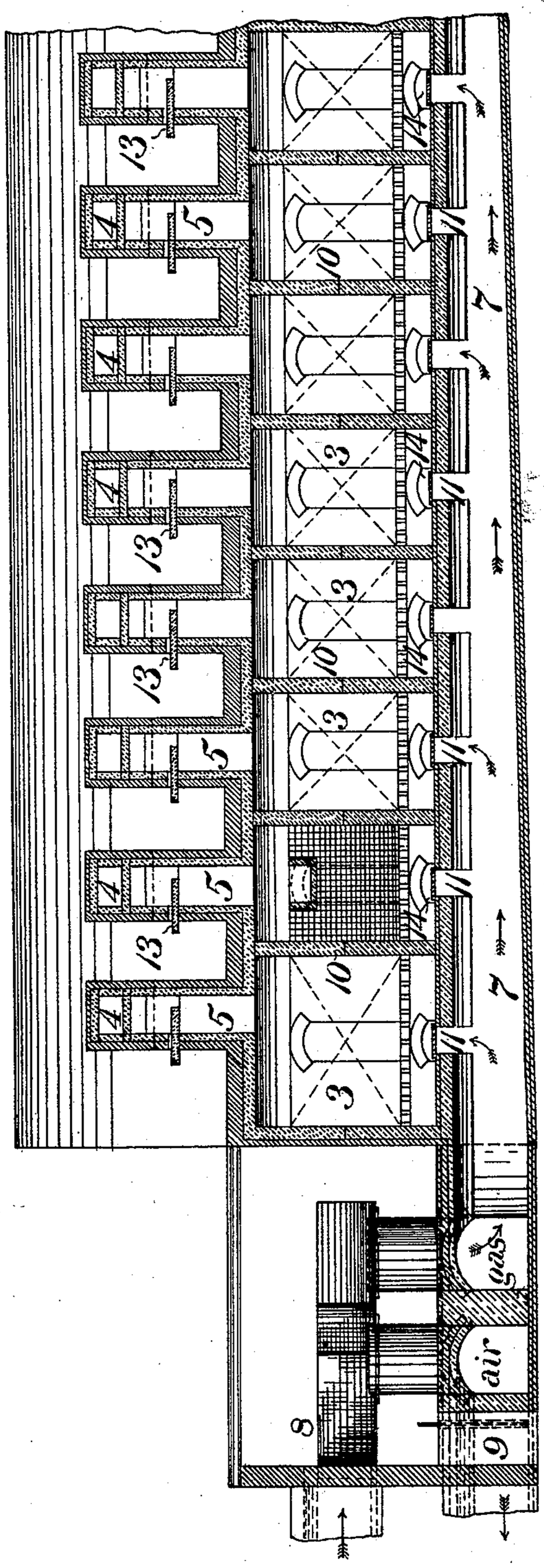
FIG. 3.



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UNITED STATES PATENT OFFICE.

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FURNACE.

SPECIFICATION forming part of Letters Patent No. 478,767, dated July 12, 1892.

Application filed March 31, 1892. Serial No. 427,226. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL R. SMYTHE, a citizen of the United States, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented or discovered certain new and useful Improvements in Furnaces, of which improvements the following is a specification.

The invention described herein relates to certain improvements in that class or kind of glass-furnaces known as "tank-furnaces," wherein the batch is charged into the furnace at one end of the comparatively long hearth or tank, along which the glass flows as soon as it is melted to the opposite end, where it is gathered, the glass being subjected to varying degrees of heat during its passage along the tank. Great difficulty is experienced in operating these furnaces by reason of the material forming the batch, which is in a powdered or granular condition when charged into the furnace, being drawn down into the flues of the regenerating-chambers. This powdered or granular material rapidly fills up the interstices in the checker-work in the regenerating-chambers and necessitates a frequent removal of the checker-work and the dust or material collected therein. As these furnaces have been heretofore constructed, it has been necessary to entirely stop the operation of the furnace while the regenerating-chambers are being cleaned.

The object of the present invention is to so construct the regenerating-chambers and their connections with the air and gas supply and also with the melting-hearth that certain sections or parts of the regenerating-chambers may be cut off so as to permit access thereto when cleaning is required without interfering with the operation of the furnace.

In general terms the invention consists in the construction and combination substantially as hereinafter more fully described and claimed.

In the accompanying drawings, forming a part of this specification, Figure 1 is a sectional plan view of the tank-furnace constructed in accordance with my invention, the plane of section being indicated by the line $x\,x$, Fig. 2. Fig. 2 is a transverse section of the same, the plane of the section being indicated by the line $z\,z$, Fig. 1; and Fig. 3 is a vertical longitudinal section, the plane of section being indicated by the line $y\,y$, Fig. 2.

In the practice of my invention the hearth 1 of the furnace is constructed in the usual or any suitable manner, and on each side of the hearth and parallel therewith are arranged the regenerating-chambers 2 3 2^a 3^a, which are connected to the hearth by flues 4 5 and 4^a 5^a. Below these regenerating-chambers are formed the conduits 6 7 and 6^a 7^a, the conduits 7 and 7^a converging together at the front of the furnace, where they are connected with a gas-supply pipe 8 through a valve-chamber of the usual construction and provided with a valve, as is customary, for directing the gas and products of combustion and with a stack-flue 9. The air-flues 6 and 6^a also converge together at the front end of the furnace to a common flue 9, leading to the stack, and at such point of conjunction are arranged suitable valves for the admission of air and for the direction of the air and products of combustion. As shown in Figs. 1 and 3, the regenerating-chambers are divided into series of compartments by a series of transverse vertical walls 10, and from these compartments extend the series of flues 4 5 and 4^a 5^a. Each of the compartments is also provided with an inlet in its bottom wall communicating with the air or gas conduits extending under the regenerating-chambers. In each of the flues 4 5 4^a 5^a, at a point intermediate between the regenerating-chamber and the melting-hearth, is placed a valve 13, adapted to close said flue when desired. In each of the flues 11, connecting the gas or air conduits with the compartments of the regenerating-chambers, is placed a valve 14, adapted to regulate the flow of gas or air into such compartments or to entirely cut off the gas or air therefrom.

When it is desired to clear out any section or compartment of the regenerating-chambers, the valves 13 and 14 in the furnace-flues and the flues leading from the conduits below such compartment are closed and the outside wall of such section or compartment is torn down and the checker-work removed. The closing of the valves 14 will entirely prevent the inflow of gas and air into such compartments, and the closing of the valves 13 in the furnace-flues will prevent the heat and products

of combustion from the hearth or tank passing down into such compartment or section. As it is preferred to divide up the regenerating-chambers into a number of compartments or sections, the stopping off of one section in the manner described will not prevent or interfere with the usual and efficient operation of the furnace.

In addition to the function heretofore described, the valves 13 and 14 can be employed for regulating the flow of gas and air through the regenerating-chambers and into the furnace, and thereby afford control for the heat in any part of the hearth or tank.

I claim herein as my invention—

In a tank-furnace for melting glass, the combination of a series of four or more regenerating-chambers for gas and air on each side of the furnace, each regenerating-chamber having an independent flue connection to the hearth of the furnace, flues connecting the gas-conduit with each of the gas-regenerators and the air-conduit with the air-regenerators, valves for cutting off the supply of gas and air from each of the regenerators, and valves for closing the flues from the regenerators to the hearth, substantially as set forth.

In testimony whereof I have hereunto set my hand.

SAMUEL R. SMYTHE.

Witnesses:
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