(No Model.)

H. FAHRMEIER & A. H. WARREN.

AUTOMATIC FURNACE DOOR.

No. 589,468. Patented Sept. 7, 1897.

Fig. 1.

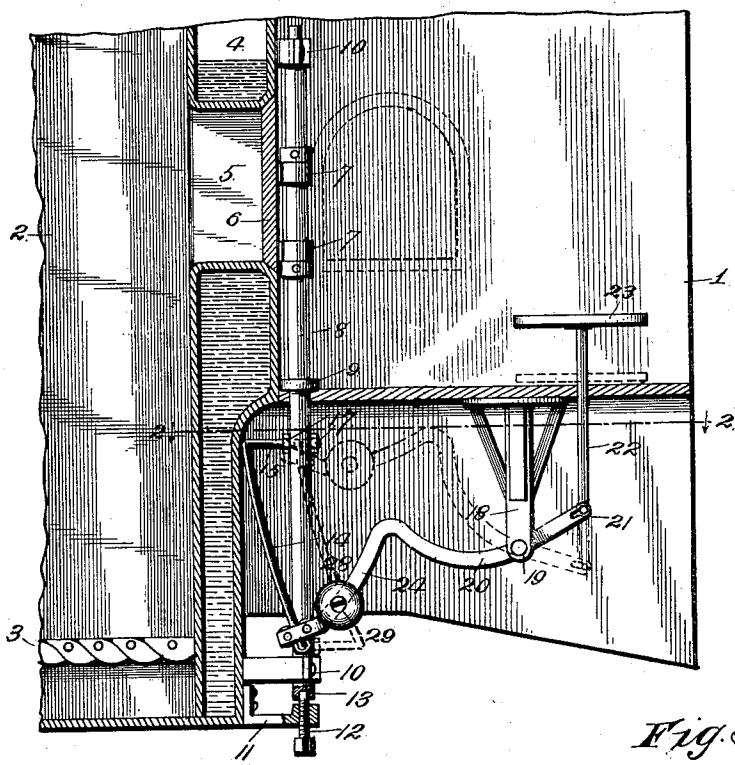


Fig. 3.

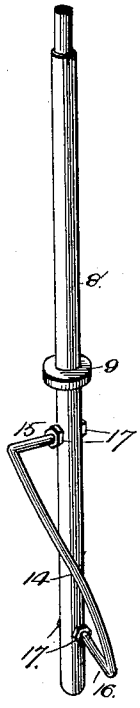


Fig. 2.

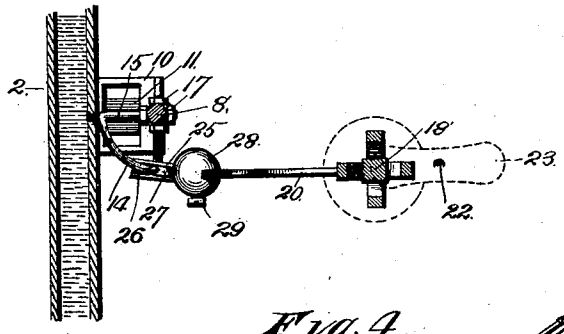
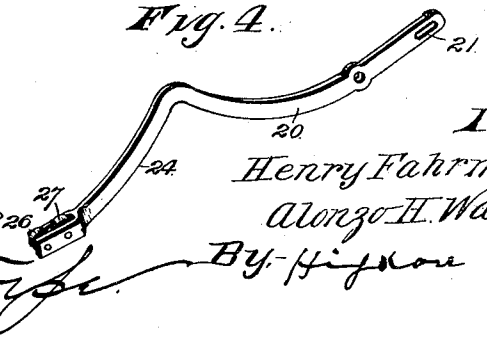


Fig. 4.



Witnesses:
F. G. Fischer
L. L. Thorpe

Inventors:
Henry Fahrmeier and
Alonzo H. Warren.
By Higdon & Higdon
Attys.

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UNITED STATES PATENT OFFICE.

HENRY FAHRMEIER AND ALONZO H. WARREN, OF HIGGINSVILLE, MISSOURI; SAID WARREN ASSIGNOR TO DANIEL HOEFER, OF SAME PLACE.

AUTOMATIC FURNACE-DOOR.

SPECIFICATION forming part of Letters Patent No. 589,468, dated September 7, 1897.

Application filed April 12, 1895. Renewed February 11, 1897. Serial No. 622,996. (No model.)

To all whom it may concern:

Be it known that we, HENRY FAHRMEIER and ALONZO H. WARREN, of Higginsville, Lafayette county, Missouri, have invented certain new and useful Improvements in Automatically-Closing Doors for Portable and other Boiler-Furnaces, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part thereof.

Our invention relates to furnace-doors, and particularly to locomotive furnace-doors; and the object of the invention is to provide a construction whereby the door may be easily and expeditiously opened, and which when the pressure or force applied in opening the same has been removed will automatically close said door.

A further object of the invention is to provide a construction of this character which is simple, strong, durable, and inexpensive.

With these objects in view the invention consists in certain novel and peculiar features of construction and combinations of parts, as will be hereinafter described and claimed.

