

J. GREEN.
Puddling Furnace.

No. 16,541.

Patented Feb. 3, 1857.

Fig. 1.

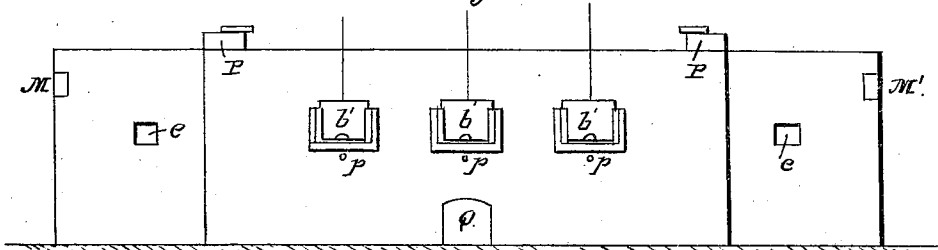


Fig. 4.

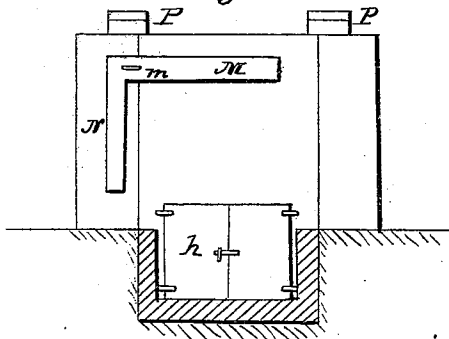


Fig. 5.

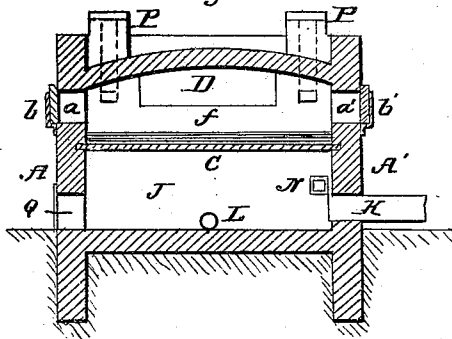


Fig. 3.

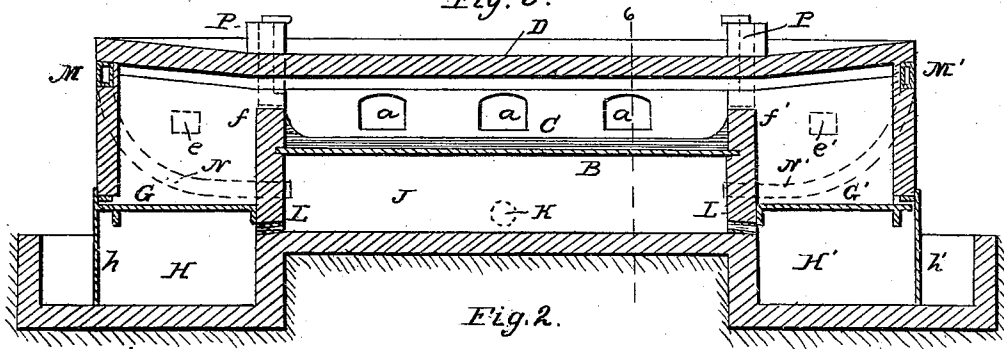
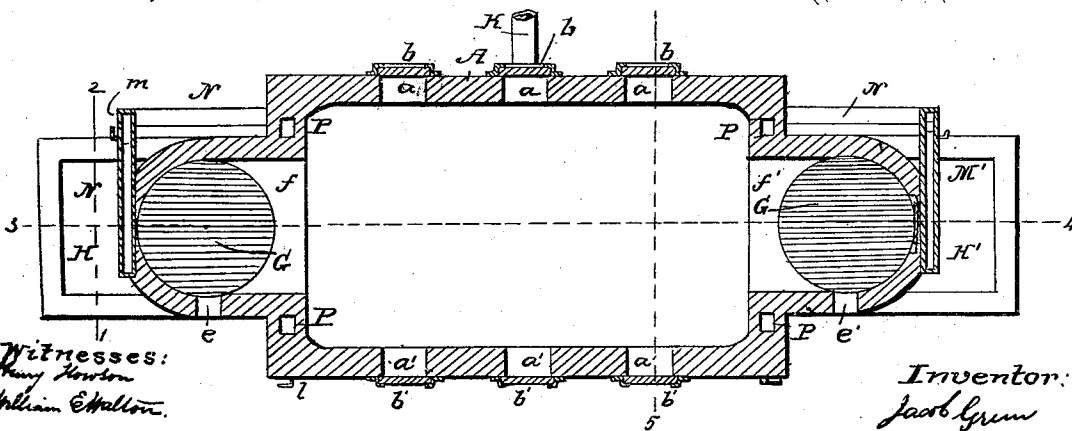


Fig. 2.



