

No. 668,496.

Patented Feb. 19, 1901.

P. L. CROWE.
GRATE FRAME.

(Application filed Mar. 24, 1900.)

(No Model.)

Fig. 1.

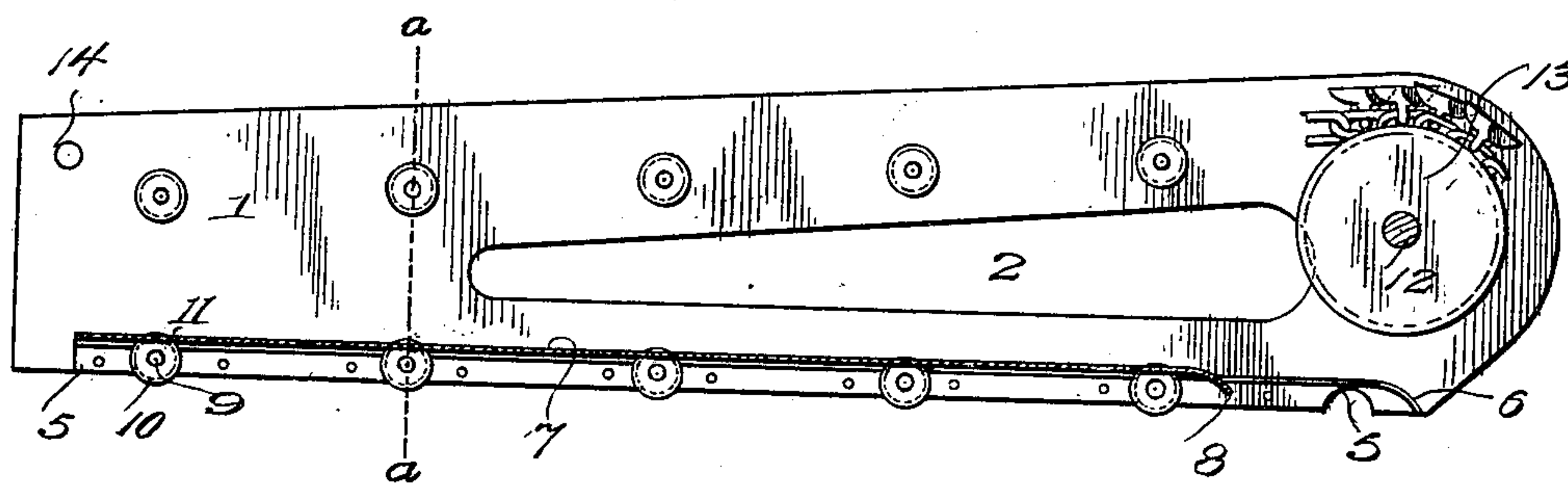


Fig. 2.

