(No Model.)

2 Sheets—Sheet 1.

S. E. FARRELL.

FURNACE DOOR OPERATING DEVICE.

No. 556,262. Patented Mar. 10, 1896.

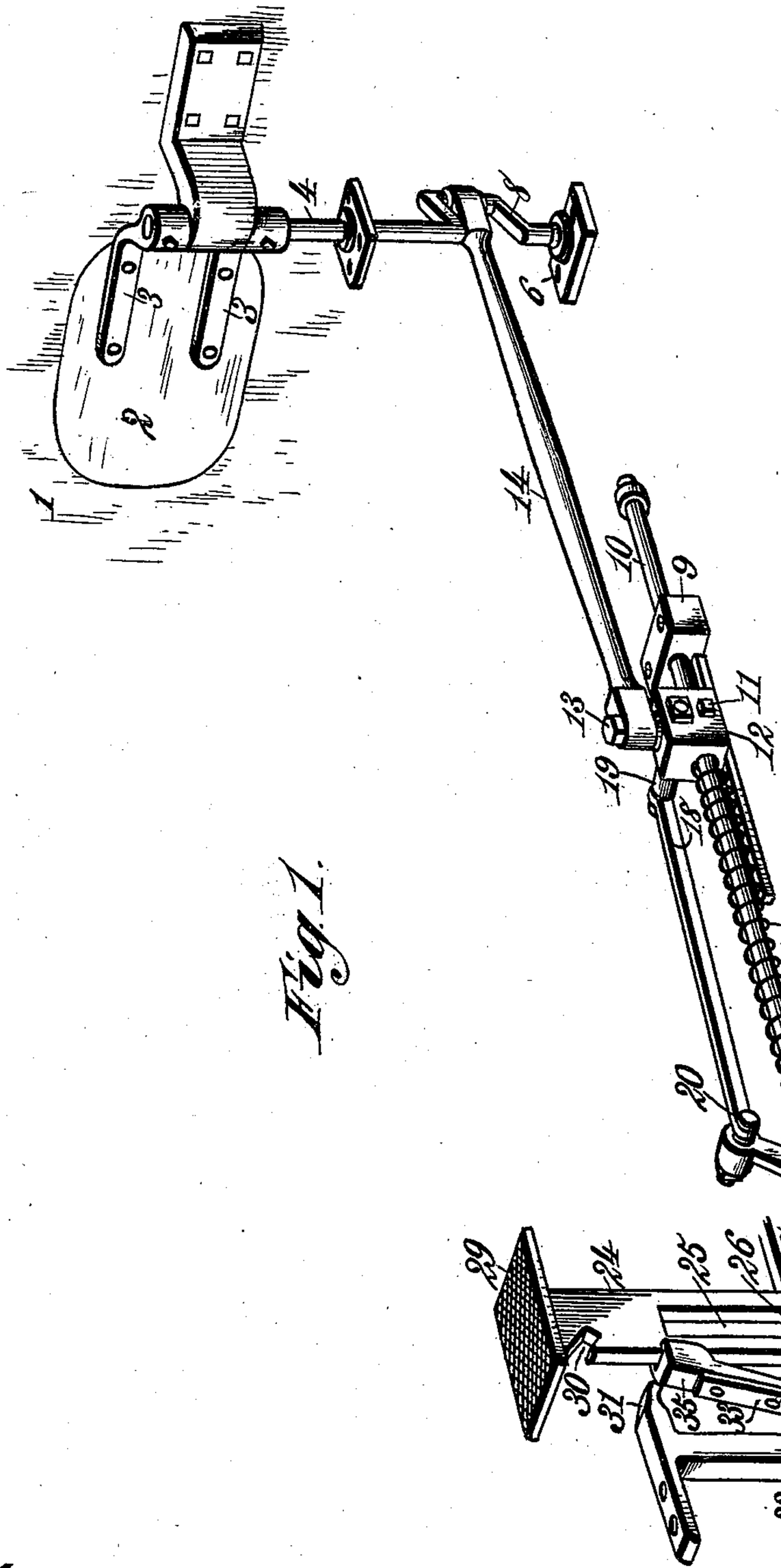

Fig. 1.

