

(No Model.)

2 Sheets—Sheet 1.

J. C. KNOEPPPEL.
FURNACE GRATE BAR.

No. 246,015.

Patented Aug. 23, 1881.

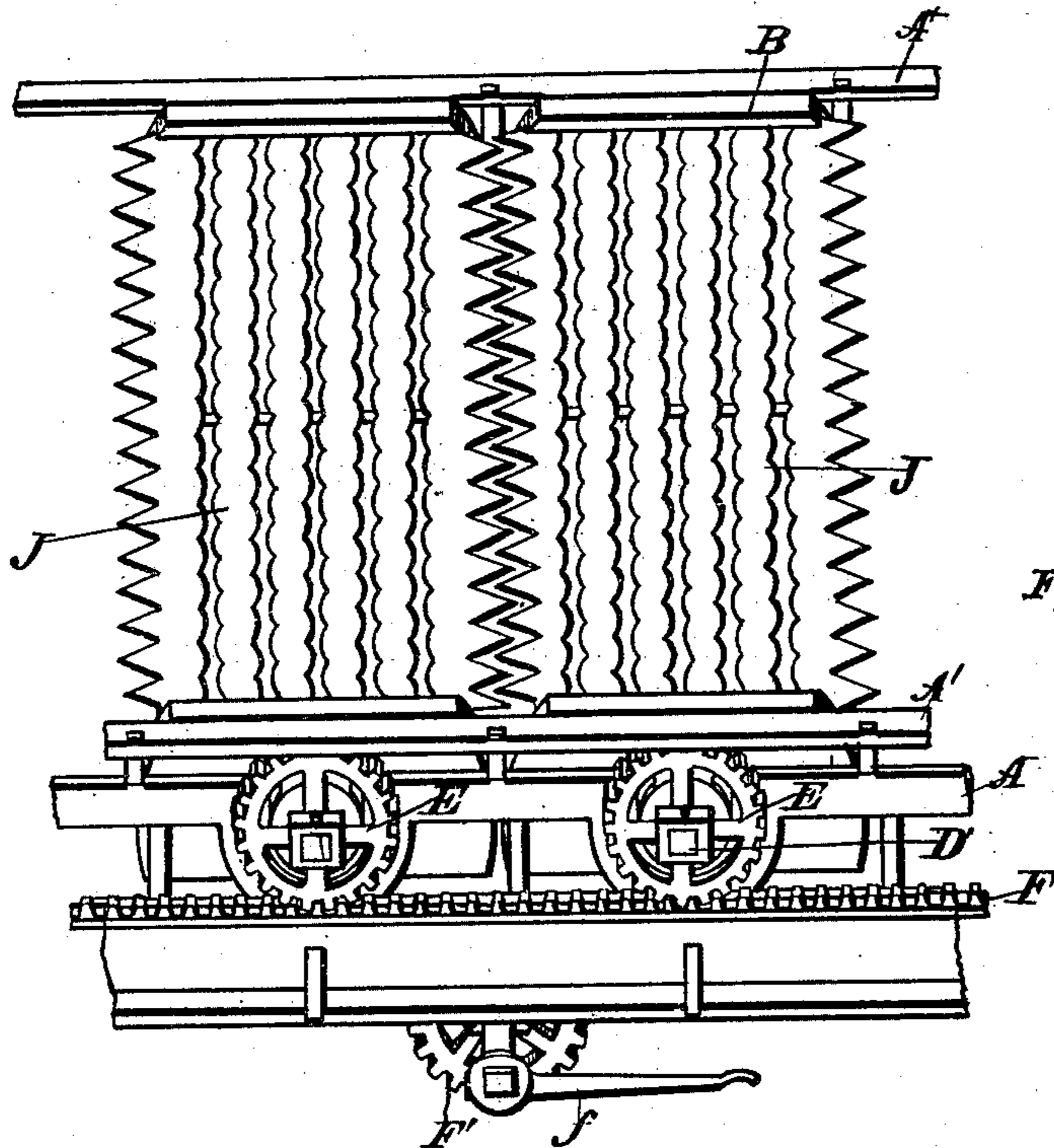


Fig. 1.

