W. HOYLAND.

Reverberatory Furnaces.

No. 138,564. Patented May 6, 1873.

Fig. 1.

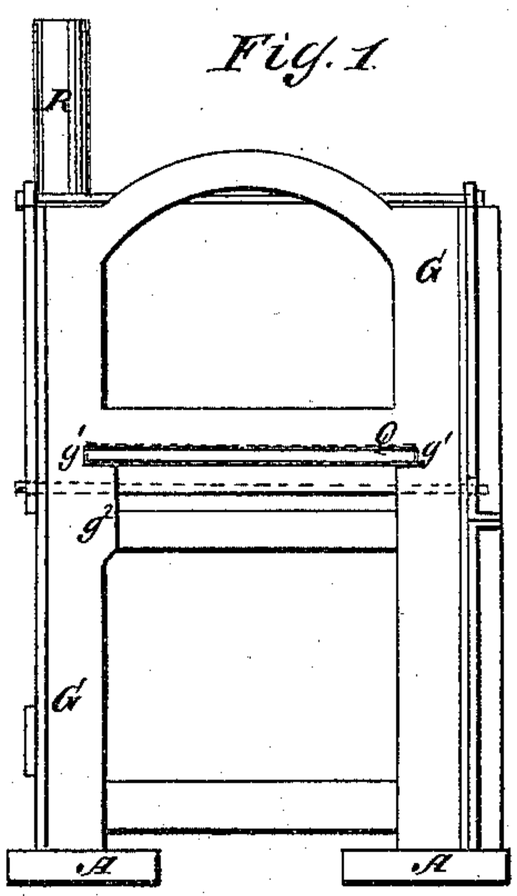


Fig. 2.

