

No. 639,970.

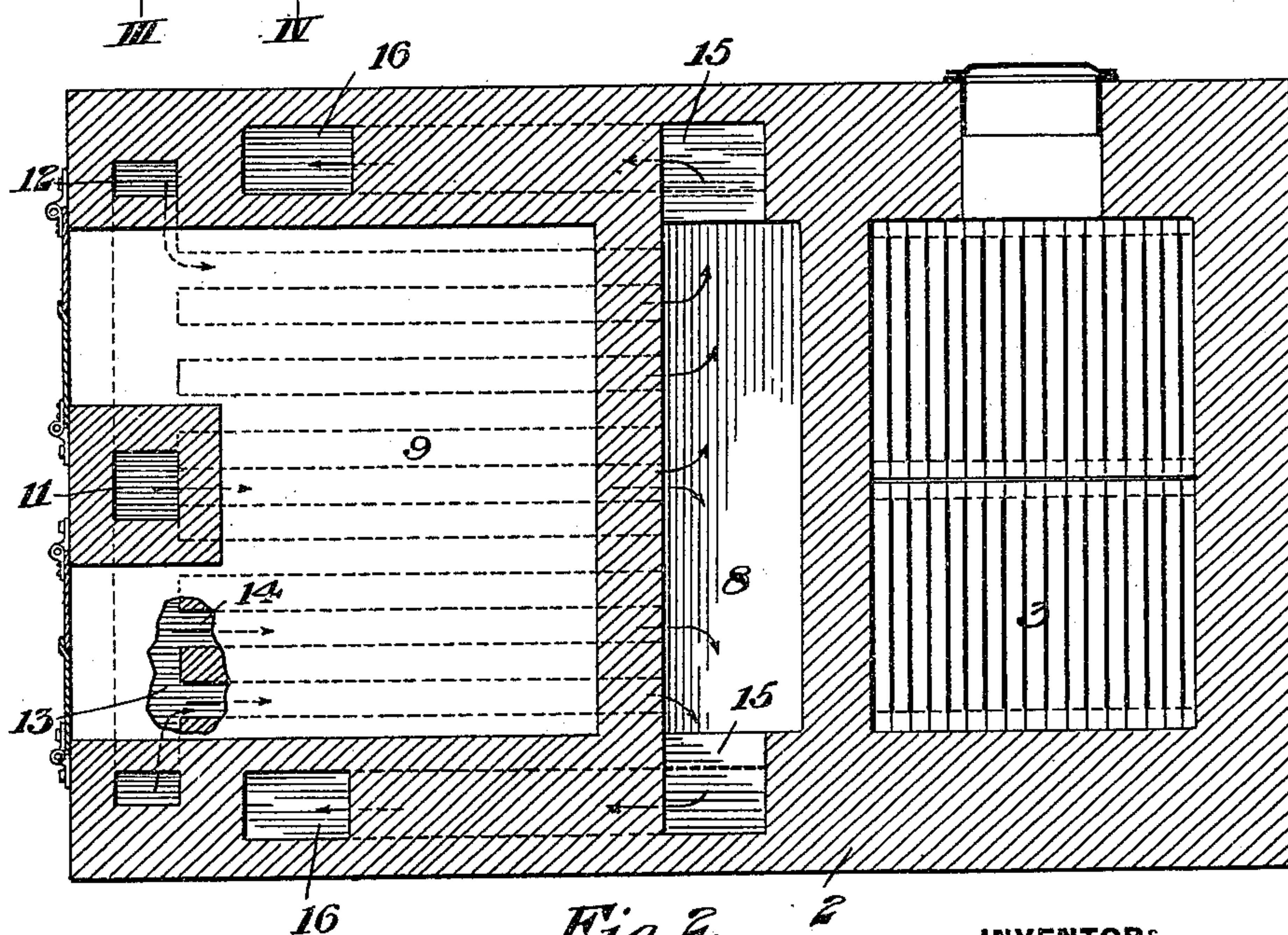
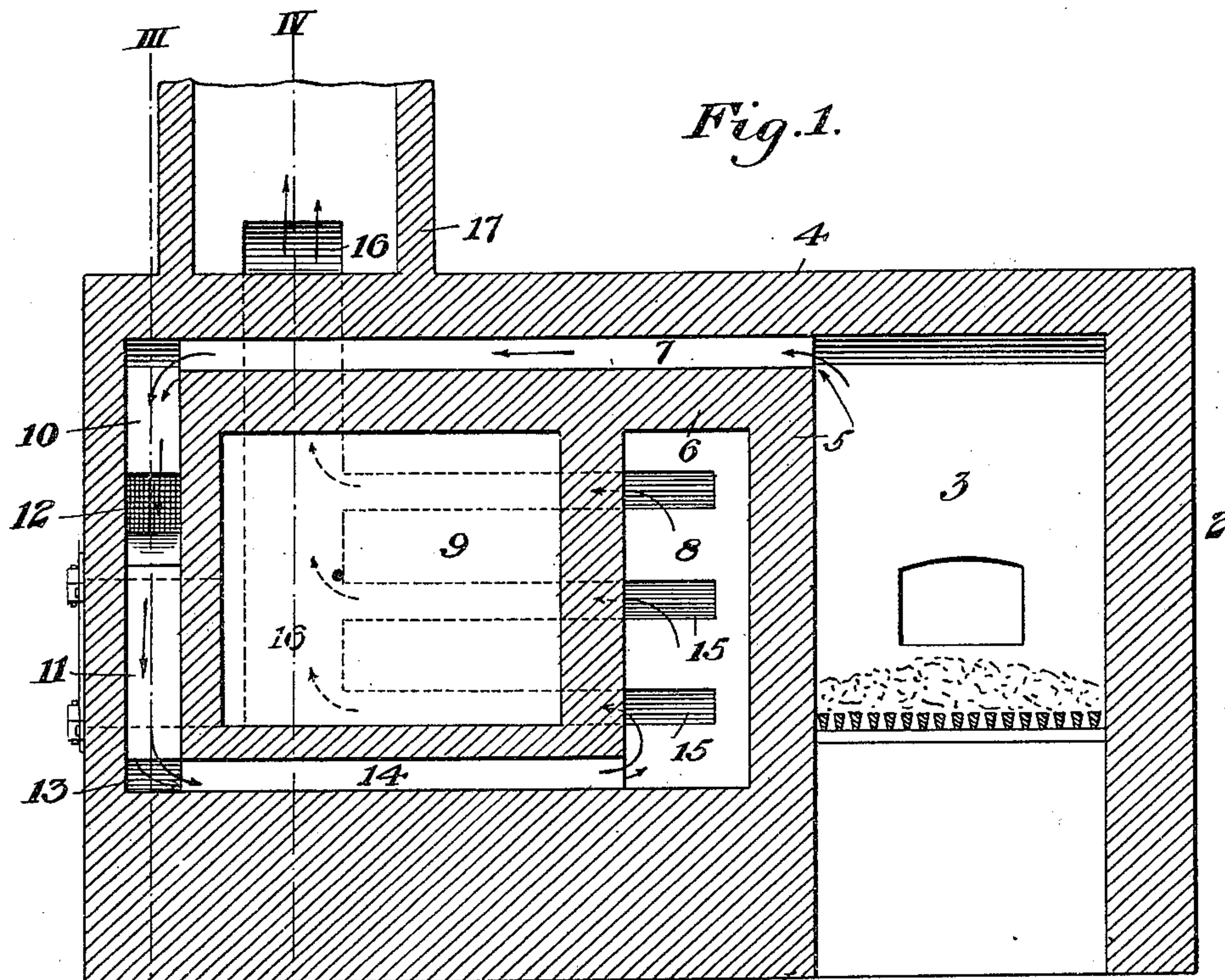
Patented Dec. 26, 1899.

