

No. 630,464

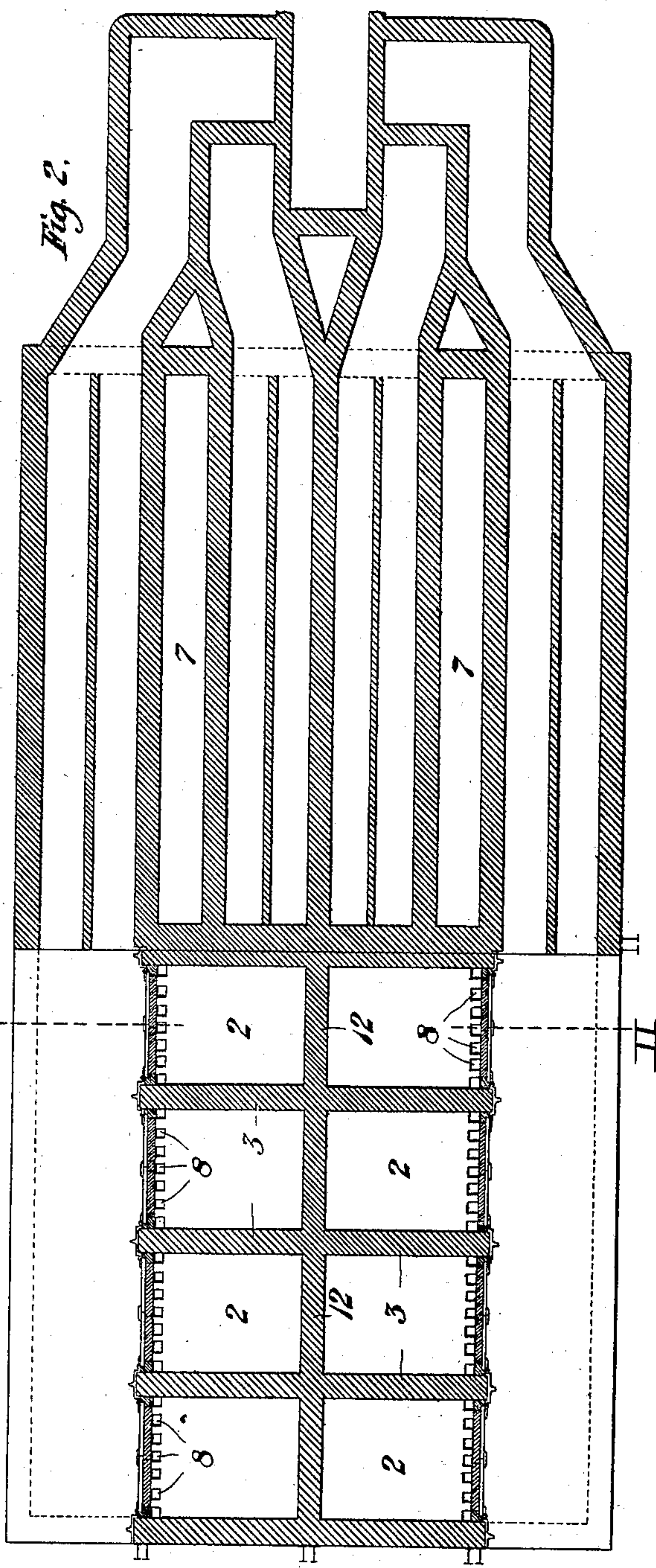
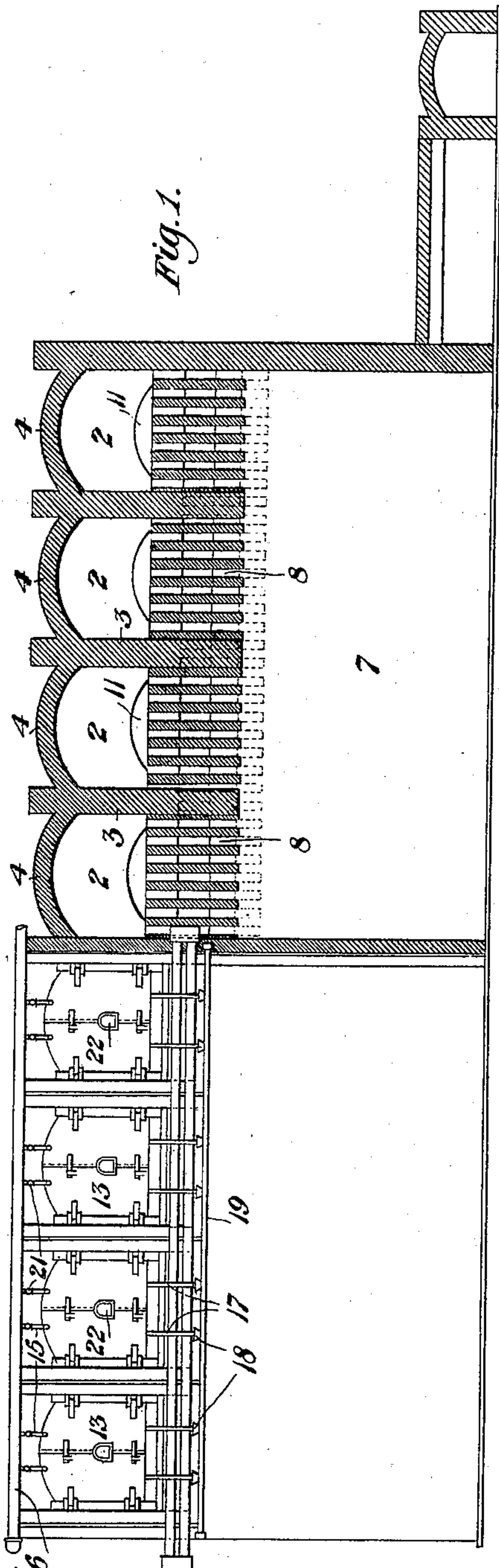
Patented Aug. 8, 1899.

