

G. B. FIELD.
Furnace.

No. 227,888.

Patented May 25, 1880.

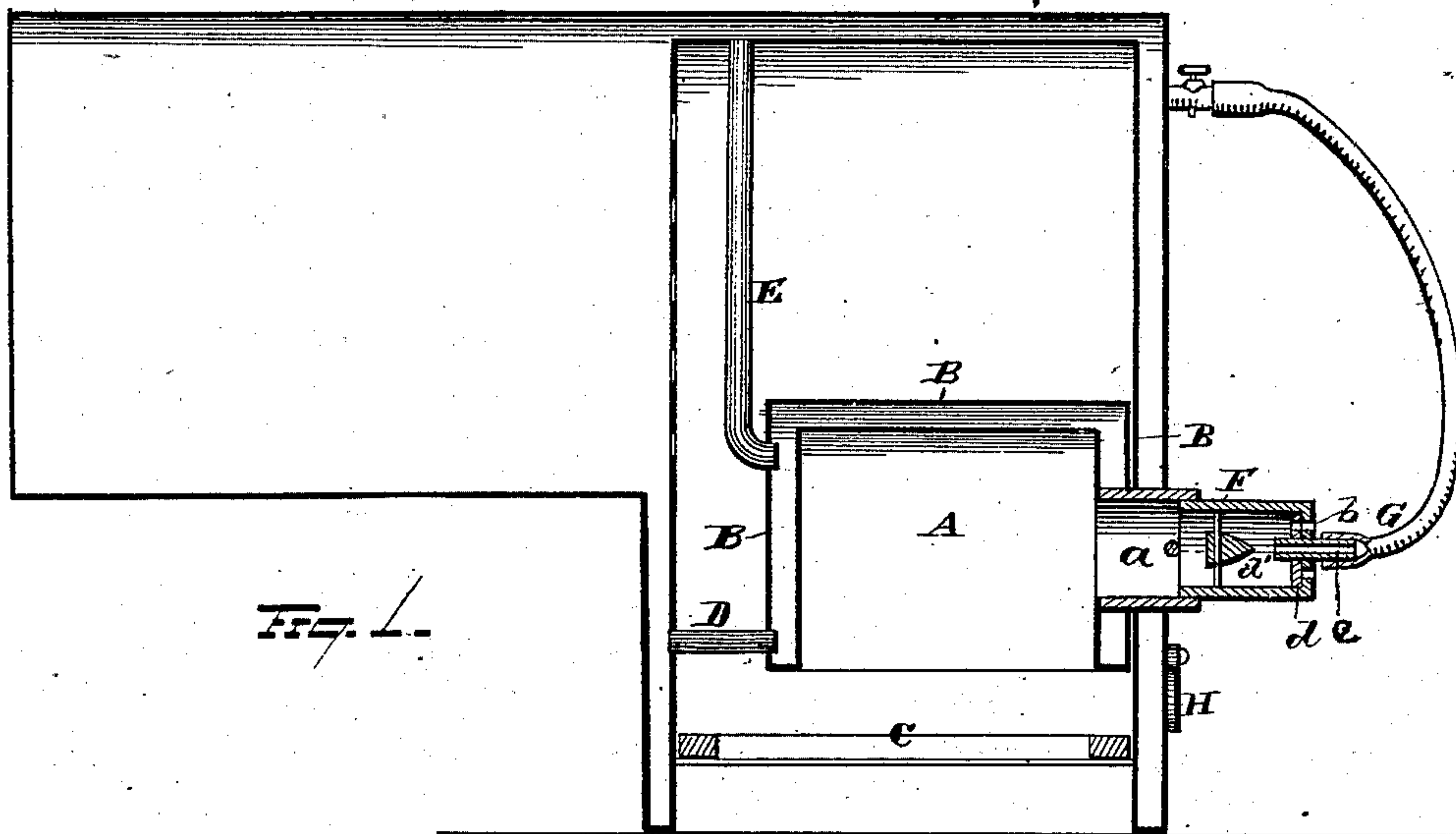


Fig. 1.