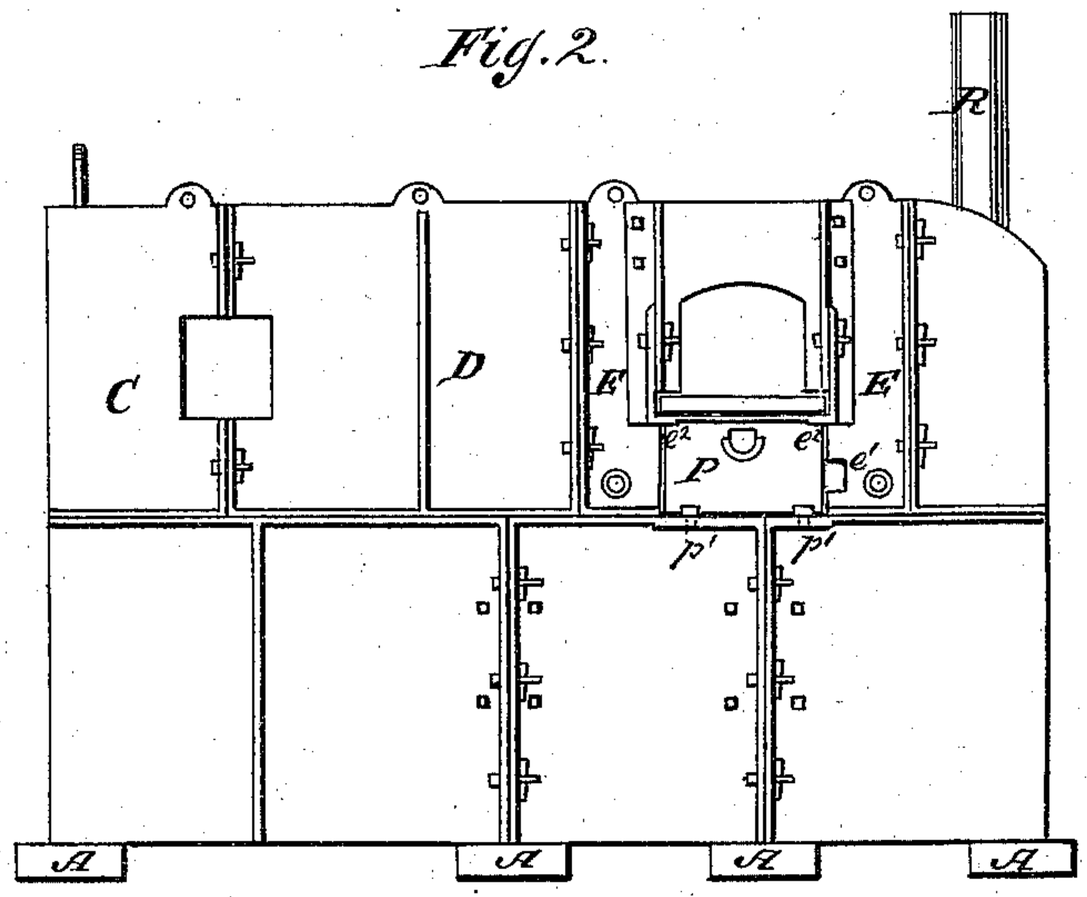


Fig. 3.

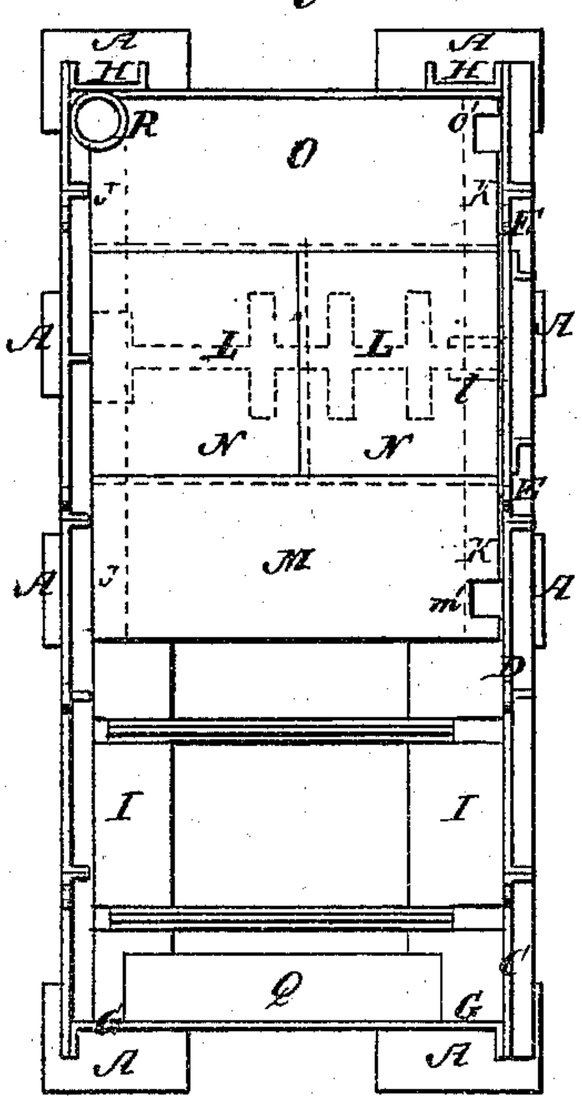
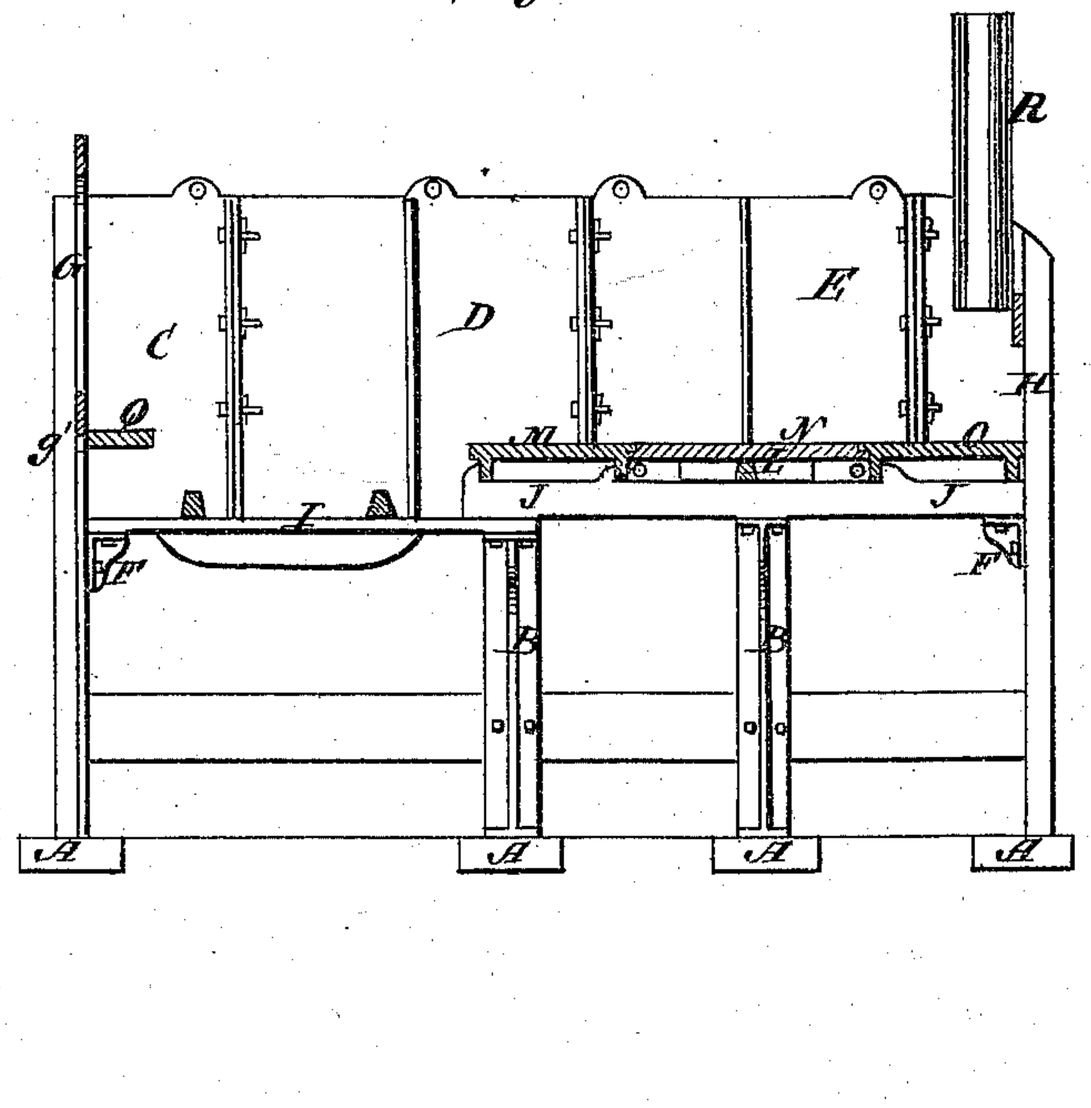


