

No. 753,259.

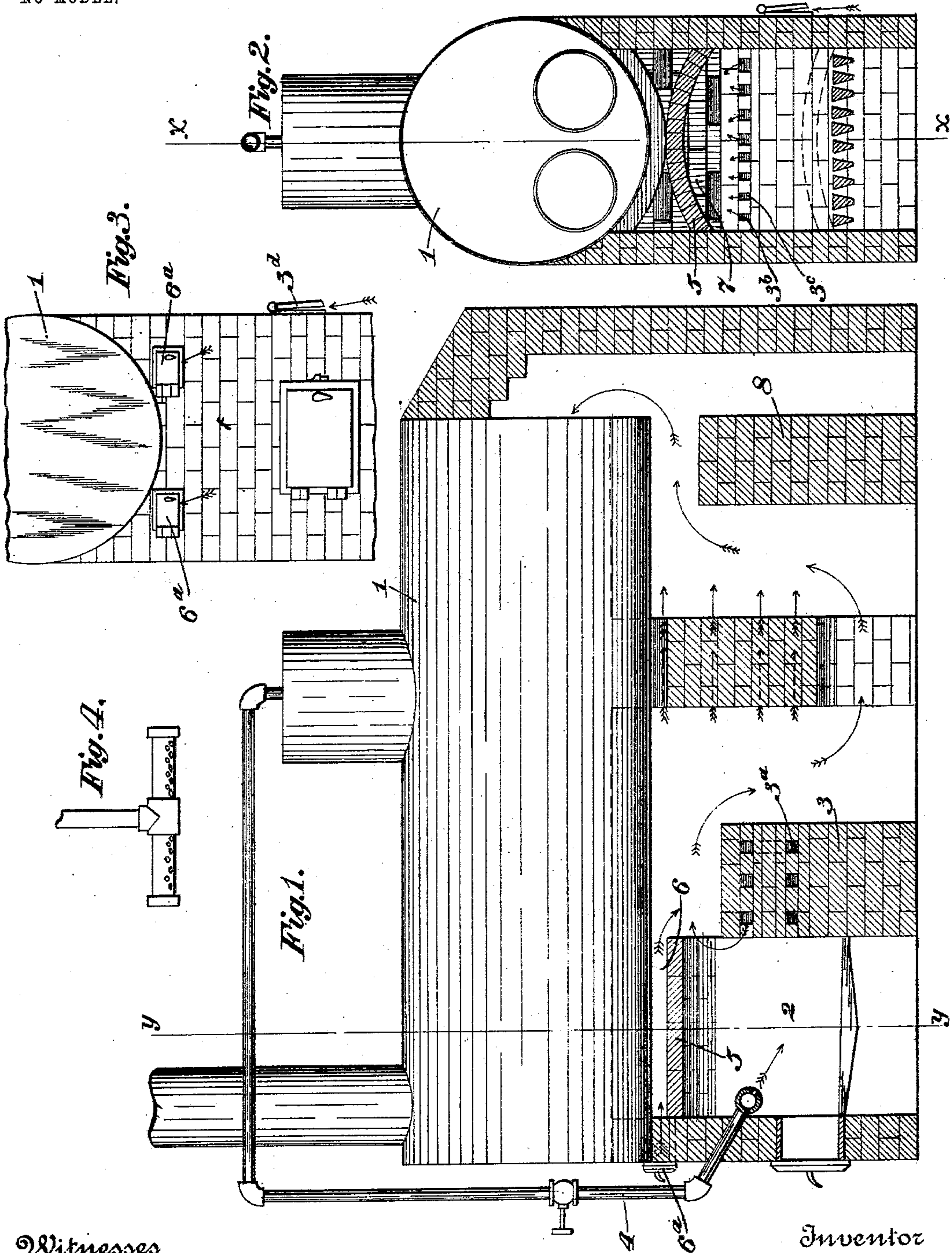
PATENTED MAR. 1, 1904.

J. H. HAWKE.
SMOKE CONSUMING FURNACE.

APPLICATION FILED AUG. 3, 1903.