Witnesses:
Henry Norton
William Walton.

Inventor:
Jacob Green

UNITED STATES PATENT OFFICE.

JACOB GREEN, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN PUDDLING-FURNACES.

Specification forming part of Letters Patent No. 16,541, dated February 3, 1857.

To all whom it may concern:

Be it known that I, JACOB GREEN, of the city of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Puddling-Furnaces; and I do hereby declare that the following is 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 relates to those furnaces used in the manufacture of malleable iron, technically termed "puddling-furnaces;" and it consists in constructing such furnaces with any convenient number of openings in each of the side walls and placing a fire-place at each end of the furnace, as fully described hereinafter, the object of my improvement being the economizing of space, fuel, and labor, and the production of a better quality of iron.

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 drawings, which form a part of this specification, Figure 1 is an external elevation of my improved furnace; Fig. 2, a sectional plan of the same; Fig. 3, a longitudinal section on the line 3 4, Fig. 2; Fig. 4, a transverse section through the ash-pit on the line 1 2, Fig. 2; Fig. 5, a transverse section on the line 5 6.

The same letters of reference allude to similar parts throughout the several views.

A and A', Fig. 2, are the opposite side walls of the furnace, in which are openings *a a a* and *a' a' a'*, furnished with doors *b b b* and *b' b' b'*, arranged to slide up and down in the usual manner, and each having small openings, through which the workmen stir the iron.

B is an iron plate built into the walls and supporting the hearth; D, the arched top of the furnace; E and E', the circular fire-places having openings *e* and *e'*, through which the fuel is thrown; *f* and *f'*, the bridge-walls; G and G', the grate-bars; H and H', the ash-pits; *h* and *h'*, the ash-pit doors; *p p p*, openings through which the slag and cinders are discharged.

K is a blast-pipe, which communicates with the interior of the reservoir J underneath the iron plate B.

L and L' are pipes leading from the reser-

voir J to the ash-pit H, and these pipes are furnished with throttle-valves, which may be operated by means of rods passing through the brick-work, and furnished with handles *l l* outside the same. (See Fig. 2.)

M and M' are pipes built into the front and near the top of the brick-work which forms the fire-places. These pipes are also furnished with handled throttle-valves, *m* and *m'*. They are also perforated with small holes, which are inclined toward the space between the top of the bridges *f f* and the arched top D of the furnace. Leading from these pipes M and M' and communicating with the reservoir J are the bent pipes N and N'.

Near each corner of the furnace, or in any other convenient position, are built short chimneys P P P P, having small flues communicating with the furnace above the hearth. These chimneys are furnished at the top with tiles for regulating the amount of opening.

Q is a door, through which access can be had to the interior of the reservoir J.

The objects of the above arrangement of furnace are as follows:

First. The number of men that can be brought to work at the present description of furnaces (even those of the best construction) is limited to two. By my above-described arrangement, there being three openings on each side, six men can be employed without interfering with each other.

Second. It is necessary to disperse the furnaces at present constructed over a large surface, which involves the necessity of the workmen carrying the balls a considerable distance from the furnace to the squeezers and other devices for shingling the iron, causing the iron to become more or less cool before it is operated upon. My furnace, which in capacity is equal to three of the present double furnaces, can be located in close proximity with the squeezers, consequently diminishing the labor to the workman and allowing but little time for the iron to cool. The latter is an object of especial importance, for the hotter the iron is when submitted to the action of the squeezers the better it becomes, inasmuch as more of the slag and cinder is pressed out of it.

Third. By placing the fires at opposite ends of the furnaces, so that the flames of each may meet each other above the hearth, an intense

heat is produced equally over the whole surface of the latter, and this (as I have found by experience) at much less expense of fuel than in ordinary furnaces where the flame acts so unequally on the surface of the hearth that the workmen have to remove the balls of iron from place to place. In the ordinary furnaces, too, it is necessary to furnish the fire-places with fuel several times during one heat, whereas my furnace can be used during the whole heat with but one supply of fuel. It will be seen that as the carbonaceous gases are consumed in my improved furnace the object of the short flues with the regulating tiles is merely to allow the spent gases to escape. It will be also seen that the blast directed under the grate-bars, as well as that above the bridges, may be regulated at pleasure by their respective throttle-valves.

I do not desire to confine myself to any particular length of furnace, or to the number of openings *a a a*, as four, or even five, on each side might be employed; but

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

The constructing of puddling-furnaces with any convenient number of openings or working-holes on each side, and a fire-place at each end, the bed of the furnace being common to both fires, and the whole being arranged and constructed substantially in the manner herein set forth, and for the purpose specified.

JACOB GREEN.

Witnesses:

HENRY HOWSON,
WILLIAM E. WALTON.