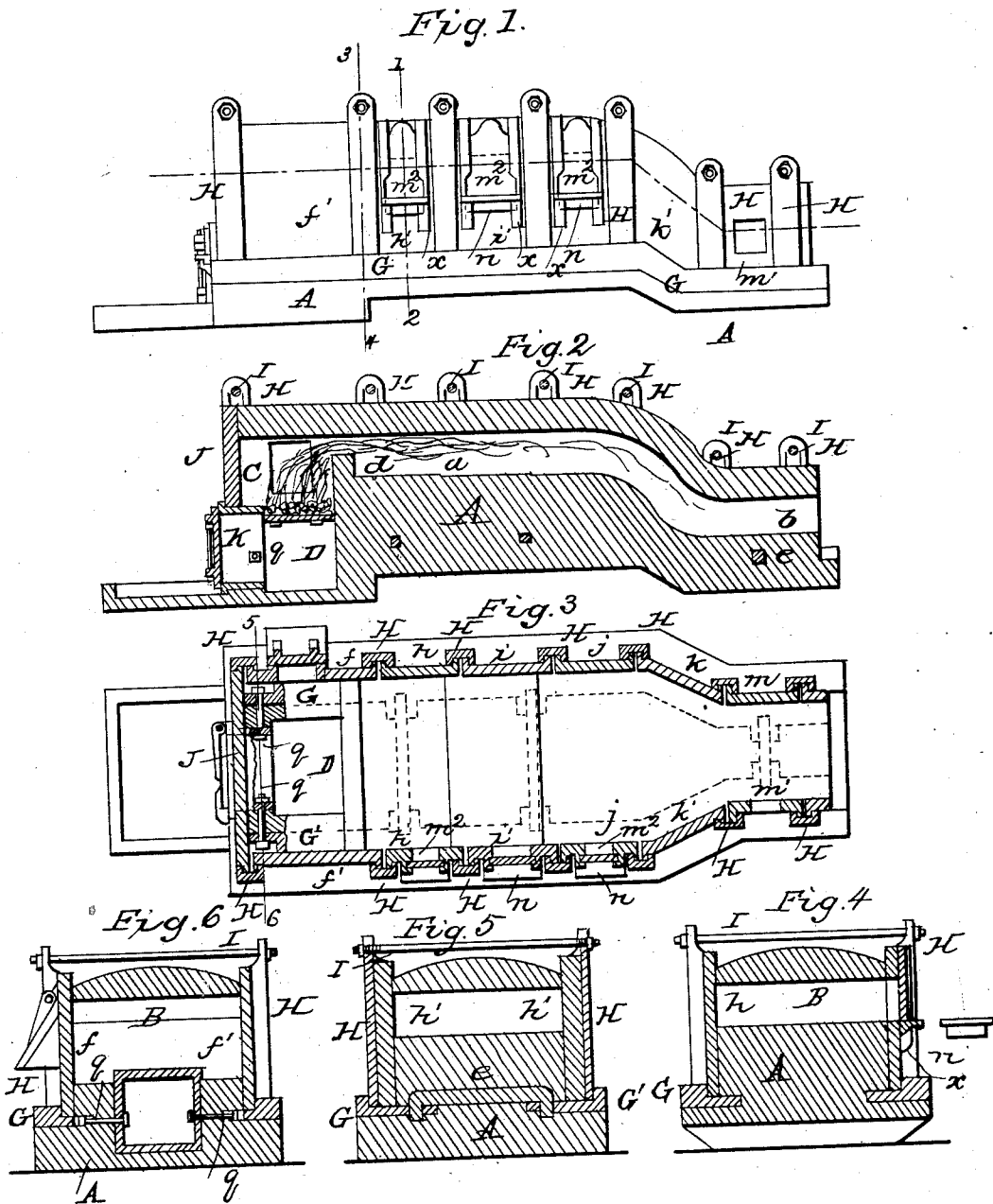


R. R. TAYLOR.

Metal Furnace.

No. 28,214.

Patented May 8, 1860.



WITNESSES
 Henry Hanson
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INVENTOR
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ROBERT R. TAYLOR, OF READING, PENNSYLVANIA, ASSIGNOR TO BORDENTOWN MACHINE COMPANY, OF NEW JERSEY.

IMPROVEMENT IN FURNACES.

Specification forming part of Letters Patent No. 28,214, dated May 8, 1860.

To all whom it may concern:

Be it known that I, ROBERT R. TAYLOR, of Reading, Berks county, Pennsylvania, have invented certain new and useful Improvements in the Construction of Furnaces; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

My invention, which relates to the construction of puddling and other like furnaces, consists, first, in certain foundation-plates with retaining-ribs, certain side plates with vertical ribs, and bars with vertical recesses, the whole being arranged, adapted to each other, and applied to the brick-work of the furnace substantially as described hereinafter, so that any one of the side plates may be removed without disturbing the others or the brick-work, and so that the said side plates may be free to expand independently of each other; secondly, in certain detachable plates adapted to the openings for receiving the doors of the furnace in the manner described hereinafter, so that they may be readily removed and replaced without disturbing the side plates; thirdly, in a box carrying the ash-pit door and connected to the foundation-plates by bolts, the whole being arranged as set forth hereinafter, for the purpose of maintaining the brick-work in front of the furnace entire.