W. GRIFFITH & J. M. ANDERSON.
HEATING AND ANNEALING FURNACE.

(Application filed Dec. 17, 1898.)

(No Model.)

2 Sheets—Sheet 1.



WITNESSES

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Fig. 3.

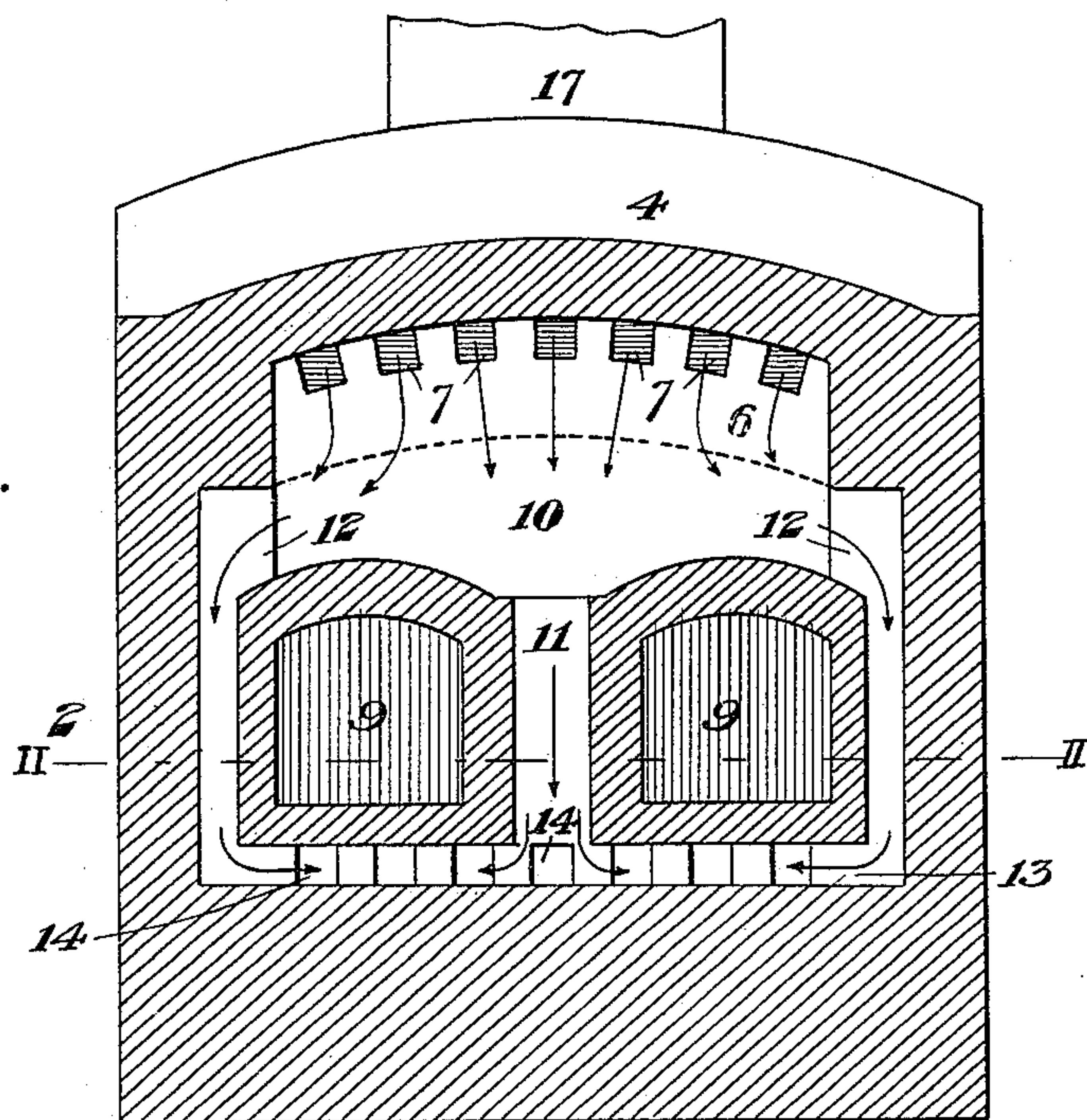
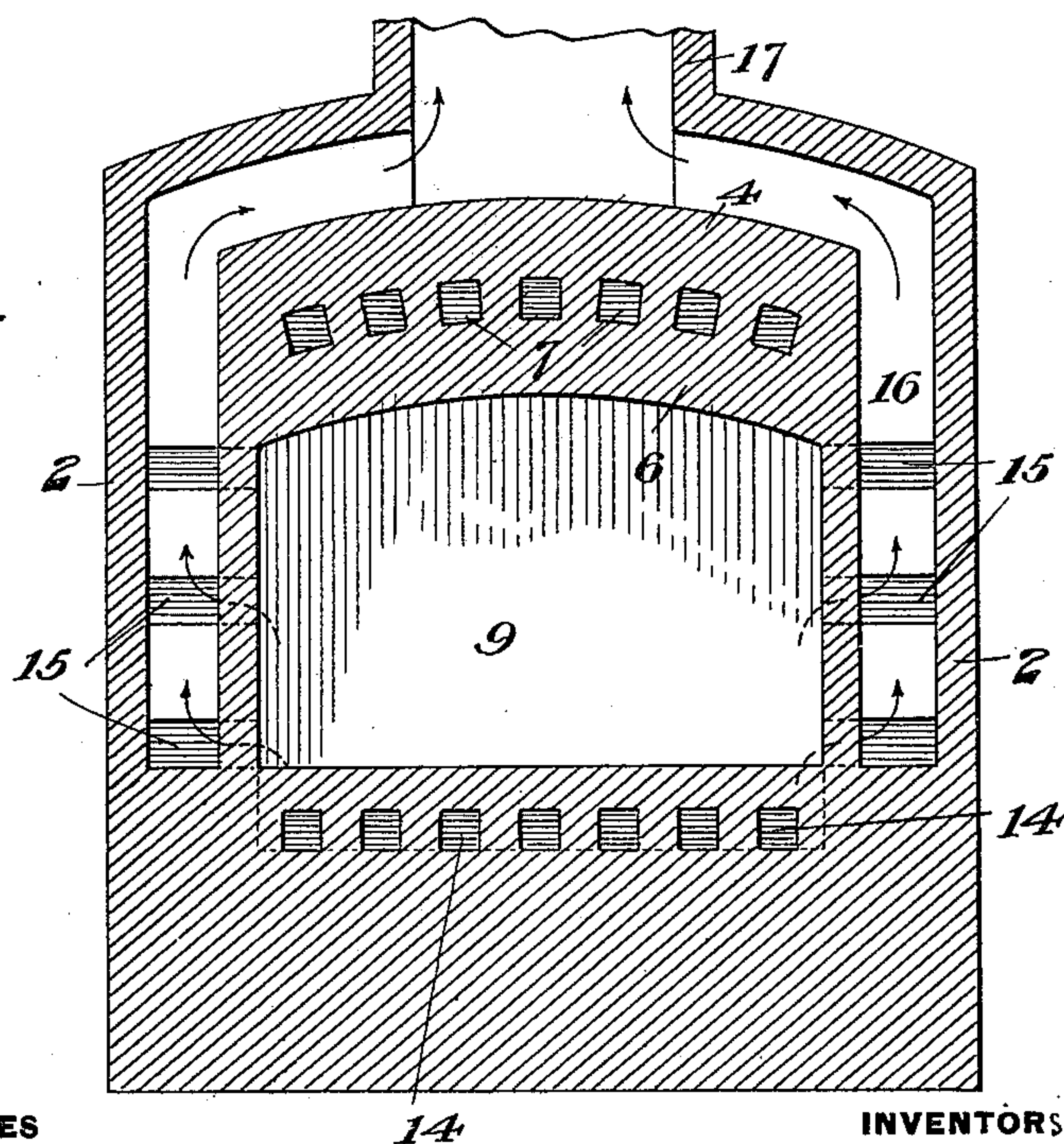


