

J. FRANZ & J. C. STEVENS.  
Brick-Kiln Furnace.

No. 205,851.

Patented July 9, 1878.

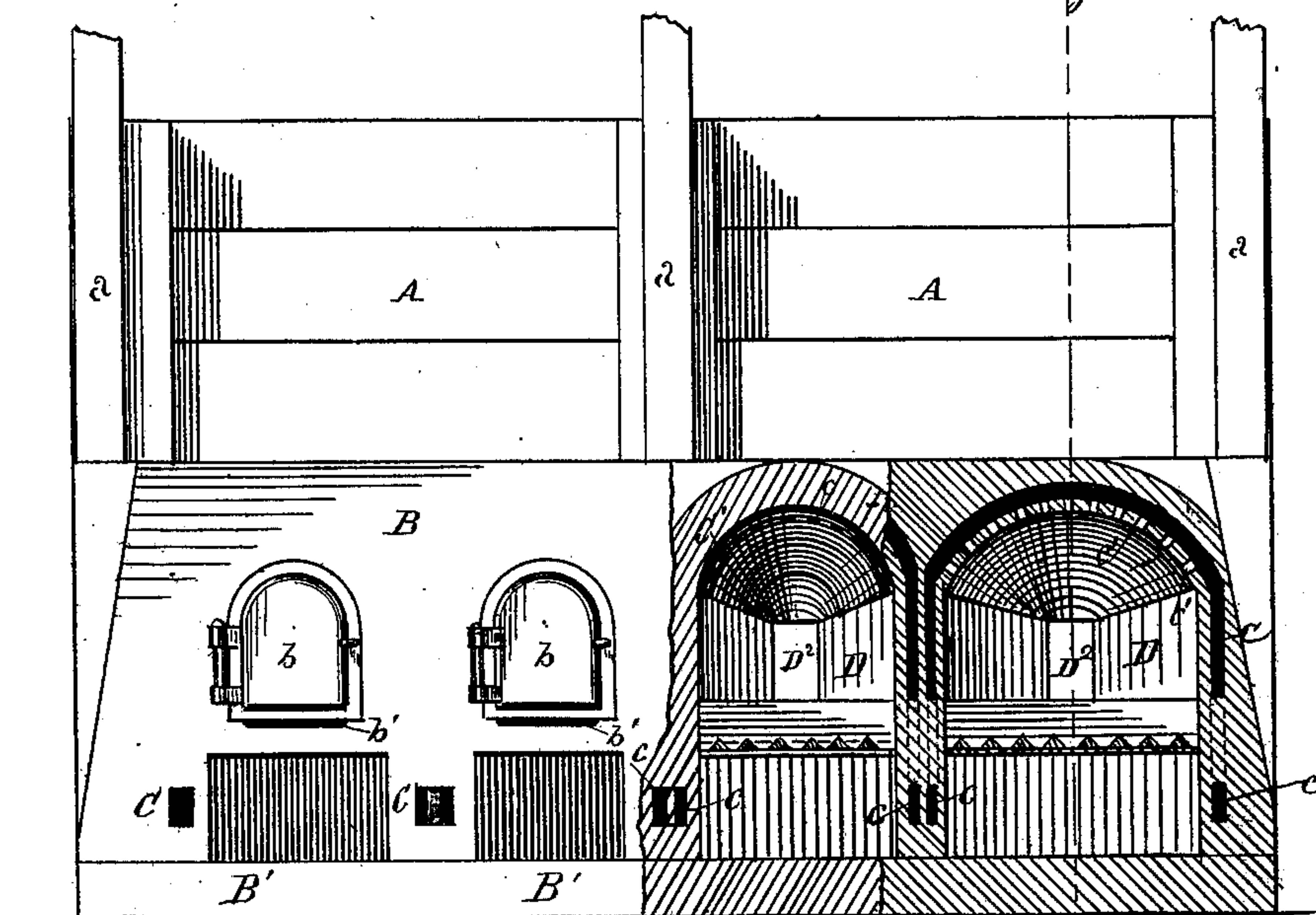


Fig. 1.

