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JAMES L. HAMILTON & H. McDONALD.

Improvement in Metallurgic Furnaces.

No. 122,380.

Patented Jan. 2, 1872.

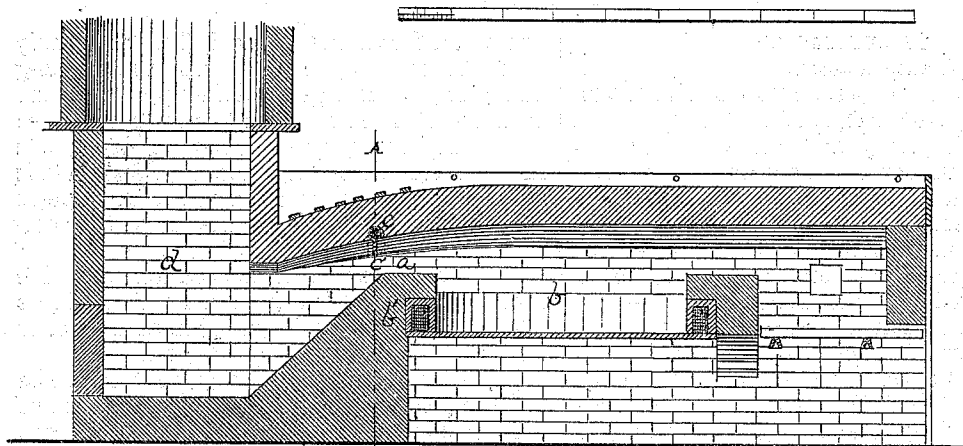


Fig. 1.

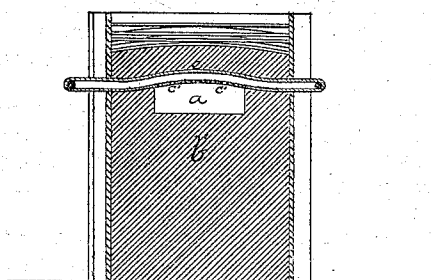


Fig. 2.

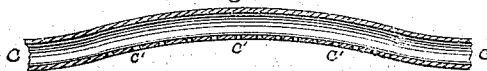


Fig. 3.

WITNESSES { James I. Kay
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INVENTORS

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UNITED STATES PATENT OFFICE.

JAMES L. HAMILTON AND HUGH McDONALD, OF PITTSBURG, PA.

IMPROVEMENT IN METALLURGIC FURNACES.

Specification forming part of Letters Patent No. 122,380, dated January 2, 1872.

SPECIFICATION.

To all whom it may concern:

Be it known that we, JAMES L. HAMILTON and HUGH McDONALD, of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Metallurgic Furnaces; and we do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawing forming part of this specification, in which—

Figure 1 is a vertical longitudinal section of a reverberatory-furnace fitted with a steam-jet pipe in the top of the neck directly back of the flue-bridge. Fig. 2 is a sectional view through A B, Fig. 1; and Fig. 3 is an enlarged longitudinal view of the steam-pipe.

Like letters of reference indicate like parts in each.

In reverberatory-furnaces of the usual construction the waste heat of the furnace acts with such intensity on the neck as to cut away the lining with great rapidity, and requires frequent renewal. Various devices have been resorted to to prevent this destructive action, such as water-necks, a box of open water in the inside bottom of the neck, and also a jet or spray of water thrown into the neck.

Our present improvement differs from that last named in the employment of a jet or jets of steam in the neck for the same, as well as for other useful purposes.

To enable others skilled in the art to make and use our improvement, we will proceed to describe the same.

The furnace shown in Fig. 1 may represent any of the known forms of puddling, heating, or boiling-furnaces in which the waste heat, smoke, gases of combustion, &c., are conducted from a heating or working-chamber, *b*, by a neck, *a*, of any known form, to a stack chimney or escape-flue, *d*. In the neck *a*, just above the flue-bridge *b'*, or at any suitable point be-

tween that and the stack *d*, (but preferably near the opening leading from the working chamber,) we arrange a steam-pipe, *c*, with one or more jet-holes *c'* opening into the neck so as to play into the neck when the furnace is in operation one or more jets of steam. This steam-pipe *c* may be arranged in any one or more of the four walls of the neck, top, bottom or sides.

The steam may be discharged from the pipe *c* at the open end or from a nose or nozzle placed thereon, or from jet-holes, as shown, or from a slot or slots in the side of the pipe.

The effect of the steam we have found to be to lessen materially the destructive action of the escaping heat, gases of combustion, &c., on the inside of the neck of the furnace, and also greatly to increase the reverberatory action of the furnace, especially when the steam is introduced, as we prefer to introduce it immediately over or just back of the flue-bridge.

We have been able to effect a saving of twenty per centum or more of the coal required as compared with the amount ordinarily used.

We claim our improvement as applied to boiling, puddling, and heating-furnaces generally, without limiting ourselves to any particular mode or place of introducing steam to the neck.

What we claim as our invention, and desire to secure by Letters Patent, is—

The introduction of a jet or jets of steam into the neck of a furnace, for the purposes set forth.

In testimony whereof we, the said JAMES L. HAMILTON and HUGH McDONALD have hereunto set our hands.

JAMES L. HAMILTON.
HUGH McDONALD.

Witnesses:

A. S. NICHOLSON,
JAMES J. KAY.

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