

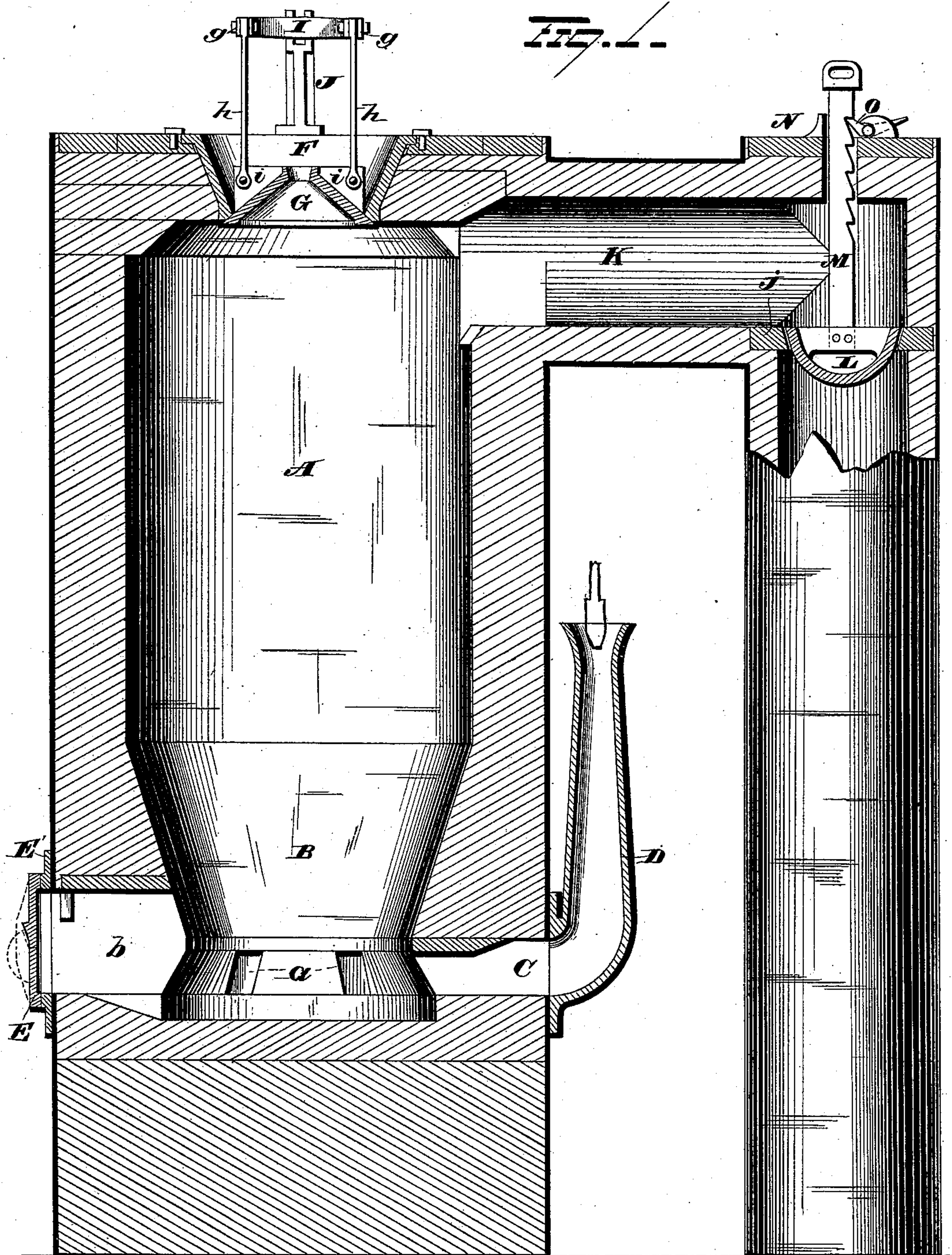
(No Model.)

2 Sheets—Sheet 1.

N. M. LANGDON.  
GAS PRODUCING FURNACE.

No. 294,796.

Patented Mar. 11, 1884.



