(No Model.) 2 Sheets—Sheet 1.

D. CURRY.

FURNACE DOOR OPENER.

No. 477,888. Patented June 28, 1892.

Fig. 1.

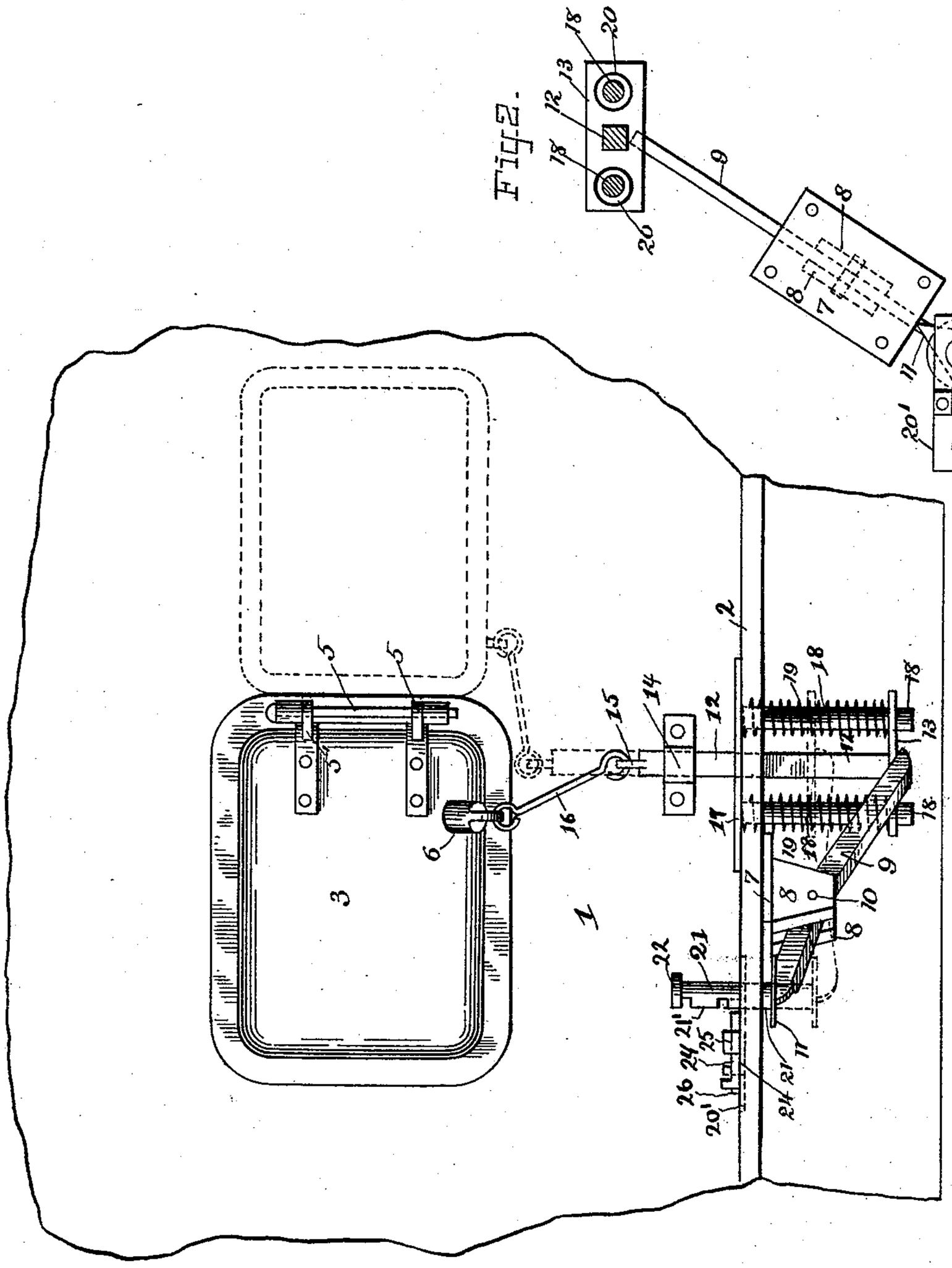

Fig. 2.

