

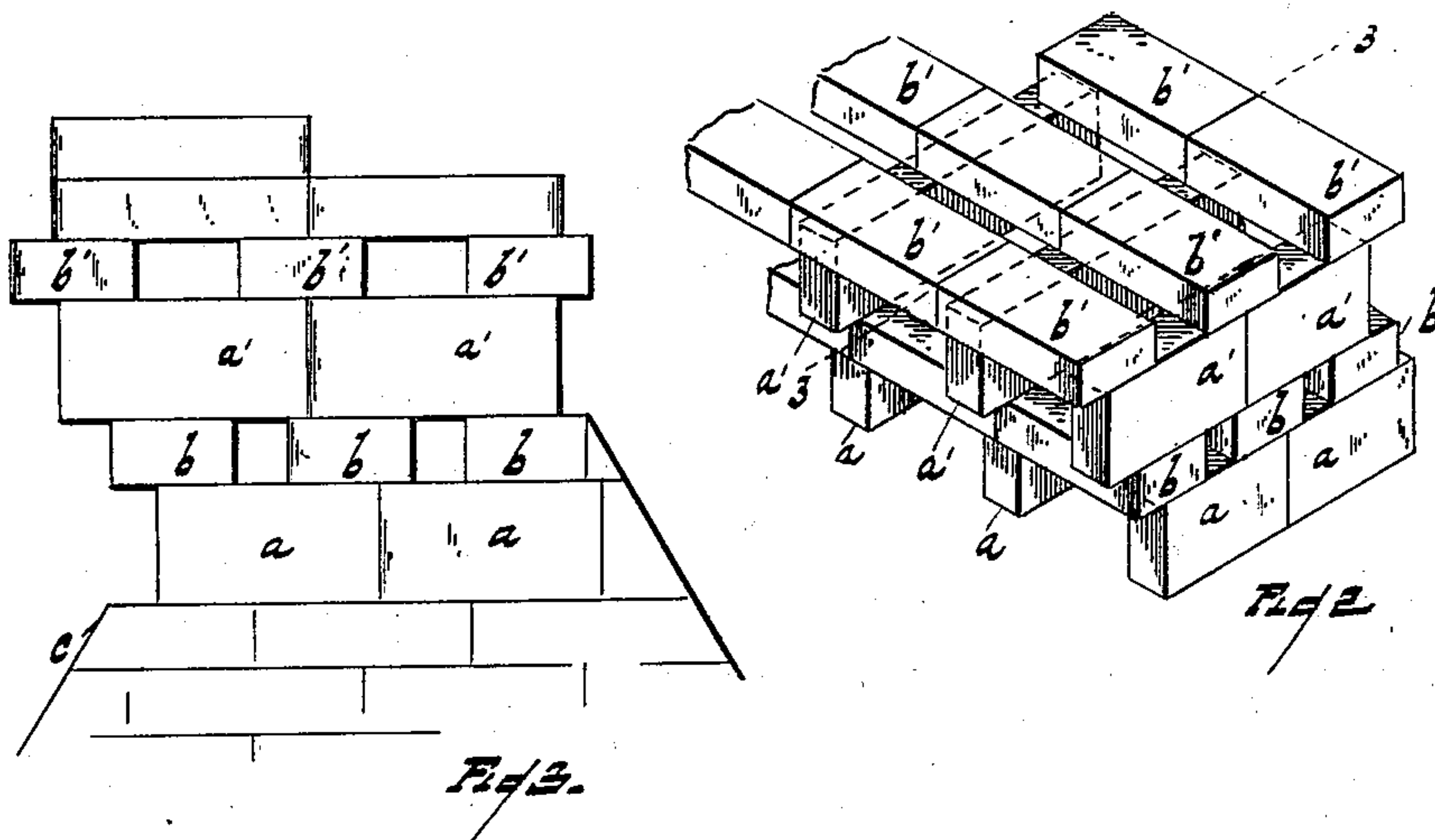