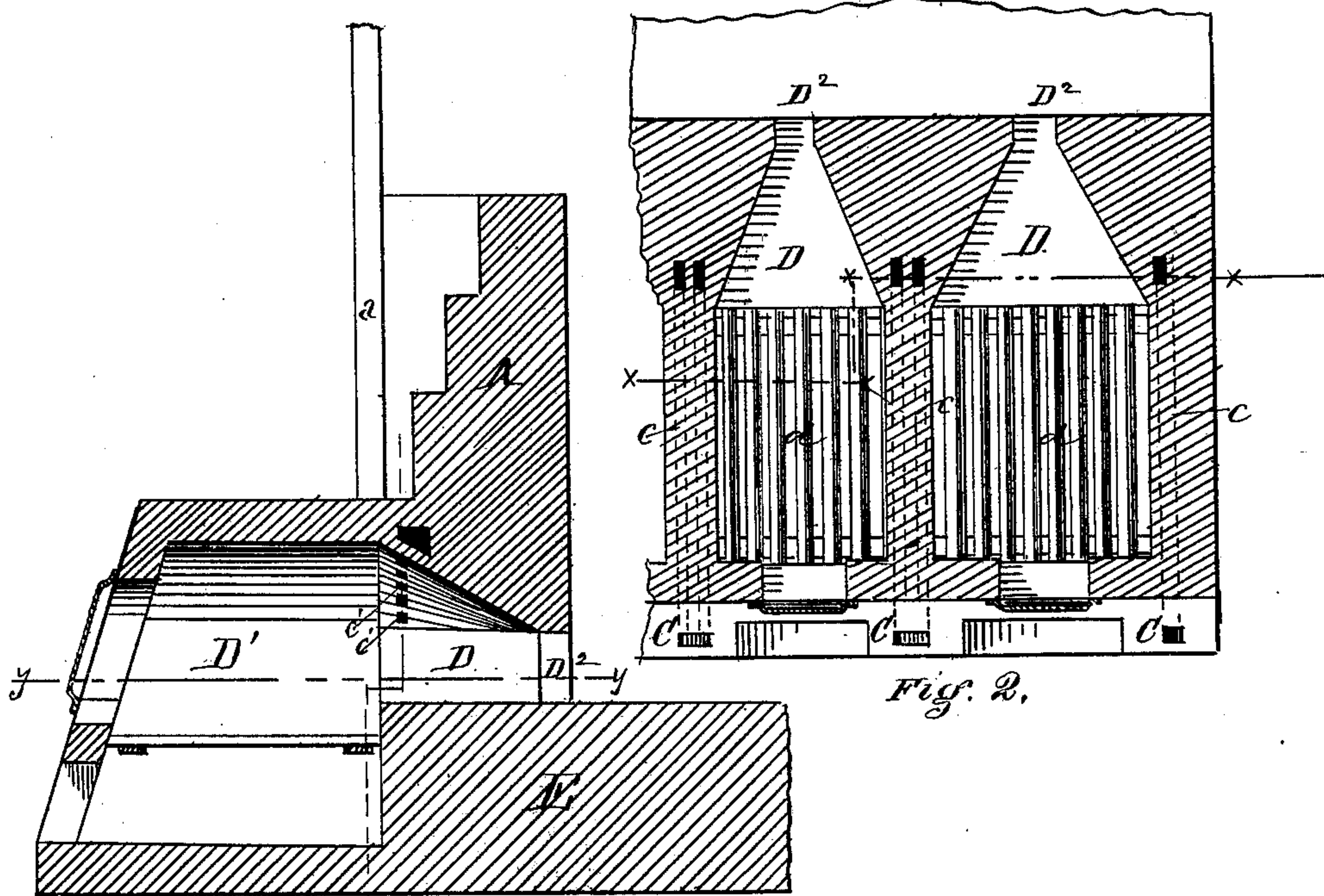


Fig. 2.

Fig. 3.

Witnesses

Francis L. Clark  
Albert Martin

Inventors John C. Stevens  
Jacob Franz  
By Attorney J. H. Stevenson



# UNITED STATES PATENT OFFICE.

JACOB FRANZ AND JOHN C. STEVENS, OF ALLEGHENY, PENNSYLVANIA.

## IMPROVEMENT IN BRICK-KILN FURNACES.

Specification forming part of Letters Patent No. **205,851**, dated July 9, 1878; application filed June 21, 1877.

*To all whom it may concern:*

Be it known that we, JACOB FRANZ and JOHN C. STEVENS, of Allegheny, Pennsylvania, have invented a new and useful Improvement in Brick-Kiln Furnaces, which improvement is fully set forth in the following specification, reference being had to the accompanying drawings.

Similar letters of reference indicate corresponding parts.

