(No Model.)

V. W. BLANCHARD.

FURNACE DOOR.

No. 413,913. Patented Oct. 29, 1889.

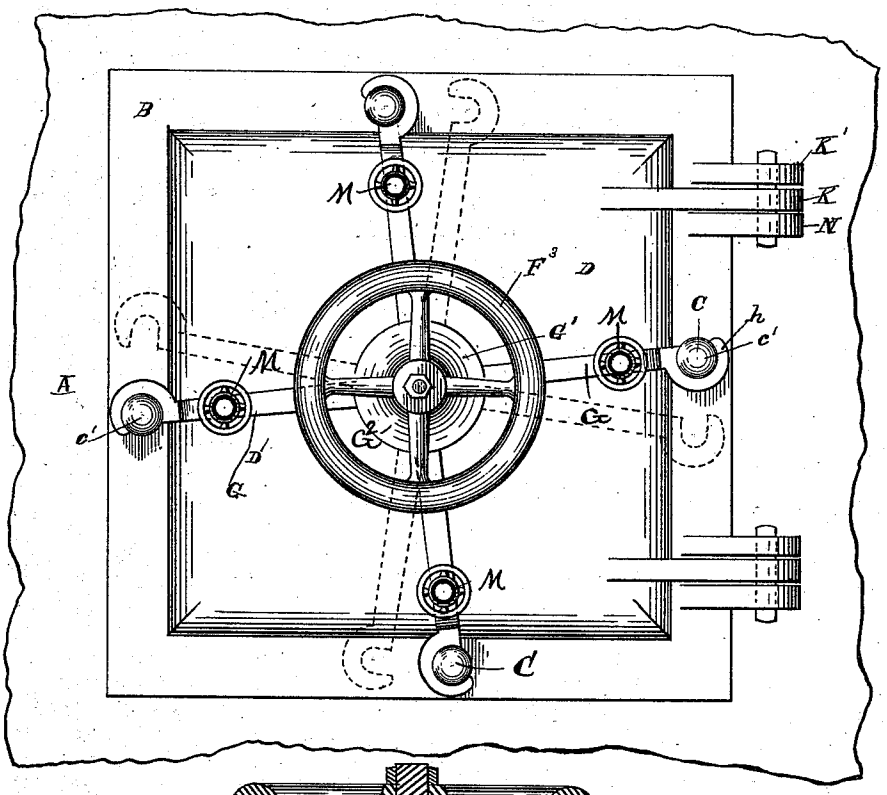


Fig 1

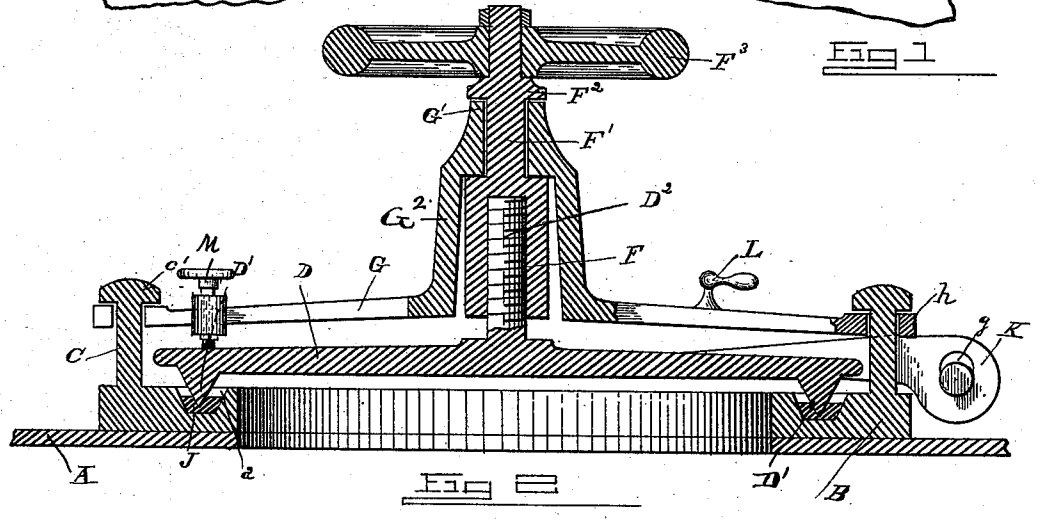


Fig 2

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UNITED STATES PATENT OFFICE.

VIRGIL W. BLANCHARD, OF NEW YORK, N. Y., ASSIGNOR TO JOSEPH A. DAVIS, OF SAME PLACE.

FURNACE-DOOR.

SPECIFICATION forming part of Letters Patent No. 413,913, dated October 29, 1889.

Application filed April 11, 1889. Serial No. 306,802. (No model.)

To all whom it may concern:

Be it known that I, VIRGIL W. BLANCHARD, of New York, in the county and State of New York, 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, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form part of this specification, in which—

Figure 1 is a front view of a section of a furnace, showing in dotted lines the hooked arms disconnected from the heads of the studs of the door-frame to allow the door to be swung on its hinges and in full lines showing said arms connected to the studs. Fig. 2 is a horizontal section taken through dotted line *x x*, showing the door fastened hermetically.

