E. H. ASHCROFT.

Furnace Door.

No. 167,210. Patented Aug. 31, 1875.

Fig. 1.

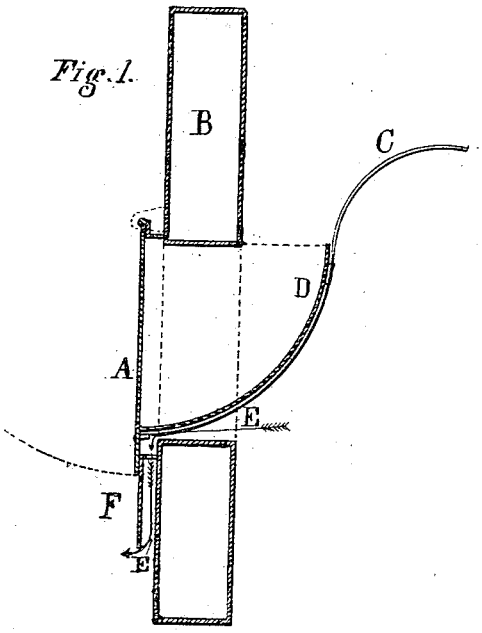


Fig. 2.

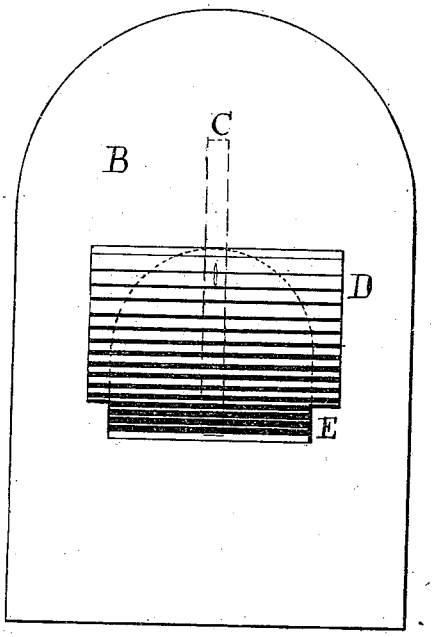


Fig. 3.

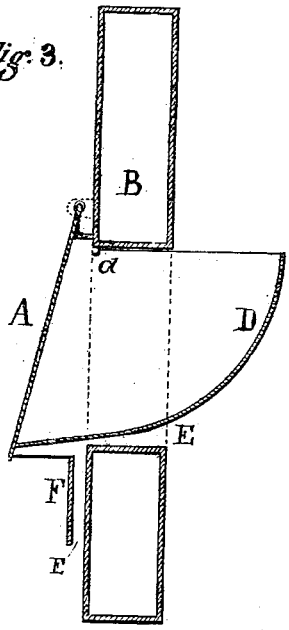
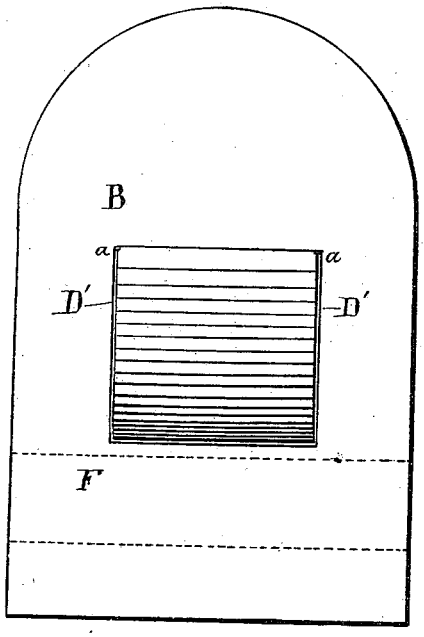


Fig. 4.



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UNITED STATES PATENT OFFICE.

EDWARD H. ASHCROFT, OF BOSTON, MASSACHUSETTS.

IMPROVEMENT IN FURNACE-DOORS.