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(No Model.) 2 Sheets—Sheet 2.

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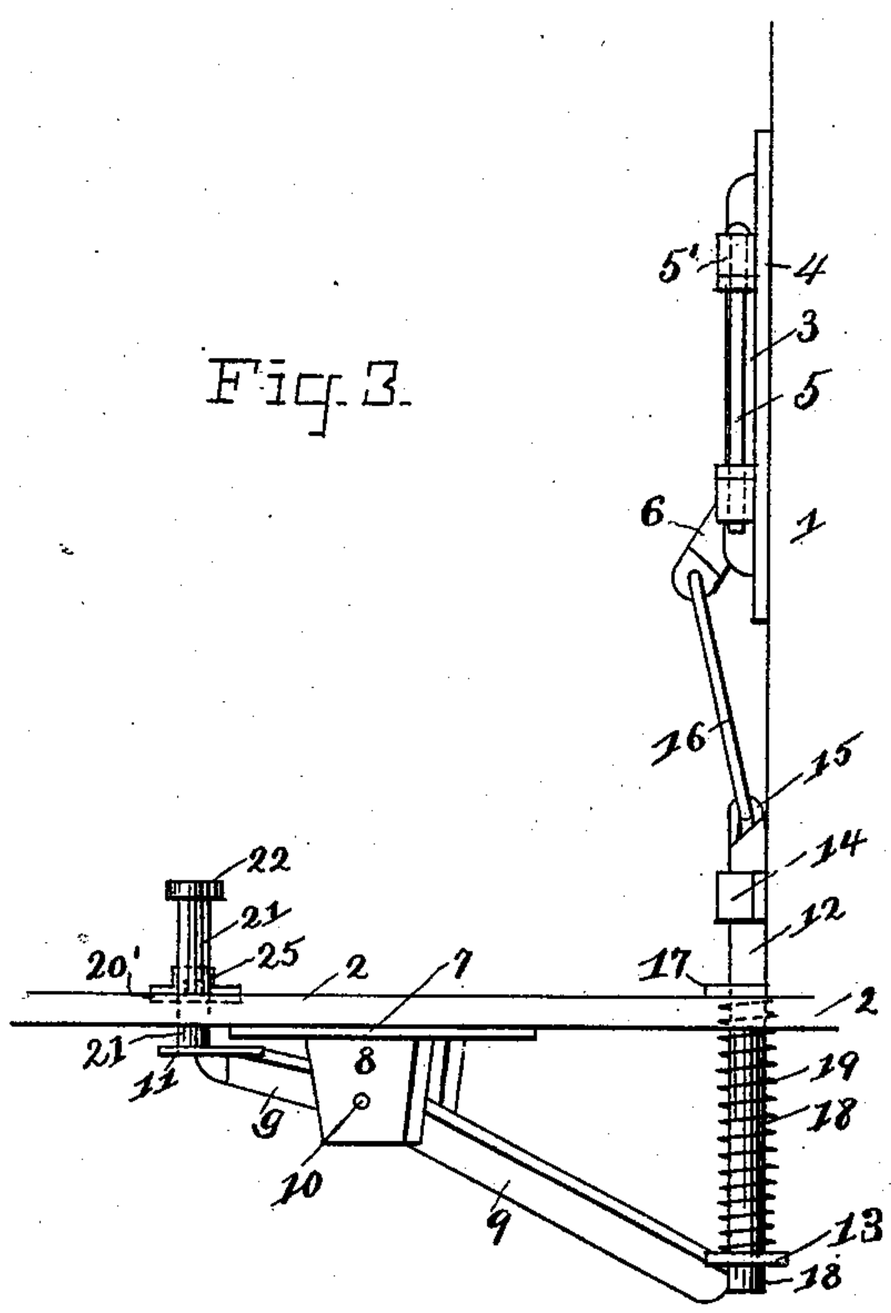
Fig. 3.



ATTEST:

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INVENTOR:

David Curry

By Joseph R. Levy

Attorney

UNITED STATES PATENT OFFICE.

