

No. 744,238.

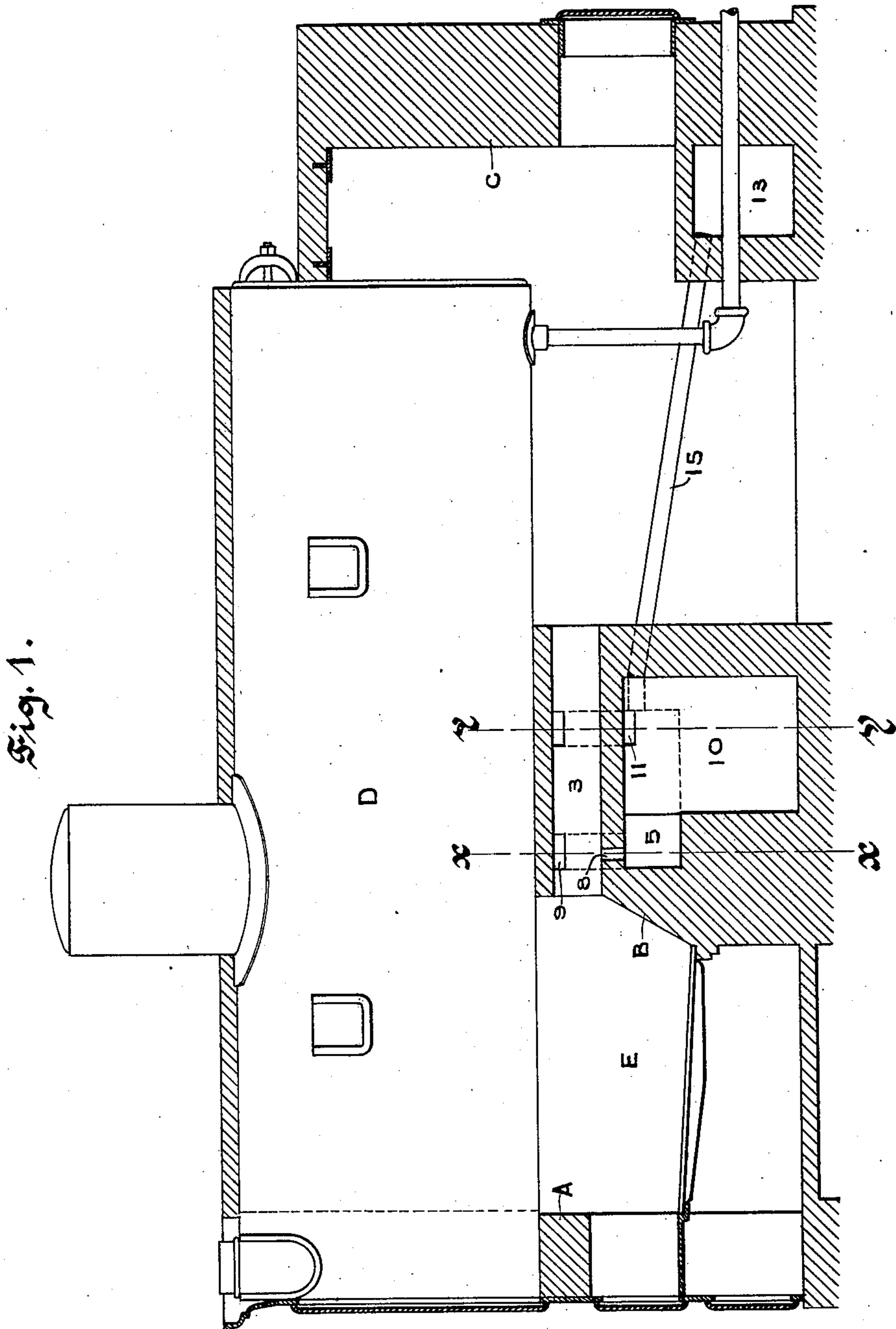
PATENTED NOV. 17, 1903.

J. D. ROBERTS.
FURNACE.

APPLICATION FILED JUNE 12, 1902.