**WITNESSES**

*Gt Nottingham.  
G. J. Downing.*

INVENTOR

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Nelson M. Langdon.  
By H. A. Symons,  
Attorney



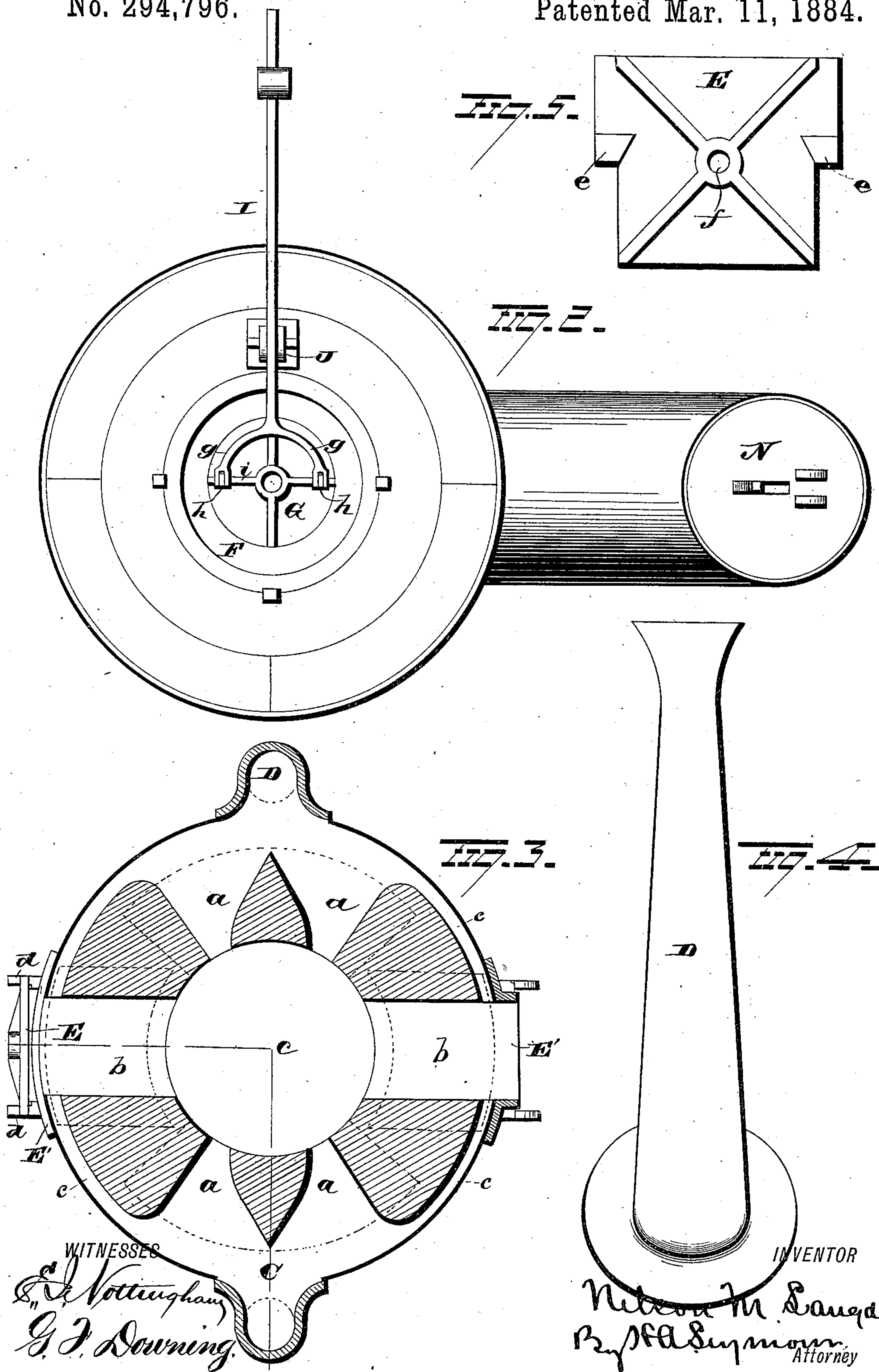
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*G. J. Nottingham*  
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INVENTOR  
*Nathan M. Langdon*  
*By H. A. Symmons*  
Attorney



# UNITED STATES PATENT OFFICE.

NELSON M. LANGDON, OF CHESTER, NEW JERSEY.

## GAS-PRODUCING FURNACE.

SPECIFICATION forming part of Letters Patent No. 294,796, dated March 11, 1884.

Application filed May 28, 1883. (No model.)

*To all whom it may concern:*

Be it known that I, NELSON M. LANGDON, of Chester, in the State of New Jersey, have invented certain new and useful Improvements in Gas-Producing 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.