NO MODEL.

2 SHEETS—SHEET 1.



Witnesses

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John C. Smith

Inventor

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his Attorneys

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2 SHEETS—SHEET 2.

Fig. 7.

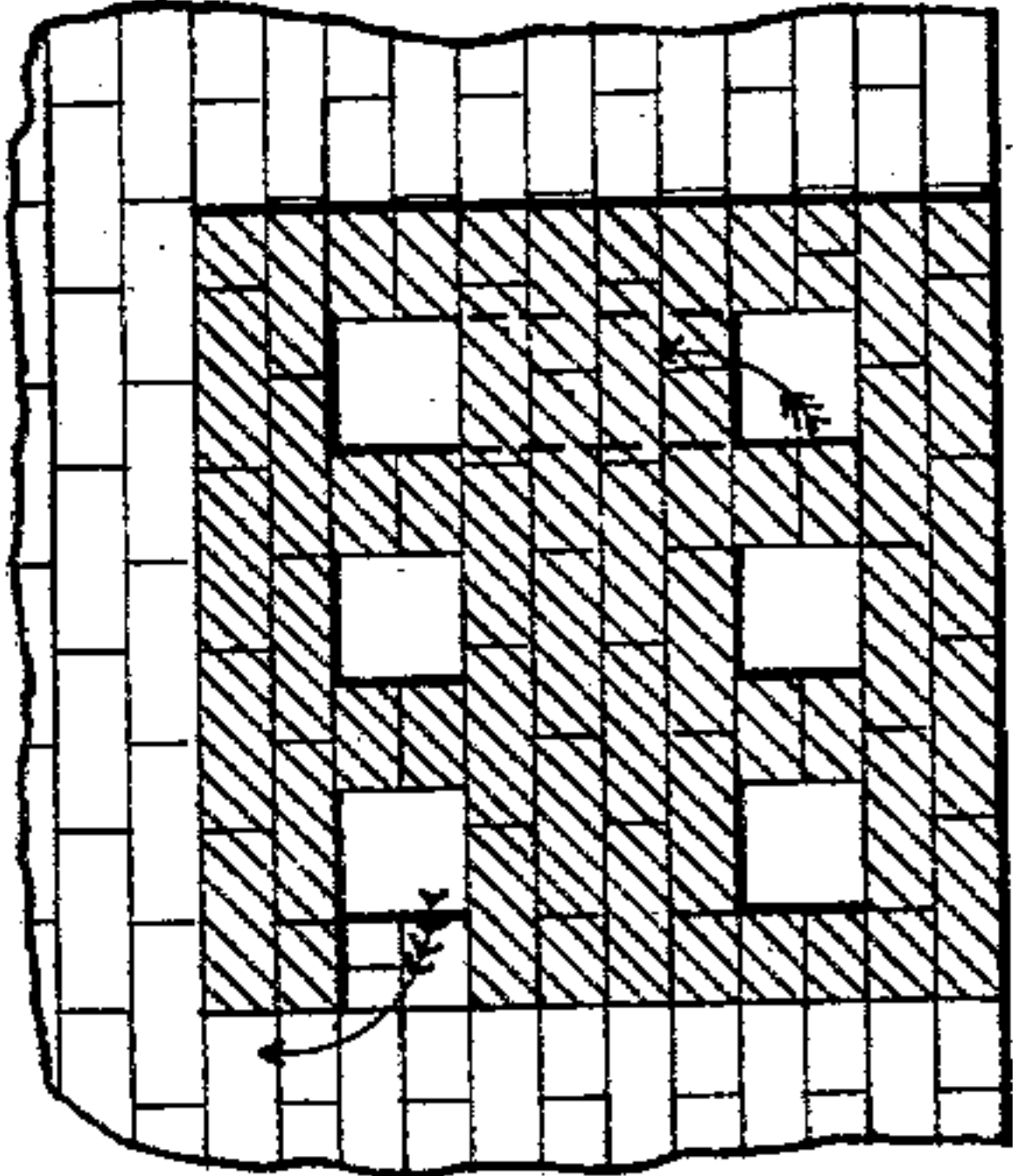


Fig. 6.