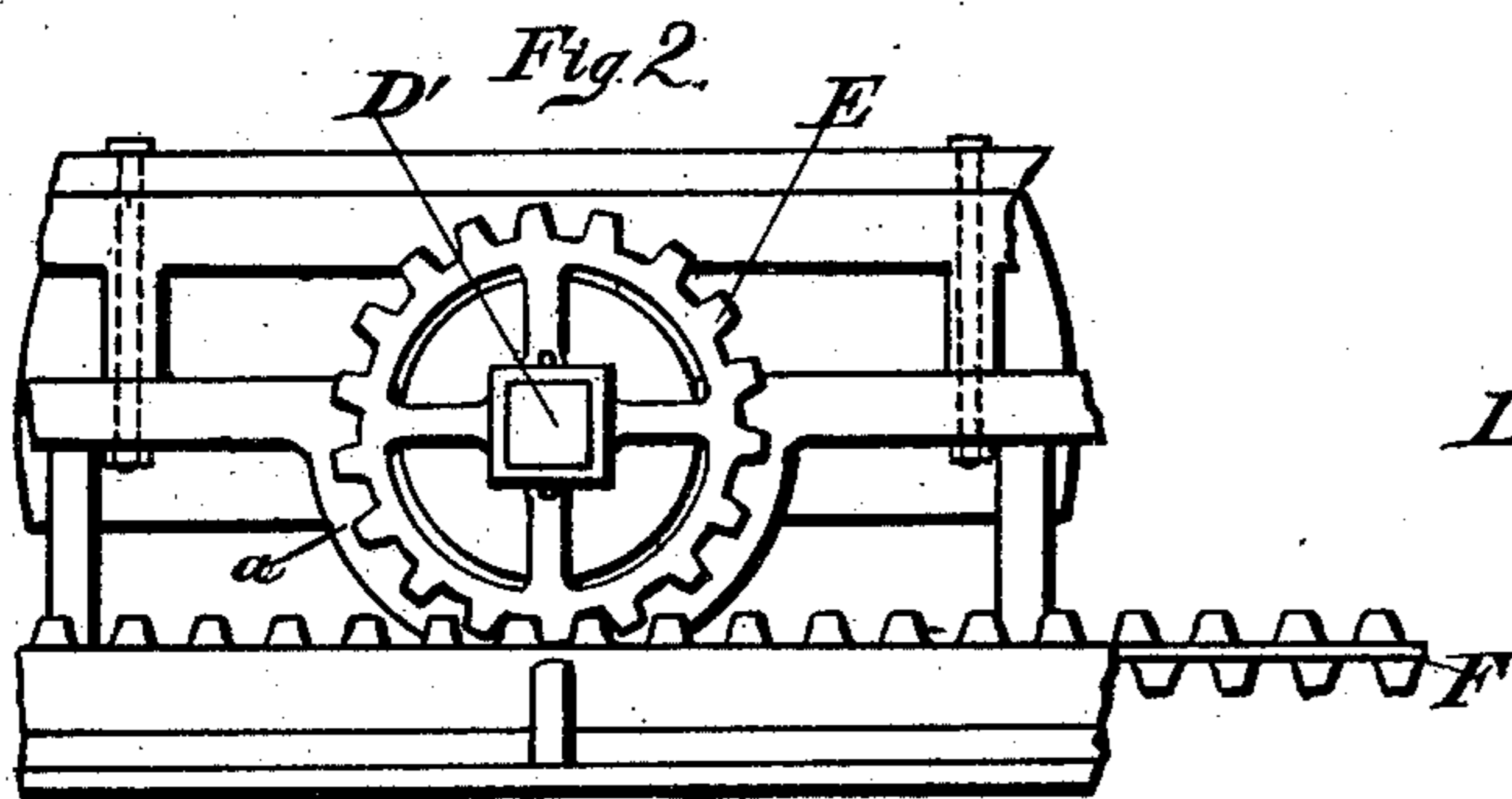


Fig. 2.

