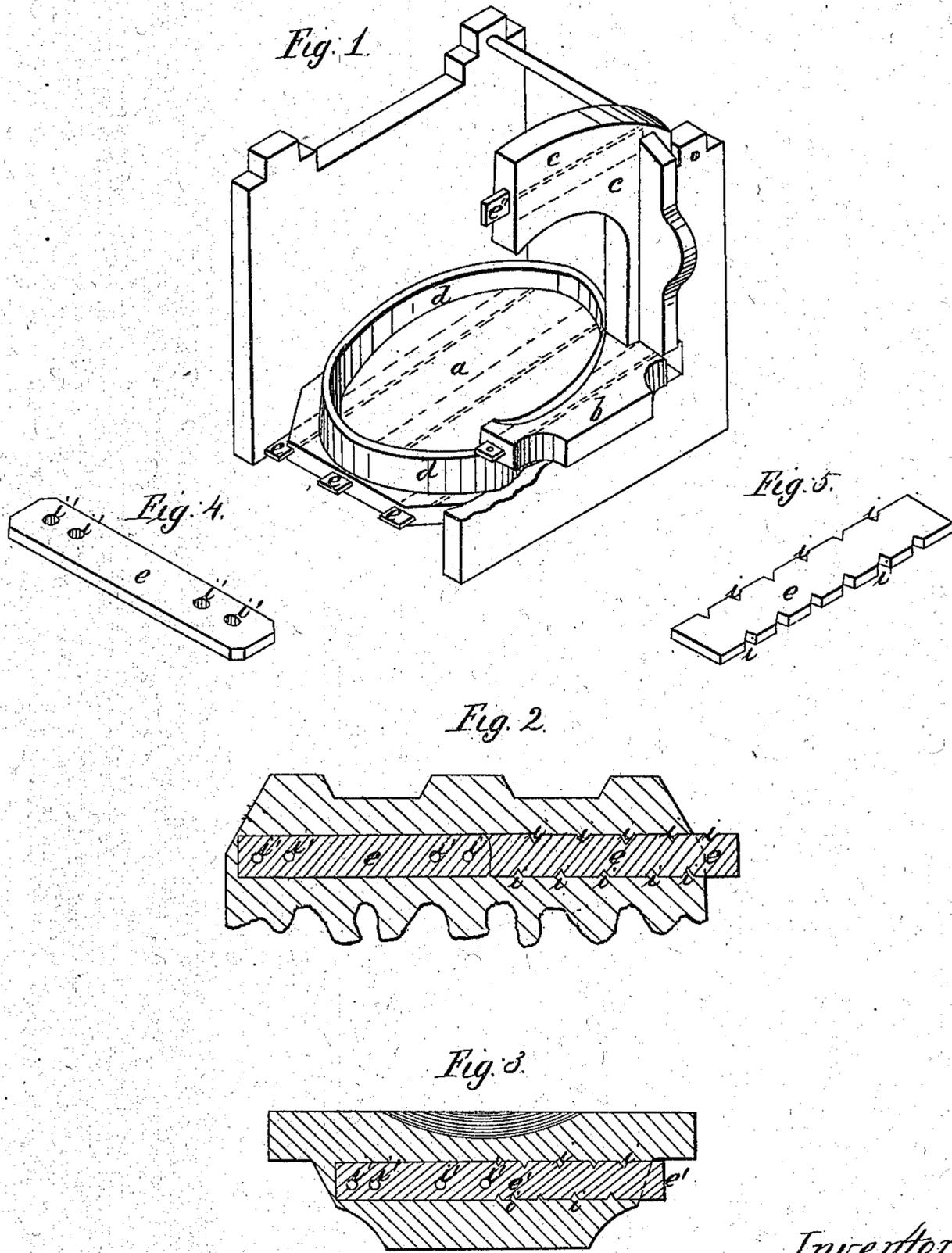


H. McDONALD.
 PUDDLING OR OTHER FURNACE.

No. 87,578.