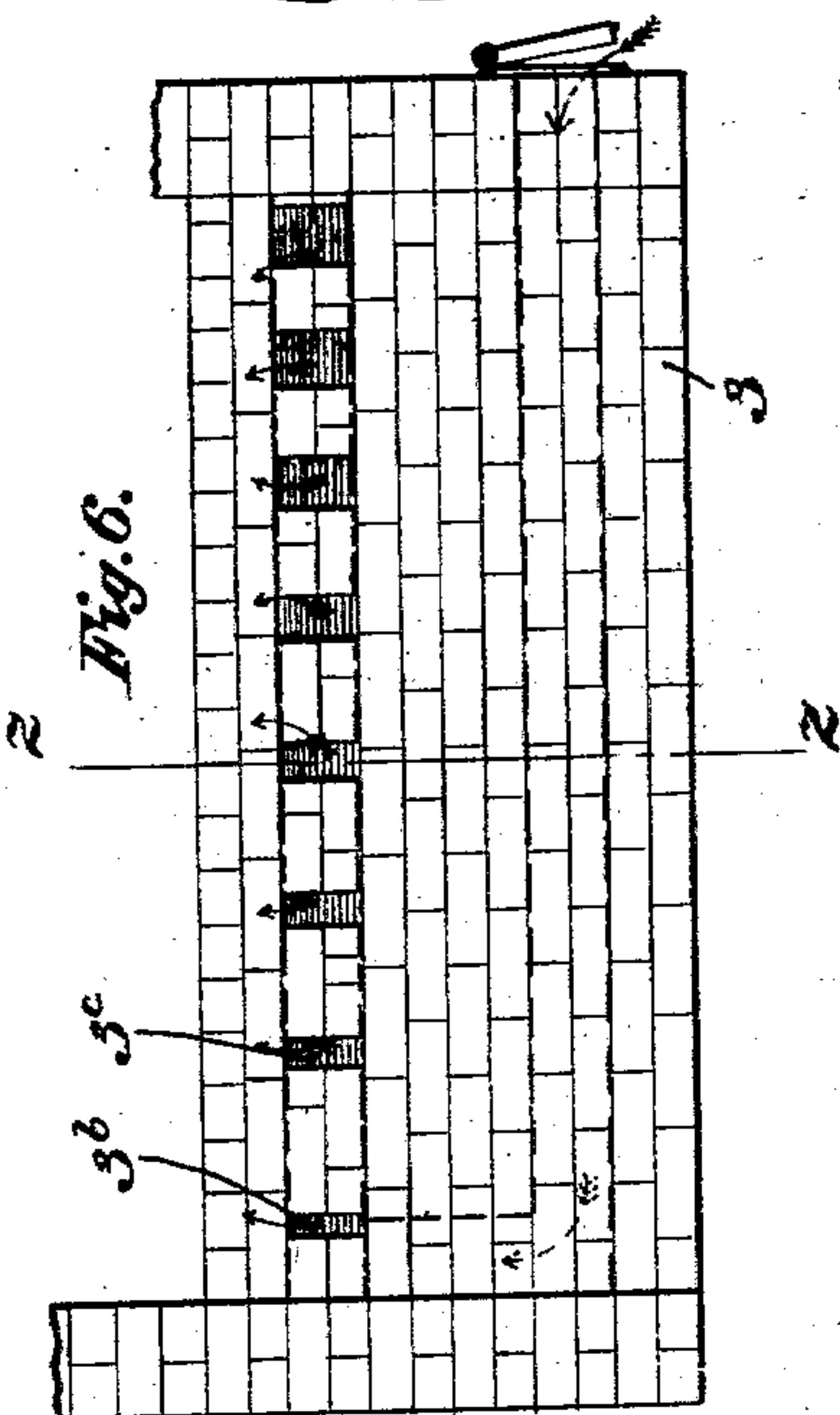


Fig. 8.