NO MODEL.

2 SHEETS—SHEET 1.



Witnesses,
W. H. Palmer
Emily Eastman Otis

Inventor,
John D. Roberts.
by Lathrop Johnson
his Attorneys.

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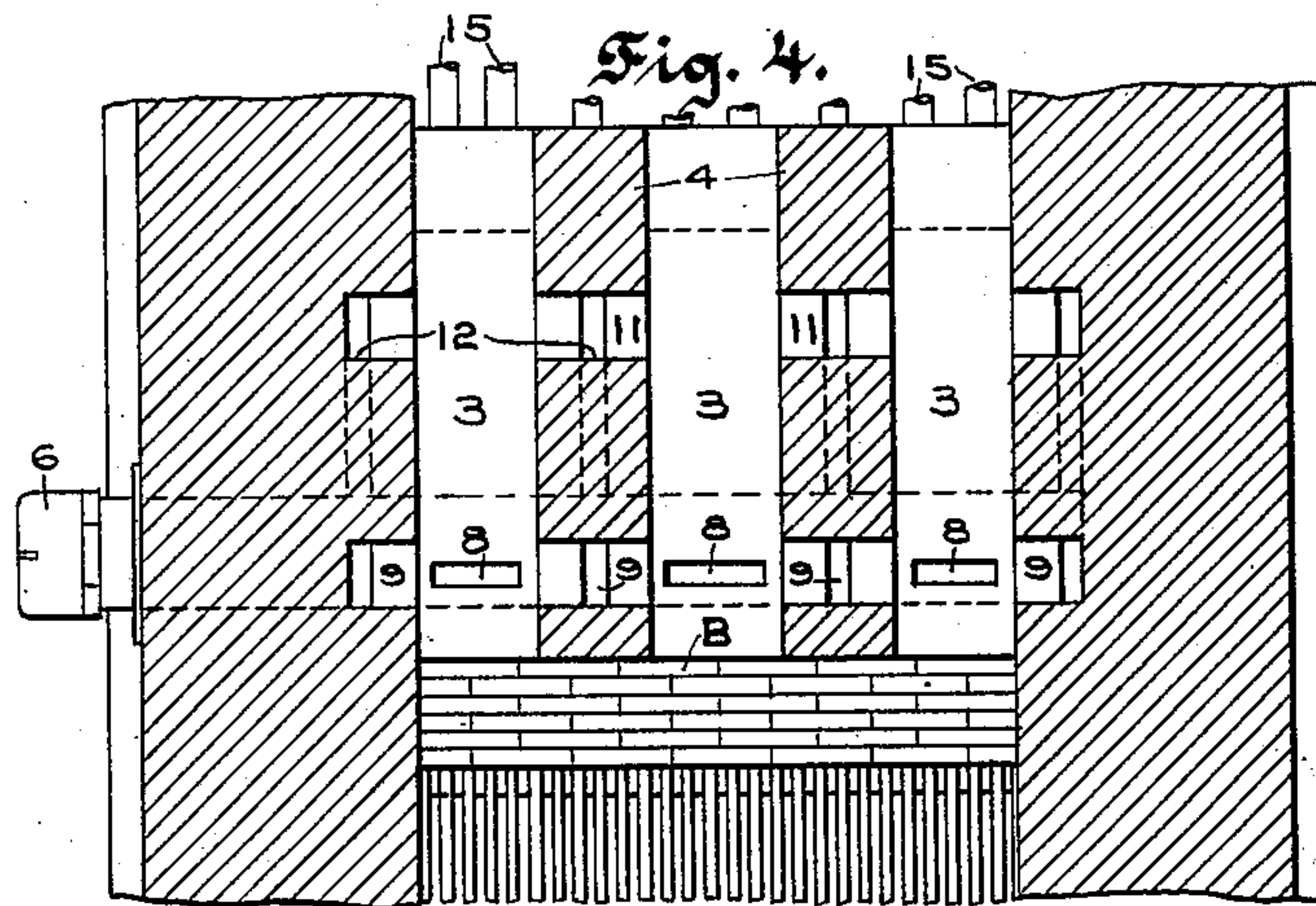
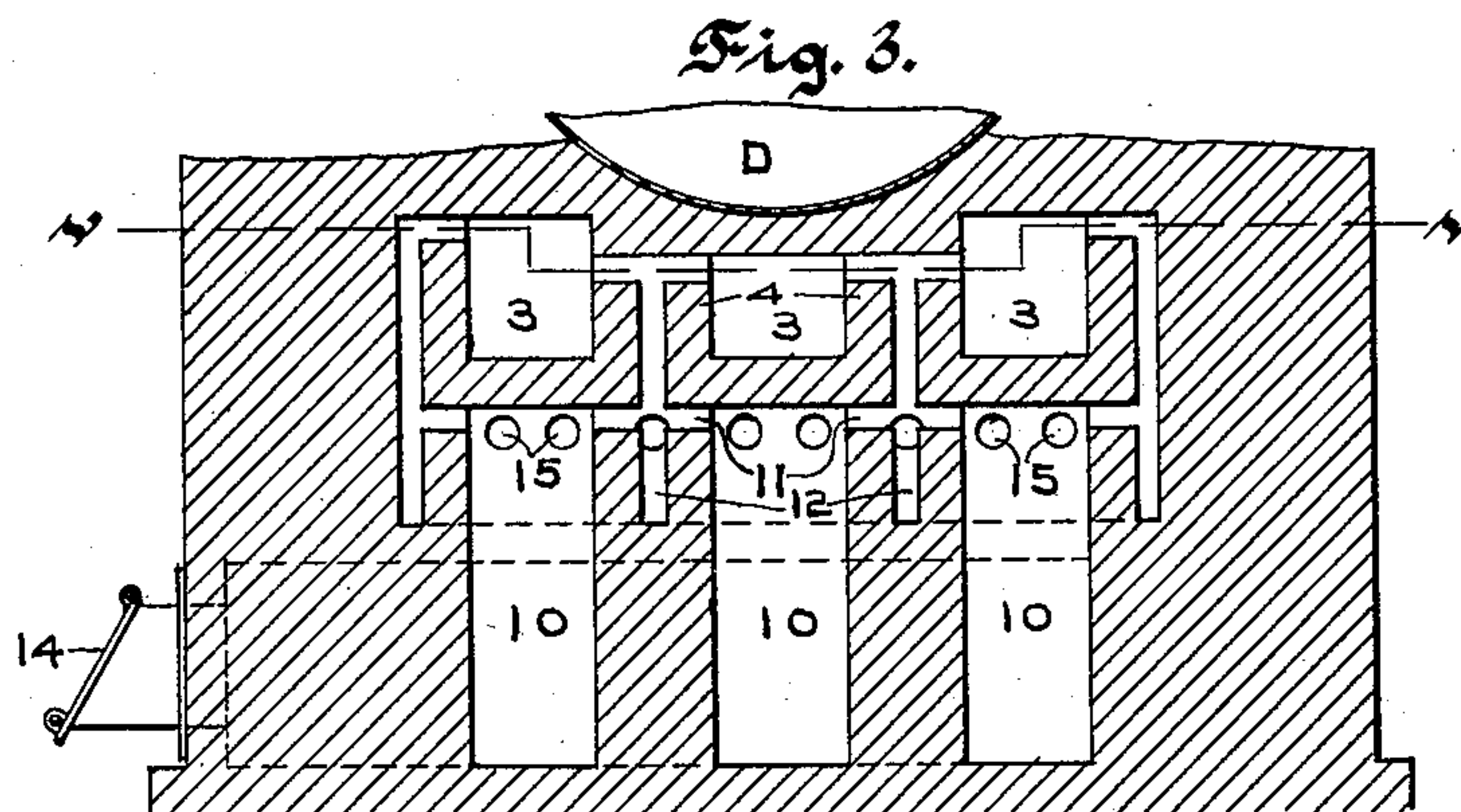
