

S. M. WICKERSHAM.

Refining Iron and Steel in Runways.

No. 133,690.

Patented Dec. 3, 1872.

Fig. 1.

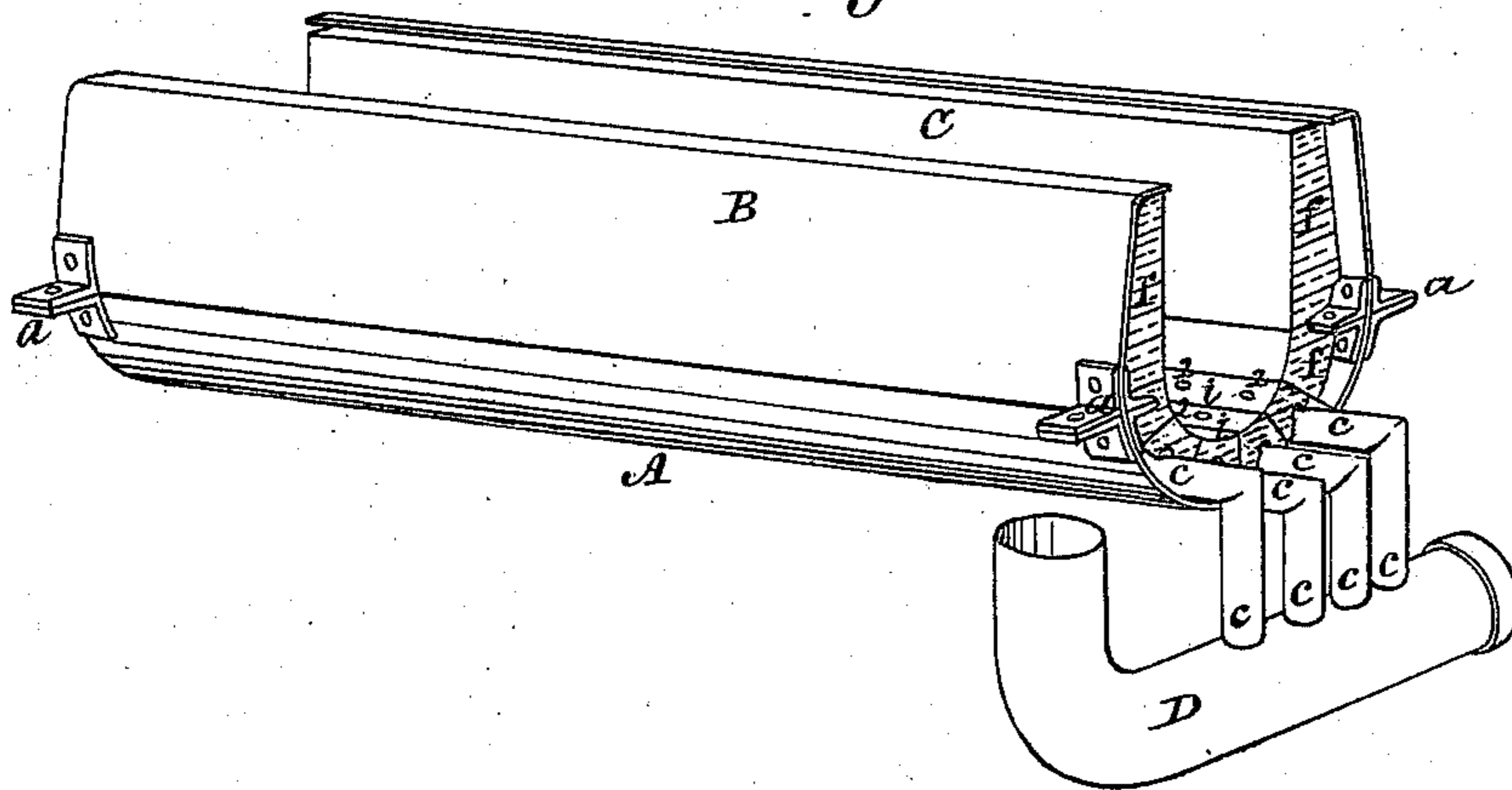


Fig. 2.