Patented Mar. 9, 1869.



Witnesses;
 R. Wrenshall
 Thos. B. Kern

Inventor;
 Hugh McDonald,
 by Bakewell & Christy
 his Attys.

United States Patent Office.

HUGH McDONALD, OF PITTSBURG, PENNSYLVANIA, ASSIGNOR TO HIMSELF AND WILLIAM STUART, OF SAME PLACE.

Letters Patent No. 87,578, dated March 9, 1869.

IMPROVEMENT IN PUDDLING AND OTHER FURNACES.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, HUGH McDONALD, of the city of Pittsburg, in the county of Allegheny, and State of Pennsylvania, have invented a new and useful Improvement in Puddling-Furnaces; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawing, making a part of this specification, in which—

Figure 1 is a perspective view of a puddling-furnace, partly in section, illustrative of my improvement;

Figure 2 is a horizontal section of a portion of the bottom plate;

Figure 3 is a horizontal section of the fore plate; and

Figures 5 and 6 are perspective views of the wrought-iron bars, grooved, notched, corrugated, or perforated, on or around which I cast the bottom plate, fore plate, and door-frame of the puddling-furnace.

Like letters of reference indicate like parts in each.

The nature of my invention consist in casting the parts of a puddling or boiling-furnace most subject to the intense heat, on or around one or more wrought-iron bars, placed in the moulds in which such parts are to be cast, such wrought-iron bars being first notched, grooved, serrated, corrugated, or perforated, so that the fluid cast-metal shall run into and fill up such notches, grooves, or perforations. Then, when, under the effect of the intense heat required in puddling and boiling-furnaces, the bottom plate, or other part so made, breaks or cracks, the wrought-iron bar or bars will hold the broken pieces in close contiguity, so that they may continue to be used.

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

a is the bottom plate of a puddling or boiling-furnace.

b is the fore plate.

c, the door-frame.

d, the chills or boshes.

After being used for a time, longer or shorter, the bottom plate *a*, fore plate *b*, and door-frame *c*, all crack or break crossways, or in a plane at right angles to the front of the furnace. The parts so broken or cracked are thus seriously injured, if not rendered useless. To

overcome this difficulty, I cast each of the parts named on or around one or more wrought-iron bars *e e'*.

These bars are notched, or serrated in their edges, as shown at *i*, or have grooves running across the indentations in their faces, or are corrugated, or are perforated at intervals, as at *z*, or the notches, perforations, &c., may be combined in the same bar.

These bars, in any desirable number, and of a suitable length, are set in the moulds in which the plates *a* or *b*, or frame *c*, as the case may be, are to be cast, and are so placed that the metal, when poured into the moulds, shall run in on all sides of the bars, and also so that the bar, or bars, in the finished casting, shall extend lengthways of the part in which it or they are cast, as shown in fig. 1, or, in other words, at right angles to the most frequent line of breakage. Then, when either the bottom plate *a*, or fore plate *b*, or frame *c* breaks or cracks, the pieces will be held together by the cast-metal in the notches, grooves, corrugations, or perforations of the wrought-iron bar or bars.

Thus the pieces will be prevented from slipping apart even when the cast-metal of the part is broken entirely in two; and the wrought-iron bar or bars, not being affected by heat in the same way, will not crack or break. The durability of the furnace is thus greatly increased, with little or no increased cost.

Steel bars may take the place of the iron bars for the purposes described.

What I claim as my invention, and desire to secure by Letters Patent, is—

The mode hereinbefore described, of making the several parts of a puddling or boiling-furnace, by casting such part or parts on or around one or more notched, grooved, serrated, or corrugated bars, iron or steel, substantially as described.

In testimony whereof, I, the said HUGH McDONALD, have hereunto set my hand.

HUGH McDONALD.

Witnesses:

A. S. NICHOLSON,
G. H. CHRISTY.