In the accompanying drawings, which form a part of this specification, Figure 1 is a front elevation of our furnace, showing in the left-hand division the outer or face wall and doors, and in the right-hand division of the figure a vertical section of the furnace as cut on the lines *x x x x* in Fig. 2. Fig. 2 is a horizontal section of the furnace, showing the chambers as cut along the lines *y y* in Fig. 3; and Fig. 3 is a longitudinal section of one of the furnaces as cut on the lines *y y* in Fig. 1.

A represents the back walls of the furnaces. *a a a* are posts for maintaining the roof of a kiln. B shows the front or face of the furnace. *b b* are doors in the walls B. *b' b'* are draft-openings under the doors *b*. C C are flue-openings into the walls of the combustion-chambers. *c c* are air-passages for draft. *c' c'* are openings of the flues *c* into the mouth of the flues D. B' B' are ash-pits. D D are converging flues of the furnaces. D<sup>1</sup> is the combustion-chamber. D<sup>2</sup> D<sup>2</sup> are the flues D continued. *d d* are grate-bars. E is the base of the furnaces.

Our furnace is constructed mainly of fire-brick on the interior and ordinary building-brick on the outside. The doors and grate-bars should be metallic. Beneath the doors *b* are draft-openings *b'*. The combustion-chamber D<sup>1</sup> is properly arched over from the front backward about the distance of the grate-bars, where the wall A is commenced. These doors *b*, side walls of chamber D<sup>1</sup>, grate-bars, &c., are of ordinary construction. Beneath the grates are the ash-pits B' B'.

Our furnace has a series of combustion-chambers, D<sup>1</sup>, and in the main are constructed alike. In the walls along the outside of these chambers are single flue-openings C for air. These flues extend along the center of the outer walls

till they reach the back end of the chamber D<sup>1</sup>, at which point the flues cease to run in a horizontal line and rise vertically over the chamber D<sup>1</sup> to the dome, and there connect with a similar flue from the other side of the arch. This latter is a flue along near the center of the bridge-wall between two of the chambers D<sup>1</sup>, as seen in Fig. 1. It will be seen that the flues in the walls between two of the furnaces separate after entering the wall, and form two distinct flues between these chambers D. At the top and along each of the sides of the arch of the flue D, the air passing along these several flues *c*, finds egress into the flues D through the openings *c' c'*. In this way each of the arches of these chambers D<sup>1</sup> has its flue *c* and flue-opening *c'* in the flues D. These flues D are so constructed as to converge from the sides and dome till a small square flue, D<sup>2</sup>, is formed, and this leads the flame off into the kiln proper.

Our furnaces are constructed on a plane with the floor of the kiln, so that the flame passing through the flue D<sup>2</sup> has no descent or ascent to make, but goes to the desired place in the flues of the kiln on a straight line.

When thus constructed, and the brick properly placed in the kiln and ready for burning, the operation of our furnace will be as follows: The proper fuel will be put in the combustion-chamber D<sup>1</sup> and fire set thereto. The doors will be closed, and, after the fire has fairly started, the flues C C will be opened. Air will then pass into the same and along through the walls on the outside and between the furnaces, traversing the distance back to where the flue begins to ascend. The air passes up the sides of the walls of the chambers and on up to the dome, and finds exit into the flame at about the diverging point of the flue D. Here the air will meet the flame of the combustion-chamber D<sup>1</sup>, and will aid in producing heat.

We make the flue D diverging, as seen in Figs. 1 and 2, in order to concentrate the flame, thus making the heat more intense before it passes into the kiln.

We make the double flues between the furnaces or chamber D<sup>1</sup> for the reason that by this means an equal proportion of air will be

given the flue to the right and the one to the left, thus affording a more equal distribution of air into the mouth of the flues D.

We notice that the flue-openings in similar furnaces to ours are so placed that the ashes and cinders in the combustion-chambers are likely to, and do in fact, often close them up, thus impeding draft. For this reason we have our flue-openings in the combustion-chamber at the top, where they will not be stopped up by any substance, but will always be clean and ready for action.

Having thus described our invention, what we claim, and desire to secure by Letters Patent, is—

1. In a brick-kiln furnace, the double flues in the walls between the several furnaces, for

the purpose of conveying an equal quantity of air into the furnace-chambers in aid of combustion, substantially as described.

2. In a furnace for brick-kilns, the double flues between the several furnaces terminating in the dome of the combustion-chambers in the openings *c' c'*, in combination with said combustion-chamber D<sup>1</sup> and flue D, substantially as described and shown.

In testimony that we claim the foregoing we hereto set our hands.

JACOB FRANZ.

JOHN C. STEVENS.

Witnesses:

J. H. STEVENSON,

JAMES OWEN.