Fig. 4.



Witnesses:

E. Wolff.

A. Sedgwick

Inventor:

W. Hoyland

Per Munn & Co

Attorneys.

UNITED STATES PATENT OFFICE.

WILLIAM HOYLAND, OF NEWCASTLE, PENNSYLVANIA.

IMPROVEMENT IN REVERBERATORY FURNACES.

Specification forming part of Letters Patent No. **138,564**, dated May 6, 1873; application filed April 5, 1873.

To all whom it may concern:

Be it known that I, WILLIAM HOYLAND, of Newcastle, in the county of Lawrence and State of Pennsylvania, have invented a new and useful Improvement in Puddling-Furnaces, of which the following is a specification:

Figure 1 is a front-end view of my improved furnace. Fig. 2 is a front-side view of the same. Fig. 3 is a top view of the same. Fig. 4 is a vertical longitudinal section of the same.

Similar letters of reference indicate corresponding parts.

My invention has for its object to furnish an improved set of furnace-plates, to be used in the construction of puddling-furnaces, which shall be simple in construction and convenient in use, enabling the furnace to be built and repaired at much less expense than when the furnace is constructed in the ordinary manner. The invention consists in the combination of the breast-plate with the side plate, as hereinafter described; in the recess formed in the side plate at the side of the opening for the breast-plate to enable the bottom plate to be withdrawn through said opening; in the arrangement of the bearers with respect to each other and the bottom plates; in the recess formed in the end plate for the end-wall plate to be drawn through; in the combination of the pipe with puddling-furnace; and in the holes in the end bottom plates in connection with the pipe, as hereinafter fully described; in the employment of flag-stones and metal columns for supporting a puddling-furnace; in the combination of the side plates with the metal columns for forming a puddling-furnace.