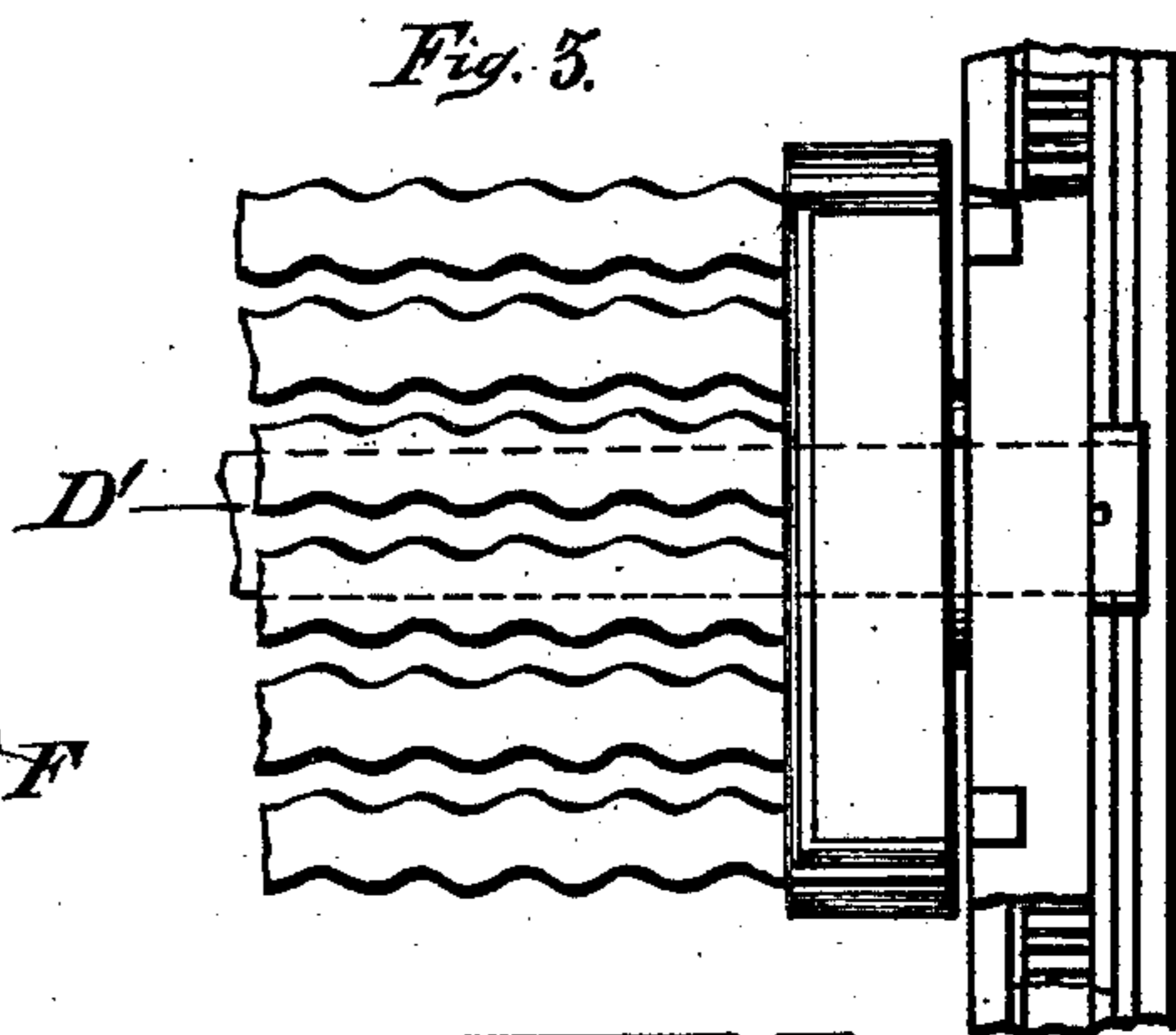


Fig. 3.



Fig. 4.

Witnesses.

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(No Model.)