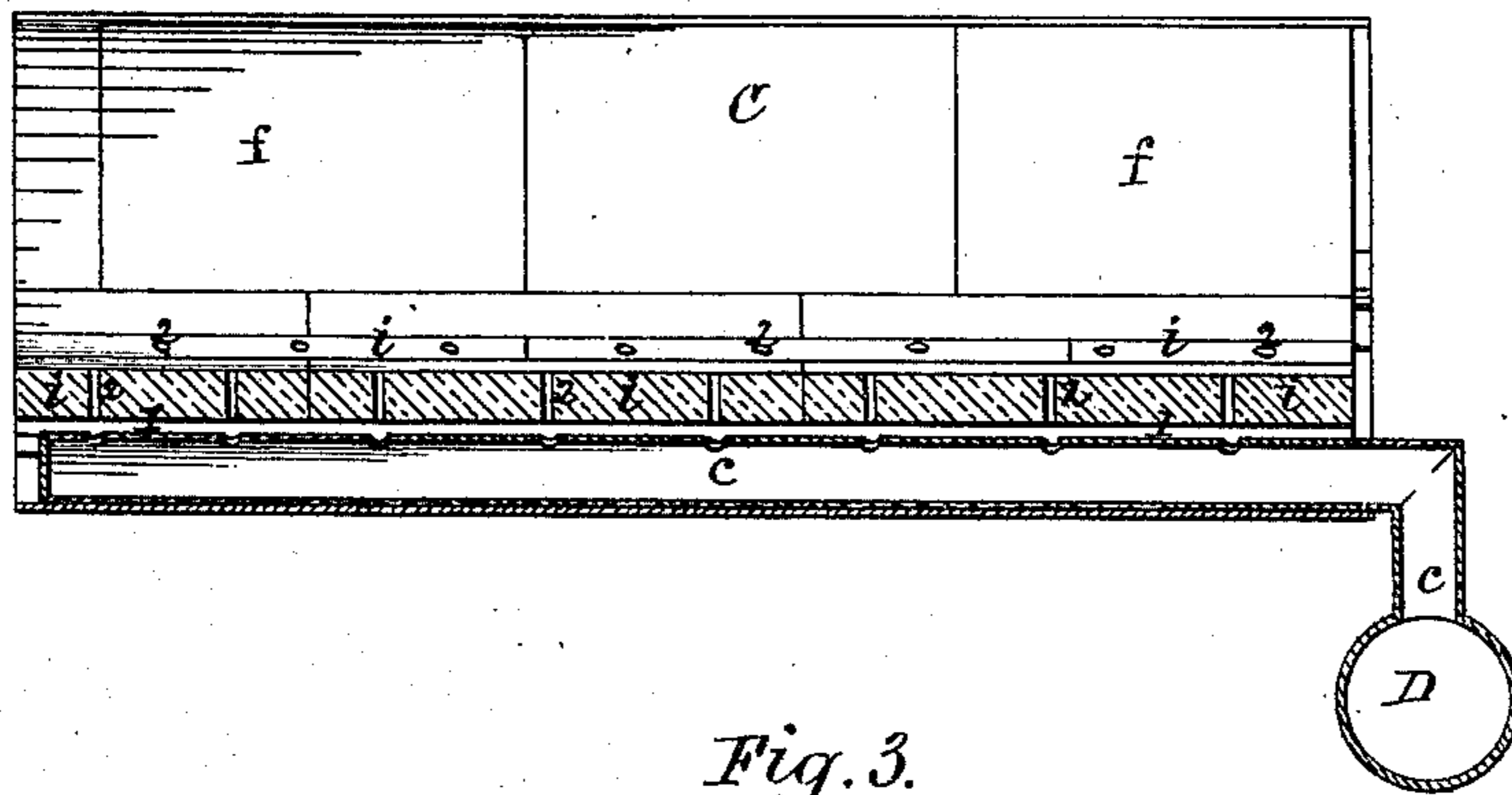