Specification forming part of Letters Patent No. **167,210**, dated August 31, 1875; application filed May 27, 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 sectional elevation of a portion of a steam-generator with my improved door and coal-hopper attached. Fig. 2 is a front elevation, showing the aperture in the generator, the coal-hopper, and the strip of metal which holds the door in its closed position. Fig. 3 is a sectional elevation, showing the parts in a modified form; and Fig. 4 is a front elevation of the modified form.

Similar letters denote corresponding parts in all of the figures.

This invention relates to furnace-doors for steam-generators and other furnaces; and it consists in the combination and arrangement of some of the parts of which it is composed, as will be more fully explained hereinafter.

Furnace-doors, as usually constructed, open outward, as a consequence of which, when used upon locomotive-engines, they are very much in the way of the engineer.

The object of this invention is to remedy the defect above alluded to, and at the same time to provide means for the quick introduction of the fuel, and for the constant admission of a current of air to the upper surface thereof, as a consequence of which the fuel may be introduced in a short space of time, and thus the passage of a large amount of cold air to the interior of the generator be prevented, and a fresh supply of oxygen be mingled with the gases as they arise from the solid portion of the fuel.

In constructing furnaces with this improvement attached, a door, A, is pivoted to the inside of the generator or furnace B, as shown in Figs. 1 and 3, or in any other suitable manner, it being so arranged as to open inwardly and above the fuel upon the grates. In order that the door may be fastened in the position shown in Fig. 1, or in its closed position, a strip of metal, C, is pivoted to the lower portion thereof, it being made to conform to the outer surface of the fuel-hopper to which it may be attached, for fastening the door. This strip may also be used for opening the door after the fuel has been placed in the hopper. In order that provision may be made for the insertion of the fuel in the shortest possible space of time, and thus preventing the passage of a current of cold air to the interior of the generator, a hopper, D, is attached to the generator or arch front, in such a manner that its lower and inner end comes nearly or quite in contact with the door when it is closed, its upper portion rising to near the top of the aperture through which the fuel passes, or high enough to cause it to hold a sufficient amount of fuel. Into this hopper the fuel is shoveled, where it may be allowed to remain until it is desirable to inject it into the furnace, when, by detaching the strip C from the hopper, the weight of the fuel will cause the door to open and the fuel will fall upon the grates, and the door will instantly close by the operation of its own gravity.

In all furnaces in which the fuel used is coal or coke, it is of vital importance that provision should be made for the introduction of a supply of air to the gases arising therefrom, in order that their combustion may be effected. In this case, in making provision for this feature of economy in the burning of fuel, there is a space, E, left between the lower portion of the fuel-hopper and the upper surface of the aperture in the generator or arch-front, through which, when the door is closed, air passes, as shown by the arrows in Fig. 1. In order that the supply of air, entering as above indicated, may be properly distributed over all the coal, a deflector, F, is attached to the inside of the furnace, across which it extends, it being projected inward therefrom for a short distance, and then downward, in order that it may direct the air onto the fuel or among the gases arising therefrom, and cause it to travel the entire length of the furnace in connection therewith, thereby insuring its thorough admixture with such gases, and insuring their thorough combustion.

Figs. 3 and 4 represent a slight modification of my improvement, the door A being shown as placed at an angle to the surface of the interior wall of the furnace, for the purpose of insuring its closing with more certainty than would otherwise be the case. The hopper D, as shown in its modified form, is of such a width as to cause it to pass inside of the aperture in the generator, and has sides D′ D′ placed upon it, to enable it to contain the fuel; and it may, if preferred, be hinged to the generator at *a*, so that it may be, to a certain extent, adjustable in its position, in order that when the fuel is placed therein, and the door is opened, it may be swung into the furnace to some extent, and thus cause the fuel to be delivered nearer the center of the grates.

I have described the inwardly-swinging door A and the fuel-hopper D as used in combination or connection with an air-passage, E; but it is obvious that they may be used to advantage without such passage, and hence I do not intend to limit myself exclusively to such a combination; but,

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

In combination with a steam-generator or arch-front, an inwardly-swinging door, a fuel-hopper, and an air-passage, the parts being arranged substantially as and for the purposes specified.

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

EDWARD H. ASHCROFT.

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