In order to enable others skilled in the art to make and use my invention, I will now proceed to describe its construction and operation.

On reference to the accompanying drawings, which form a part of this specification, Figure 1 is a side view of my improved furnace; Fig. 2, a longitudinal section; Fig. 3, a sectional plan; Fig. 4, a transverse section on the line 1 2, Fig. 1; Fig. 5, the same on the line 3 4; and Fig. 6, the same on the lines 5 6, Fig. 3.

Similar letters refer to similar parts throughout the several views.

A represents the foundation of the furnace, B the roof, *a* the bed, *b* the flue leading to the chimney, *d* the bridge, C the fire-place, and D the ash-pit, all of which are similar in form and arrangement to those of ordinary puddling-furnaces. In the foundation are built the two cast-iron plates G and G', which are connected together in front in the peculiar manner described hereinafter, and which may be

connected at intermediate points by tie-rods *e e*, or any other suitable attachments. On the opposite side of the furnace are the plates *f* and *f'*, *h* and *h'*, *j* and *j'*, *k* and *k'*, and *m* and *m'*, the lower ends of which rest against and are confined to the side walls of the furnace by a rib on the foundation-plates G and G', as seen in Figs. 4, 5, and 6. The edges of these side plates are furnished with projecting ribs, which fit into the vertical bars H—one of the ribs of each adjacent plate into the recess of one of the said vertical bars—as best observed on reference to Fig. 3. The lower ends of each bar fit snugly into a recess formed in the foundation-plate, and the upper end of the opposite bars are connected together by the bolts I. The end plate, J, is connected to the opposite side plates, *f* and *f'*, by vertical bars H, in a manner similar to that by which the side plates are connected together by the same style of bars.

It is well known that the plates which hold together the walls of puddling and other furnaces are apt to break by constant expansion and contraction, and that the substitution of new plates for the broken ones is a source of constant expense and delay, as the ordinary method of securing the plates by bolts passing through their lower ends, as well as through the brick-work, involves the necessity of much fitting and adjusting, as well as the demolishing of the brick-work to a greater or less extent when a new plate is substituted for an injured one. It will be readily seen that these difficulties are obviated by the above-described improvement, for should any one of the side plates be broken, all that is required is to loosen the vertical bars H which hold that plate, raise the bars from their sockets in the foundation-plate, and after removing the broken side plate replacing it with a whole one, and finally restoring the vertical bars and tightening their bolts, all this being accomplished without any injury to the brick-work, and without displacing the remaining plates. Moreover, the distance intervening between the edges of the adjacent plates, and the recesses of the bars being sufficiently large, the said bars offer no impediment to the free and independent expansion of each plate longitudinally, the plates being equally free to expand vertically.

Each of the plates *h' i' j'* has an opening fur-

nished with the usual sliding door, *m*, and a plate, *n*, which is level with the bed of the frame, and over which the masses of metal are drawn from the interior. These plates in ordinary furnaces form a part of the side plates, and are the first to crack and become useless, thereby involving the necessity of removing the entire plate.

It will be seen, on reference to Fig. 1, that each side plate which has an opening and door is furnished with lugs *x x*, which are inclined (at the top) downward toward the side plate, as seen in Fig. 4. Each plate *n*, which is a separate casting, has an inclined rib on the under side adapted to the inclination on the top of the lugs *x*, so that each plate can be removed, when broken or otherwise deteriorated, and replaced with a new one without the necessity of destroying the entire side plate to which it is connected.

In all puddling-furnaces the brick-work at the front end is the first to become displaced, hence the importance of a proper retention of the plates at this point.

It will be seen, on reference to Figs. 2 and 6, that the ash-pit door is hung to a box, *K*, built into the brick-work, independent of the end plate, and that this box is connected by bolts *q q* to the foundation-plates *G* and *G'*, so that there is no possibility of any outward

movement of the said plates taking place. The brick-work in front of the furnace is thus securely confined, and the end plate, *J*, and box *K* are allowed a free and independent expansion and contraction.

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

1. The foundation-plates *G* and *G'* with their retaining-ribs, the side plates of the furnace with the vertical ribs, and the bars *H* with their vertical recesses, the whole being arranged and adapted to each other and applied to the brick-work of a furnace substantially as and for the purpose set forth.

2. The detachable plates *n*, adapted to the lugs *x x* on the side plates, and arranged in respect to the openings on the same in the manner and for the purpose specified.

3. The box *K*, carrying the ash-pit door, and connected to the foundation-plates *G* and *G'* by bolts *q q*, the whole being arranged as set forth, for the purpose specified.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

R. R. TAYLOR.

Witnesses:

HENRY HOWSON,
CHARLES D. FREEMAN.