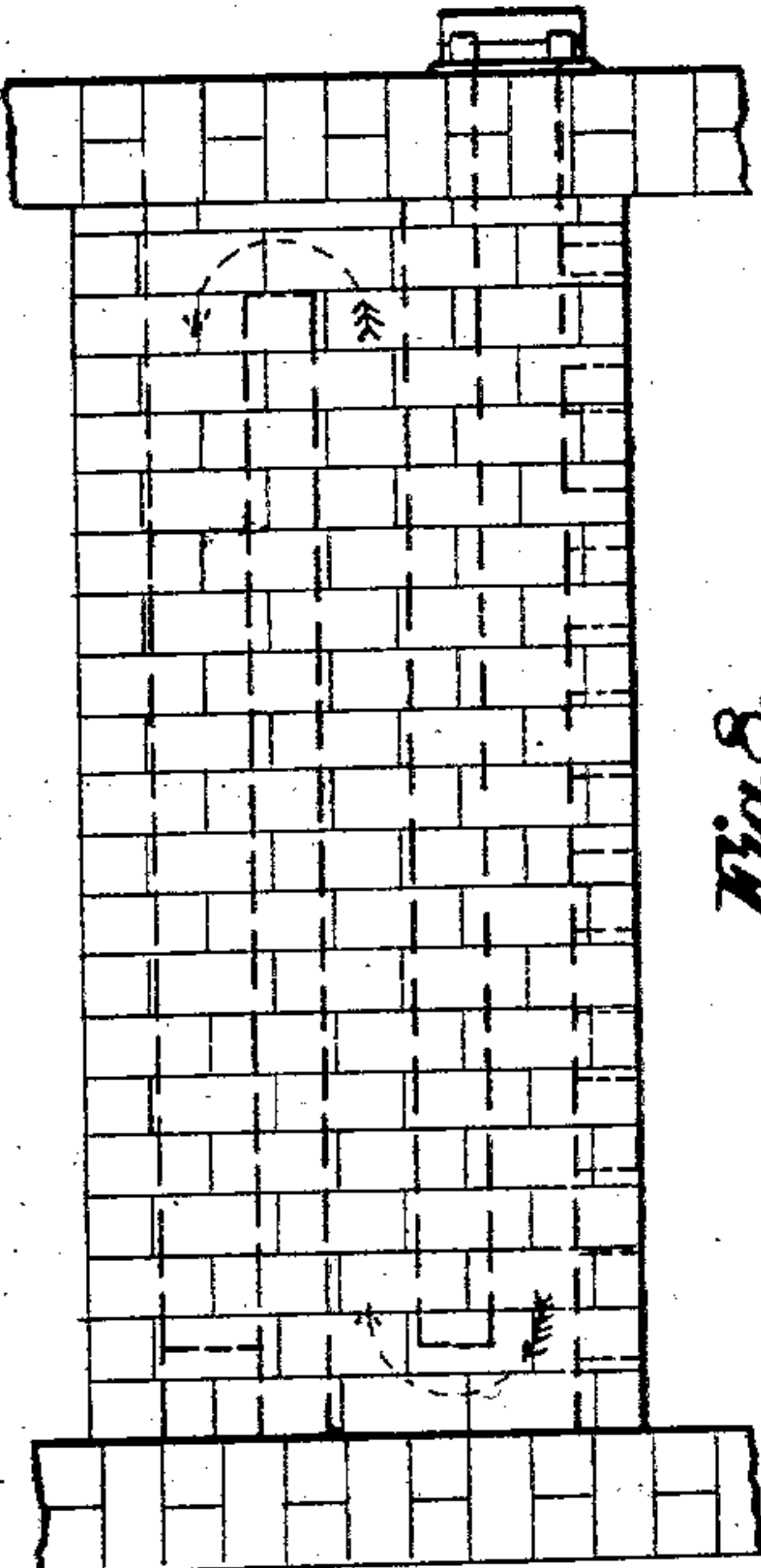