J. M. MILLER.
GLASS FURNACE.

(Application filed Sept. 25, 1897, Renewed Jan. 11, 1899.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses:
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L. J. Edwards

Inventor:
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2 Sheets—Sheet 2.

Fig. 3.

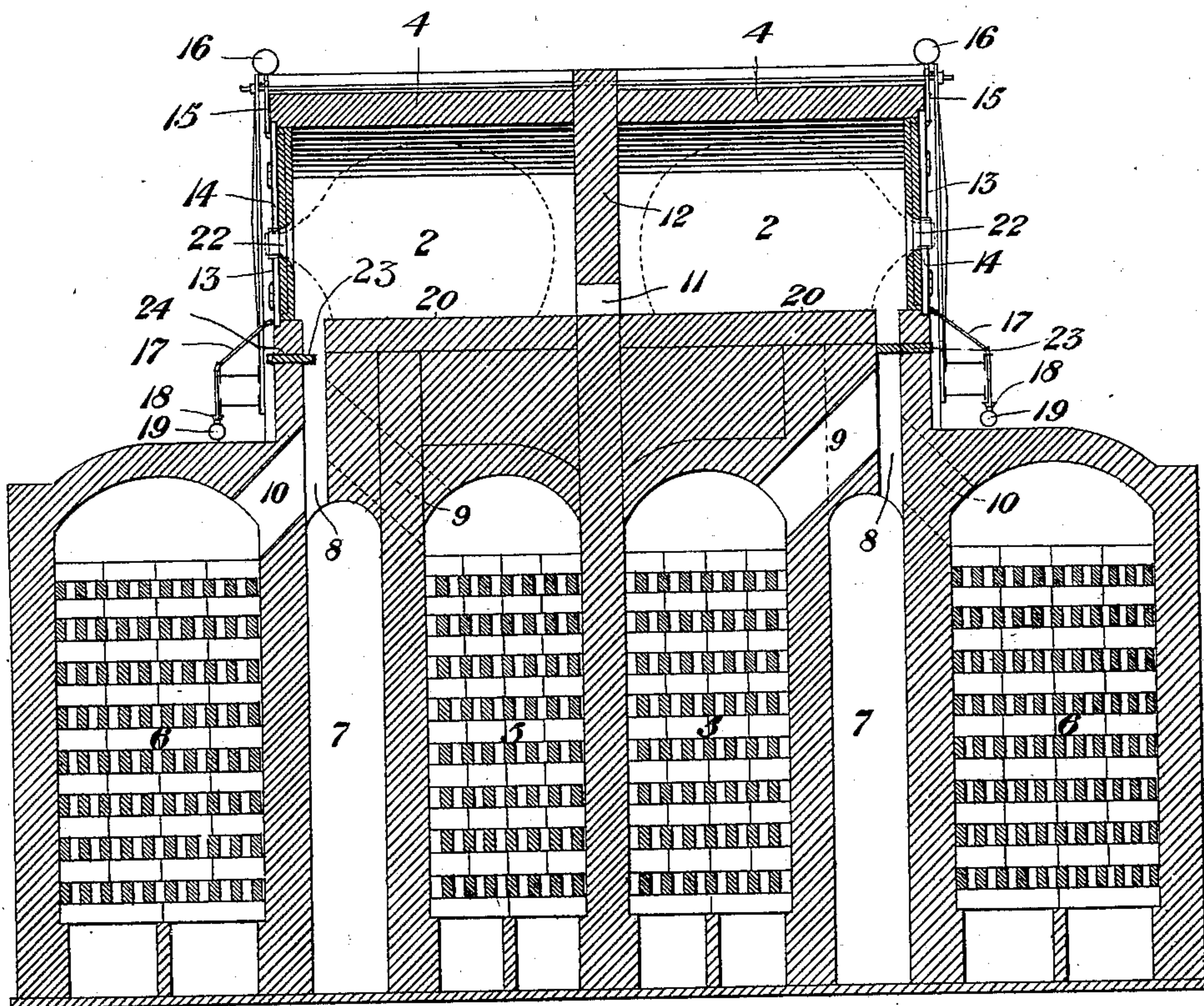
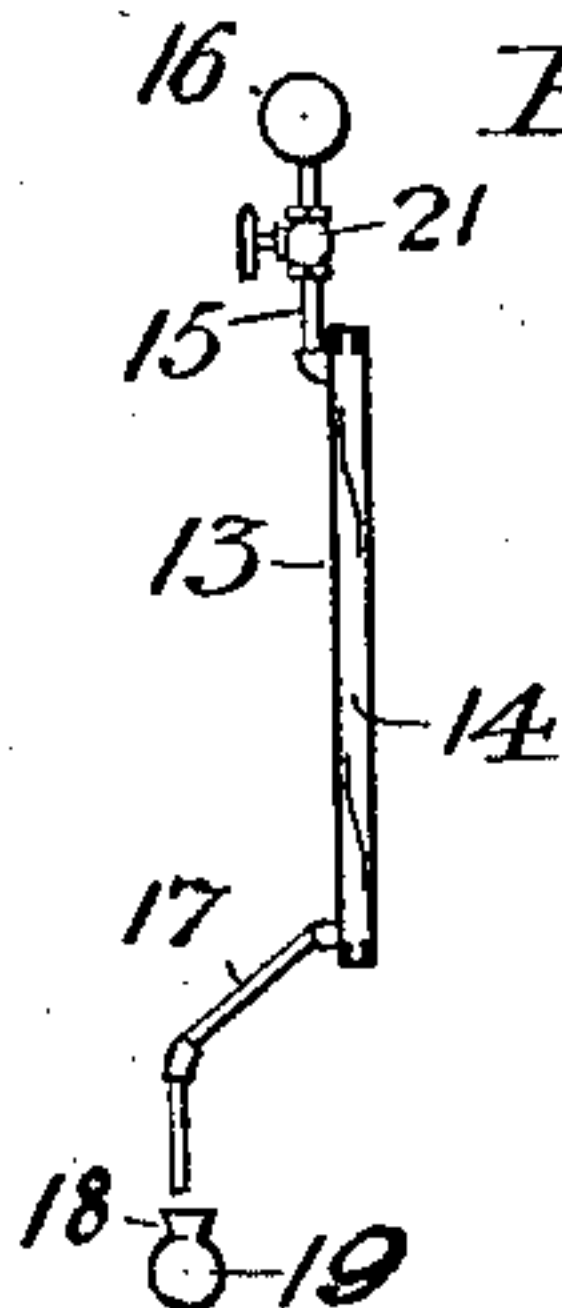