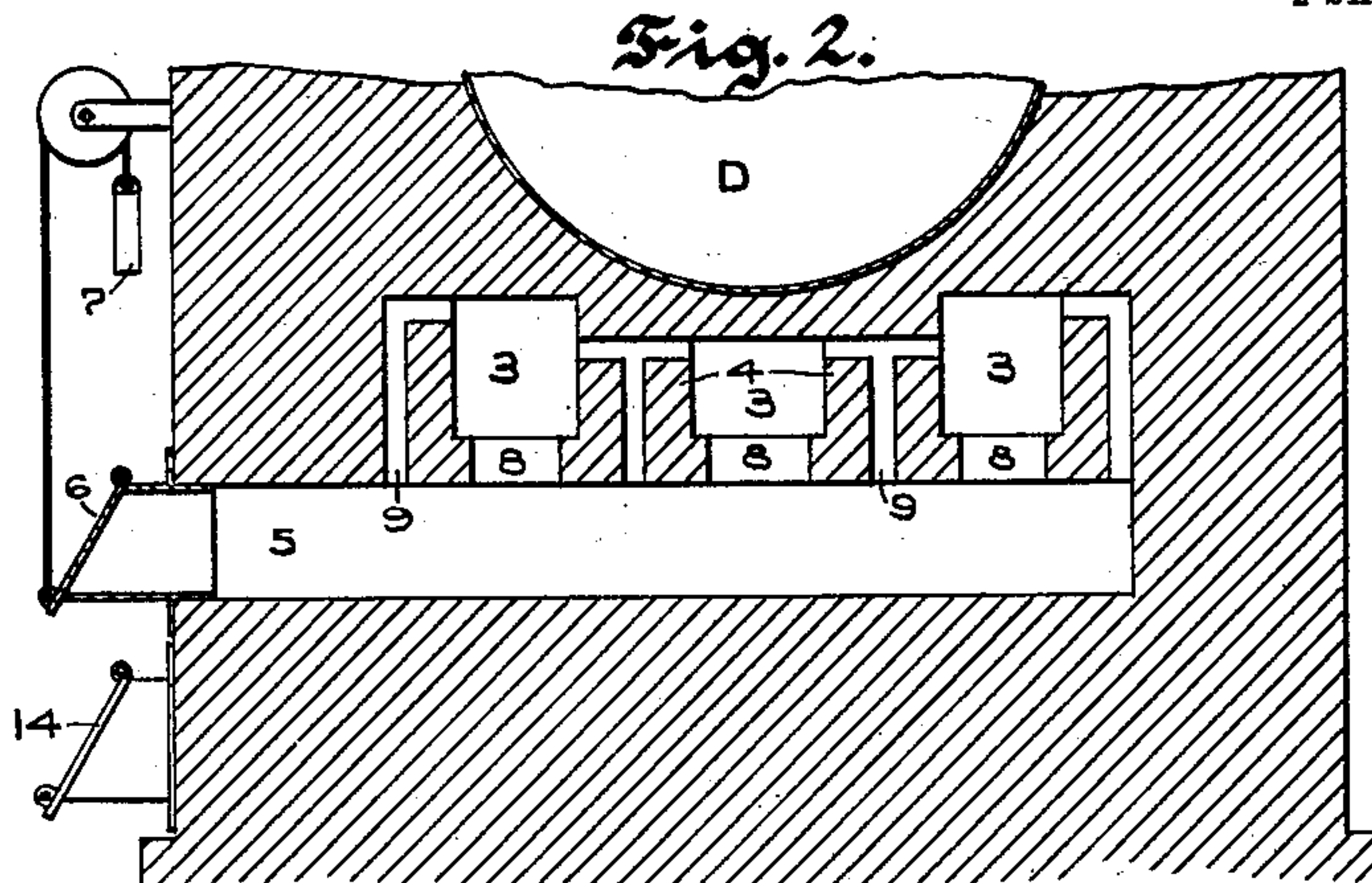
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UNITED STATES PATENT OFFICE.

