2 Sheets—Sheet 1.

J. M. SMITH.

Hot-Blast Oven.

No. 198,820. Patented Jan. 1, 1878.

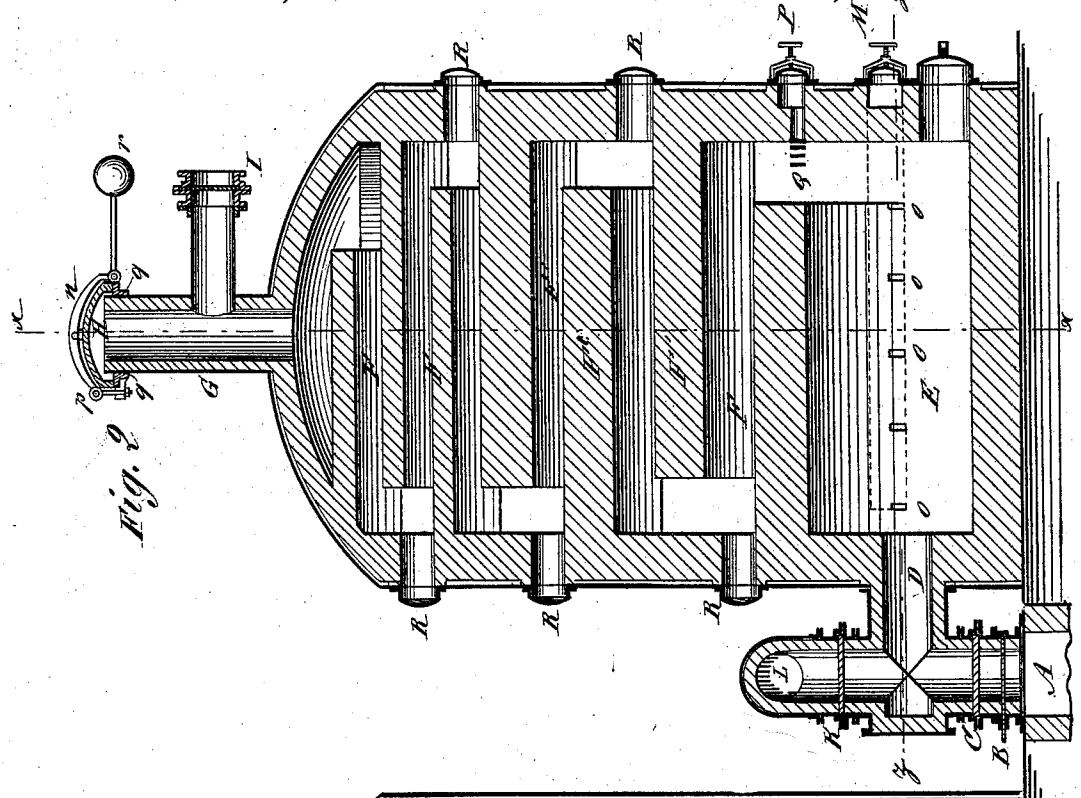

Fig. 2

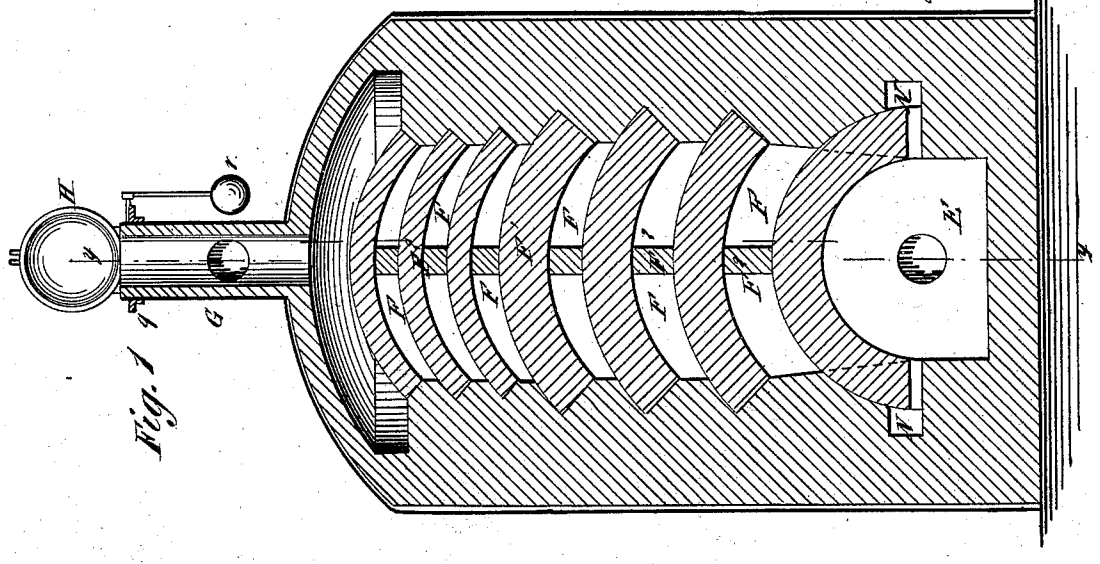

Fig. 1

WITNESSES:

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INVENTOR:

J. M. Smith.

BY

ATTORNEYS.