Fig. 4.



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UNITED STATES PATENT OFFICE.

WILLIAM GRIFFITH AND JOHN M. ANDERSON, OF PITTSBURG,
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HEATING AND ANNEALING FURNACE.

SPECIFICATION forming part of Letters Patent No. 639,970, dated December 26, 1899.

Application filed December 17, 1898. Serial No. 699,549. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM GRIFFITH and JOHN M. ANDERSON, of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Heating and Annealing Furnaces, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, in which—

10 Figure 1 is a longitudinal central section of our improved heating-furnace. Fig. 2 is a horizontal section on the line II II of Fig. 3. Fig. 3 is a cross-section on the line III III of Fig. 1, and Fig. 4 is a similar view on the line
15 IV IV of Fig. 1.

The object of our invention is to provide a heating, annealing, or smelting furnace of large capacity in which copper, zinc, brass, gold, silver, sheet-iron, packs of black plate,
20 bars or billets, and other articles or metals may be heated, annealed, or smelted without oxidization.

Our invention consists in arranging the flues and ports with respect to the annealing,
25 heating, or smelting chamber in such a manner as will insure the equal distribution of the heat upon all sides of the annealing or heating chamber. To accomplish this, we arrange a flue or flues between the furnace-roof
30 and the bridge-wall and top of the heating-chamber, which carry the caloric current to a distributing-chamber in the front wall of the furnace, which in the present case is the front wall of the heating-chamber as well.
35 The heat is thence conducted downwardly and beneath the heating-oven to a chamber in the bridge-wall, from whence it is carried along flues in the side walls of the furnace, which serve as the side walls of the heating-
40 chamber. These flues lead to a suitable stack.