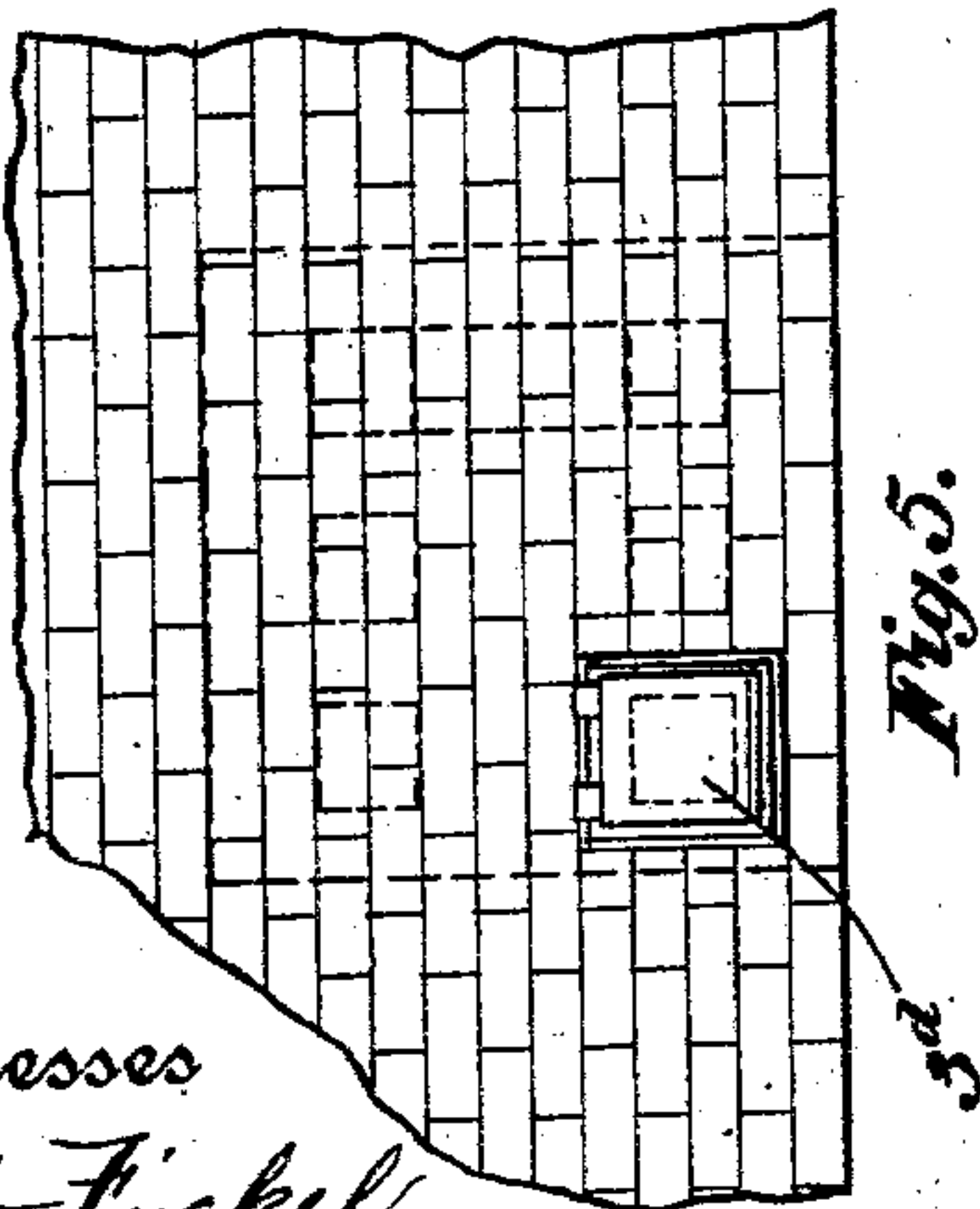