Witnesses.
Robert Everett.
Milton Coombs

Inventor.
Sydney E. Farrell.
By James L. Norris.
Atty.

(No Model.) 2 Sheets—Sheet 2.

S. E. FARRELL.

FURNACE DOOR OPERATING DEVICE.

No. 556,262. Patented Mar. 10, 1896.

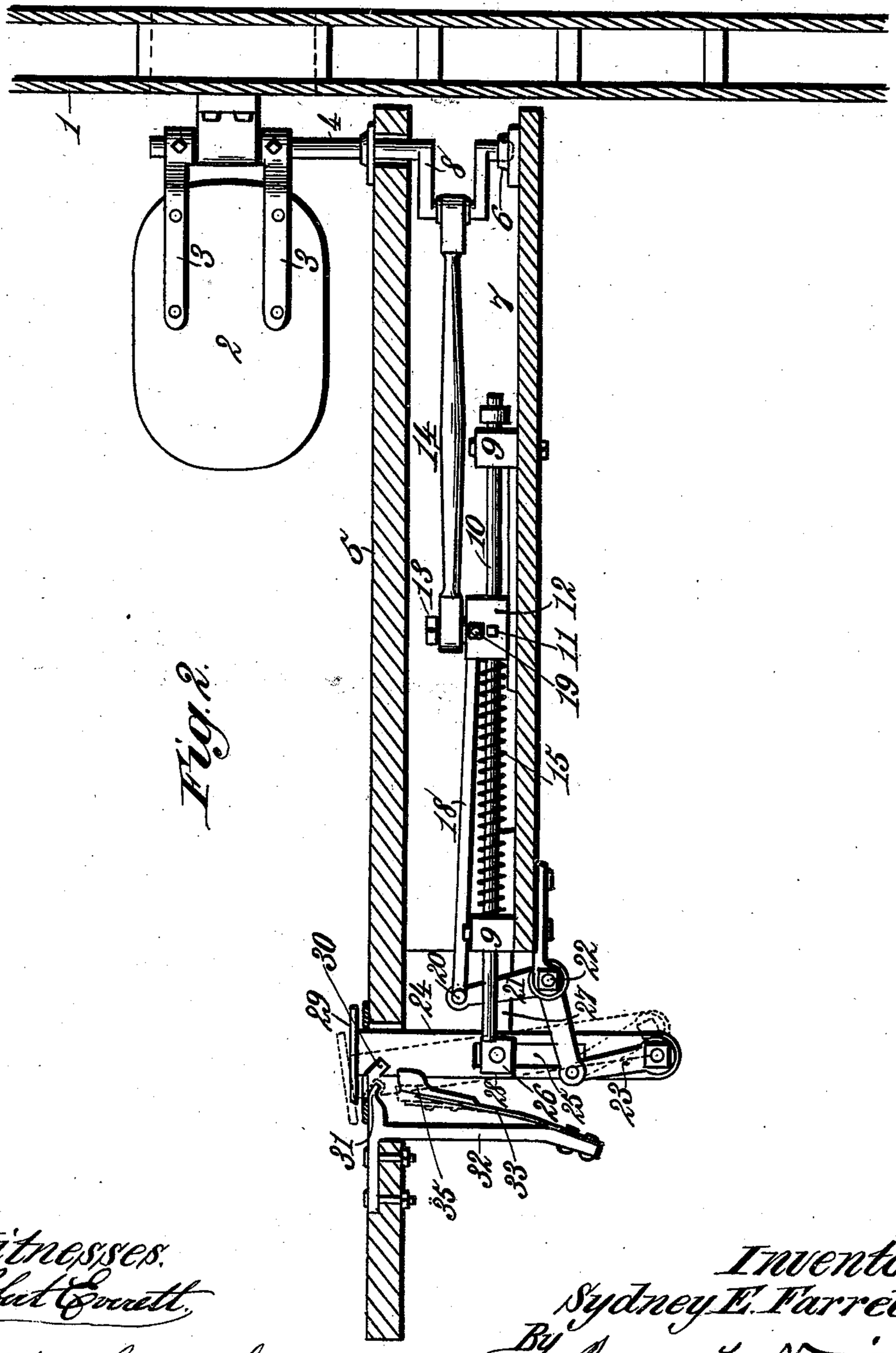

Fig. 2.

