T. W. RODGERS.

FURNACE DOOR.

No. 191,474. Patented May 29, 1877.

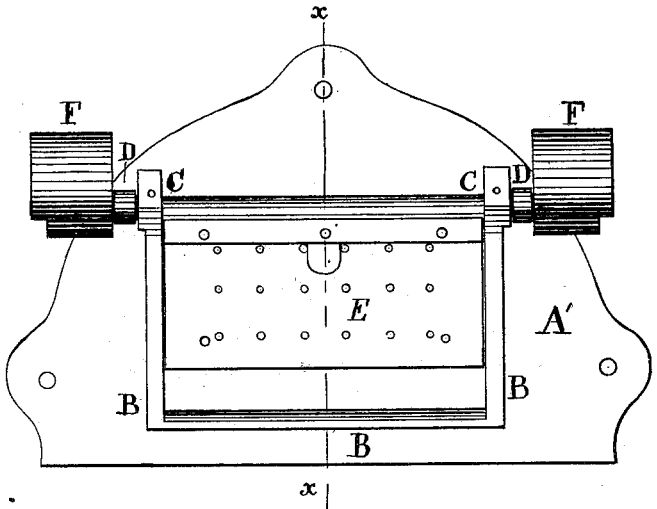

Fig. 1.

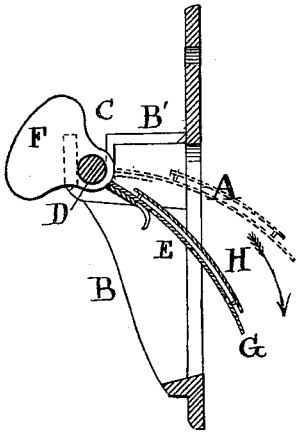

Fig. 2.

Witnesses

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UNITED STATES PATENT OFFICE.

THOMAS W. RODGERS, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO EDWARD H. ASHCROFT, OF SAME PLACE.

IMPROVEMENT IN FURNACE-DOORS.

Specification forming part of Letters Patent No. **191,474**, dated May 29, 1877; application filed April 27, 1877.

To all whom it may concern:

Be it known that I, THOMAS W. RODGERS, 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 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 front elevation of my improved door, showing the frame in which it is placed, the outer curved plate of the door, the shaft upon which it turns, and the counterbalances; and Fig. 2 is a transverse section on line *x x* of Fig. 1, showing the parts above referred to and the interior plate of the door.

Corresponding letters denote like parts in both figures.

This invention relates to that class of furnace-doors which are provided with counterbalance weights for the purpose of retaining the doors in more or less open, or in their closed, positions; and it consists in providing such doors with an inwardly-curved plate for closing the aperture in the frame through which the fuel is inserted, the object being to cause the air which enters the furnace through the aperture in the frame or arch-front when the door is partially open to impinge directly upon the burning fuel.

It has been customary heretofore to construct counterbalanced doors with the plate curved outwardly at its center; but this has been found not to be the best method of construction, for the reason that the air entering under the lower edge of the door comes directly in contact with the current of air passing through the grates and the gases arising from the fuel thereon, and is thus carried directly toward the rear of the furnace without being allowed to impinge directly upon the fuel, while a door, having its central portion curved inward, as in my case, gives a directly downward direction to the air as it passes its lower edge, and thus causes it to impinge immediately upon the fuel with a force due to its velocity.

In constructing furnaces with my improved door attached, I form an aperture, A, in the wall of a furnace, or in a frame, A′, to be attached thereto. To the furnace or to the plate a frame-work, B B, is attached, in the upper surfaces of which are formed bearings for the reception of a shaft soon to be described. The end walls of this frame are of the form shown in Fig. 2, for the purpose of preventing the ingress of air at the ends of the door when it is closed, or above it when it is partially opened, the plate B′ preventing the ingress of air above the door at all times. Into bearings C C, formed in the upper surface of the frame B B, there is placed a shaft, D, or, it may be, journals formed upon the ends of the door. To that portion of the shaft D which is between the walls B B the door is secured, its length being such as to cause it to extend from one wall to the other, and yet not prevent it from turning between them. The plate E, which is the door proper, may be composed of cast or of wrought metal, it being secured to the shaft in any suitable manner; or, when made of cast-iron, it may have journals formed upon its ends, which are to be of sufficient length to cause them to pass through the journals of the frame, and receive upon their outer ends counterbalancing weights F F, so that, in whatever position the door may be placed, whether full open for the insertion of fuel, closed entirely, or partially open for the admission of air, it will be so held, which result will be accomplished even when the door is placed upon sea-going vessels, the boilers of which have their positions changed by the waves of the water or by the rolling of the vessel.

The feature of novelty in my improvement over doors such as have been hereinbefore described is, that the plate which constitutes the door proper, and which is shown at G, Figs. 1 and 2, is curved inward at its center, whereby the air which is caused to pass its lower edge when partially open is made to impinge directly upon the burning fuel, and so is caused to mingle more fully with the gases

arising therefrom than it is when the door is curved outwardly at the same point. This door may be provided with perforations, as shown in Fig. 1, and may have a deflecting-plate placed in the rear thereof, as shown at H, Fig. 2, or it may be without the perforations, and the deflecting-plate may be dispensed with.

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

A counterbalanced furnace-door, the swinging plate of which is curved inward in the direction of its greatest length, substantially as and for the purpose set forth.

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

THOMAS WILLIAM RODGERS.

Witnesses:

F. T. TAPLEY,

MARTIN LUSCOMB.