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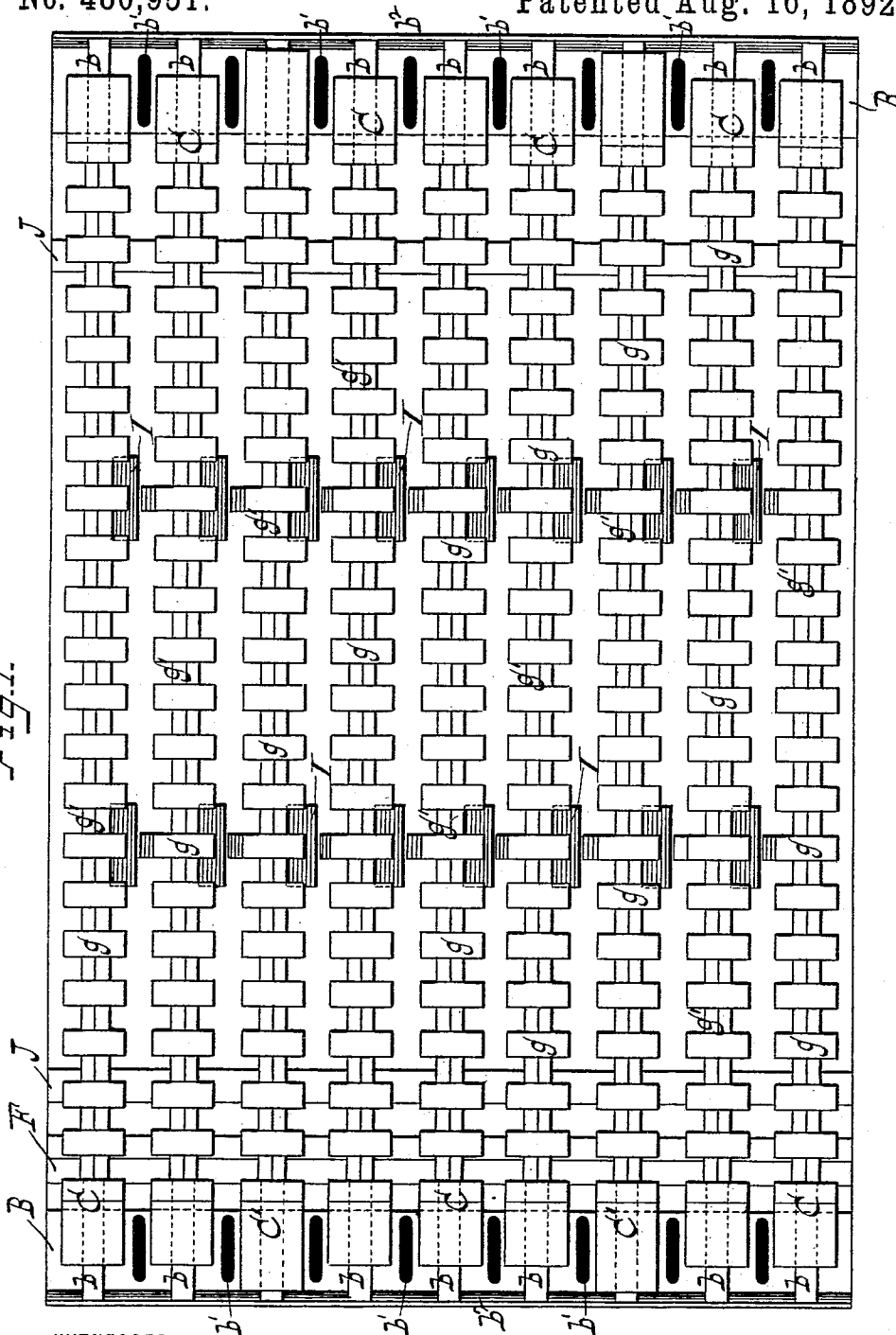
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J. L. MASON.
FURNACE GRATE.

No. 480,951.

Patented Aug. 16, 1892.

Fig. 1.