Witnesses.
Robert Everett.
Victor Coombs

Inventor:
Sydney E. Farrell.
By James L. Norris.
Atty.

UNITED STATES PATENT OFFICE.

SYDNEY ETHINGTON FARRELL, OF KEB, IOWA, ASSIGNOR OF ONE-HALF TO LINCOLN BROWN, OF SAME PLACE.

FURNACE-DOOR-OPERATING DEVICE.

SPECIFICATION forming part of Letters Patent No. 556,262, dated March 10, 1896.

Application filed July 29, 1895. Serial No. 557,489. (No model.)

To all whom it may concern:

Be it known that I, SYDNEY ETHINGTON FARRELL, a citizen of the United States, residing at Keb, in the county of Wapello and State of Iowa, have invented new and useful Improvements in Furnace-Door-Operating Devices, of which the following is a specification.

This invention relates to furnace-door-operating devices, and particularly to that class of devices employed for opening and closing the doors of locomotive-furnaces by mechanism operated by the foot of the fireman, whereby as the fireman approaches the door he may cause the door to open by stepping upon a pedal and then heave the coal into the fire-box, and as he steps back the door is automatically closed by a spring, the door thus being open only during the moment the coal is being actually thrown into the fire-box, preventing the entrance of cold air to the furnace and effecting a great economy in the consumption of fuel.

My invention has for its object to provide improved means for opening and closing the door and for holding the door open when it is desired to cool the furnace; and to these ends it consists in the novel features and in the construction or arrangement of parts hereinafter described and pointed out in the claims following the description, due reference being had to the accompanying drawings, forming a part of this specification, in which—

Figure 1 is a perspective view illustrating the door closed. Fig. 2 is a sectional elevation showing the door open, also showing the pedal-lever, in dotted lines, thrown rearwardly to hold the furnace-door open.

Referring to the drawings, the numeral 1 indicates a portion of a locomotive-furnace, and 2 the furnace-door. The door 2 is hinged to the furnace by leaf-hinges 3 and a pintle 4, the latter being extended down below the floor 5 of the cab and is stepped at its lower end in a bearing 6 supported on the floor of a housing 7, that serves to inclose the operating mechanism. The pintle 4 near its lower end is cranked, as at 8, for the purpose hereinafter described.

Arranged in bearings 9, supported upon the floor of the housing 7, is a reciprocating rod 10, upon which is rigidly secured by a set-screw 11 a cross-head 12, upon the upper side of which is formed a wrist-pin 13, and journaled upon said wrist-pin is one end of a pitman 14, the other end of which is journaled upon the crank 8.

Arranged upon the rod 10, between the cross-head 12 and the rear bearing 9, is a stiff coiled spring 15, which operates to throw the cross-head forward and thus cause the pitman 14 to throw the crank 8 in the proper direction to close the door, in which position the spring 15 normally retains it.

The numeral 18 indicates a connecting-rod provided at its opposite ends with journal-pins 19 20, the pin 19 being journaled in a suitable bearing formed in the cross-head 12 and the pin 20 journaled in a bearing formed in one end of a bell-crank lever 21, which is journaled on a pivot 22 supported by the floor of the housing 7.

To the other end of the bell-crank lever 21 is pivotally secured one end of a link 23, which at its other end is pivotally connected to a pedal-lever 24. The pedal-lever 24 extends up through an opening in the floor of the cab and is slotted, as at 25, to embrace a guide-block 26 pivotally mounted on a supporting-bracket 27 and flanged upon each side, as at 28, to hold the pedal-lever in engagement with the latter. The upper end of the pedal-lever is provided with a pedal 29, and near its upper end is provided with a downwardly-inclined notch or slot 30, which, when the pedal-lever is depressed and swung rearwardly, is adapted to engage a fixed hooked detent 31, secured to the floor of the housing 7, and hold said lever depressed until it is released from engagement with said detent.

