

J. NICHOLSON, Jr.
Reverberating-Furnaces.

No. 158,862.

Patented Jan. 19, 1875.

FIG. 1.

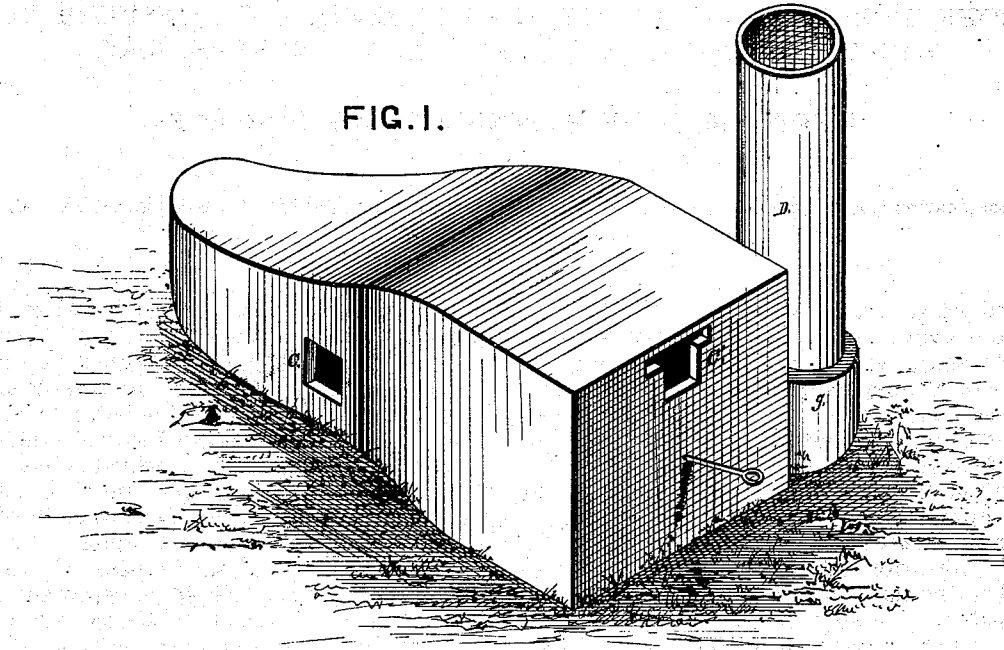


FIG. 2.

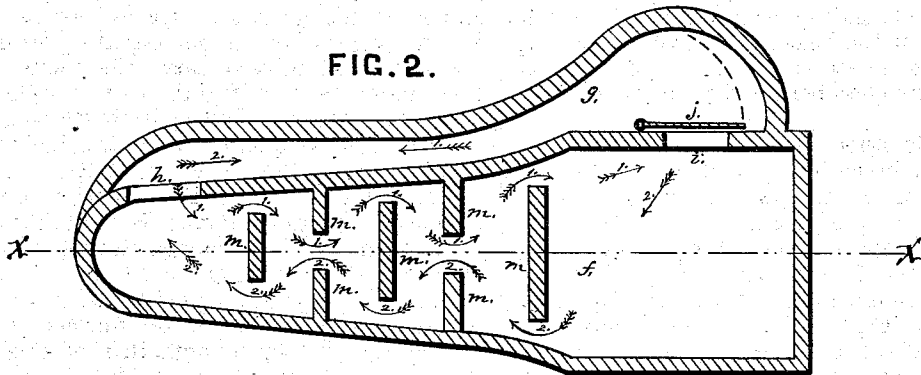
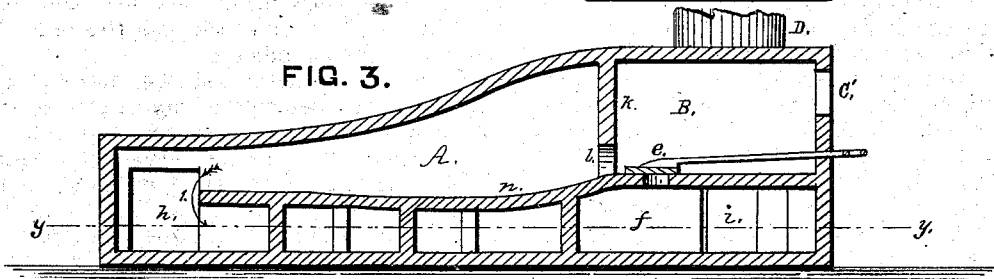


FIG. 3.