DAVID CURRY, OF NEW YORK, N. Y.

FURNACE-DOOR OPENER.

SPECIFICATION forming part of Letters Patent No. 477,888, dated June 28, 1892.

Application filed November 10, 1891. Serial No. 411,435. (No model.)

To all whom it may concern:

Be it known that I, DAVID CURRY, a citizen of the United States, residing at New York, in the county of New York and State of New York, have made new and useful Improvements in Furnace-Door Openers, of which the following is a specification.

My invention relates to that class of devices used for opening and closing doors of furnaces which are operated by a lever and foot-bolt, and the special use for which my device is designed is on locomotives, where the foot-bolt can be so located on the cab-platform that the fireman can operate the door with his foot while he takes coal from the tender, keeping the door open with his foot while so doing, or he can approach the door with the coal ready for casting into the furnace and at the proper moment open the door with his foot. This will enable the operator to keep the door open only just so long as the actual act of casting the coal takes, where a great economy in the consumption of coal is had, and change of temperature due to leaving the door open the length of time usually done is materially reduced. This is the preferred method of using my device, the first stated being a possible one.

My invention consists in a series of levers adapted to be operated by the foot, the depression of one part opening the door, the door being closed by springs. To obtain this, I employ a pivoted lever connected at one end with a foot-bolt, at the other end with an upwardly-extending bar, and a link connecting the said bar with the furnace-door, and springs located between said bar and the cab-platform.

My invention also comprises devices for holding the door partly or fully open when combined with the said operating mechanism.

My invention further consists in the construction, combination, and arrangement of parts shown and described in the accompanying drawings, in which—

Figure 1 is the front elevation of the cab end of a locomotive-boiler, showing the platform, my device secured thereto, the dotted lines illustrating the movements of the parts. Fig. 2 is a plan of a part of the operating mechanism, partly in section, with the cab-platform removed; Fig. 3, a side elevation of Fig. 1.

Same letters of reference refer to like parts throughout the several views.

In the drawings, 1 is the back sheet of the boiler; 2, the cab-platform; 3, the furnace-door; 4, the door-plate, the furnace-door being hinged to the door-plate by the hinge 5 5′ in the usual manner. The door is provided with a downwardly-projecting lug 6. The brackets 7, having arms 8, are secured under the platform 2. A lever 9 is fulcrumed to the brackets 7 at 10. The shorter arm of said lever extends upwardly toward the platform and rearwardly from the boiler, and the other end extends downwardly toward the boiler. The rear end of the lever is provided with a striker-plate 11. An upright movable bar 12, provided with a transverse plate 13, is supported so as to move up and down. A strap 14, fixed to the boiler, guides its upper part. The upper part of said rod is provided with a hook 15.

Between the hook 15 and the lug 6 on the furnace-door is placed a link 16, which extends outwardly from the bar 12 at an oblique angle. The bar 12 passes through a plate 17, secured to the platform. This plate has two downwardly-projecting rods 18, which support springs 19. The plate 13 on the bar 12 is provided with holes 20 to permit said plate to ride up and down on the bars. The springs 19 rest on the plate 13 below and against the plate 17 above, so that the upward movement of the plate 13 will compress them. The plate 13 and the bars 19 serve to further guide the bar 12 in its movement up and down.

At 20′ is a plate secured to the platform 1, and which is provided with a hole, through which a foot-bolt 21, provided with an enlarged head 22, passes. The bolt 21 has a feather 21′ and the plate 20′ a corresponding groove, in which the feather works for the purpose of preventing the bolt from turning. The bolt 21 passes through a guide-plate 23, secured under the platform. The plate 20′ carries a sliding bolt 24, working in the strap 25. A pin 26 is secured to the plate 20 in such a position as to limit the movement of the bolt 24. The foot-bolt 21 is provided with a series of notches in the feather 21′, into

which the bolt 24 is adapted to be moved. The feather and groove keep the notches in front of the bolt. These notches are placed in any desired position on the foot-bolt 21, so that the door may be held entirely open or to any other degree desired.

