

No. 678,282.

Patented July 9, 1901.

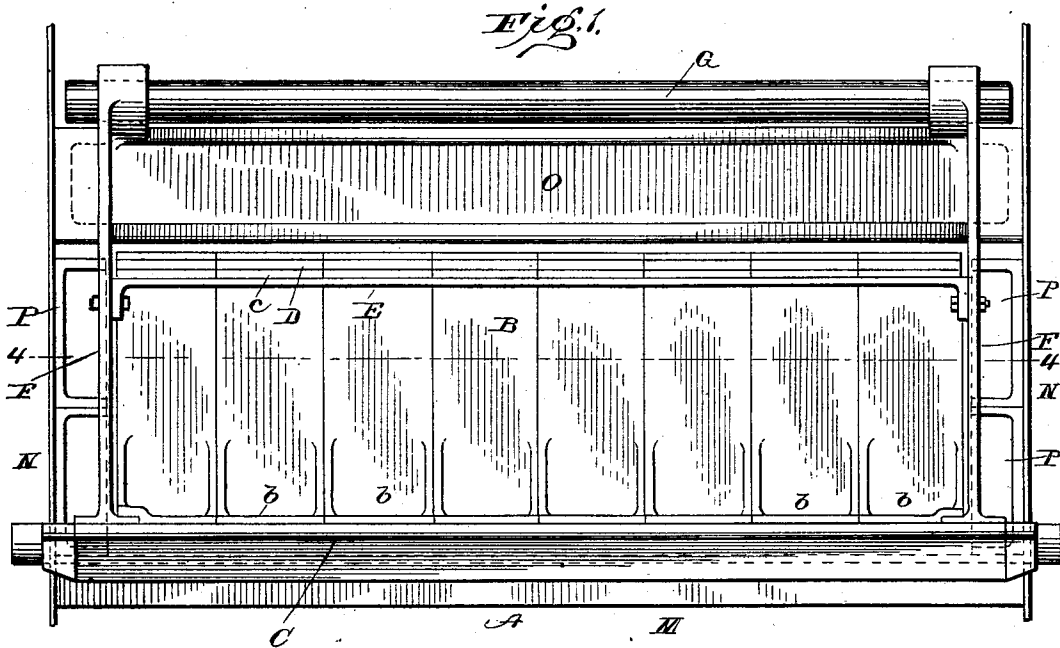
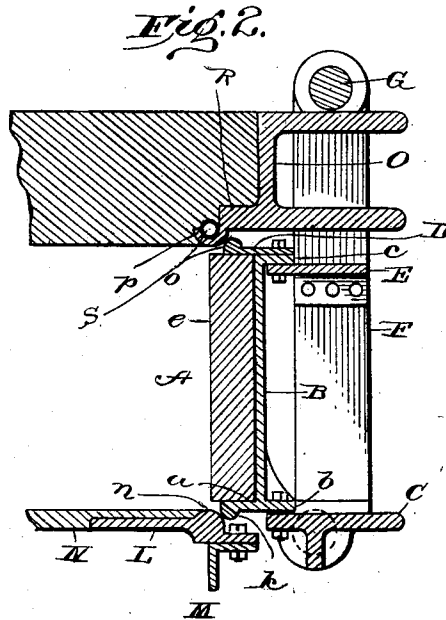
J. P. ROE.

PUDDLING FURNACE.

(No Model.)

(Application filed Jan. 5, 1901.)

2 Sheets—Sheet 1.



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2 Sheets—Sheet 2.

Fig. 3.

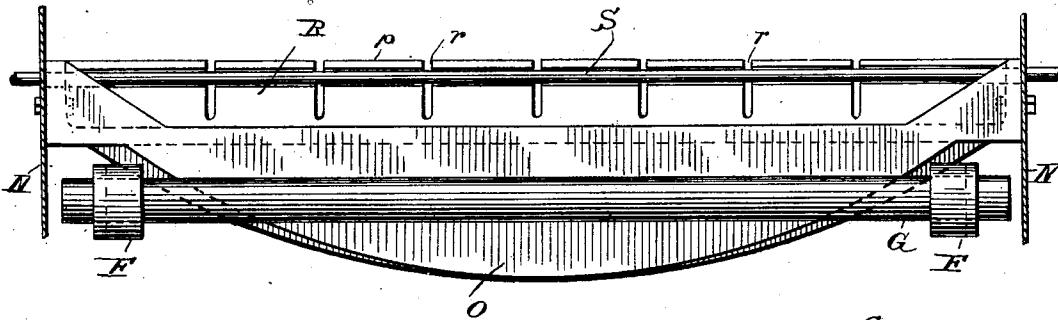


Fig. 5.