My invention relates to an improvement in gas-producing furnaces; and it consists in the parts and combinations of parts, as will be more fully described, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a view in vertical section, the right half of the figure being taken through the gas-exit flue, injector, and tuyere, and the left half through the door-passage. Fig. 2 is a plan view. Fig. 3 is a horizontal sectional view, showing the arrangement of the doors, tuyeres, and injectors. Fig. 4 is a detached view of one of the injectors, and Fig. 5 is a view in front elevation of one of the doors.

A represents an upright shaft-furnace, preferably cylindrical in shape, having a bosh, B, formed by the inclined or sloping walls thereof.

Immediately below the bosh, and in direct communication therewith, are the doors and combined steam and air passages, while the gas-exit passage is connected to the furnace near the top thereof.

The small tuyeres or passage-ways *a*, situated immediately under and in communication with the bosh B, are bifurcated at their inner ends, forming two distinct flues, which, together with the door-passages *b*, terminate in the central chamber, C, while the outer ends of the tuyeres *a* are in direct communication with the injectors D, through which blasts of commingled steam and air are forced in the usual manner.

Small passages or flues *c* connect the injectors and door-passages *b*, and a portion of the blast of commingled steam and air, entering the door-passage *b* through the flues *c*, prevents the door E from getting too hot and warping.

The doors E, to facilitate cleaning, are placed opposite each other, so that a continuous passage-way is formed through the furnace.

The door-frames E' are firmly secured in the furnace, and each is provided on opposite sides

with the outwardly-extending arms *d*, which latter support the doors. Each arm is provided on its upper face with a wedge-shaped groove or recess, into which correspondingly-shaped lugs *e*, formed integral on opposite side edges of the door, rest. Thus it will be seen that when the door, which is removable, is rested on the side arms of the door-frame the weight thereof causes it to move down the wedge-shaped recesses in the side arms of the said frame and fit snugly against the door-frame, the contact-surfaces between the door-frame and door being planed, so as to form practically an air-tight joint. Each door is provided centrally with a female screw-threaded recess, *f*, into which a piece of gas-pipe can be secured for the purpose of forming a handle by which the doors can be conveniently removed and reset when necessary.

F is a hopper situated in the top of the furnace for the purpose of introducing the fuel. This hopper is secured to the furnace in a substantial manner, and is closed by the bell G, which latter is held in place by the weighted forked lever I. This lever is fulcrumed to the standard J, and the two arms *g* thereof, which terminate over the bell G, are connected to the said bell by the links *h*, the lower ends of which latter are pivotally secured to the guide-flanges *i*. The center or apex of the bell G is provided with an opening, through which a bar may be introduced for punching or spreading out the fuel in the producer. When this opening is not in use, it can be closed by a suitable plug to prevent the escape of any gas.

The gas-exit flue K is connected to the furnace near the top thereof, and is provided with the valve ring or seat *j*, secured in the wall thereof, on which the valve rests. This valve L is connected to the lower end of the notched bar M, which latter passes upwardly through the slot in the plate N and terminates in a handle by which it is grasped. The plate N also forms a seat for the pawl O, which latter is adapted to engage the notched bar for the purpose of holding the valve in an elevated position.

To produce gas in the furnace the fuel is first ignited and the combustion maintained and gas generated by the introduction through the



tuyeres or flues by means of the steam-jet injectors of a blast of commingled steam and air. A portion of this blast passes through flues *c* into the door-passages *b*, and serves to prevent the doors *E* from becoming overheated and warped. When the furnace is first started, the valve *L* is closed until the heat attained is sufficient to decompose the steam, after which it is opened and the gas generated allowed to pass into a suitable receiving tank or reservoir.

Having fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination, with a chamber encircling the bosh, door-passages located on diametrically opposite sides of the bosh and communicating at their outer ends with said encircling chamber and at their inner ends with the combustion-chamber, and tuyeres located between said door-passages and on opposite sides of the bosh, of the steam-jet-blast injector for

introducing steam and air into the annular chamber around the bosh and from thence through the door-passages and tuyeres to the combustion-chamber, substantially as set forth. 25

2. The combination, with a gas-producing furnace provided with a chamber encircling the bosh, of the tuyeres *a a*, constructed to diminish in width from their outer to their inner ends, the door-passages *b b*, located on diametrically-opposite sides of the bosh, and the steam-jet-blast injectors *D*, substantially as set forth. 30

In testimony whereof I have signed this specification in the presence of three subscribing witnesses. 35

NELSON M. LANGDON.

Witnesses:

ISAAC HANCE,  
DAVID SWACKHAMER,  
JAS. H. NEIGHBOUR.