In order that the invention may be fully understood, we will proceed to describe it with reference to the accompanying drawings, in which—

Figure 1 represents a vertical longitudinal section of a portion of the cab and furnace of a locomotive and shows therein an apparatus embodying our invention. Fig. 2 is a horizontal section taken on the line 2 2 of Fig. 1. Fig. 3 is a detail perspective view of the hinge-post. Fig. 4 is a detail perspective view of the lever for operating rotatably the hinge-post.

In the said drawings, 1 designates the cab of a locomotive and 2 the usual furnace of the boiler, which may be provided with a grate 3 of any suitable or preferred construction. Said furnace is surrounded in the usual manner by the water-jacket 4 and communicates with the interior of the cab by way of the passage 5, through which the fuel is received. Said passage is normally closed by a door 6 of similar contour, which is provided at one edge with the vertically-alined sleeves 7. These sleeves 7 embrace the vertical hinge-post 8, which projects a suitable distance below the floor of the cab, as shown. Said post is provided with a collar 9, which rests upon the floor of the cab, and is also journaled at its upper and lower ends in bearings 10 of the construction shown, or of any other suitable or preferred construction. A bracket 11 is bolted to the furnace at its lower end, and extending vertically through the same is a set-screw 12, which engages a cavity 13 in the lower end of the hinge-post 8, so that in case the door should sag by reason of a slight downward movement of the post through wear or from any other cause said set-screw may be operated properly to elevate it the required distance to cause the door to again fit snugly and accurately the said passage 5. Said post is provided with a spiral hinge-rod 14. The curve described by the said spiral as viewed in plan is equal to ninety degrees, and its upper and lower ends 15 and 16 are secured by nuts 17 or in any other suitable manner to the hinge-post. Depending from the bottom of the cab in any suitable manner is a post 18, and pivotally mounted at 19 in the lower end of the same is a lever 20. This lever 20 at one side of its pivot is longitudinally slotted and is engaged by the pin 21 of a vertical rod 22, extending up through the bottom of the cab and provided at its upper end with a foot-plate 23. At the opposite side of its pivot the lever is provided with an inclined arm 24, which terminates in a bifurcated end 25, in which is journaled the antifriction-rollers 26 and 27, which embrace opposite sides of the hinge-rod 14 at its lower end when the door is closed. Said lever 24 is provided with a weight 28, adjustable by a set-screw 29 when required.

When the furnace-door is closed or in its normal position, as shown in full lines, Fig. 1, the foot-plate 23 is a suitable distance above the floor of the cab. When it is necessary to fire the engine, or, in other words, to deposit more fuel in the furnace, the fireman fills his shovel with coal from the tender in the usual manner, and as he steps within the cab toward the furnace he places his foot upon the foot-plate 23 and depresses the same. This action pivotally operates the lever, causing its weighted end to rise and the antifriction-rollers, by traveling upon the hinge-rod 14, to

move to its upper end and thereby rotate the hinge-post about ninety degrees and open the door 6 of the furnace, as shown in dotted lines, Fig. 1. This action is practically almost instantaneous, and the fireman deposits the fuel from his shovel within the furnace and immediately withdraws his foot from the foot-plate 23 and permits the weighted end of the lever to move by gravity to its original position. This action of course rotates the hinge-post in the opposite direction and closes the furnace-door and at the same time again elevates the foot-plate. Each time the fireman steps upon the foot-plate the door is opened and immediately he releases said plate the door automatically closes. Therefore it will be apparent that cold air in large quantity is prevented from entering the furnace and counteracting in a degree the heating effects of the fuel, as is the case with all furnaces provided with doors of the ordinary construction, because the fireman almost invariably opens said door and leaves it open until he has placed the required quantity of fuel in the furnace, thus permitting cold air to enter the furnace continuously from the time he begins to fire until he is through. With our construction the furnace-door is closed at all times except when he is in the act of placing the fuel within the furnace, as will be understood.

While we have described and illustrated a particular apparatus for accomplishing the opening and the automatic closing of a furnace-door, it is to be understood that slight changes in the form, arrangement, and detail construction of the parts and also the substitution of equivalents may be made without departing from the essential spirit and scope or sacrificing any of the advantages of our invention; also, that said apparatus may be employed upon other portable furnaces and upon stationary furnaces, if found desirable.

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

In a furnace-door, the combination with a locomotive, of a vertical hinge-post rotatably mounted in the cab of the locomotive, a door carried by said hinge-post closing the fuel-opening of the furnace, and provided below the floor of the cab with a spiral hinge-rod, a standard depending from the floor of the cab, a lever pivotally mounted in the lower end of said standard, and provided at one end with antifriction-rollers which normally engage snugly the lower end of said hinge-rod, an adjustable weight upon said lever contiguous to said antifriction-rollers, a vertical rod extending through the floor of the cab, pivotally connected at its lower end to the opposite end of said lever, and provided at its upper end with a foot-plate, and a set-screw, engaging a cavity in the lower end of said hinge-post, substantially as set forth.

In testimony whereof we affix our signatures in the presence of two witnesses.

HENRY FAHRMEIER.
ALONZO H. WARREN.

Witnesses:
W. C. BOYER,
S. R. WILLIAMSON.