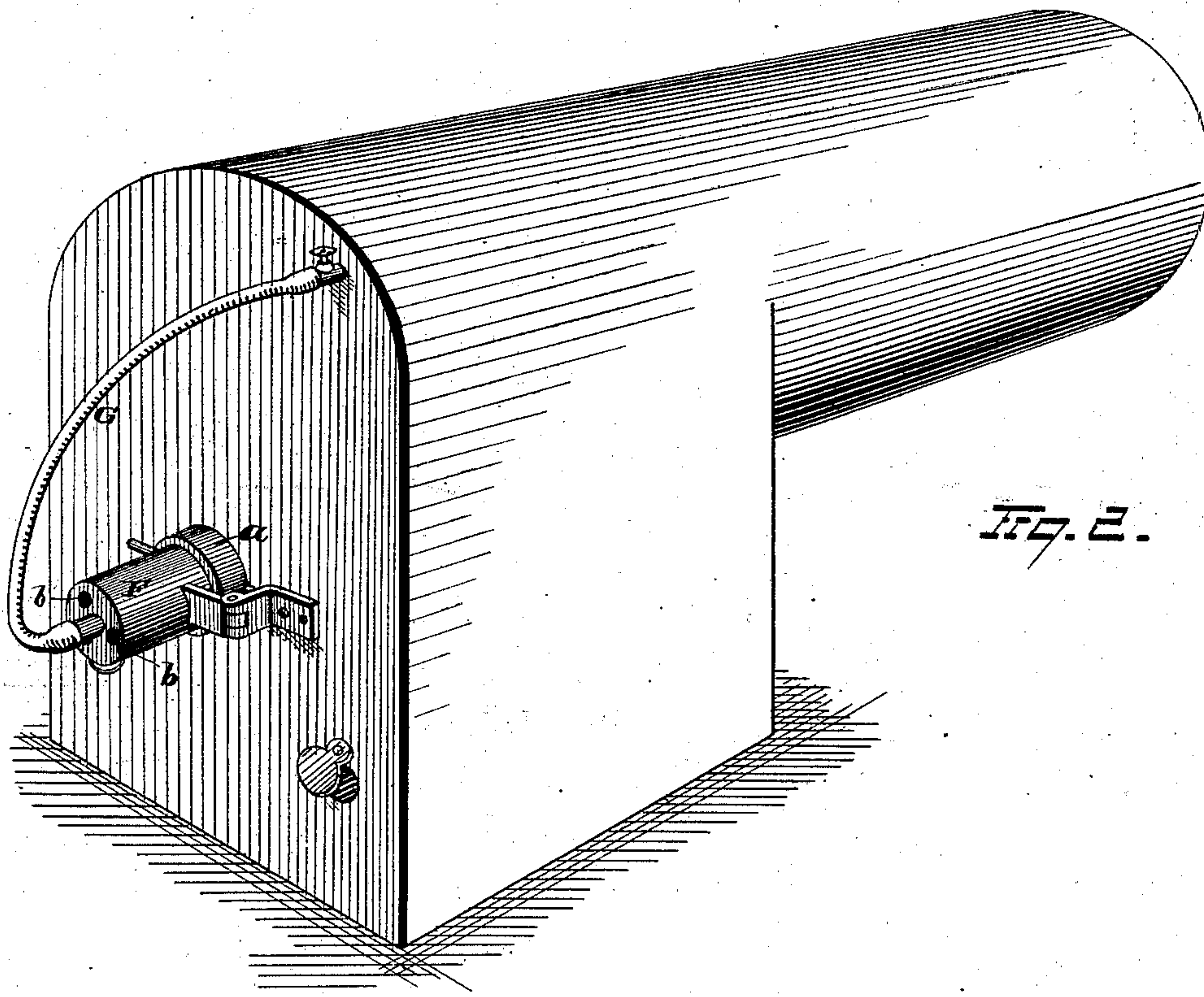


Fig. 2.