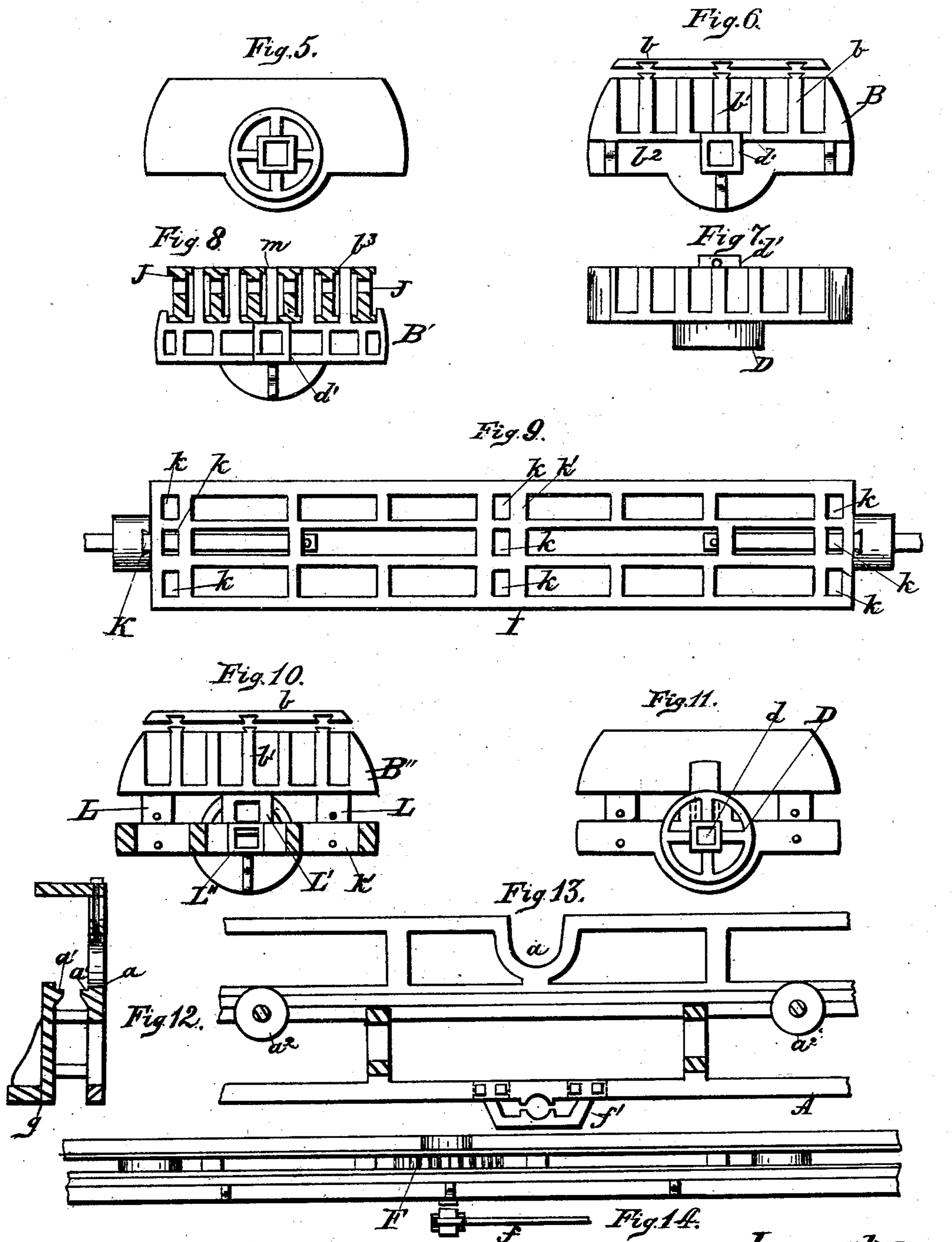
2 Sheets—Sheet 2.

J. C. KNOEPPPEL.

FURNACE GRATE BAR.

No. 246,015.

Patented Aug. 23, 1881.



Witnesses.

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UNITED STATES PATENT OFFICE.

JOHN C. KNOEPPPEL, OF MILWAUKEE, WISCONSIN.

FURNACE GRATE-BAR.

SPECIFICATION forming part of Letters Patent No. 246,015, dated August 23, 1881.

Application filed June 14, 1881. (No model.)

To all whom it may concern:

Be it known that I, JOHN C. KNOEPPPEL, of Milwaukee, in the county of Milwaukee, and in the State of Wisconsin, have invented certain new and useful Improvements in Agitating and Dumping Devices for Furnace Grate-Bars; and I do hereby declare that the following is a full, clear, and exact description thereof.

My invention relates to furnaces; and it consists in devices for securing two or more grate-bars together and shaking and dumping them in series, as will be more fully described hereinafter.

In the drawings, Figure 1 is a perspective view of a furnace-bed embodying my invention. Fig. 2 is an end view of a portion of the same. Fig. 3 is a top view. Fig. 4 is a side view of an improved grate-bar which forms the subject of a separate application bearing even date herewith. Fig. 5 is an outer end view of one of the end seats for the grate-bars. Fig. 6 is an inner end view of the same, and Fig. 7 is a top view. Fig. 8 is an end view of a center rest for long grate-bars, which latter are shown in cross-section. Fig. 9 is a rocking bed, which I use in connection with short grate-bars. Fig. 10 is a cross-section of the rocking bed, and an end view of a seat for the ends of the short bars partly adjusted upon it. Fig. 11 is an end view of the same. Fig. 12 is a detail section of the front bearing-bar, and an angle-bracket which assists it in supporting the operating mechanism. Fig. 13 is a front view of the bearing-bar, with the angle-bracket removed. Fig. 14 is a top view of angle-bracket and bearing-bar.

A A are what I term the "bearing-bars," and these are placed upon or in the furnace-walls.

B B are seats in which the ends of the grate-bars rest and are secured, and b are caps having dovetailed grooves by which they are secured upon dovetailed projections on certain of the partitions b' of the seats B, to hold the bars in place.