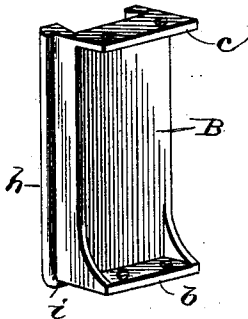


Fig. 6.

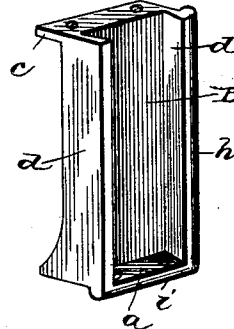
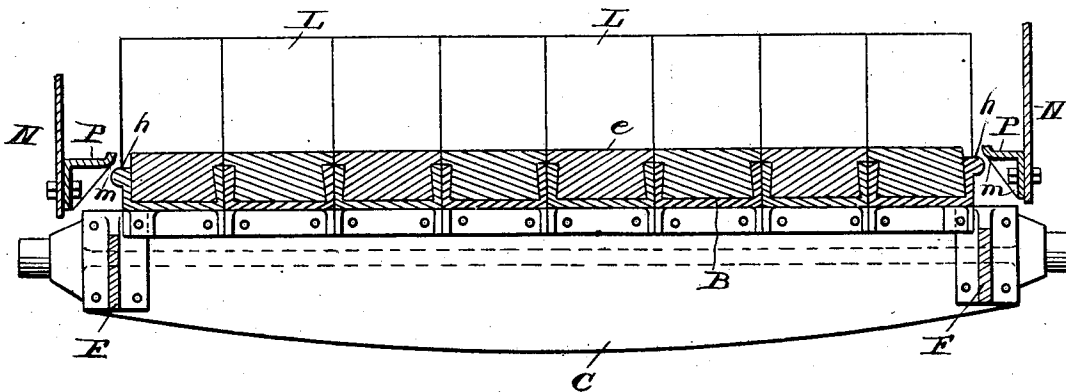


Fig. 4.



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UNITED STATES PATENT OFFICE.

JAMES P. ROE, OF POTTSTOWN, PENNSYLVANIA.

PUDDLING-FURNACE.

SPECIFICATION forming part of Letters Patent No. 678,282, dated July 9, 1901.

Application filed January 5, 1901. Serial No. 42,238. (No model.)

To all whom it may concern:

Be it known that I, JAMES P. ROE, a citizen of the United States, residing at Pottstown, in the county of Montgomery and State of Pennsylvania, have invented certain new and useful Improvements in Puddling-Furnaces; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates generally to furnaces, and particularly to doors for puddling-furnaces; and it has for its object to provide a durable and permanent door adapted to prevent the adhesion of the liquid cinder at or about its joint with the door-frame on chilling; and it consists of the parts and combinations of parts hereinafter described and claimed.

In the accompanying drawings, forming a part of this specification, Figure 1 is a front elevation of my improved door in position; Fig. 2, a detail vertical section through the door and its frame; Fig. 3, a top plan view of the same; Fig. 4, a horizontal section on the line 4 4, Fig. 1; Fig. 5, a detail perspective view of one of the sections forming the door, and Fig. 6 a similar view of the reverse side to that shown in Fig. 5.

Similar letters refer to similar parts throughout the several views.

Referring to the drawings, A represents the door, which is made up of a series of sections, each of which consists of a casting having a back-plate B, having the inwardly-extending flange *a* and the outwardly-extending flange *b* at the bottom of the casting and the outwardly-extending flange *c* at the top thereof and the two inwardly-projecting side flanges *d*, which, as best shown in Fig. 4, are inclined on their adjacent faces, so as to form a dovetail space therebetween. (See Figs. 5 and 6.) The sections or castings just described are arranged side by side and are bolted through their bottom flanges *b* to a cross-girder C, and after the refractory material *e*, with which the door is faced, is in place they are bolted to a cross-girder E through the joint-pieces D and the top flanges *c*, said girder E being secured at each end to levers or bars F, depending from a shaft G,

which is mounted in suitable bearings secured to the end of the furnace, said levers being secured at their lower ends to the cross-girder C. The refractory material *e* is preferably formed in the shape of a brick and is inserted from the top of the sections or castings and rests on the lower or bottom flanges *a* and between the side flanges *d* and is held securely in place by the joint-pieces D, so that there is no liability of their displacement. The castings for the end sections of the series of sections are formed with vertical convex flanges or edges *h* at one side, and similar convex seats *i* are formed on their bottom edges, as clearly shown in Figs. 5 and 6, and the intermediate sections are each formed with a convex seat *k* at its bottom. (See Fig. 2.)