WITNESSES
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UNITED STATES PATENT OFFICE.

GEORGE B. FIELD, OF NEW YORK, N. Y.

FURNACE.

SPECIFICATION forming part of Letters Patent No. 227,888, dated May 25, 1880.

Application filed October 4, 1879.

To all whom it may concern:

Be it known that I, GEO. B. FIELD, of New York, in the county of New York and State of New York, have invented certain new and useful Improvements in 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 pertains to make and use it, reference being had to the accompanying drawings, which form part of this specification.

My invention relates to furnaces, and is designed to prevent smoke and economize fuel.

The prominent feature consists of an independent retort located within the furnace and provided with a water-jacket surrounding its top, sides, and ends. The coal is fed into this retort and is fanned by a jet of steam, which carries with it a volume of air through the feed-door. The retort is made with an open bottom, and the furnace is adapted to be filled with incandescent fuel from the grate up to the said open bottom. The volume of combined steam and air, entering the retort through the door, circulates through the whole mass of coal within the retort, mixes with the disengaged gases, and finally passes down to the bottom of the retort, where it attacks the burning coal, and intense combustion ensues, without smoke or cinders.

Referring to the drawings, Figure 1 is a longitudinal vertical sectional view. Fig. 2 is a view in front perspective. These views illustrate the invention as applied to a locomotive-boiler, merely by way of example, as it is apparent that the improvement is applicable to all furnaces.

The retort A is preferably made of iron, but may be of any suitable material. It is located within the furnace independently of the latter, and can be separately repaired or replaced, as may be necessary. It is provided with a water-jacket, B, surrounding its top, sides, and ends. Its bottom is open, and is placed at a suitable height above the furnace-grate C.

A feed-water pipe, D, communicates with the lower portion of the water-jacket at the rear end of the retort, and a water and steam exit pipe, E, communicates with the upper portion of said rear water-jacket. Both pipes

are thus subjected to the heating action of the products of combustion as the latter pass rearward into the flues.

The retort-nozzle *a* projects through the water-jacket at the forward end of the retort, and is provided with a swinging door, F. A steam-conduit, G, connects with this door, and is made flexible or otherwise adapted to adjust itself to the swinging movement of the door. It may take steam at any suitable point, and the steam may be either live or exhaust.

The door is provided with a series of air-draft passages, *b*, surrounding the steam-jet *c*, and a rotary plate, *d*, governs the quantity of air admitted therethrough.

A conical deflector, *d'*, is located longitudinally within the cylindrical door, its apex being in horizontal line with the steam-jet. Its office is to diffuse the jet of steam and produce a strong current of air.

The two front doors, H, located below and respectively on opposite sides of the retort-nozzle, are for the purpose of poking the fire and like operations.

It is apparent that different mechanical changes may be introduced in accomplishing the principles of construction and operation set forth in the foregoing, and I desire to be understood as including all mechanical modifications of the invention covered in the following claims.

In this connection I might observe that a blower or other device for producing an air-draft may be employed in lieu of or together with the steam-jet.

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

1. In a furnace, the combination, with an interior retort having its forward end provided with a water-jacket and a retort-nozzle projecting therethrough, of a door provided with an air-draft device and a steam-conduit connected with the door, substantially as set forth.

2. In a furnace, the combination, with an interior retort and a door provided with an air-draft device, of a steam-conduit connected with the door and a deflector located within the latter to diffuse the steam-jet and produce a strong air-draft, substantially as set forth.

3. In a furnace, the combination, with an interior retort, of a swinging retort-door provided with a conical deflector and a flexible steam-conduit connected with the door, the
5 latter being further provided with a series of air-draft passages surrounding the steam-jet and a rotary plate governing the draft, substantially as set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 30th day of 10 September, 1879.

GEORGE B. FIELD.

Witnesses:

T. P. HALL,
FRANK O. McCLEARY.