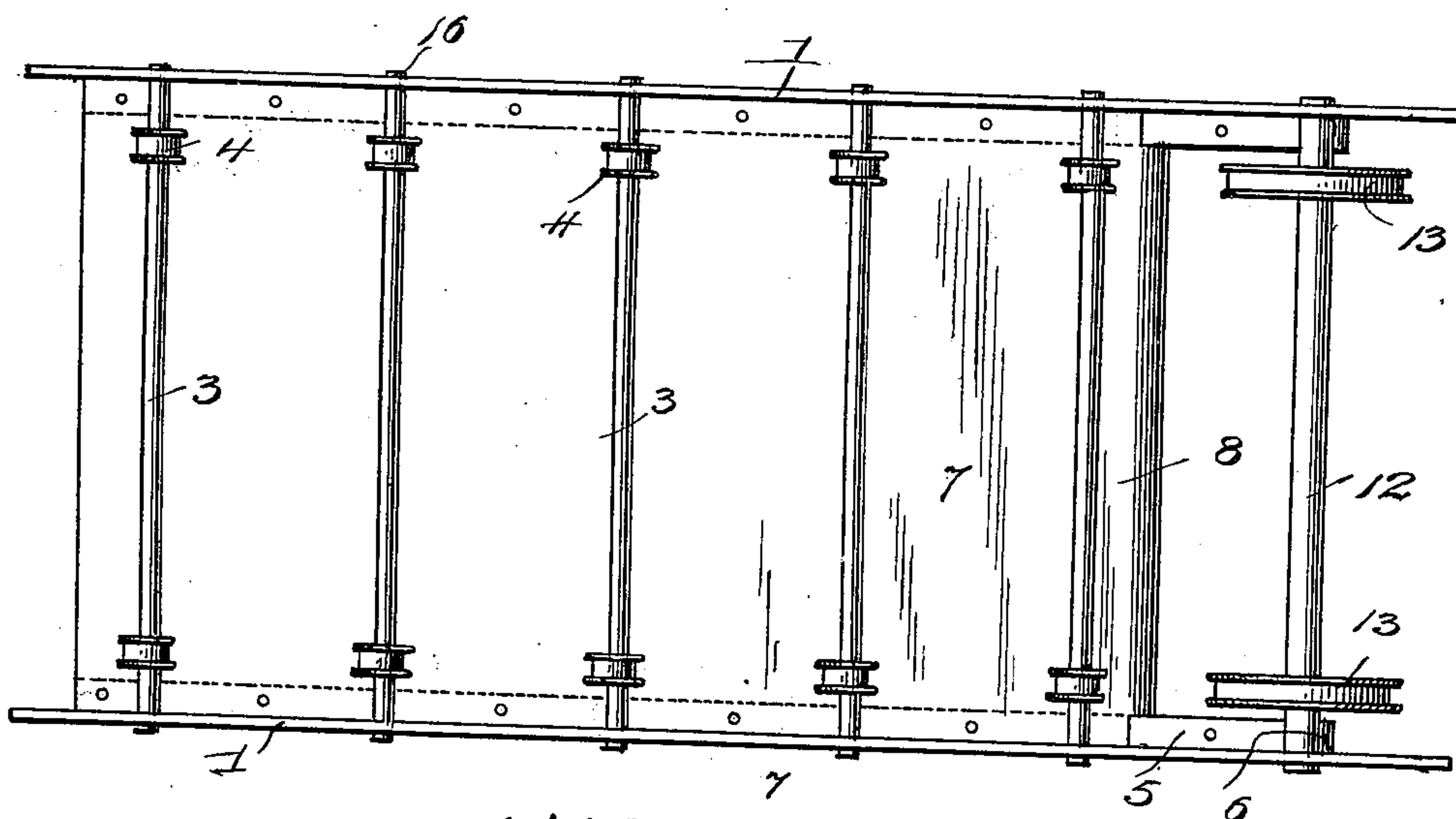
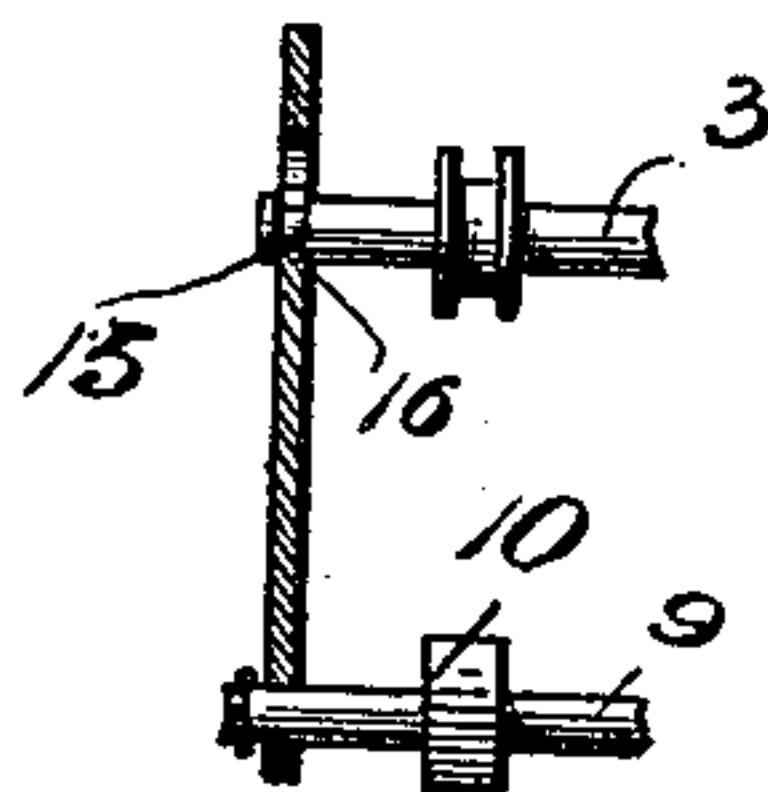


Fig. 3.



Witnesses

Fenton S. Pelt,
Edgar M. Fitchkin

Inventor
Paul L. Crowe
By
Mason Fitchkin
His Attorneys

UNITED STATES PATENT OFFICE.

PAUL L. CROWE, OF DULUTH, MINNESOTA.

GRATE-FRAME.

