

(No Model.)

2 Sheets—Sheet 1.

F. X. GOSSELIN.
GRATE.

No. 538,829.

Patented May 7, 1895.

Fig. 1.

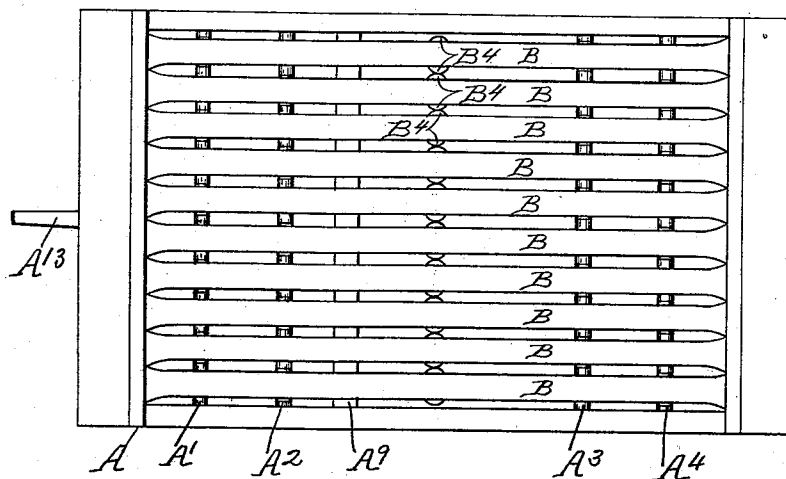
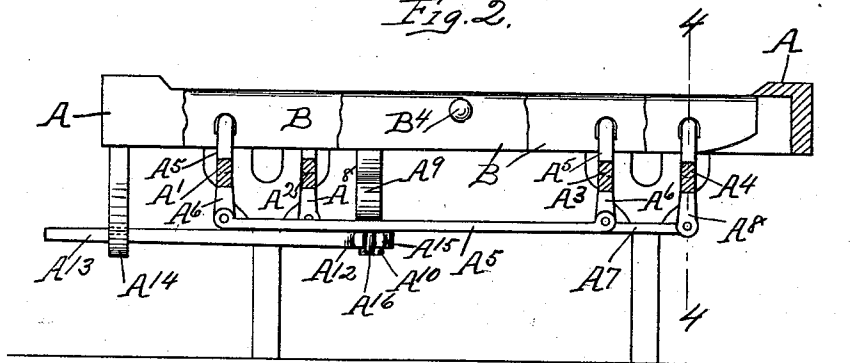


Fig. 2.



Witnesses=

G. W. Curtis

L. Nolan

Inventor:

Frank X. Gosselin

by Mosher & Curtis
Attys.