In the drawings, 2 indicates the walls of the furnace, and 3 the combustion-chamber.

The main roof of the furnace 4 is a sufficient distance above the roof 6 of the annealing-chamber 9 and the hollow bridge-wall 5
45 to form a flue or flues 7. The bridge-wall is formed with a chamber 8, the purpose of which will be hereinafter described.

In the drawings we have shown a series of
50 flues 7, which are distributed in such a way as to direct the caloric current equally, so

that when delivered to the distributing-chamber 10, formed in the front wall of the furnace, an equal amount of heat will be carried
downwardly through the central diving-flue 55 11 and the side flues 12 to the cross-flue or header 13 in the bottom of the furnace. It will be noticed by reference to Figs. 2 and 3 that the column between the openings into the annealing-chamber is built hollow, so as
60 to form the flue 11. The openings into the annealing-chamber are covered by arches, which form the bottom of the distributing-chamber 10. These openings just described are closed by suitable doors, (not shown), which can be
65 luted or otherwise sealed, so as to exclude the air from the annealing-chamber 9. Beneath the floor of the annealing-chamber are flues 14, which communicate directly with the cross-flue or header 13 and at the other end
70 with the chamber 8 in the bridge-wall. In this chamber the heat is collected and then distributed by the ports in this chamber that open into the flues 15 in the side walls of the furnace, which, as shown in the drawings, 75
serve as the side walls of the annealing-chamber 9. The exit-flues 16 lead to a stack 17, which may be located at any convenient point.

The operation of our invention is apparent. The caloric current is drawn by the draft of
80 the stack through the flue or flues at the top of the furnace, so as to heat the upper portion of the annealing-chamber, thence into the distributing-chamber, which heats a portion of the front wall, and the diving-flues further
85 carrying out this heating action. The caloric current on reaching the cross-flue passes into the flues beneath the floor of the heating-chamber and heats the same to the desired temperature, and thence into the chamber 8,
90 where it comes into contact with the rear wall of the heating-chamber 9. The heated currents then pass through the flues in the side walls forwardly, as shown in the drawings, and heat the side walls of the heating-chamber. 95
After this has been accomplished it is not material where the exit ports or flues lead; but we have illustrated a convenient location for these ports and stack-flues.

The advantages of our invention will be ap- 100
preciated by those skilled in the art, since by constructing a furnace as just described a

uniform distribution of heat is effected, all parts of the heating or annealing chamber being brought into contact with the caloric current, a heating-chamber of large capacity is afforded, and a simple and economical furnace is produced, so that the annealing or heating process may be conducted expeditiously and with none of the trouble and annoyance arising from the use of annealing-boxes which have been generally employed heretofore.

Changes may be made within the scope of our claims in the number and arrangement of the flues, and other modifications will suggest themselves to those skilled in the art. Such changes may be made without departing from the spirit and scope of our invention, since

We claim—

1. The combination with an annealing or heating furnace having a combustion-chamber and a bridge-wall, of a heating-chamber, flues above the bridge-wall and heating-chamber, a distributing-chamber in communication with said flues, diving-flues leading from said distributing-chamber, flues beneath the heating-chamber with which said diving-flues communicate, a second distributing-chamber in the rear of the heating-chamber, flues in the side walls of the heating-chamber leading from said second chamber, and a stack

communicating with said side flues, substantially as described.

2. In combination with an annealing or heating furnace having a combustion-chamber and a bridge-wall, a heating-chamber, flues above the bridge-wall and heating-chamber, a pair of openings through the front wall of the annealing-chamber, a distributing-chamber formed in said front wall above these openings, diving-flues in the walls surrounding said openings and in communication with the distributing-chamber, a cross-flue or header into which said diving-flues lead, a flue or flues beneath the floor of the annealing-chamber, a second distributing-chamber in the rear of the annealing-chamber in communication with said flues beneath the annealing-chamber, flues in the side walls of the annealing-chamber leading from said second chamber and a stack in communication with said side flues, substantially as described.

In testimony whereof we have hereunto set our hands.

WILLIAM GRIFFITH.
JOHN M. ANDERSON.

Witnesses:

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