SPECIFICATION forming part of Letters Patent No. 668,496, dated February 19, 1901.

Application filed March 24, 1900. Serial No. 10,099. (No model.)

To all whom it may concern:

Be it known that I, PAUL L. CROWE, a citizen of the United States, residing at Duluth, in the county of St. Louis and State of Minnesota, have invented certain new and useful Improvements in Grate-Frames; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in grate-frames, and particularly to frames which are adapted to inclose chain-connected traveling grates.

It consists in a frame made up of side pieces arranged parallel and having transverse shafts connecting the same, the said shafts having pedaler-wheels or chain-supporting pulleys mounted thereon, a shoe-plate connecting the lower edges of the side plates, and means for supporting the shoe-plate in position.

It also consists in certain other novel constructions, combinations, and arrangement of parts hereinafter fully described, illustrated, and specifically claimed.

In the accompanying drawings, Figure 1 represents a longitudinal vertical section through a grate-frame constructed in accordance with my invention. Fig. 2 represents a top plan view of said frame. Fig. 3 is a transverse cross-section through said frame on a line with the upper and lower shafts.

In using chain grates for furnaces I find it desirable to employ a light and yet rigid and durable frame for inclosing and supporting the same. I also find it very desirable to employ a shoe-plate or floor beneath the return portion of the chain grate, which will be in position to collect the unburned fuel which may sift from the upper portion of the chain grate before it has become coked or partially burned thereon. The use of this shoe-plate or floor will enable me to collect the said unburned fuel and to have it carried forward by means of the return portion of the chain grate and deposited at a point where it may be returned to the fuel-chamber of the grate.

In embodying my invention in practical form I contemplate using vertically-arranged side plates, as 1 1, which can be made of comparatively thin material and are further

lightened by forming elongated apertures, as 2, in the body portion of said plates, which apertures also provide liberal air-passages for the admission of air to the space immediately beneath the fuel-carrying grate-bars and thence upward to aid combustion of fuel, at the same time cooling said bars. These plates are arranged parallel with the elongated sides of a chain traveling grate which the said frame is to inclose and support. Near the upper edges of the said plates 1 and extending from one side plate to the other is arranged a series of transverse shafts, as 3 3, mounted at their ends in the said plates. The shafts 3 3 are preferably provided at their ends with annular grooves, as 15, which are adapted to engage journal-bearings, as 16, formed in the side plates 1 1. The journal-bearings 16 are preferably formed with enlarged entrance-openings extending into the side plates and above them, so that the ends of the shafts may be inserted and permitted to be dropped down into place. These shafts not only serve to connect the sides of the frame, but are preferably provided with a series of pedaler-wheels or loose pulleys arranged near each side plate and adapted to support the connecting-chains of a chain grate. For this purpose the pedaler-wheels are preferably concaved upon their peripheries or are provided with side flanges, as 4, for limiting the movement of the chains. Near the lower edges of the side plates 1 are arranged longitudinally - extending angle-irons, as 5 5, forming shelves which extend nearly the whole length of the grate-frame. These shelves are preferably bent downwardly at their rear ends, as at 6, so as not to retard the chain of the grate in its movement. Supported upon these angle-irons or shelves is a shoe-plate or floor, as 7, extending from one side plate to the other and from one end of the frame almost or, if desired, quite to the other end thereof. The rear end is preferably turned downwardly, as at 8, to receive the grate-bars of the grate, and the front end may also be turned downwardly, if desired.

Immediately beneath the shoe-plate is arranged another series of transverse shafts, as 9 9, journaled at their ends to the side plates 1. In order to hold the plates in proper

relation to the shafts 9 9, I preferably drill pin-holes in the said shafts, adapted to receive cotter-pins which are placed through the said holes inside of the side plates. These shafts 5 9 also carry pedaler-wheels, as 10 10, the pedaler-wheels in this instance having flat peripheries and being adapted to project upwardly through a series of apertures or recesses 11 11, formed in the shoe-plate 7. The pedaler-wheels 10 10 extend sufficiently far above the surfaces of the shoe-plate to support the return portion of the grate as it passes through the grate-frame. The rear end of the grate-frame is provided also with the transverse shaft 15 12, which is located about half-way of the height of the said frame and is provided with large pedaler-wheels 13 13, provided with flanges to accommodate the chain grate in its descending movement. The shaft 12 is preferably located at the rear end of the frame, so that the chain grate travels rearwardly upon the pedaler-wheels 4 and downwardly around the pedaler-wheels 13 and forwardly again over the pedaler-wheels 10. It will be 25 seen that the shoe-plate 7 forms an imperforated surface beneath the return portion of the chain grate, so that it is in position to collect any siftings of fine unburned fuel from the fire-supporting portion of said grate. This sifting is likely to occur at the forward end of the grate where new fuel is fed thereon and before the same becomes coked upon the grate. After the coking operation takes place the fuel is less likely to fall through the 35 grate. The chain grate in its return movement to the front of the furnace will pass along the upper surface of the shoe-plate and scrape along all fuel which falls in front of its bars, returning the same to the front end of the furnace, where it is deposited within easy reach of the furnace-stoker and may be returned by him to the fuel-chamber for consumption.