2 Sheets—Sheet 2.

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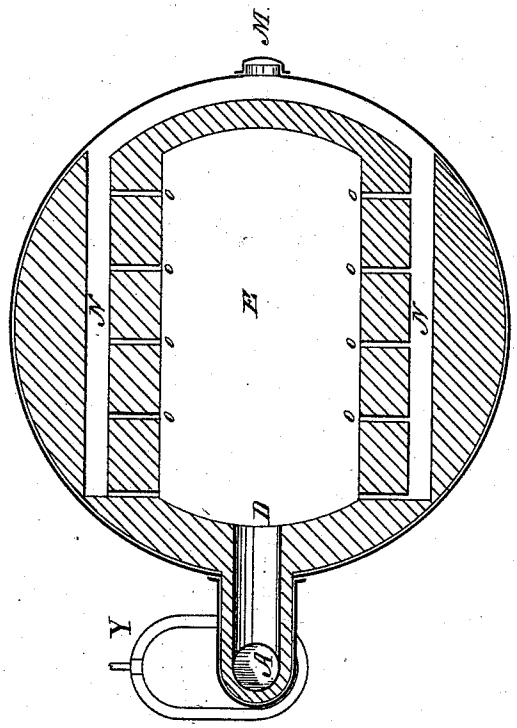
Fig. 3.



WITNESSES:

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UNITED STATES PATENT OFFICE.

JESSE M. SMITH, OF NEWARK, OHIO.

IMPROVEMENT IN HOT-BLAST OVENS.

Specification forming part of Letters Patent No. **198,820**, dated January 1, 1878; application filed June 11, 1877.

To all whom it may concern:

Be it known that I, JESSE M. SMITH, of Newark, in the county of Licking and State of Ohio, have invented a new and useful Improvement in Hot-Blast Ovens for Metallurgic and other Furnaces, of which the following is a specification:

This invention relates to ovens which are designed for heating air or gas for the purpose of supplying blast-furnaces, Bessemer converters, heating and other furnaces; and the nature of my invention consists in a novel construction of oven, whereby the operation of heating is conducted with great facility and at a comparatively small cost, as will be understood from the following description.

In the annexed drawings, Figure 1 is a diametrical section through the oven, taken in the plane indicated by dotted line *x x* on Fig. 2. Fig. 2 is a diametrical section taken in the plane indicated by dotted line *y y* in Fig. 1; and Fig. 3, Sheet 2, is a horizontal section taken through the oven in the plane indicated by dotted line *z z* in Fig. 2.

Similar letters of reference indicate corresponding parts.

The oven is heated by gas, which may be obtained from the waste gases of the blast-furnace, or from the distillation of coal, wood, and various kinds of oils.

The gas is conducted into the oven through the flue A, which is provided with a slide-damper, B, and a slide-valve, C. Passing through short flue D, the gas enters the combustion-chamber E, where it meets with the air necessary for the combustion. The air enters the combustion-chamber through an opening provided with a valve, M, and through the flues N and small openings O. The said valve serves to regulate the amount of air entering in a given time. A second supply of air is furnished by an air-inlet, having a regulating-valve, P, and through openings C, which communicate with said air-inlet, and are located on a higher level than the flues N.

The flame and products of combustion pass from the combustion-chamber through a series of flues, F, formed by fire-brick arches F^1, which are supported along their lengthwise middle by division-walls F^2, and are arranged one above the other, with an opening at the end of each arch, to allow the flame to pass to the next flue above. Arriving, by this zig-zag course, at the top of the oven, the products of combustion pass out through a chimney, G, a valve or cap, H, which is used to cover the chimney, being open.

The gas is allowed to burn in the oven until the mass of brick-work is heated to a red heat. The gas-valve C, and also the chimney-valve H, are then closed. Valve I is now opened, which allows the cold air which is to be heated to enter the oven at its upper end. This air is conducted through the same passages F through which the flame had been conducted, and, arriving in the combustion-chamber E, passes out through the opening D, and through the hot-blast valve K into the hot-blast main L, thence to the furnace.

In practice I shall use the ovens in groups of two or more, so that while air is being heated in one group the others are being heated by the burning gas. The ovens will be changed from air to gas as often as may be required to raise the proper temperature. The oftener they are changed the higher the temperature of the air will be.

The brick-work is inclosed in a wrought-iron shell, circular in form, and constructed with a hemispherical crown or dome.

In case the flues F become obstructed by dust they may cleaned through the doors R by means of steam or air jets or a scraper.

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

1. The hot-blast oven, circular in form, with dome-shaped top, in combination with horizontal walls, or arches and cross-walls, substantially as and for the purposes specified.

2. The oven constructed to form the chamber E, the flues N, and the holes O, as shown and described, for the purpose specified.

3. The combination of the air-inlet and its valve P, the openings Q, communicating with said air-inlet, the chamber E, and flue F, all as shown and described.

JESSE MERRICK SMITH.

Witnesses:
JAS. H. SMITH,
LUTHER J. JOHNSON.