Witnesses:
Wm. W. S. Dyre.
Geo. D. Patten

Inventor:
John Nicholson Jr.
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UNITED STATES PATENT OFFICE.

JOHN NICHOLSON, JR., OF PITTSBURG, PENNSYLVANIA, ASSIGNOR TO
RAGOT DE MONTHUREUX GAS COMPANY, OF SAME PLACE.

IMPROVEMENT IN REVERBERATING FURNACES.

Specification forming part of Letters Patent No. 158,862, dated January 19, 1875; application filed
March 24, 1874.

To all whom it may concern:

Be it known that I, JOHN NICHOLSON, JR., of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a certain new and useful Improvement in Reverberating Furnaces; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings and to the letters of reference marked thereon.

My invention relates to a heating-furnace used in the manufacture of iron and steel; and consists in placing a heating-chamber under the bottom of the working-chamber of such furnace, said heating-chamber being so constructed that the heat shall travel in a zigzag course from either the front or rear end of said working-chamber, at the will of the operator.

To enable others skilled in the art to make and use my invention, I will proceed to describe its construction and operation.

In the accompanying drawings, which form part of my specification, Figure 1 is a perspective view of the furnace. Fig. 2 is a horizontal and longitudinal section of the same at line *y* of Fig. 3. Fig. 3 is a vertical and longitudinal section at line *x* of Fig. 2.

In the accompanying drawings, A represents the working-chamber of the furnace, and is provided with a door, C, both of which are of the ordinary construction for heating or puddling furnaces. B is a combustion-chamber, where the gas used for heating the furnace is heated and mixed with the desired quantity of air. K is a partition-wall between the working-chamber A and the gas combustion-chamber B. At or near the bottom of the partition-wall K is an opening, *l*, at or near which point, through the medium of suitable apertures, may be admitted the desired quantity of cold or heated air. In the bottom of the combustion-chamber is an opening covered by a valve, *e*. The gas-generator, which may be of any known construction, communicates with the combustion-chamber through the

opening C'. The opening *h* at the front end of the furnace communicates with the working-chamber A and the heating-chamber *f* and flue *g*, which communicates with the stack D. The heating-chamber *f* for the bottom *n* of the working-chamber is provided with an opening, *i*, furnished with a valve, *j*, which is used for the purpose of carrying back under the bottom *n* the heat after it has performed its office in the working-chamber A. When it is desirable for the waste heat to pass off direct, the valves *e* and *j* are closed, as represented in Figs. 2 and 3. The piers or abutments *m* are for the purpose of causing the heat to travel under the bottom *n* in a zigzag course, and for the purpose of supporting the bottom *n*. When it is desirable to carry the waste heat back under the bottom *n* the valve *j* is opened so as to close the flue *g*, in which case the waste heat travels back under the bottom *n*, as indicated by the arrows marked 1.

If it is desirable to heat the bottom *n* from the gas combustion-chamber B, then the valve *e* is opened, in which the heat travels as indicated by the arrows marked 2.

The advantage of my improvement consists in heating the bottom *n* of the furnace, which is desirable in the manufacture of steel. I also more perfectly utilize the heat and complete the combustion of the gas through the medium of the chamber B.

Having thus described the nature, construction, and operation of my improvement, what I claim as of my invention is—

A heating or melting furnace, provided with a heating-chamber, having alternate ridges *m*, thereby causing the heat to travel in a zigzag course from either the front or rear end of the working-chamber at the will of the operator, substantially as herein described, and for the purpose set forth.

JOHN NICHOLSON, JR.

Witnesses:

JAMES J. JOHNSTON,
WM. W. S. DYRE.