WITNESSES:

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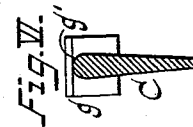
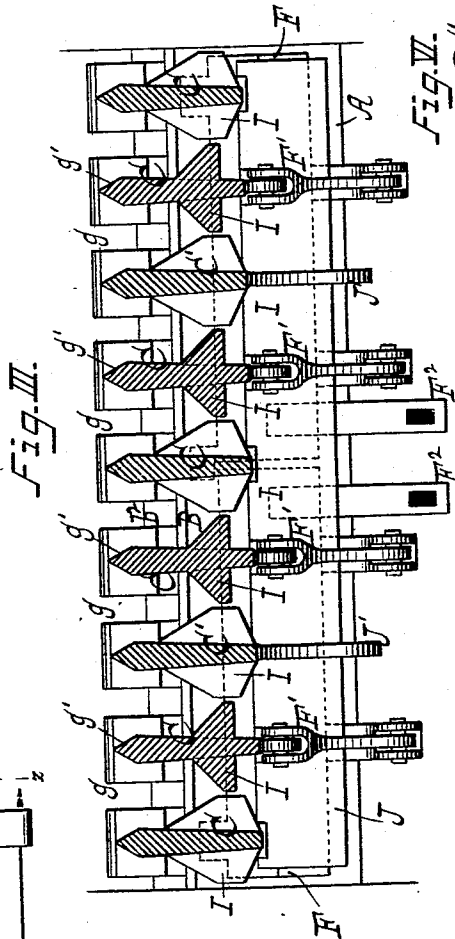
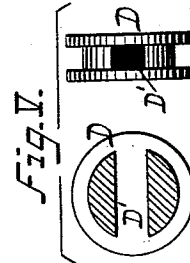
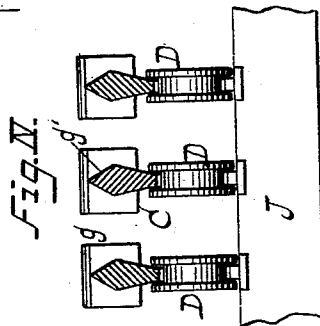
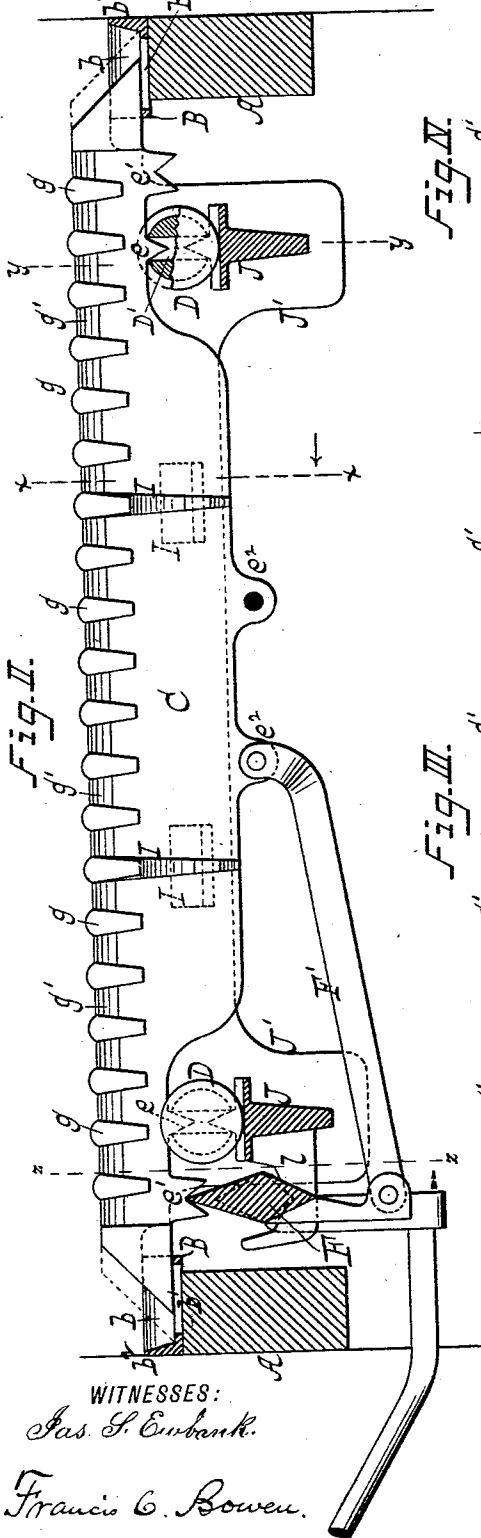
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FURNACE GRATE.