Fig. 4.



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UNITED STATES PATENT OFFICE.

JOHN MURRAY MILLER, OF BELLEVUE, PENNSYLVANIA.

GLASS-FURNACE.

SPECIFICATION forming part of Letters Patent No. 630,464, dated August 8, 1899.

Application filed September 25, 1897. Renewed January 11, 1899. Serial No. 701,853. (No model.)

To all whom it may concern:

Be it known that I, JOHN MURRAY MILLER, a citizen of the United States, residing at Bellevue, in the county of Allegheny and State of Pennsylvania, have invented or discovered a new and useful Improvement in Glass-Furnaces, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this application, in which—

Figure 1 is a view, partially in front elevation and partially in longitudinal vertical section, of a glass-pot furnace made in accordance with my invention. Fig. 2 is a sectional plan view thereof. Fig. 3 is a cross-section on the line III III of Fig. 2. Fig. 4 is an enlarged vertical sectional detail view taken through the door, showing the connections.

My invention consists of an improvement in glass-melting furnaces, and has for its object the construction of a furnace in which separate chambers are arranged for each pot, through which chambers the gas may be directed at will and the operation of any of the chambers discontinued without interfering with the rest of the furnace. To that end it consists in the construction and arrangement of gas and air passages and ports whereby a circulation is maintained in either direction, as shown in the accompanying drawings and hereinafter described.

It further consists in the construction of a slag-pocket for collecting waste or melted glass, broken pots, &c., and in an improved water-cooled door, as shall be set forth.

In the ordinary form of pot-furnace when a pot breaks, allowing the melted glass to escape, the pot may not be renewed until the heat is finished, and then only by throwing the entire furnace out of operation. My improved furnace is designed to obviate these difficulties and to secure a furnace which is compact and economical to construct and possessed of the advantages heretofore described.