When it is desired to open the door, the operator places his foot upon the foot-bolt 21, which act raises the long arm of the lever 9, moves the plate 13 and bar 12 upward, compressing the springs, said plate and bar being guided by the rods 18 and strap 14, which upward movement is transferred to the link 16 and thence to the door, whereby the same is opened, as shown in dotted lines.

It will be seen by reference to Fig. 3 that the link 16 is inclined at an angle between the hook 15 and lug 6, so that when the bar 12 is moved upwardly it will tend to move the upper end of said link outwardly, vibrating the door 3 on its hinge 5, and a continuation of the upward movement of the bar 12 will continue this movement of the door. At any period of this movement the bolt 24 can be moved into the notches on the foot-bolt 21, holding the door in any desired position. When either the bolt 24 is disengaged from the bolt 21 or other pressure removed therefrom, the springs 19, which have been compressed during the upward movement of the bar 12, are free to act to move the parts back into their normal position, whereby the link 16 will be pulled down, moving the door back to a closed position.

Instead of using the springs 19 the bar 12 could be weighted so as to act in exactly the same manner as the springs do. The long arm of the lever is placed in connection with the springs, so that a greater leverage will be had to return the parts to their normal position.

Other changes in the shape or construction of parts could be made without altering the nature of my invention.

What I claim is—

1. The combination, with a door, of a lug or projection extending therefrom, a lever pivotally supported, a foot-bolt engaging with one end of said lever, an upwardly-extending bar engaging with the other end, and a link extending between said bar and the projection on the door, the said link being disposed at an oblique angle between said lug and said bar, substantially as described.

2. The combination, with a pivoted door, of a lever pivotally supported, a foot-bolt engaging with one end of said lever, an upright bar with springs adapted to coact with said lever and bar, a lug on the door, and a link disposed at an oblique angle, connecting said upright bar and said lug, substantially as described.

3. The combination, with a pivoted door, of a lever pivotally supported, a foot-bolt engaging the said lever, means adapted to engage said foot-bolt to prevent its movement, an upwardly-extending bar engaging with the other end of the lever, springs adapted to coact with said lever and bar, a lug on the door, and a link disposed at an oblique angle, connecting said upright bar and lug, substantially as described.

4. The combination, with a pivoted door, of a pivoted lever having a long and short arm, a foot-bolt engaging with the short arm of said lever, articulated devices in connection with the door and lever, and springs engaging with the said articulated devices and the long arm of said lever, substantially as described.

5. The combination, with a pivoted door, of the bracket 7, secured to the platform 2, the lever 9, fulcrumed in said bracket, the foot-bolt 21, supported on one end of said lever, the upright bar 12, having the plate 13 thereon engaging with the other end of said lever, the guide-rods 18, secured to the platform upon which the said plate 13 is adapted to move, springs 19 on said rods, and the link 16, uniting the door and the upright bar, substantially as described.

6. The combination, with a pivoted door, of the bracket 7, supported on the platform 2, the lever 9, fulcrumed in said bracket, a foot-bolt 21, having the enlarged head 22, engaging with the lever 9, notches 27 in the bolt 21, a sliding bolt 24, adapted to enter said notches, an upright bar 12 and a link 16, secured to the door, the rods 18, springs 19 on said rods, and a plate 13 on the bar 12, adapted to move on the said rods and engage with the said springs, the plate 13 resting on the lever 9, substantially as described.

7. The combination of the lever 9, pivoted to the platform 1, the pivoted door, articulated devices between the door and said lever, a foot-bolt 21 on said lever, said foot-bolt having the feather 21′, and the plate 20′ on the platform 2, having a groove adapted to engage with said feather, substantially as described.

8. The combination, with the plate 17, secured to the platform, having the depending rods 18, springs 19 about said rods, the upright bar 12, having the plate 13 engaging the rods and springs, the link 16, uniting the door and bar, and a lever 9, having a long and short arm, the long arm engaging the plate 13 and the short arm with a foot-bolt, substantially as described.

Signed at the city, county, and State of New York, this 6th day of November, 1891.

DAVID CURRY.

Witnesses:
JOSEPH L. LEVY,
HERBETT DURBIN.