Fig. 5.



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UNITED STATES PATENT OFFICE.

JAMES H. HAWKE, OF MARTINSBURG, OHIO.

SMOKE-CONSUMING FURNACE.

SPECIFICATION forming part of Letters Patent No. 753,259, dated March 1, 1904.

Application filed August 3, 1903. Serial No. 188,050. (No model.)

To all whom it may concern:

Be it known that I, JAMES H. HAWKE, a citizen of the United States, residing at Martinsburg, in the county of Knox and State of Ohio, have invented certain new and useful Improvements in Smoke-Consuming Furnaces; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The object of this invention is to provide a construction in furnaces adapted to effectually consume the smoke.

In order to effect the ignition and combustion of smoke, I have discovered that it is necessary to inject into and commingle with the smoke rising from the fuel a large volume of highly-heated air. Further, I have found that the ignition and combustion are aided if the fine particles constituting the smoke are integrated or collected into larger particles by the injection of steam at the point where the smoke is thickest and where the hot-air is injected.

My invention, therefore, is embodied in the improved construction hereinafter described and claimed, whereby the air may be sufficiently heated and injected into the smoke or such air and steam together can be injected at the point where ignition and combustion are certain to be effected.

In the accompanying drawings, Figure 1 shows a longitudinal vertical sectional view taken on the plane xx , Fig. 2. Fig. 2 is a transverse vertical sectional view on the plane yy , Fig. 1. Fig. 3 is an elevation of a portion of the front of the furnace. Fig. 4 is a view of the steam-injector. Fig. 5 is an elevation of the side opposite the air-heating bridge-wall, showing the door of the air-inlet thereto. Fig. 6 is an elevation of the front side of the air-heating bridge-wall. Fig. 7 is a transverse section on plane zz , Fig. 6, of the air-heating bridge-wall; and Fig. 8 is a top plan view of the bridge-wall, indicating in broken lines the position of the air-heating passage.

In the views, 1 designates the boiler, 2 the furnace or fire-chamber, and 3 the bridge-wall.

The bridge-wall is built of masonry, as

usual, except that it is provided with an air-passage 3^a , extending inward and back several times across the bridge-wall and opening finally in several passages 3^b 3^c of graduated size to insure an equal exit of heated air into the smoke. The openings 3^b 3^c discharge into the fire-chamber 2 directly above the fire-bed, so as to intercept the smoke just as it comes off the coal and while it is hottest. The air can be supplied to the bridge-wall through an opening closed by a door 3^d .

Arranged in the front wall of the furnace is a steam-injecting pipe 4, taking steam from the dome of the boiler. Said pipe has its opening or openings directed in an inclined direction toward the rear end of the grate, so as to discharge the steam into the body of the smoke where it is thickest.

To increase the supply of hot-air, I will in some cases build an arch of masonry 5 over the fire-chamber and leave an air-heating space 6 between the arch and the lower side of the boiler. Air can be supplied to the space 6 through openings closed by doors 6^a on the front wall of the furnace. The doors 6^a and 3^d can of course be opened more or less to regulate the quantity of air admitted, and thus regulate the temperature to which it shall be heated and injected.

Constructed in the chamber in rear of the bridge-wall there can be a perforated baffle-wall 7, tending to retard the body of smoke undergoing combustion, and in rear of this there can be built another wall, 8, tending to direct the heat and products of gases up toward the rear end of the boiler.

What I claim, and desire to secure by Letters Patent, is—

1. In a furnace, the combination of a fire-chamber, a boiler vertically above and over the fire-chamber, an arch over the fire-chamber, an air-heating space 6 between the boiler and the arch, said air-heating space discharging near the top of the bridge-wall, and the bridge-wall having an air-heating passage discharging into the fire-chamber.

2. In a furnace, a fire-chamber, a boiler vertically above and over the fire-chamber, an arch over the fire-chamber, an air-heating space 6 between the boiler and the arch, said

air-heating space discharging near the top of the bridge-wall, and the bridge-wall, the latter having an air-heating passage discharging into the fire-chamber, in combination with a
5 steam-injector discharging toward the rear end of the fire-chamber.

3. In a furnace, a bridge-wall in rear of the fire-chamber having an air-heating passage 3^a leading back and forth across the bridge-wall

and opening above the fuel in several passages 3^b and 3^c of graduated size, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

JAMES H. HAWKE.

Witnesses:

R. H. RALSTON,

JOHN B. WILSON.