Referring to the drawings, the pot-chambers 2 2 are arranged in pairs extending across the top of the checker-work, each pair constituting a separate furnace, and a sufficient number of such pairs are embodied in one plant to give the required capacity, being

separated by cross partition-walls 3 and provided with arched roofs 4. Beneath these furnaces are located the continuous gas-regenerative chambers 5 5 and air-regenerative chambers 6 6, both gas and air chambers making connection with the usual Siemens or other valve (not shown) at one end of the furnace structure. Between the gas and air regenerative chambers on each side is a continuous slag pocket or chamber 7, running from end to end and provided with a proper opening for entrance and exit of workmen to remove slag, refuse, &c. Extending upwardly from such chamber is a series of open ports 8, which serve the double purpose of acting as gas and air inlet and outlet passages and as escape-ports for melted glass, &c., escaping from the pot-chamber into the slag-pocket. Into these ports 8 also lead lateral ports 9 from the gas-chamber and ports 10 from the air-chamber, whereby the gas and air are introduced into the pot-chamber prior to combustion. An open port 11 through the bottom of a middle partition-wall 12 or immediately above the bench serves as a communicating passage for the gas to the adjoining chamber, from which the products of combustion pass downwardly through the ports 8 on the opposite side and out through the regenerative chambers in the usual well-known manner.

It will be understood that the slag-pocket is sealed during the operation of the furnace and closed against circulation of the gases. By reversing the circulation the gases will travel in the reverse direction, so that an equal heat may at all times be maintained in the pot-chambers.

The front of the pot-chambers is closed by hinged doors 13 13, made of cast or sheet metal, with an interior water-compartment 14, internally reinforced by baffle-plates, such door acting as a shield to protect the workman from the heat. Inlet-pipes 15 connect the door when closed with a main feed-water pipe 16, located along the front of the furnace above the tops of the doors, while similar outlet-pipes 17 serve to carry off the waste water into openings 18, leading into a common exhaust-pipe 19 below the level of the floor. A valve 21 in each inlet-pipe is used to regulate the inflow. At the meeting edges of the

doors and of a convenient height from the floor is a reduced opening 22, through which the neck of the pot projects to the exterior.

For the purpose of accurately regulating the distribution and flow of the incoming or outgoing gases the tops of the ports 8 may be wholly or partially covered by tiles 23, inserted through openings 24 in the front wall of the furnace-chamber under the doors.

The advantages of my improved furnace will be appreciated by the skilled furnace builder and glass manufacturer, and while changes and variations may be made in the proportions or arrangement of the chambers, ports, &c., to suit varying conditions of use all such are to be considered as within the scope of my invention, since I do not wish to be confined to the exact construction shown in the drawings.

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

1. In a glass-furnace, adjoining pot-chambers laterally arranged across the structure in isolated pairs, a central longitudinal partition midway between the opposite chambers, a communicating passage through the base of the partition, air and gas regenerative chambers located below the pot-chambers with ports leading to flues opening upwardly into the pot-chambers, and a slag-pocket between such regenerative chambers into which the flues lead downwardly, substantially as set forth.

2. In a glass-furnace, adjoining pot-chambers laterally arranged across the structure in isolated pairs, a central longitudinal partition midway between the opposite chambers, a communicating passage through the base of the partition, air and gas regenerative chambers located below the pot-chambers with ports leading to flues opening upwardly into

the pot-chambers, a slag-pocket between such regenerative chambers into which the flues lead downwardly and damper-valves in the flues, substantially as set forth.

3. The combination, with a series of laterally-arranged adjoining pot-chambers extending across the structure having intervening partitions and a communicating passage therethrough at the base, of continuous gas and air regenerative chambers located below the floor of the pot-chambers, continuous slag-pockets between the gas and air regenerative chambers having ports leading upwardly into the pot-chambers, and lateral ports communicating with such port and with the gas and air regenerative chambers respectively, substantially as set forth.

4. The combination, with a longitudinal series of laterally-arranged adjoining pot-chambers extending across the structure having intervening cross-partitions with a communicating passage at the base, continuous slag-pockets beneath the pot-chamber floors, and air and gas regenerative chambers on each side of such slag-pockets, ports leading upwardly from the slag-pockets to the pot-chambers and air and gas ports leading thereinto from the regenerative chambers; of water-cooled doors hinged at the front of the pot-chamber having a chambered interior, reinforced, valve-controlled feed-water branch pipes leading from a main feed-pipe to the interior of the door, and exhaust-pipes leading from the door to a waste-pipe, substantially as set forth.

In testimony whereof I have hereunto set my hand this 27th day of May, 1897.

J. MURRAY MILLER.

Witnesses:

PETER J. EDWARDS,
C. M. CLARKE.