In my Letters Patent, No. 289,963, dated December 11, 1883, I show a furnace-door provided with a refractory gasket seated in a groove in the door-frame, in combination with a door having a single hinge, a rib being formed on this door to embed itself in the said gasket. I also show two arms having hooked ends engaging with headed lugs on the door-frame and means for securing the door tight when it is properly adjusted in position.

I have found that in practice it is desirable to make the door and also the gasket and rib rectangular, and that it should be provided with more than one hinge and more than two radial locking-arms; and I have also found it desirable to apply to said arms auxiliary fastening devices for the purpose of positively securing said door. These features will be fully understood from the following description and claims.

Let A represent the shell of a steam-boiler, a furnace, or any other vessel which it is desired to hermetically seal. On the outside of this vessel I suitably secure a rectangular door-frame B, which is represented in Fig. 1. This frame should be secured to the shell A so that it is both air-tight and gas-tight. In its outer face is a continuous groove *a*, preferably of angular form, as shown in Fig. 2, in which I pack asbestus paper or a gasket J of any suitable material. At four or more points on the frame B, I cast or otherwise apply posts C, which are equidistant to each other, and which have heads *c'* on their outer extremities. The drawings show four of these posts protruding from frame B.

D designates a door which has a continuous triangular rib D' on its under face, adapted to bear on or embed itself into the packing J and to form a hermetically-sealed joint when the door is closed tightly in the manner which I shall hereinafter describe. Rising perpendicularly from the center of the door is a screw-threaded post D^2, which is received into the screw-threaded socket F, formed on the end of a stem F', which stem has an annular collar F^2 and a hand-wheel F^3 rigidly connected to it. The shoulder of the socket F bears against a shoulder in an elongated eye G' of a yoke G^2, from which radiate arms G, forming a spider, which arms are hooked or notched, as indicated at *h*, and adapted to engage with post C in frame B under the heads *c'* of said posts. I employ four arms G', so as to have bearings at four points on the door-frame equidistant from each other, as shown in Fig. 1, for the purpose of uniformly seating the door before the screw-pressure is applied. It is advisable that the door should be hung by two hinges formed of the parts K K' N, and a handle L can be applied to one of the arms G, which handle should be a non-conductor of heat.

M M designate screw-bolts passing through threaded sockets in the arms G near the extremities thereof, and adapted to be turned down after the arms are hooked to posts C and bind against the face of the door at points just above rib D'.

By the aid of bolts M, should the door warp by heat or other cause, so that the rib D' is not properly seated on the gasket, a close joint can be produced by tightening these bolts.

The operation of my device is as follows: By taking hold of the handle L and moving the arms G' out of engagement with posts C the door can be swung on its hinges K, the pintles of which are cylindrical and are fixed to ears N, rigid on the shell A. The eyes of

the hinges K are elongated, as indicated at *g*, for the purpose of allowing the door D to be squarely seated against its gasket. After the door D is closed and the arms G adjusted beneath the heads of the posts C, I now turn the hand-wheel F^3 and forcibly press the small ends of the ribs D′ against the yielding gaskets J, and thus make a hermetically-sealed door, employing bolts M also, if desired.

This invention is especially applicable to the lower chambers of my improved furnaces wherein I generate an intense degree of heat by means of the constriction of gases; but it is also useful for other purposes.

It will be observed that I can open and close the furnace-door with great facility, that I can quickly adjust the radial locking-arms, that I can bring my door squarely to its seat, and that I can adjust it home with great force, so that I can embed the rib D′ into the gasket J and prevent the escape of gas or the inlet of air between the door and its frame.

Having thus described my invention, I claim—

1. The combination, with a rectangular double-hinged furnace-door having a rib on its inner face, a door-frame having a rectangular gasket to receive said rib, and four headed lugs equidistant from each other, of the spider having four radial locking-arms having notched ends, and the screw-clamping device for forcibly seating the door when closed, all constructed and adapted to operate substantially as and for the purposes described.

2. The combination, with the door-frame having an angular gasket and four headed lugs at equidistant points, of a door hinged by loose joints to said frame and having an angular rib adapted to engage said gasket and a central screw-threaded post, the four radial locking-arms engaging said headed lugs and the central post of the door, and the screw-clamping devices for forcibly seating the door when closed, all substantially as and for the purpose specified.

3. The combination of the door-frame having a gasket and the door having a rib engaging said gasket, with a spider having arms engaging lugs projecting from said frame, and the screw-bolts in said arms engaging and locking the door when closed, as and for the purpose specified.

4. The combination of the door-frame having a gasket and posts C, and the door loosely hinged to said frame, having a central screw-threaded post D^2, with the socket-piece F, engaging said post D^2, and the spider having a hub G^2, and radial arms G, mounted on piece F, all constructed substantially as described.

5. The combination, with the door-frame, its gasket J, the door D, having an angular rib engaging said gasket and a central screw-threaded post and loosely hinged to said frame, with the screw-threaded socket F, radial arms G G, engaging lugs on said frame, and the screw-bolts M on said arms, all substantially as and for the purpose described.

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

VIRGIL W. BLANCHARD.

Witnesses:
P. L. BROOKS,
M. P. CALLAN.