H. McDONALD.

REVERBERATING FURNACES.

No. 182,527. Patented Sept. 26, 1876.

fig. 1.

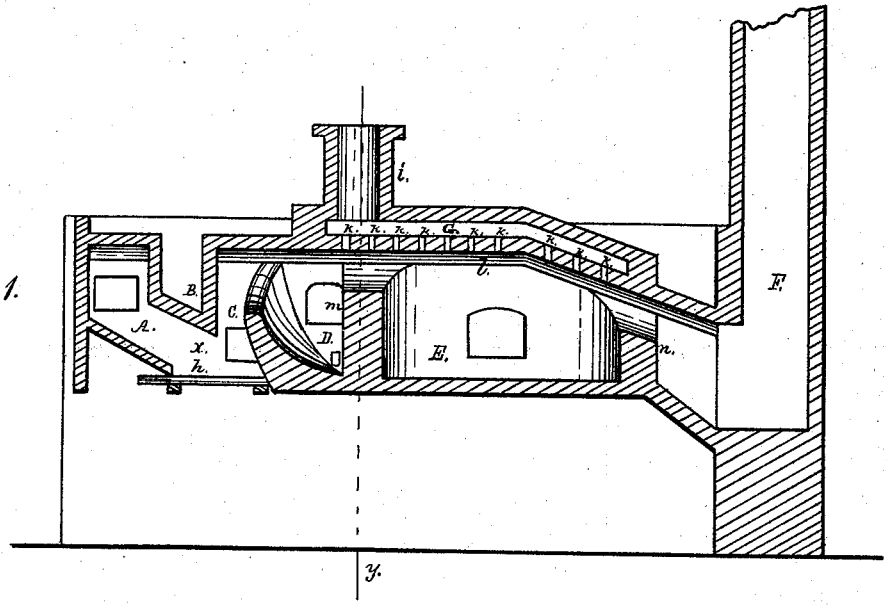
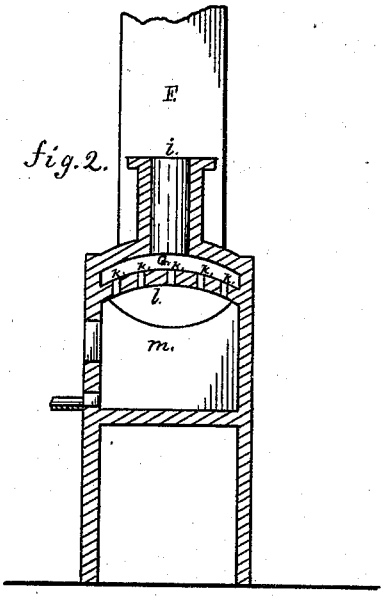


fig. 2.



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UNITED STATES PATENT OFFICE.

HUGH McDONALD, OF ALLEGHENY, PENNSYLVANIA.

IMPROVEMENT IN REVERBERATING-FURNACES.

Specification forming part of Letters Patent No. **182,527**, dated September 26, 1876; application filed November 13, 1875.

To all whom it may concern:

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

My invention relates to an improvement in metallurgic furnaces; and it consists in providing the furnace with a puddling and heating chamber adjoining each other, and in placing over the crown of the furnace an air-chamber, or chambers, which communicates with the interior of the furnace through the medium of perforations in the crown.

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

In the accompanying drawings, which from part of my specification, Figure 1 is a vertical and longitudinal section of my improvement in furnaces. Fig. 2 is a transverse section of the same at line *y* of Fig. 1.

In the drawings, A represents the fuel-chamber of the furnace, which is separated from the fire-chamber C through the medium of a partition-wall, B, and communicates with the fire-chamber by an opening between the lower edge of the partition and the grate *h*. D represents a melting-chamber; E, puddling-chamber; F, the stack; G, the air-chamber, placed over the crown of the furnace, which is provided with a pipe, *i*, for conveying air into the chamber G. The crown *l* of the furnace is furnished with a series of openings, for the purpose of allowing the air which enters the chamber G to pass from it in jets into the interior of the furnace.

The operation of my improved furnace is as follows: Coal is placed in the chamber A, where it is subjected to a sweating process, from which it is drawn in the desired quantities through the openings *x* onto the grate. The heat, flame, and smoke passing over the bridge-wall *m*, the air in jets passing from the chamber G through the openings *k*, commingles with the said heat, flame, and smoke, thereby causing complete combustion, resulting in an intense heat, which heat, through the medium of said jets, is forced toward the bottom of the several chambers. The chamber G may be connected with a hot-blast or hot-air device of any of the known kinds, and may also be used with cold-blast, or by the induction of hot or cold air into said chamber by the draft of the stack. The chamber G and perforations *k* in the crown *l* of the furnace may be applied to any of the known furnaces used in the manufacture of iron and steel. The charge of metal is placed in the chamber E, where it is melted and puddled, or partially puddled, from which chamber it is removed by suitable tools over the division-bridge *n* into the chamber D, where the puddled or partially-puddled iron is remelted, from which it is run off into ingot-molds. The furnace hereinbefore described is designed for the manufacture of puddled steel.

Having thus described my improvement, what I claim as of my invention, is—

In a metallurgic furnace, the ordinary puddling-chamber E and remelting-chamber D, in combination with the air-chamber G and perforated crown *l*, substantially as described, and for the purpose set forth.

HUGH McDONALD.

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