No. 480,951.

Patented Aug. 16, 1892.



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(No Model.)

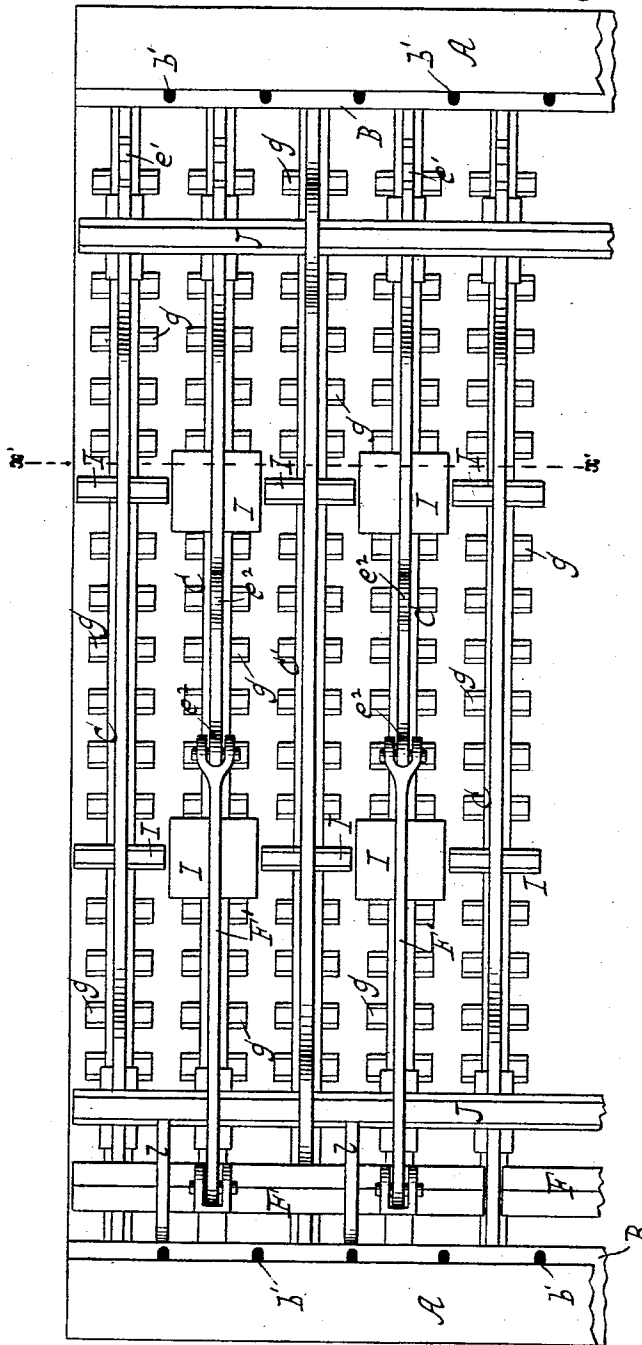
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FURNACE GRATE.

No. 480,951.

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Fig. III.



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FURNACE GRATE.

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Fig. VIII.

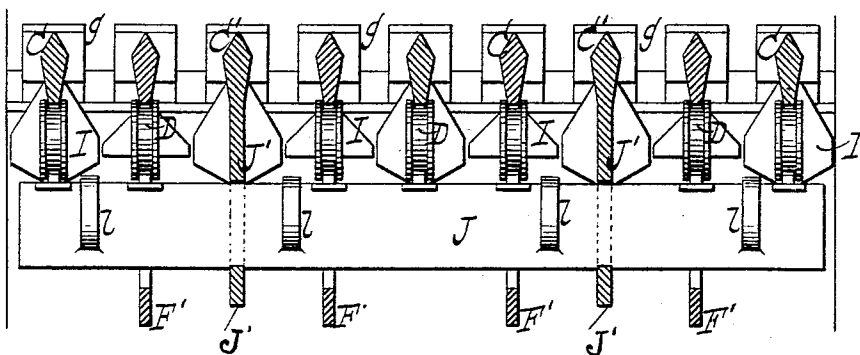
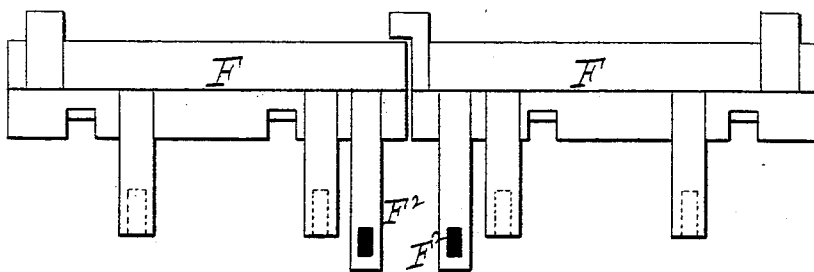