A A are flag-stones, upon which rest the lower ends of the columns B, to which the plates C D E are bolted. The size of the columns B should be about nine by one and one-fourth inch; and their head and foot should be about nine by ten inches.

When two furnaces are placed side by side there are no division-plates between them below the tops of the columns B; but the inner columns of the two furnaces are bolted back to back. The columns B and the brackets F attached to the end plates G H thus take the whole weight of the furnace. This construction leaves a clear open space beneath the furnaces, which greatly assists in keeping the bottom of the furnace cool. I are plates, resting, one end upon the brackets F and their other end upon the heads of the columns B, and which are designed to carry the side walls of the fire-grate. J K L are the bearers, which sustain the weight of the whole interior of the furnace. The bearer J is about four inches wide and four and a half inches deep, and has its top beveled off so as to leave it about two inches wide, and has three lugs or toes cast upon it to keep the bottom plates from spreading. In the top of the bearer J is cut a notch of suitable size to receive the end of the bearer L. The bearer K is made exactly like the bearer J, except that, instead of a notch, it has a section of about four inches cut from its middle part to receive the bearer L between the adjacent ends of its parts. The end of the bearer L is supported, at the proper level, by a chock or wedge, *l*, driven between it and the head of the column B. The bearer L is made with two or more cross-bars. M N O are the bottom plates, the middle one, N, of which is made in two parts.

When it becomes necessary to change the middle plate N, the breast-plate P is removed, and the chock or wedge *l* drawn out. This allows the end of the bearer L to drop upon the head of the column B. The half of the bottom plate N drops with the bearer L, and may be drawn out, through the breast-plate opening and the recess *e* in the plate E, by means of a pair of blacksmiths' tongs. The new plate may then be put in through the said opening and recess, and the plate and bearer raised into place by a crowbar, a little fire-clay being put upon the lip to joint them firmly together.

In this way the plate N can be changed without delaying the furnace more than fifteen minutes.

The breast-plate P can be changed alone without delaying the furnace at all. This is done by removing the loose pins p' that keep the bottom of said plate in place by inserting the point of a crowbar in the recess e^1 and prying the lower part of said plate P outward. This draws the upper part of the plate P down from the flanges e^2 which hold it when in place, and which project about one and a quarter inch along the front of the upper part of the said plate P.

Q is the end-wall plate, which is nine inches wide and four feet long, and beneath the ends of which are placed pieces of three-fourths-inch iron. In the end plate G is formed, three-fourths of an inch below the plate Q, a recess, g^1.

The plate Q may be removed by knocking out the iron pieces beneath the ends of the plate Q, which allows the said plate to drop three-fourths of an inch, when it may be drawn out through the recess g^1.

This enables the plate Q to be changed without stopping the furnace or cutting away the brick-work above the said plate.

The wall at the back of the fire-grate is made twelve inches thick, and is incased by the piece or flange g^2 formed upon or attached to the end plate G, and which may be upon one or the other part of said plate, according as the furnace is to be right or left furnace.

R is a pipe for drawing the air through the chills; and, also, to carry off the gases that accumulate under the furnace, and carry them above the heads of the workmen. m' o' are holes formed in the bottom plates to serve as inlets to the air and gases, which pass thence through the chills, and escape through the pipe R.

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

1. The combination of the breast-plate P with the plate E, substantially as herein shown and described.

2. The recess e^1, formed in the plate E at the side of the opening for the breast-plate P, to enable the plate N to be withdrawn through said opening, substantially as herein shown and described.

3. The arrangement of the bearers J K L with respect to each other and the plates M N O, substantially as herein shown and described.

4. The recess formed in the end plate G for the end-wall plate Q to be drawn through, substantially as herein shown and described.

5. The combination of the pipe R with the puddling-furnace, substantially as herein shown and described, and for the purpose set forth.

6. The holes m' o' in the plates M O, in connection with the pipe R, substantially as herein shown and described, and for the purpose set forth.

WILLIAM HOYLAND.

Witnesses:
W. E. REIS,
K. CAMPBELL.