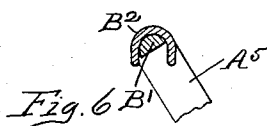
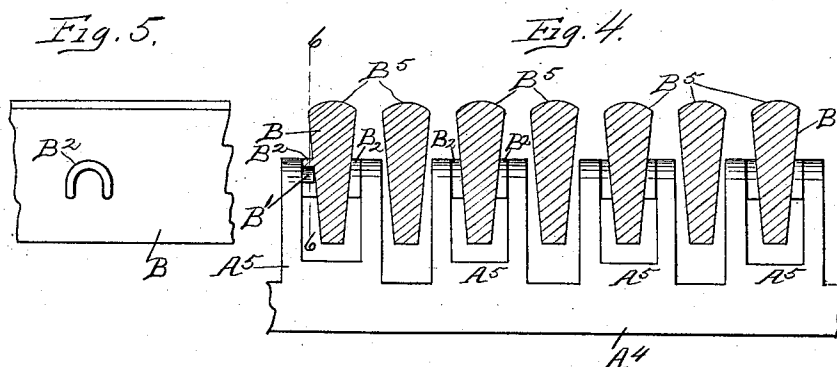
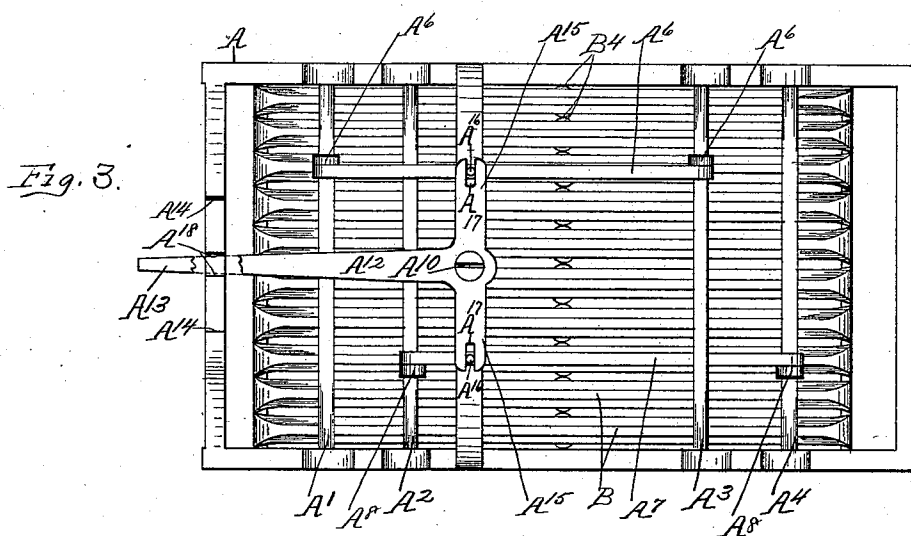
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2 Sheets—Sheet 2.

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UNITED STATES PATENT OFFICE.

FRANK X. GOSSELIN, OF WEST TROY, NEW YORK.

GRATE.

SPECIFICATION forming part of Letters Patent No. 538,829, dated May 7, 1895.

Application filed December 21, 1894. Serial No. 532,597. (No model.)

To all whom it may concern:

Be it known that I, FRANK X. GOSSELIN, a citizen of the United States, residing at West Troy, county of Albany, and State of New York, have invented certain new and useful Improvements in Grates, of which the following is a specification.

The invention relates to such improvements and consists of the novel construction and combination of parts hereinafter described and subsequently claimed.

Reference may be had to the accompanying drawings, and the letters of reference marked thereon, which form a part of this specification.

Similar letters refer to similar parts in the several figures therein.

Figure 1 of the drawings is a top plan view of my improved grate. Fig. 2 is a side elevation of the same with the bars and supporting-frame partly broken away. Fig. 3 is a bottom plan view of same. Fig. 4 is a view in cross-section of a plurality of neighboring bars, taken on the broken line 4 4 in Fig. 2. Fig. 5 is a view in side elevation of a portion of one of the bars. Fig. 6 is a vertical section taken on the broken line 6 6 in Fig. 4.

A is the supporting frame in which four rock-shafts A¹, A², A³, and A⁴ have end bearings. Each rock-shaft is provided with upwardly projecting bar-supports A⁵ severally bifurcated and adapted to support one end of a grate bar B. The bar-supports on the rock-shaft A¹ support the contiguous ends of the alternate bars. Those on rock-shaft A² support the corresponding ends of the other bars, and those on rock-shafts A³ and A⁴ support in a similar manner the opposite ends of the same bars. The shafts A¹ and A³ which support the opposite ends of the same bars, are connected by a link pivoted at its opposite ends to the respective rock-levers A⁶ depending from the shafts, and the shafts A² and A⁴ are similarly connected by the link A⁷ pivoted to rock-levers A⁸. The cross-bar A⁹ fixed at its ends upon the side-pieces of the grate-frame, supports about midway of the grate the pivot or fulcrum A¹⁰ of the three-arm lever A¹², the operating arm A¹³ being considerably longer than either of the other two. The operating arm extends to the front of the furnace within easy reach of the fireman, and is limited in its

vibratory movements by the two stops A¹⁴. The short arms A¹⁵ are respectively connected with the links A⁶ and A⁷ by pins A¹⁶ capable of an endwise and sidewise movement in the open end slots A¹⁷ in the ends of the lever-arms.