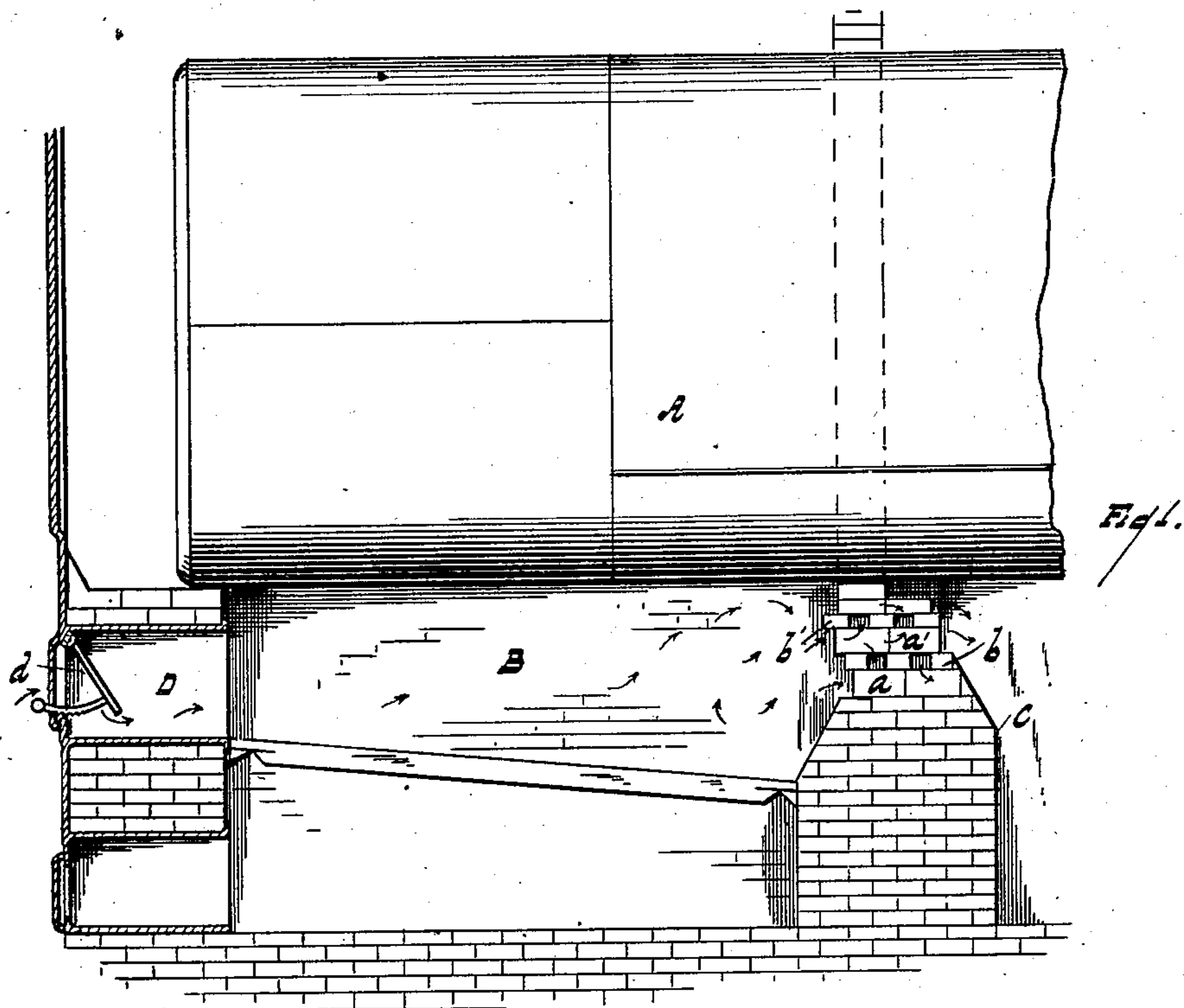
No. 723,663.