The frame or case surrounding the opening for the door in the end of the furnace is also made up of sections, the bottom cross-piece being composed of the plates L, secured to the cross angle-iron or bar M, which is secured to the side girders or body N of the furnace, and the top being formed of the cross-girder O. The girder O is bolted to the side girders or body of the furnace N, and to the latter are also bolted the side jambs P of the door-case. The jambs P are preferably formed of angle-irons and are bent over or otherwise formed with a convex seat, as at *m*, against which the convex seats *h* of the end sections or castings of the door abut. The plates L are also formed with a convex seat *n*, which abuts against the convex seat *k* at the bottom of the door-case, while the joint-plates D are also formed with a convex seat *o* at their inner edges, which abuts against a similar seat *p*, formed on the inner edge of the flange R of the girder O, said convex seat *p* being preferably trough-shaped and supporting a pipe S. The side of the girder O is exposed to the heat of the furnace, and in order to prevent warping thereof and to relieve it of the strain it is slotted, as at *t*, and as an additional precautionary measure to the water-pipe S. The side plates or jambs P are also formed of sections, as shown best in Fig. 1. Any desired or suitable means for swinging the door to open and close the same may be employed.

It will be observed that with a door constructed as above described the bars or levers

F, the shaft G, and the cross-girders C and E, are removed from or not subjected to distorting heat and that the peculiarities of the girder O protects it from the injurious effects of such heat, and as the meeting edges of the door and the case are convex there is no liability of the liquid cinder when chilled adhering thereto, and thus forming an obstacle to the working of the door.

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

1. The combination, in a puddling-furnace, of a door-frame having a convex seat around the opening for the door, and a door having a similar convex seat around its inner face to abut against the convex seat on the frame, whereby a rounded surface is presented to the liquid cinder and the latter thus prevented from adhering to the door-frame and door upon chilling.

2. The combination, in a puddling-furnace, of a door-frame comprising side jambs formed in sections arranged one above the other, an upper cross-girder, a lower cross-piece, a door comprising a series of castings to hold the lining arranged side by side, cross-girders to which said castings are secured, and a lining of refractory material.

3. The combination, in a puddling-furnace, of a door-frame comprising an upper cross-girder having a flange formed with a convex seat, a lower cross piece or plate having a convex seat, and side jambs having convex seats, and a door having a convex seat extending around the same and arranged to abut against the door-frame convex seats when the door is closed.

4. The combination, in a puddling-furnace, of a door-frame comprising side jambs com-

posed of a series of sections each having a convex seat at its edge, an upper cross-girder having a flange formed with a convex seat and said flange being slotted at intervals, a bottom cross-piece composed of a series of plates each of which is formed with a convex seat, and a door having a convex seat surrounding the same to engage the convex seats on the frame.

5. The hereinbefore-described door for puddling-furnaces, comprising a series of castings each of which having a top and bottom flange on one side thereof, a recess on the opposite side having inclined side walls, refractory material for said recess, a joint-plate for securing said material in place, and suitable cross-girders arranged for connection with said castings to hold the same together.

6. The combination, in a puddling-furnace, of a door-frame comprising an upper girder having a convex seat, a pipe arranged in proximity to said seat, a lower girder or cross-piece composed of separate plates each having a convex seat formed thereon, side jambs having convex seats, and a door having a convex seat around its inner face arranged to engage the convex seats of the frame.

7. The combination, in a puddling-furnace, of a door-frame having a convex seat surrounding the opening for the door, a door having a surrounding convex seat arranged to abut against the convex seat on the frame, and means for pivotally supporting the door in position.

In testimony whereof I affix my signature in presence of two witnesses.

JAMES P. ROE.

Witnesses:

JNO. R. BRIGGS,

HARRY S. CAMPBELL.