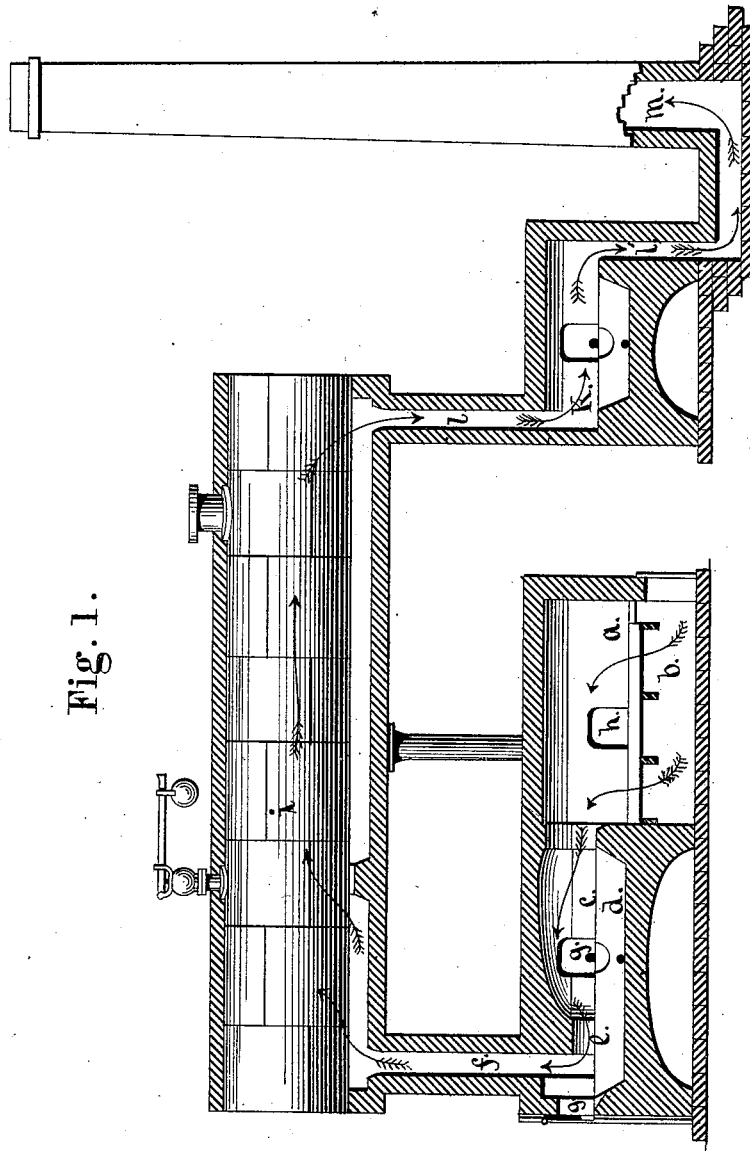


I. BEANLAND.
Puddling-Furnace.

No. 215,863.

Patented May 27, 1879.

Fig. 1.



WITNESSES:

Charles L. Ladd

William L. Cook

INVENTOR:

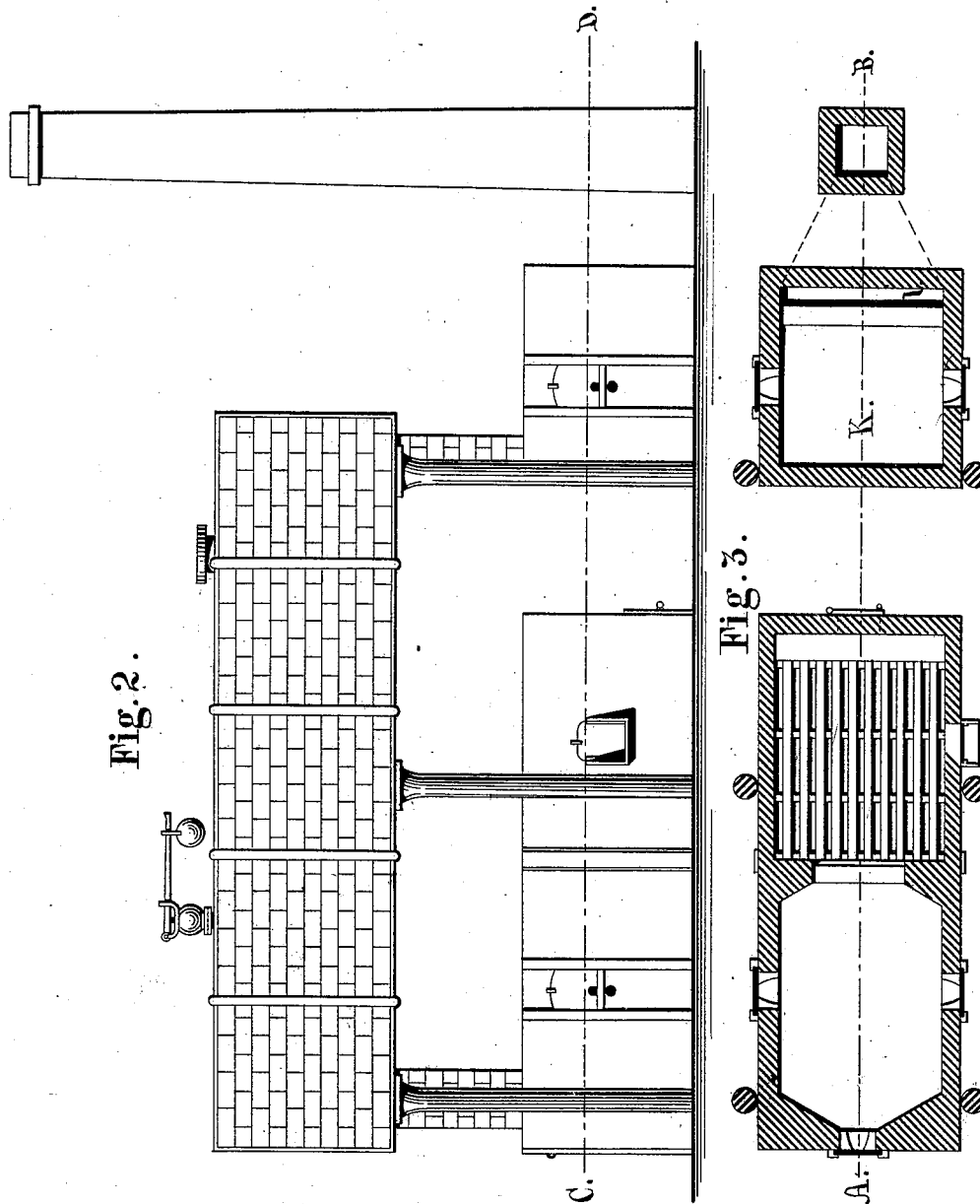
Isaac Beanland

by Joseph A. Miller

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WITNESSES:

Chas E Lader
William L. Roper

INVENTOR:

Isaac Beanland
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UNITED STATES PATENT OFFICE.

ISAAC BEANLAND, OF FALL RIVER, MASSACHUSETTS.

IMPROVEMENT IN PUDDLING-FURNACES.

Specification forming part of Letters Patent No. **215,863**, dated May 27, 1879; application filed February 4, 1879.

To all whom it may concern:

Be it known that I, ISAAC BEANLAND, of the city of Fall River, county of Bristol, and State of Massachusetts, have invented a new and useful Improvement in Puddling-Furnaces; and I hereby declare that the following is a full, clear, and exact description of the same, which will enable others skilled in the art to make and use the same.

Figure 1 is a sectional view through the line A B, Fig. 3, showing the construction of the puddling-furnace and its connection with the steam-generator, the reheating-furnace, and the chimney. Fig. 2 is a side view of the puddling-furnace and the accessories connected with the same. Fig. 3 is a ground plan or horizontal section through the line C D, Fig. 2.

Puddling-furnaces as heretofore constructed could be worked from the two sides only, as the throat and neck leading to the stack were located at one end and the fire-chamber at the other end.

The object of this invention is, first, to arrange the furnace so that it may be worked from three sides; and, second, so to arrange the furnace in relation to the steam-generator and chimney that the heat can be more thoroughly utilized; and it consists in placing the throat over the hearth near the end, so that the flue carrying off the products of combustion rises beyond the throat upward to the bailer, and a work-hole may be placed on the end, so that the furnace can be worked from three sides.

It further consists in the arrangement, with the puddling-furnace, steam-generator, and chimney, of a reheating-furnace, arranged to use up the waste heat before it reaches the chimney, all of which will be more fully set forth hereinafter, and pointed out in claim.

In the drawings, A is the fire-chamber; b, the ash-pit; C, the iron or reverberatory chamber; d, the hearth; e, the throat; f, the uptake; gg, the working-holes; h, the stock-hole; i, the steam-generator; K, the reheating-furnace; l, the drop-flue to the reheating-furnace K; and m is the down-draft flue to the chimney.

By placing the throat some distance from the end of the hearth the uptake f is brought

over the end of the puddling-furnace, and the heat and the air carried with the products of combustion are compelled to pass near the hearth and closer to the molten metal.

By this arrangement a working-hole at the end of the furnace is made possible, and the working at this end exposes the fluid metal much more thoroughly to the air and products of combustion than the working at the side holes, owing to the location of the throat, and the consequent path of the products of combustion and the accompanying oxygen, by which the iron is much more rapidly decarbonized.

The uptake f carries the products of combustion under the steam-generator i, and thence down to the reheating-chamber; but, instead of passing to the chimney in the usual manner, the heat is retained in the reverberatory chamber k of the reheating-furnace, and this is facilitated by the construction of the down-draft flue l, which is of the width of the reheating-furnace, and diminishes gradually in area to the chimney, so that the flow of heat through the reheating-furnace is slow, and the heat is retained a longer time than at any portion of the flues, and to a large extent is used up before entering the chimney.

The construction of the puddling-furnace is better, as all parts can now be secured by stay-bolts and braces, and cheaper, as it requires less material to construct the same. It is more efficient, for the reasons hereinbefore stated, and more economical in fuel, as all available heat is used up in the reheating-furnace.

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

The combination of the puddling-furnace a and d, constructed as described, rising flue f, steam-generator i, drop flue l, reheating-furnace K, and down-draft flue m, connected with the chimney, substantially as and for the purpose described.

ISAAC ^{his} × BEANLAND.
mark.

Witnesses:

JOSEPH A. MILLER,
D. B. POTTER.