Each of the seats B is provided with a trunnion, D, having a squared opening, d , through its length, to receive a supporting and operating shaft, D' , and a flange, b^2 , serves to strengthen each seat B, and on the side of flange, opposite the trunnion, I provide the seats with a shaft-box, d' .

The trunnions D are designed to rest in bearing-boxes a on the bearing-bar, and to be cov-

ered by caps $A' A'$, which also serve to protect the operating mechanism from falling ashes, &c. Gear-wheels E are keyed to shaft D' , just in front of the trunnions D, and these gear-wheels mesh with the upper teeth of a rack-bar, F, the lower teeth of which mesh with a second gear-wheel, F' , having a handle, f , by which it is operated.

The rack-bar F is supported by lugs $a' a'$ on the angle-piece and bearing-bars, so that its lower teeth will hang down between them, and to relieve the friction of the bar upon the lugs $a' a'$, I journal rollers $a^2 a^2$ between the bearing-bar and angle-bar, just high enough to take some of the weight of the bar.

The gear-wheel F' is journaled in hangers f' on the lower edge of the angle-bar and front bearing-bar.

If I so desire, I may dispense with the rack-bar and connect the gear-wheels E by another gear-wheel journaled between, without departing from the spirit of my invention.

I usually place six bars side by side, securing their ends in the seats B, the partitions of which serve to hold them the desired distance apart. I also provide center rests, B' , when the grate-bars are long, which, like the end rests, have partitions, and have strengthening-flanges and shaft-boxes b^2 passing through them, as shown in Fig. 8.

In Fig. 1 I have shown the grate-bars extending from one side to the other of the fire-bed; but it may be found desirable at times to use a double row of bars. To meet such an emergency I have provided a rocking bed, I, Fig. 9, to which I attach trunnions by a dovetail, K. This rocking bed is cast with vertical openings $k k k$, through which lugs $L L' L$ on seat or rests B'' , which are modifications of the seats B, are passed. The center lug, L' , on the end seat or rest, B, has a squared opening through it, which, when the seat or rest B'' is in place, coincides with a shaft-box, L'' , in the rocking bed, so that the shaft D' at that end will lock the seat or rest to the rocking bar. Bolts passed through the partitions $k' k' k' k'$ and the depending lugs $L L' L$ also afford additional security. One center piece may serve as a seat for the ends of both sections of the grate-bars J, or each section may have a pair of seats or rests.

Instead of the rocking bar, I may retain the

long supporting and operating shaft, and passing a center rest, B', to its middle, secure it there, and then lay the short bars in place, those in one section resting with their inner ends against the inner ends of those in the next section; or I may run the long shaft D' through the trunnions and shaft-boxes of the rocker-bar.

I preferably make the outer bars of each series with wider flanges than those on the inner bars, and these flanges have their outer edges serrated, the serrations of the outer flange of the grate-bar of one series meshing with those of the outer bar of the next series, so that when the grate-bars are in their normal or vertical position the fire-bed will be uninterrupted, and yet neither series will interfere with the movements of the other.

It is obvious that my seats or rests are equally well adapted for stationary fire-beds with either long or short bars as they are for dumping and agitating grates, and when such fire-beds are employed I may dispense with gears and rocking devices and employ stationary bearings or rests.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a furnace-bed, the bearing-bars having trunnion-boxes, in combination with one or more supporting and operating bars, and seats provided with partitions for the grate-bars, as set forth.

2. In a furnace-bed, the combination of bearing-bars, end seats provided with partitions,

and grate-bars with the supporting and operating bars and gear-wheels, substantially as set forth.

3. In a furnace-bed, the combination of bearing-bars, end seats provided with partitions, and grate-bars with the supporting and operating bars, gear-wheels, and rack-bar, as set forth.

4. In a furnace-bed, the end seats for the grate-bars, having trunnions and shaft-box, and divided by partitions into spaces for the ends of the grate-bars to fit in, as set forth.

5. The end seats having partitions for securing the bars the proper distance apart, some of which partitions have dovetail projections to receive caps having corresponding grooves, as set forth.

6. The center seats or rests having vertical partitions, and having a squared opening to receive the operating-shaft, as set forth.

7. The combination of the front bearing-bar, having shoulder a' , and angle-piece, having like shoulder a' , with the rack-bar, as set forth.

8. The combination of shaft D', end rests, B, having trunnions D, gear-wheels E, rack-bar supported between the bearing-bar A and angle-piece g by shoulders $a' a'$, and rollers $a^2 a^2$, and the gear-wheel F', as set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 2d day of June, 1881.

JOHN C. KNOEPPPEL.

Witnesses:

S. S. STOUT,

HAROLD G. UNDERWOOD.