JOHN D. ROBERTS, OF ST. PAUL, MINNESOTA.

FURNACE.

SPECIFICATION forming part of Letters Patent No. 744,238, dated November 17, 1903.

Application filed June 12, 1902. Serial No. 111,262. (No model.)

To all whom it may concern:

Be it known that I, JOHN D. ROBERTS, a citizen of the United States, residing at St. Paul, in the county of Ramsey and State of Minnesota, have invented certain new and useful Improvements in Furnaces, of which the following is a specification.

My invention relates to improvements in furnaces, its object being particularly to provide improvements in the construction of the furnace whereby more thorough combustion of the fuel is obtained than in the ordinary construction of furnace, thus preventing the smoke due to unconsumed fuel.

To this end my invention consists in the features of construction and combination hereinafter particularly described and claimed.

In the accompanying drawings, forming part of this specification, Figure 1 is a longitudinal vertical section of a furnace and boiler embodying my invention. Fig. 2 is a section on line *xx* of Fig. 1. Fig. 3 is a section on line *yy* of Fig. 1, and Fig. 4 is a section on line *vv* of Fig. 3.

In the drawings, A represents the front wall, B the bridge-wall, and C the rear wall, of the furnace, supporting a boiler D. The bridge-wall is carried up around the boiler, as shown in Figs. 1 and 2. The bridge-wall above the grate is provided with a series of passages or retorts 3, connecting the fire-box with the space at the rear of the bridge-wall, said retorts being separated by partition-walls 4. Extending longitudinally of the bridge-wall and opening to the outer air, preferably through one side of the furnace, is an air-passage 5, the outer end of said passage being closed by a door 6, provided with a suitable counterweight 7. The air-passage 5 opens into the bottom of the front ends of the retorts by means of the ports 8 and is connected with the upper portion of the retorts by conduits 9. Arranged in the bridge-wall, at the rear of the air-passage 5, is a series of superheating-chambers 10, opening into the air-passage, as shown in Fig. 1. The chambers 10 connect the rear ends of the re-

torts by means of the conduits 11. The conduits 11 are also directly connected with the air-passage 5 by conduits 12.

In order to admit heated air into the retorts 3, I provide a passage 13, extending longitudinally of the rear furnace-wall C and opening at one side of the furnace to the outer air, said passage being preferably provided with a suitable door 14. The passage 13 is connected with the chambers 10 by conduits 15 passing through the combustion-chamber. The air as it passes through the conduits 15 will thus be heated. I may admit the air to the retorts 3 through either the passages 5 or 13 or through both, as may be desired. In operation the gaseous products of combustion will pass from the fire-box E through the retorts to the combustion-chamber at the rear of the bridge-wall. The air which is drawn into the passages 5 and 13 will pass through the connecting-conduits into the retorts 3, supplying the necessary oxygen to complete the combustion.

I claim—

1. In a furnace, the combination with the fire-box and boiler, of the bridge-wall arranged at the rear of the fire-box provided with retorts or passages connecting said fire-box with the space at the rear of the bridge-wall, an air-passage extending longitudinally of said bridge-wall and connected with the outer air, conduits leading from said passage through the bottom of said retorts, conduits leading from said passage through the sides of said retorts, relatively larger superheating-chambers arranged at the rear of said passage and connected therewith, and conduits connecting said superheating-chambers with the rear of said retorts.

2. In a furnace, the combination with the fire-box and boiler, of the bridge-wall at the rear of the fire-box provided with retorts or passages connecting said fire-box with the combustion-chamber at the rear of the bridge-wall, an air-passage extending longitudinally of said bridge-wall and connected with the outer air, conduits connecting said passage

with said retorts, relatively larger superheating-chambers arranged at the rear of said passage and connected therewith, conduits connecting said superheating-chambers with
5 said retorts, a longitudinal passage at the rear of the combustion-chamber connected with the outer air, and conduits connecting said air-passage and said superheating-chambers, said conduits passing through the combustion-chamber. 10

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

JOHN D. ROBERTS.

Witnesses:

H. S. JOHNSON,

EMILY EASTMAN OTIS.