

# SIBLEY & SHIVERICK.

## Door for Furnaces.

No. 53,894.

Patented April 10, 1866.

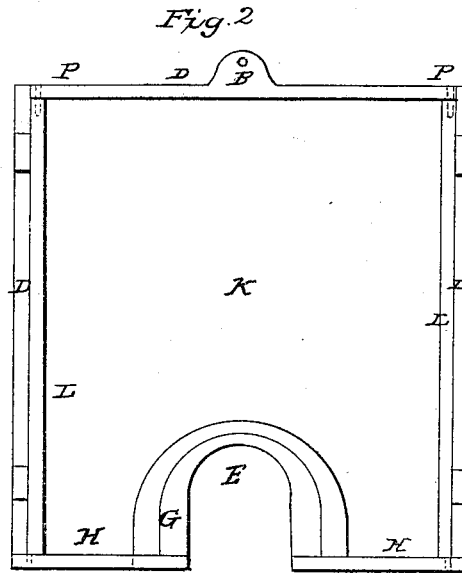
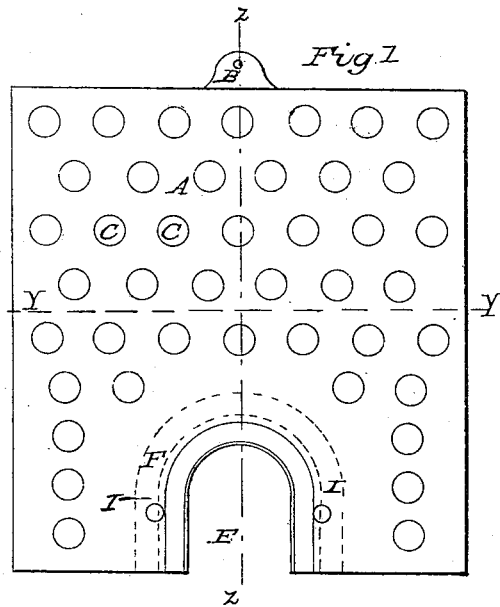


Fig. 7



Fig. 4

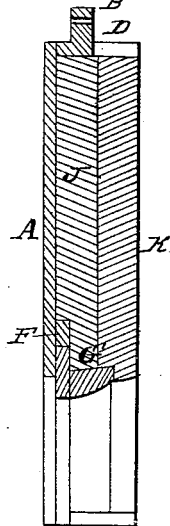


Fig. 6

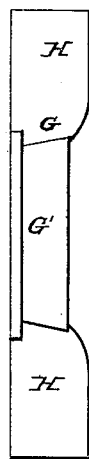


Fig. 3

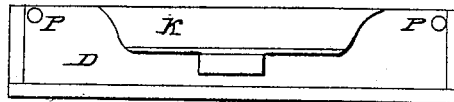


Fig. 8

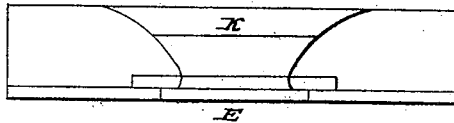
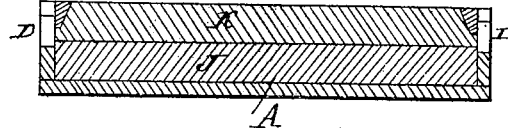


Fig. 5



Witnesses.

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# UNITED STATES PATENT OFFICE.

NATHANIEL L. SIBLEY, OF WESTON, AND BENJAMIN SHIVERICK, OF WALTHAM, MASSACHUSETTS.

## IMPROVEMENT IN DOORS FOR PUDDLING AND OTHER FURNACES.

Specification forming part of Letters Patent No. 53,894, dated April 10, 1866.

*To all whom it may concern:*

Be it known that we, NATHANIEL L. SIBLEY, of Weston, and BENJAMIN SHIVERICK, of Waltham, both in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Furnace-Doors; and we do hereby declare that the same are described and represented in the following specification and drawings.

To enable others skilled in the art to make and use our improvements, we will proceed to describe their construction and operation, referring to the drawings, in which the same letters indicate like parts in each of the figures.

Figure 1 is a front elevation of a furnace-door. Fig. 2 is an elevation of the inside of the door. Fig. 3 is a view of the top edge of the door. Fig. 4 is a section on the line Z Z, Fig. 1. Fig. 5 is a section on the line Y Y, Fig. 1. Fig. 6 is a top view of the nose-piece. Fig. 7 is an elevation of one edge of the door. Fig. 8 shows the lower edge of the door.