Fig. IX.



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UNITED STATES PATENT OFFICE.

JOHN L. MASON, OF BROOKLYN, NEW YORK.

FURNACE-GRATE.

SPECIFICATION forming part of Letters Patent No. 480,951, dated August 16, 1892.

Application filed December 12, 1890. Serial No. 374,440. (No model.)

To all whom it may concern:

Be it known that I, JOHN L. MASON, a citizen of the United States, and a resident of Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Furnace-Grates, of which the following is a specification.

My invention relates to the construction of the grate-bars and other parts of furnace-grates, and especially that class thereof incorporating longitudinally-movable grate-bars and a means for shaking or reciprocating such bars alternately in opposite directions.

The novel features of my construction and the advantages arising therefrom are hereinafter fully described, with reference to the accompanying drawings, and pointed out in the claim.

In the accompanying drawings, Figure I represents a plan or top view of a grate embodying my invention. Fig. II represents a vertical longitudinal section thereof. Fig. III represents a vertical cross-section thereof on the line $x x$, Fig. II, and line $x' x'$, Fig. VII. Fig. IV represents a cross-section of a portion thereof on the line $y y$, Fig. II. Fig. V represents detail views of a friction-roller. Fig. VI represents a cross-section of one of the grate-bars with a modification in the shape thereof. Fig. VII is an inverted plan view. Fig. VIII represents a vertical cross-section of the grate on the line $z z$, Fig. 2, and Fig. IX represents a side view of the rocking bar.

The letter A indicates a girder, which in practice is erected at each end of the furnace and on which are mounted sills B for supporting the ends of the series of grate-bars.

The letter C indicates the grate-bars, two of which C' are usually left stationary for the purpose of supporting certain other parts hereinafter described, while the remaining bars are movable in longitudinal direction.

The letter D indicates friction-rollers serving to support the intermediate portion of the movable grate-bars C, two or more rollers to each bar, and F indicates a rocking bar for operating the series of movable grate-bars.

Each of the movable grate-bars C is formed with two spurs e and two forks e' upon its lower edge, by which spurs each of said bars engages the friction-rollers D, and by one of which forks alternate movable bars engage

the rocking bar F, the remainder of the movable bars being connected to the rocking bar by pivoted links F' in such a manner that when the proper motion is imparted to the rocking bar it acts on the grate-bars to shake or reciprocate the same alternately in opposite directions.

On the upper edge of each grate-bar C or C' is formed a series of teeth g , which project laterally in opposite directions therefrom, and those portions of said upper edge which are intermediate of these teeth are beveled or chamfered toward both sides of the bar, as at g' , such beveled part being either flat, as in Figs. 3 and 4, or round, as in Fig. 6.

On the opposite sides of each grate-bar C or C' are formed blades or wings I, usually in two sets, with those of each set lying in a corresponding plane transversely to the grate. Said wings I extend approximately at right angles to each other upon the contiguous sides of adjacent grate-bars, they being respectively vertical and horizontal. In other words, the wing or wings on either side of either grate-bar extend at right angles to the wings on the contiguous side of an adjacent bar. The purpose of these wings I is to brace or support the grate-bars laterally by contacting with each other upon their vertical edges during wabbling or sidewise movement, caused by the longitudinal movement of the bars or expansion due to the heat, they being, however, designed to remain out of actual contact under normal conditions, and by reason of the support thus afforded the bars are not liable to buckle or warp by the heat to which they are exposed in use, while, due to the arrangement of the wings at right angles to each other, such support is maintained throughout the reciprocating motion of the bars. In other words, the wings I of adjacent bars may always contact at some one point, irrespective of the positions of the bars. The wings I are independent of the teeth g of the grate-bars, and are of a proper width or thickness to project beyond said teeth laterally to the bars, so as to preserve and regulate the degree of the space between the bars, and in order to present the least obstruction to the air-draft between the bars those wings which extend in vertical direction may be in the