PATENTED MAR. 24, 1903.

E. A. FIELD & J. LYNN.
FURNACE.

APPLICATION FILED OCT. 28, 1901.

NO MODEL.



WITNESSES

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UNITED STATES PATENT OFFICE.

EDWARD A. FIELD AND JAMES LYNN, OF DETROIT, MICHIGAN; SAID
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FURNACE.

SPECIFICATION forming part of Letters Patent No. 723,663, dated March 24, 1903.

Application filed October 28, 1901. Serial No. 80,200. (No model.)

To all whom it may concern:

Be it known that we, EDWARD A. FIELD and JAMES LYNN, citizen of the United States, residing at Detroit, county of Wayne, State of Michigan, have invented a certain new and useful Improvement in Furnaces; and we 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 pertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

Our invention relates to furnaces; and the object of our improvements is to secure the complete combustion of the inflammable gases given off by the fuel and to prevent the discharge of smoke. We attain this object in the apparatus shown in the accompanying drawings, in which—

Figure 1 is a side elevation of part of a steam-boiler and a section of the furnace thereunder. Fig. 2 is a detail perspective view of the superstructure upon the bridge-wall. Fig. 3 is a section on the line 3 3 of Fig. 2, the commencement of the brickwork, which is built up to close the passage between furnace and the stack except through the apertures through the superstructure in the bridge-wall, being also shown.

A is the boiler; B, the furnace; C, the bridge-wall; D, the opening for the admission of fuel and air above the fire, and *d* a valve or door adapted to close the opening D and adjustable so as to let more or less air flow into the furnace above the grate.

Upon the top of the bridge-wall we erect a superstructure of fire-brick consisting of parallel rows, the constituent bricks *a a* of which are laid end to end and upon one of their longer edges. These rows are a distance apart from center to center about equal to the length of a brick. Upon the top of these bricks *a a* we lay bricks *b b*, extending laterally to the bricks *a a* and lying upon one of their broader faces. The bricks *b b* lie in rows extending across the furnace, and the rows are a distance apart equal to perhaps half the width of a brick, the row adjacent to the furnace extending partly over the end of the brick and beneath it. Upon the bricks *b b* are placed a third row of bricks *a' a'*, similar and simi-

larly located to the bricks *a a*. The brick *a'*, which are toward the furnace, overhang the brick *b*, upon which they rest. Upon the bricks *a' a'* we place other bricks *b' b'*, forming rows similar to those of the bricks *b b*, the row upon the furnace side overhanging the bricks *a'*, upon which they rest. In this way we build up to within perhaps four or five inches of the boiler. We then fill in the remaining space with bricks laid in the usual way and fill in the space around the boiler with ordinary brickwork, so that there is no passage between the furnace and stack except through the passage-way between the bricks *a a' b b'*.

It will be noticed that the method of laying the bricks *a a' b b'* leaves horizontal direct passages between the furnace and the space of the bridge-wall and that these passages communicate with each other by both vertically and horizontally expanding passages. It will be also noted that the bricks *b b* overlapping the underlying bricks have an effect to break up the currents of gases and thoroughly mix them.

In practice the bricks *a a' b b'* become white-hot, so that they will ignite inflammable gases that enter them. The valve *d* is slightly opened, so as to admit the proper quantity of air. The air and inflammable gases are mixed and together enter the passage between the bricks *a a' b b'*, and the latter are ignited by contact with said bricks, the vertical passages permitting the gases to expand on ignition into passages bounded by white-hot walls, so that the combustion is very complete.

The expansion of the gases on ignition within the passages among the bricks *a a' b b'* still further mixes the gases, so that if sufficient air is admitted to burn the gases the air and gases are sure to be brought into intimate contact.

The formation of the superstructure upon the bridge-wall that is toward the flues presents a large radiating-surface by which heat is radiated to the boiler back of said bridge-wall.

What we claim is—

1. In a furnace, the combination of a bridge-wall, a system of parallel rows of bricks resting upon their edges, extending from the front toward the back of said bridge-wall on the

top thereof, said rows being spaced from each other, a second system of parallel rows of bricks lying upon their sides upon the first-mentioned bricks and extending transversely
5 thereof, said last-mentioned rows being spaced from each other, the row toward the furnace overhanging the bricks upon which it rests, and a third system of parallel rows of bricks resting upon the second system, and
10 located in a similar manner to the first-mentioned bricks.

2. In a furnace, the combination of a bridge-wall, a system of parallel rows of bricks resting upon their edges, extending from the front
15 toward the back of said bridge-wall on the top thereof, said rows being spaced from each other, a second system of parallel rows of bricks lying upon their sides upon the first-mentioned bricks and extending transversely
20 thereof, said last-mentioned rows being

spaced from each other, the row toward the furnace overhanging the bricks upon which it rests, and the row toward the stack being spaced from the end of the bricks upon which it rests, and a third system of parallel rows
25 of bricks resting upon the second system, their furnace ends extending over the bricks upon which they rest, and their other ends being spaced from the edges of the bricks upon which they rest.

In testimony whereof we sign this specification in the presence of witnesses.

EDWARD A. FIELD.

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