While a frame of this character may be 45 mounted in any suitable manner, yet I preferably provide side plates 1 thereof with apertures, as 14, near their forward ends, forming journals by which the frame may be pivotally mounted in a furnace. This is often 50 desirable, as it is sometimes necessary in chain grates to raise or lower the rear end of the same to vary the distance between it and the bridge-wall of the furnace.

While I have described the pedaler-wheels 55 as loosely mounted upon the shafts 3 and 9, it will be apparent that the pedaler-wheels might be rigidly secured thereto and the shafts might be journaled at their ends in the side plates 1 1 without departing in the least 60 from the spirit of my invention. It will also be observed that the shelves 5 might be formed by upsetting the lower edges of the side plates, or the shoe-plate might be secured to the side plates by having its edges 65 bent upwardly or downwardly to form detaching-flanges, all within the scope of the present invention. It will be evident that a

frame constructed in this manner is well adapted for inclosing a chain grate and that it can be made quite light without detracting 70 from its strength and rigidity.

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

1. A frame for chain grates, comprising side 75 plates, transverse shafts connecting the same, a floor or shoe-plate connecting the lower edges of said side plates, whereby the frame may be well held together and the chain grate may be properly supported therein. 80

2. A supporting-frame for chain grates, comprising side plates, flanges or shelves formed near the lower edges of the side plates upon their inner surfaces, a shoe-plate or floor mounted upon the said shelves, and 85 means for supporting a chain-connected traveling grate between the said side plates, whereby the return portion of the chain grate may be caused to travel over the shoe-plate and scrape unburned fuel to the forward end 90 of said frame for further use.

3. A frame for supporting and inclosing a traveling grate, comprising side plates having apertures for reducing the weight of said plates and to provide air-passages, transverse 95 shafts connecting the said side plates, pedaler-wheels mounted upon the said shafts, a floor or plate connecting the lower edges of said side plates having apertures for accommodating the pedaler-wheels upon the lower shafts 100 mounted in the frame, the structure being such that a chain-connected traveling grate may be movably mounted in the frame, its return portion traveling over the surface of the shoe-plate for removing unburned fuel 105 therefrom, substantially as described.

4. A grate-supporting frame for chain grates, comprising side plates arranged vertical and parallel with each other, angle-irons 110 secured to their inner surfaces near their lower edges, forming shelves, a shoe-plate supported upon the said shelves and extending from one side plate to the other, the rear edges of said plate and the rear ends of said shelves being bent downwardly to more readily 115 receive the chain grate upon its return movement, a series of transverse shafts mounted near the upper edges of said plates, pedaler-wheels mounted near the ends of each of said shafts for supporting a chain-connected trav- 120 eling grate, a series of transverse shafts mounted beneath the shoe-plate and connecting the side plates, a series of pedaler-wheels mounted near the ends of said shafts, apertures being formed in the shoe-plate immediately 125 above the said wheels, so that they may partially project through the same to support the return portion of the chain grate, a transverse shaft arranged near the rear end of the grate-supporting frame and having 130 comparatively large pedaler-wheels mounted thereon for directing the grate in its downward movement, the side plates of the frame being provided near their forward ends with

apertures or journal-bearings, whereby the frame may be pivotally mounted in a furnace, substantially as described.

5 A frame for chain grates comprising side plates, transverse shafts connecting the same, some of said shafts near the upper edge of the frame having annular grooves near their ends adapted to engage journal-bearings formed in the said side plates, said journal-bearings
10 having enlarged entrance-openings above them, and some of said shafts being connected

with the said plates and held in proper position with relation to the same by means of cotter-pins, and a floor or shoe-plate connecting the lower edges of the side plates for completing the frame, substantially as described. 15

In testimony whereof I hereunto affix my signature in presence of two witnesses.

PAUL L. CROWE.

Witnesses:

JOSEPH F. HAYES,

FRANK COLEMAN.