E. H. ASHCROFT.

Furnace-Door.

No. 162,335. Patented April 20, 1875.

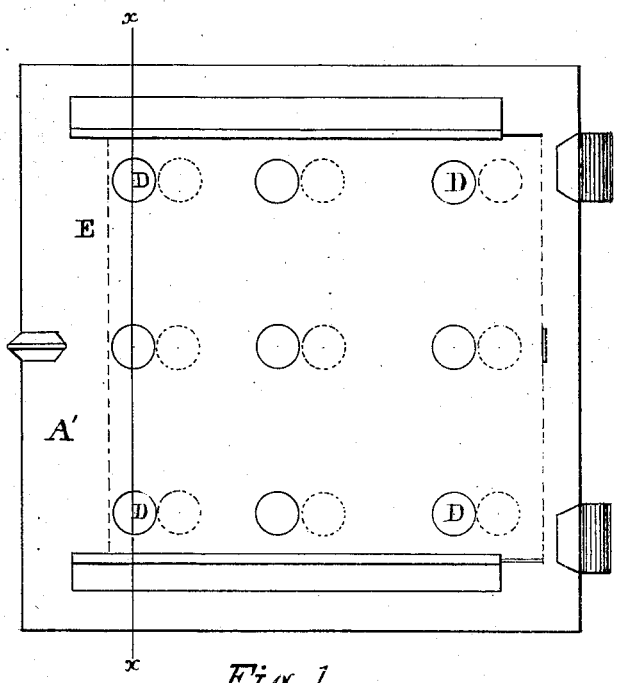

Fig. 1.

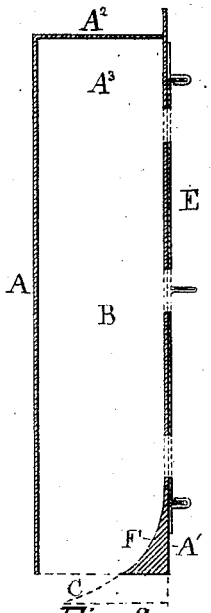

Fig. 2.

Attest

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UNITED STATES PATENT OFFICE.

EDWARD H. ASHCROFT, OF BOSTON, MASSACHUSETTS, ASSIGNOR OF ONE-HALF HIS RIGHT TO JOHN ASHCROFT, OF BROOKLYN, NEW YORK.

IMPROVEMENT IN FURNACE-DOORS.

Specification forming part of Letters Patent No. **162,335**, dated April 20, 1875; application filed March 9, 1875.

To all whom it may concern:

Be it known that I, EDWARD H. ASHCROFT, of Boston, in the county of Suffolk and State of Massachusetts, 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 pertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification—

Figure 1 being a front elevation, showing in dotted lines the perforated slide for the admission of air to the space between the plates of the door, and in full lines the apertures through the outer plate; and Fig. 2 is a vertical cross-section on line *x x* of Fig. 1, showing the perforations through the slide and plate as registering with each other, and also the passage for the air through the bottom of the door.

Similar letters refer to corresponding parts in both of the figures.

This invention relates to furnace-doors adapted for use upon steam-generators and other kinds of furnaces; and it consists in a door having within it a chamber into which air is admitted through perforations in its outer plate, and in which it is, to some extent, heated before passing to the fuel, and from which it is deflected directly upon the burning fuel, as will be more fully described hereinafter.

In constructing doors of this character, I make them of plates of cast or of wrought metal, A A^1 A^2 A^3, which form within them a chamber, B, the two plates A and A^1 being united with a top plate, A^2, and side plates A^3, which prevent the egress of air from the chamber B, and any point except through the aperture C at the bottom of the door. The outer plate A^1 of the door is provided with hinges for attaching it to the frame thereof, and has perforations D D formed therein, through which the air passes to the chamber. In order that the amount of air admitted may be regulated according to the condition and amount of fuel upon the grates, a perforated slide, E, is placed upon the outer surface of the plate A′ of the door, and arranged to slide in grooves formed thereon, so that by moving it to the proper position the perforations therein are made to register wholly or partially with the apertures in the door, and thus the amount of air admitted can be regulated. It is important that the air which passes through this door be admitted to the fuel in horizontal direction, or at such an angle therefrom as to cause it to impinge directly upon the surface of the burning fuel, and in order that this result may be accomplished, a deflector, F, is placed upon the inner surface of plate A^1 of the door, as shown in Fig. 2. The form of this deflector may be varied, according to circumstances, and made to cover more or less of area of the opening C; and if found desirable, in order to give the proper direction to the ingoing current of air, the plate A′ and its deflector F may be extended below the lower end of plate A, to such an extent as to give to the current of air a horizontal direction. Should it be found advisable to admit more air at the front of the furnace than will pass through the openings, or to admit air above the door, perforations may be formed in the frame of the door; or when a cast-iron arch front is used such perforations may be formed therein. Some of the advantages due to this form of door may be enumerated as follows: The inner plate of the door will, to a great extent, be prevented from burning out by the air which passes through the perforations in the outer plate, as, owing to the direction in which it enters, it will be caused to impinge directly against said inner plate, and hence it will take up the heat thereof and return it to the furnace. Secondly, all of that portion of the air which is admitted to the furnace through the door will have its temperature raised several degrees by heat, which would otherwise be wasted, thus resulting to that extent in a saving of fuel. Thirdly, the air admitted at this point will be brought directly in contact with the fuel at the point from which the inflammable gases escape therefrom, and hence will be mingled with such gases and cause a more perfect combustion thereof.

Having thus described my invention, what

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

1. A door for steam-generators and other furnaces, having within it a chamber closed at all points, except its lower end, against the egress of air, and a deflector for directing the air upon the fuel within the furnace, substantially as and for the purpose set forth.

2. The combination, in a furnace-door, of a chamber within such door, a perforated slide for controlling the admission of air to said chamber, and a deflector for giving direction to the air as it emerges therefrom, the parts being constructed and arranged substantially as and for the purpose set forth.

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

EDWARD H. ASHCROFT.

Witnesses:

C. M. CONNELL,

E. A. BULLEY.