In order to prevent the pedal-lever from engaging the fixed detent 31 when it is not desired to hold the pedal-lever 24 depressed, I provide a bracket-arm 32, which projects downward from the bottom of the floor of the cab and has secured to it one end of an upwardly-projecting spring 33, to the free end of which is secured a shoe 35, which bears against the rear side of the pedal-lever and normally presses the same forward out of en-

gagement with the detent 31, and the pedal-lever can thus be caused to engage said detent only when it is swung to the rear.

From the foregoing description the operation of my improved device will be readily understood.

In charging the furnace as the fireman approaches the furnace-door he places his foot upon the pedal 29 and depresses the pedal-lever 24, and thus through the medium of the link 23, bell-crank lever 21, and connecting-rod 18 retracts the cross-head 12 and rod 10 against the tension of the spring 15. As said cross-head is retracted it carries with it the pitman 14, which turns the crank 8 and thus rotates the pintle 4 and opens the door. After having cast the coal into the fire-box of the furnace the fireman steps back and off from the pedal 29, when the spring 15 will immediately thrust forward the cross-head 12 and rod 18 and through the medium of the pitman 14 and crank 8 will close the door.

At times the furnace becomes overheated and it is necessary to hold open the furnace-door to permit the furnace to cool, and in such event the fireman merely has to place his foot upon the pedal 29 and depress the pedal-lever 24 and at the same time push the pedal rearwardly, thus causing the slotted portion of the pedal-lever to engage the hooked detent 31, which holds the pedal-lever depressed and the door open. The door will be held in its open position until the pedal-lever is released from its engagement with the detent by being pushed forward, when the spring-pressed shoe 35 will force said lever out of engagement with the detent and the coiled spring 15 will restore the parts to their normal position and close the door.

It will thus be seen that the furnace-door is opened only during the time actually consumed in throwing the fuel therethrough into the fire-box and that the fireman has the free use of both hands to handle the coal, and also that the door may be held open whenever it becomes necessary to cool the furnace.

Having described my invention, what I claim is—

1. In a furnace-door-operating device, the combination with the furnace-door, of an oscillating pedal-lever, and mechanism operated thereby for opening the door, a spring operating to close the door, and a catch operating when the pedal-lever is oscillated rearwardly to engage said pedal-lever and hold the same depressed to keep the door open, substantially as described.

2. In a furnace-door-operating device, the combination with the furnace-door rigidly mounted on a cranked pintle 4, of a cross-head 12 fixed upon a reciprocating rod 10, a pitman 14 connecting said cranked pintle and cross-head, a spring operating to force said cross-head forward to close the door, a connecting-rod journaled at one end in said cross-head and at its other end pivotally connected to one end of a bell-crank lever, a pedal-lever, and a link pivotally connected to said pedal-lever and to the bell-crank lever, substantially as described.

3. In a furnace-door-operating device, the combination with the furnace-door, of a pedal-lever having a notch or recess upon one side, a fixed detent for engaging said notch, a spring for normally holding said pedal-lever out of engagement with said detent, mechanism operated by said pedal-lever for opening the door, and a spring operating to close the door, substantially as described.

4. In a furnace-door-operating device, the combination with the furnace-door rigidly mounted on a cranked pintle 4, of a cross-head 12 fixed upon a reciprocating rod 10, a pitman 14 connecting said cranked pintle and cross-head, a spring operating to force said cross-head forward to close the door, a connecting-rod journaled at one end in said cross-head and at its other end pivotally connected to one end of a bell-crank lever, a slotted pedal-lever 24 fitted upon a pivoted guide-block 26 and connected at its lower end to the said connecting-rod by a link, and provided near its upper end with an inclined notch 30, a fixed detent for engaging said notch, and a spring operating to normally maintain said pedal-lever out of engagement with said detent, substantially as described.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

SYDNEY ETHINGTON FARRELL.

Witnesses:
W. H. C. JAQUES,
LINCOLN BROWN.