The nature of our invention and improvements in furnace-doors consists in lining an iron door with calcined plaster-gypsum or other material which conducts heat slowly, made either solid or with a cavity for an air-space, and a nose-piece or guard around the hole in the door, made separate from the door and fastened to it; and in making the lining of the door to cover and protect, or partially cover and protect, the nose-piece or flange around the hole in the door; and in a lining made of plumbago or crucible material for the purpose of protecting the door and intermediate lining from the intense heat; and in a lining of calcined plaster-gypsum between the iron door and lining of fire-brick; and in making the lining of furnace-doors in one piece of white clay or fire-brick; and in fastening the lining to the door by means of bars of metal and the dovetailing form of the nose-piece or flange around the hole in the door.

In the above-mentioned drawings, A is a cast-iron plate forming the outside of the door. It may be made in the form represented or in such other form as will answer the purpose, and with a projection, B, at the top for the hook, which is to raise and lower it. This plate A may be cast with holes C C in it, which may be filled with plaster, and a flange,

D, may be cast on the top and side edges, as shown in Fig. 7. This flange D aids in holding the lining applied to the inside of the plate.

E is an opening or hole in the bottom of the door, through which the laborer works his puddle or rake, and there is a flange, F, a little distance from the edge around this hole. (Shown by dotted lines in Fig. 1 and in the section, Fig. 4.)

The bit or nose-piece G (shown separately in Fig. 6) is made in the form shown to fit the flange F, and with two arms, H H, which serve for a flange at the bottom of the door when the nose-piece G is fastened in by the screws I I. The part G' of the nose-piece is made dovetailing, as shown in section, Fig. 4, to aid in holding the lining to the door. When the nose-piece has been fitted and fastened to the plate A the holes C C may be filled with plaster and a lining, J, of plaster applied about two inches (more or less) thick, and on the top of that a lining, K, of white clay fire-brick, plumbago, or crucible material, which we prefer in one piece about two inches (more or less) thick, to resist the intense heat of the furnace and protect the lining J and plate A. The lining J may be made with a cavity in it for an air-space, if preferred that way. The lining K is made to fit around the nose-piece and partially cover it, as shown in Fig. 4, so as to partly protect it from the intense heat of the fire; and the nose-piece, being made dovetailing and the lining K fitted to it, aids in holding the lining to the door. The side edges of the lining K are made with a rabbet for the bars L L, which hold the lining to the door. The lower ends of the bars L have a tenon fitted to a mortise or holes in the arms H H to hold the lower ends in place, and the upper ends are perforated for the pins P P, which pass through holes in the top flange, D, and enter the ends of the bars to hold them in place and hold the lining to the door.

The nose-piece and bottom flange burn out first, and by making them in a separate piece they can be supplied much cheaper than making a new plate or door. By reducing the width of the flanges and perforating the door-plate we reduce the quantity of iron, which is a good conductor of heat, and supply its place with plaster, which is a poor conductor of heat,

and thus save much heat and fuel, and the heat is far less oppressive to the laborer who works before the door. By making the lining K in a single piece there are no fissures for the flames to enter to heat it, and it stands the intense heat better and lasts longer.

We contemplate that, instead of the small holes in the door, fewer and larger holes may be made for the same purpose, and also that the top flange of the iron plate A may be omitted, and the side flanges may be made inclined toward the middle to form a dovetail to hold in the linings, which may be made to fit the inclined flanges and slid down from the top; or, if the top flange is made on the door, the pieces L may be cast with the flanges and the linings slid in from the bottom before the nose-piece is put in, and the nose-piece applied afterward to hold them in.

In combination with an iron door, we claim—

1. A lining of calcined plaster-gypsum or other material which conducts heat slowly, made either solid or with an opening or air-space, as may be preferred.

2. A nose-piece or guard around the hole in the door, made separate from the door and fastened to it.

3. Making the lining of the door to cover and protect, or partially cover and protect, the nose-piece or flange around the hole in the door, substantially as described.

4. In furnace-doors, a lining made of plumbago or crucible material to protect the door and intermediate lining from the intense heat.

5. The combination and arrangement of the iron plate A, lining J, and lining K, substantially as described.

6. Making the lining of furnace-doors in one piece of white clay fire-brick or crucible material.

7. Fastening the lining to the iron plate by the bars of metal L L, substantially as described.

8. The holes in the door, in combination with the lining, for the purpose specified, substantially as described.

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Witnesses:

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