When the three-armed lever is operated, an endwise movement is communicated to all the grate-bars, one set of alternate bars being moved in one direction, and the other set of alternate bars being simultaneously moved in the opposite direction.

As a means for connecting the grate-bars with the bifurcate supports the upper ends of the supports are provided on each bifurcate arm with a half-round offset or pin B¹ and the several bars with a projecting flange B² on each of the opposite sides in the form of an inverted recess having a rounded bottom adapted to receive the half-round pin which fits loosely therein, the rounded portion bearing on the rounded bottom of a recess. Where the upper rounded, and the lower flat, surfaces of the pins meet, a comparatively sharp edge is formed on opposite sides of the pin which engages the side-walls of the bar recess when the bifurcate arms are inclined or tipped in shaking the grate, and prevents the pins from slipping out from engagement with the bar-recesses in case a bar should offer unusual resistance when the bifurcate arms are returned to a vertical position.

The grate-bars are severally provided on their opposite sides with a projecting lug or knuckle B⁴, the several knuckles being so arranged relatively to each other that they will lie in the same straight line extending transversely of the several bars when the bars are in position for use, as shown in Figs. 1 and 3, so that the neighboring knuckles of the bars will engage with each other. I am thus able to prevent the bars from warping or bending laterally under the influence of the furnace heat, thereby maintaining the bars at a uniform distance apart throughout their lengths.

When the bars are moved as previously described, in shaking the grate, the knuckles move with the bars and pass each other. The jar or vibratory movements imparted to the moving bars by the impact of the knuckles one with another, tends to remove the ashes

from the upper surface of the bars. To facilitate such removal of the ashes from the bars I make the upper surface of the individual bars slightly rounded in cross-section, or convex, as shown in Fig. 4 at B⁵. The jar imparted to the bars during their endwise movements causes the ashes to gravitate from the rounded surface and pass down between the bars to the ash-pit or floor beneath.

10 My improved grate is especially adapted for burning very fine or pea coal in which practice the mass of ignited coal above the grate-bars is kept very thin to permit of the passage of sufficient air therethrough to maintain the necessary combustion. It is essential
15 therefore that the movement of the grate-bars should be only sufficient to separate the ashes from the unburned coal without breaking up the ignited mass and interfering with its even
20 distribution over the surface of the grate.

By moving the alternate bars simultaneously and in opposite directions, I not only avoid breaking through the ignited mass, but aid the distribution and maintain a uniform
25 thickness above the grate.

By placing the operating supports and connections beneath the grate, space is economized and the mechanism is accessible from the ashpit for repairs.

30 When desired, the knuckles on the sides of the grate-bars may be projected only far enough to engage with their neighboring knuckles when the bars bend laterally, being projected sufficiently to engage before the
35 bars bend perceptibly.

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

1. In a grate, a series of parallel grate-bars movable endwise relatively one to another

and severally provided on their opposite sides 40 with knuckles so arranged relatively to each other that the several knuckles normally occupy approximately the same straight line extending transversely of the several bars, with the neighboring knuckles in engagement 45 with each other, and that the alignment and engagement of the knuckles are broken by the endwise movement of the bars, substantially as described.

2. In a grate, the combination with a series 50 of grate-bars movable endwise and severally provided with an inverted recess rounded on the bottom, of a rock-shaft, means for rocking the shaft, bifurcate bar-supports on the shaft, a pair of half-round pins on each bar- 55 support, one on each bifurcate arm projecting inwardly on the same axial line, with the round part normally bearing upon the rounded bottom of a bar-recess, whereby the bars are supported by such pins, and the sharp edges of 60 the pins on one side engage the recess-walls when the bifurcate-arms are inclined, substantially as described.

3. In a grate, the combination with a plurality of grate bars movable endwise relatively one to another and severally convexed 65 on their upper sides, of knuckles on the relatively movable bars, engagable with one another and means for moving the bars whereby the knuckles are made to strike one another, 70 substantially as described.

In testimony whereof I have hereunto set my hand this 8th day of December, 1894.

FRANK X. GOSSELIN.

Witnesses:

GEO. A. MOSHER,
FRANK C. CURTIS.