vertical plane of one of the teeth of the proper bar, as shown in Fig. 2. In order to prevent ashes from lodging on the wings I, their top edges may be beveled, as shown in Fig. 3. In the example shown the wings I of each bar are parallel; but, if desired, they may be at right angles, it being only necessary that the wings of contiguous sides of the bars shall be at right angles to each other. It will be apparent that if the teeth *g* of the grate-bars extended laterally therefrom such a distance as to bring their ends in close proximity they would act as spacing-lugs, and should any expansion of the bars and wobbling thereof occur during the longitudinal movement of the bars the teeth might contact, and thus serve to properly space the bars. The disadvantage of such an arrangement, however, would be that teeth by taking up considerable space would seriously interfere with the free passage of air to the fire on the grate.

In view of the above I construct all the teeth *g*, which serve to assist in supporting the fuel, so that their ends are at a considerable distance apart, while below the same are formed the wings I, of which, it will be seen, there are but two lines extending transversely across the grate. These wings therefore serve to keep the grate-bars properly spaced and prevent buckling, while at the same time the air-draft is interfered with to but the slightest extent and a uniform air-space is presented at the top of the grate. In other words, if the wings were at the top of the grate-bars just so much air-space as occupied by the wings at that point would be cut off.

Each of the friction-rollers D is formed with a hole D', (best seen in Fig. 5,) which extends entirely through it in a plane intersecting its axis, and the spur *e* or its substitute of either grate-bar engages the roller at one end of said hole, while the roller in turn engages with a spur *o* of a guide-bar J at the other end of said hole. The friction-roller now commonly used has sockets to engage the spurs *e o*; but these sockets are liable to clog with ashes, whereas by the hole D' extending through the roller any particles of ashes falling on the roller may readily escape, obviating the danger of clogging the parts.

Each of the roller guide-bars J is hung in stirrups J' of the stationary grate-bars C', and one of said guide-bars carries two arms *l*, Fig. 2, forming bearings for the rocking bar. The rocking bar F lies in a horizontal plane below and at right angles to the grate-bars,

and it is divided transversely into two or more sections, (see Fig. 3,) which are detached from each other, thus practically forming independent bars. Each of these sections of the rocking bar F has an arm F² projecting therefrom to receive a key or lever for imparting motion thereto independently of the other, and each is constructed to act on a certain number of the movable grate-bars C in the manner hereinbefore explained, so that by working one or both sections of the bar either a portion or the whole series of grate-bars may be operated at any one time, as the condition of the fire may demand.

Each of the sills B, on which rest the ends of the grate-bars, has a series of guides *b* for the bars engaging with suitable grooves therein and is formed with openings *b'* between said guides, while at the outer edge of each sill is a vertical flange *b*², the inner surface of which is inclined in an inward direction. The openings *b'* afford a circulation of air for cooling the sills, besides permitting escape of ashes, and by the inclined inner surface of the flange *b*² the ashes displaced by the ends of the grate-bars in the motion of the bars are deflected in an upward direction, so that the sills are left practically free of ashes at all times, thus presenting a clear or unobstructed path to the movable bars.

I do not claim as my invention the construction of the fixed grate-bars to support the roller guide-bar, nor the construction of said guide-bar to support the rocking bar, the essential features of my invention being the grate-bars with their spacing lugs or wings, the friction-rollers each with a hole extending entirely through it, and the independently-operating rocking-bar sections—that is to say, the combination of these features with certain other parts, as enumerated in the next following clause.

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

In a furnace-grate, bars having on their upper edges a series of transverse teeth projecting beyond the sides thereof and at a point below said teeth blades or wings with beveled upper edges, said blades or wings upon one bar being horizontal and on the next bar vertical, with their contiguous edges in close proximity, thereby forming spacing-lugs, substantially as set forth.

JOHN L. MASON.

Witnesses:

CHAS. WAHLERS,
JAS. S. EWBANK.