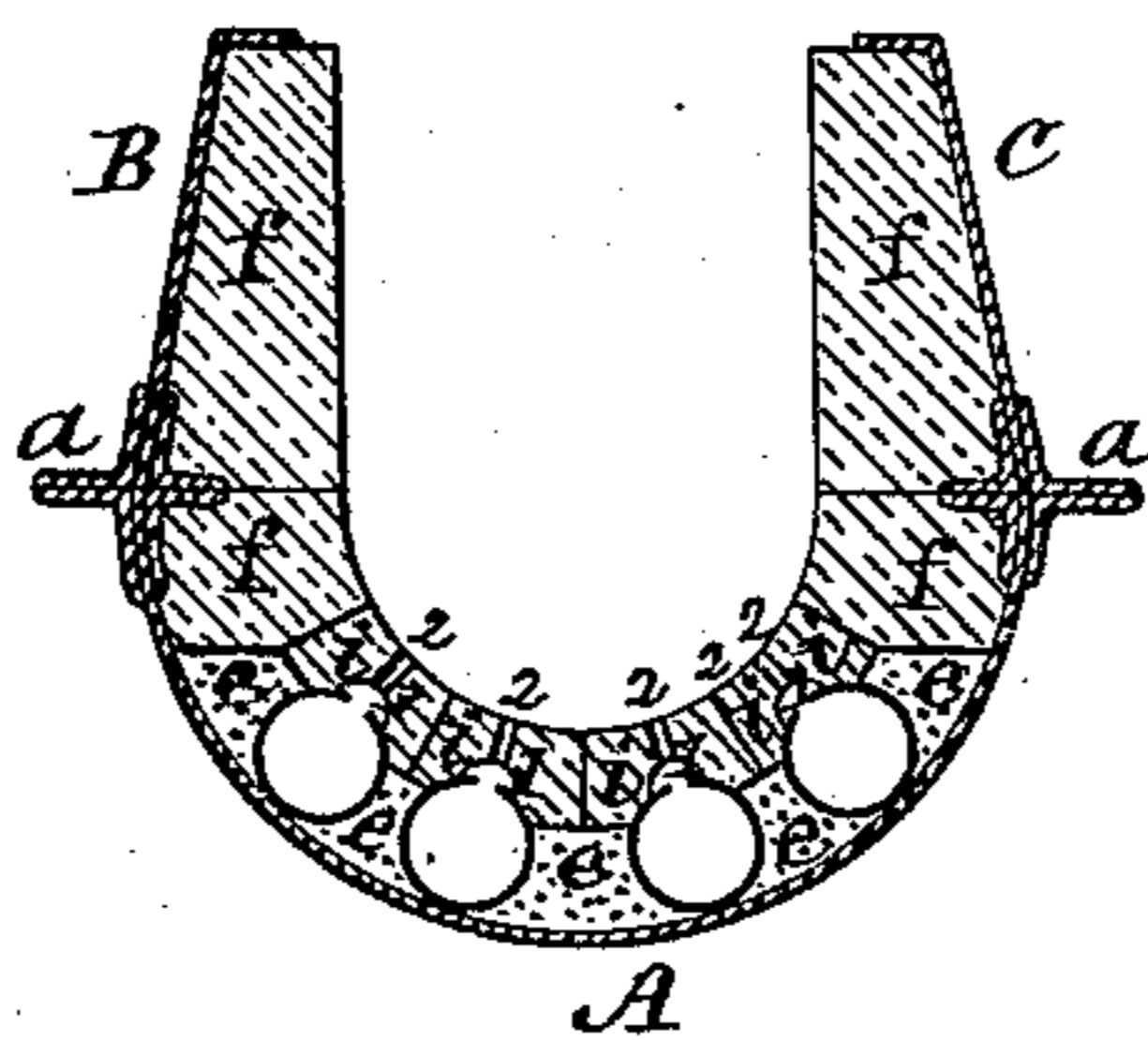


