J. MORRISON.
Furnace-Doors.

No. 208,415. Patented Sept. 24, 1878.

Fig.

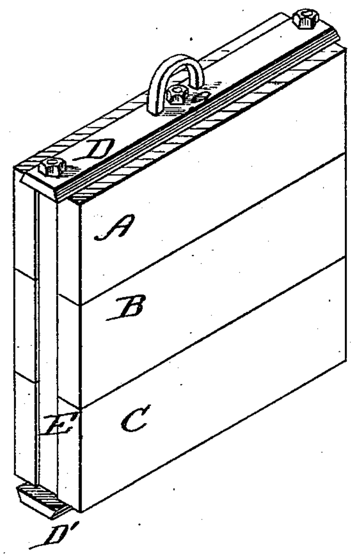


Fig. 2

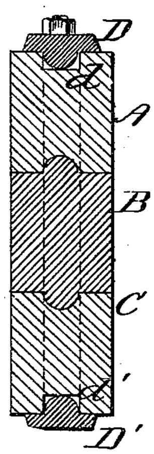


Fig. 3

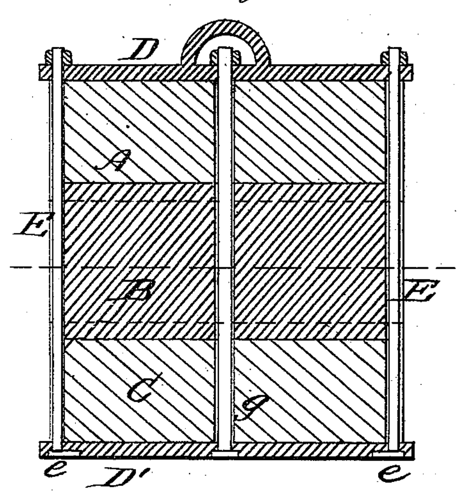
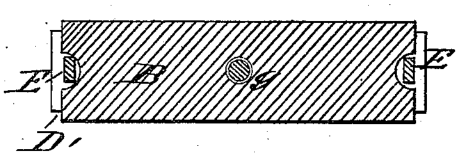


Fig. 4



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UNITED STATES PATENT OFFICE.

JOHN MORRISON, OF PITTSBURG, PENNSYLVANIA.

IMPROVEMENT IN FURNACE-DOORS.

Specification forming part of Letters Patent No. **208,415**, dated September 24, 1878; application filed January 29, 1878.

To all whom it may concern:

Be it known that I, JOHN MORRISON, of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Furnace-Doors; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

Figure 1 is a perspective view. Fig. 2 is a vertical transverse section. Fig. 3 is a longitudinal vertical section, and Fig. 4 is a horizontal section of the door.

My invention has reference to the construction of doors for metallurgic furnaces, particularly of that class known as "heating-furnaces;" and it consists in making the door of one or more blocks of fire-clay or other refractory material, so fitted to a frame-work as to form the entire front and rear faces of the door, whereby the latter is rendered reversible.

It also consists in the particulars of construction, combination, and arrangement hereinafter fully described and claimed.

In the accompanying drawings, A B C designate oblong blocks of fire-clay—their length being equal to the width of the door—grooved on their exterior edges, and jointed together by tongue and groove, as shown in sectional views. These blocks are set into a frame consisting of the top and bottom bars, D D′, having on their inner faces the longitudinal ribs *d d′*, which fit into the blocks A C.

The side bars, E, lie in the end grooves of the blocks A B C, and secure the bar D′ by a rabbeted head, *e*, fitting a recess in the bar D′, and the whole is firmly secured together by the nuts *f* or equivalent fastening.

If the door be of unusual width, a central upright, *g*, running through the blocks, may be used to give stiffness to the whole, or a similar tie-rod may be passed through horizontally, to keep the uprights from bowing outwardly and binding the door in its frame.

The advantages of this construction of door are chiefly as follows: When the interior heat has burned away the bricks to such extent as to interfere with the working of the furnace, the whole door can be reversed—both faces being alike—so as to present the unburned face inwardly. This feature of the improvement about doubles the life of the door. Again, after such reversal, when the second face becomes burned away, since the burning only takes place on the lower half of the door, it is an easy matter to take out the lower, or lower and middle, blocks, and replace them by new ones, leaving the upper block or blocks in the frame, and thus economizing in material.

As the two faces of the door are the parts most liable to injury from heat, and as the side bars are somewhat concealed in the edges of the blocks, the metal frame is not much exposed to injury. If the door be a square one—the form usually adopted—besides reversing, it may be reused by shifting the blocks so as to cause them to lie at right angles to their original positions, or they may be inverted.

The side bars of the frame may, if desired, pass through holes made near the ends of the blocks.

Another advantage resulting from the construction above described is a lessening of the liability to expansion, the door being made of non-expansible material, while those in common use are made chiefly of iron.

Having described my invention, I claim—

1. A furnace-door having both inner and outer faces of fire-clay, whereby either face of the door, or each face in succession, may be used next the fire, as described.

2. The combination of the blocks A B C, having their faces forming the faces of the door, with the side bars, E, and top and bottom bars, D D′, of the frame, substantially as set forth.

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

JOHN MORRISON.

Witnesses:
CHAS. C. LEAN,
F. J. MCTIGHE.