Fig. 3.



Witnesses.

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UNITED STATES PATENT OFFICE.

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IMPROVEMENT IN REFINING IRON AND STEEL IN "RUN-WAYS."

Specification forming part of Letters Patent No. 133,690, dated December 3, 1872.

To all whom it may concern:

Be it known that I, SAMUEL M. WICKERSHAM, of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Run-Ways for Making or Refining Iron; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawing making a part of this specification, in which—

Figure 1 represents in perspective the run-way, with the connected pipes for supplying air to the molten metal flowing through it; Fig. 2 represents a longitudinal vertical section through the run-way and pipes or passages; and Fig. 3 represents a vertical transverse section through the same.

Similar letters of reference where they occur in the separate figures, denote like parts in the drawing.

The nature of my invention consists, first, in combining with a run-way for conveying molten iron a series of perforated pipes, for the purpose of securing an equal distribution of air or gas to and throughout the run-way. It further consists in using in a run-way a tile or tiles, with an air-chamber along that side which bears or rests upon the pipes, so that the expansion of the pipes, if it occur, could not carry their air-openings past the corresponding openings in the tile, and so shut off the blast of air or gas. It further consists in a run-way having an outer casing, in which a series of perforated air-pipes are embedded in any suitable heat-resisting material to resist the heat of the molten iron, and withstand the violent ebullition of the metal when subjected to the blast. It further consists in a run-way having a series of tiles of suitable heat-resisting material, perforated for the passage of a blast of air or gas, and supported on a series of pipes for conveying the air or gas thereto. It further consists in a run-way the casing and lining of which are made in separate sections, so that the side or sides may be removed for repairing the under portion thereof.

To enable others skilled in the art to make and use my invention, I will proceed to describe the same with reference to the drawing, first premising that the run-way as a whole is designed for refining pig-iron as it flows from a blast-furnace, or when remelted in a cupola or other furnace and flowed therefrom.

For the purpose of repairs I make the run-way in three sections, A B C, of which the under section A is of a trough-shaped form, and the side sections B C connected therewith so as to be capable of being detached or removed for repairing the under section. The outer casing of the run-way I prefer to make of wrought-iron; but it may be made of other material, and angle-irons or lugs *a a* may be made thereon for the purpose of bolting or otherwise attaching the sections together. In the interior of the under section A there is arranged any suitable number of perforated pipes, *c*, which are embedded in and protected by any heat-resisting material, *e*, as seen in Fig. 3, but so as not to cover or interfere with the small air or gas openings in the upper portions of said pipes. Over the perforated pipes *c* and the material in which they are set is a series of tuyere-tiles, *i*, made of any of the well-known fire or heat resisting material, which tile may be made to rest one on each pipe, or to extend over and rest upon two or more pipes, as may be preferred; and along their under sides, or that portion thereof which is over the line of openings in the pipes, there is a recess, as seen at 1, which forms a continuous chamber into which the air or gas from the pipe-openings passes, and from whence it flows through the small openings 2 through the tile, and mingles with the molten iron flowing through the run-way.

In case iron pipes are used they are liable to expand by the heat, and simple matched openings through them and through the tiles would be shut off, closed, or obstructed. The channel or chamber 1 avoids all such contingency. The series of pipes *a* communicate with a main pipe, D, from and through which the supply or blast is furnished. The sides B C of the run-way on their interior, as well as a portion of the under section A, are lined, as at *f*, with heat-resisting material, as seen in the drawing. The pipes *c* instead of being perforated with small holes may be slotted on top, so as to make a continuous air-opening, and the tiles with the tuyere-openings only may rest against the pipes, in which case the slot answers the same purpose as the air-chamber in the tiles.

Having thus described my invention, what I claim is—

1. In run-ways for purifying or refining iron

as it flows from a blast, cupola, or other furnace, a series of perforated pipes for equally distributing the blast of air or gas through the molten metal, as and for the purpose described.

2. In combination with the perforated pipes, a series of tiles having a channel or chamber, 1, over the series of small holes in the pipes, so that any expansion of the pipes may not obstruct any of the air or gas passages, as described and represented.

3. In a run-way for refining iron, the combination of an outer casing with a series of perforated air-pipes, *c*, embedded and protected therein by the heat-resisting material *e*, as and for the purpose described.

4. In a run-way for refining iron, a series of perforated tiles, in combination and supported upon a series of perforated air or gas conducting pipes, as and for the purpose described and represented.

5. A run-way composed of sections so united as that the side or sides with their linings may be detached from the under section, as and for the purpose described and represented.

S. M. WICKERSHAM.

Witnesses:

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