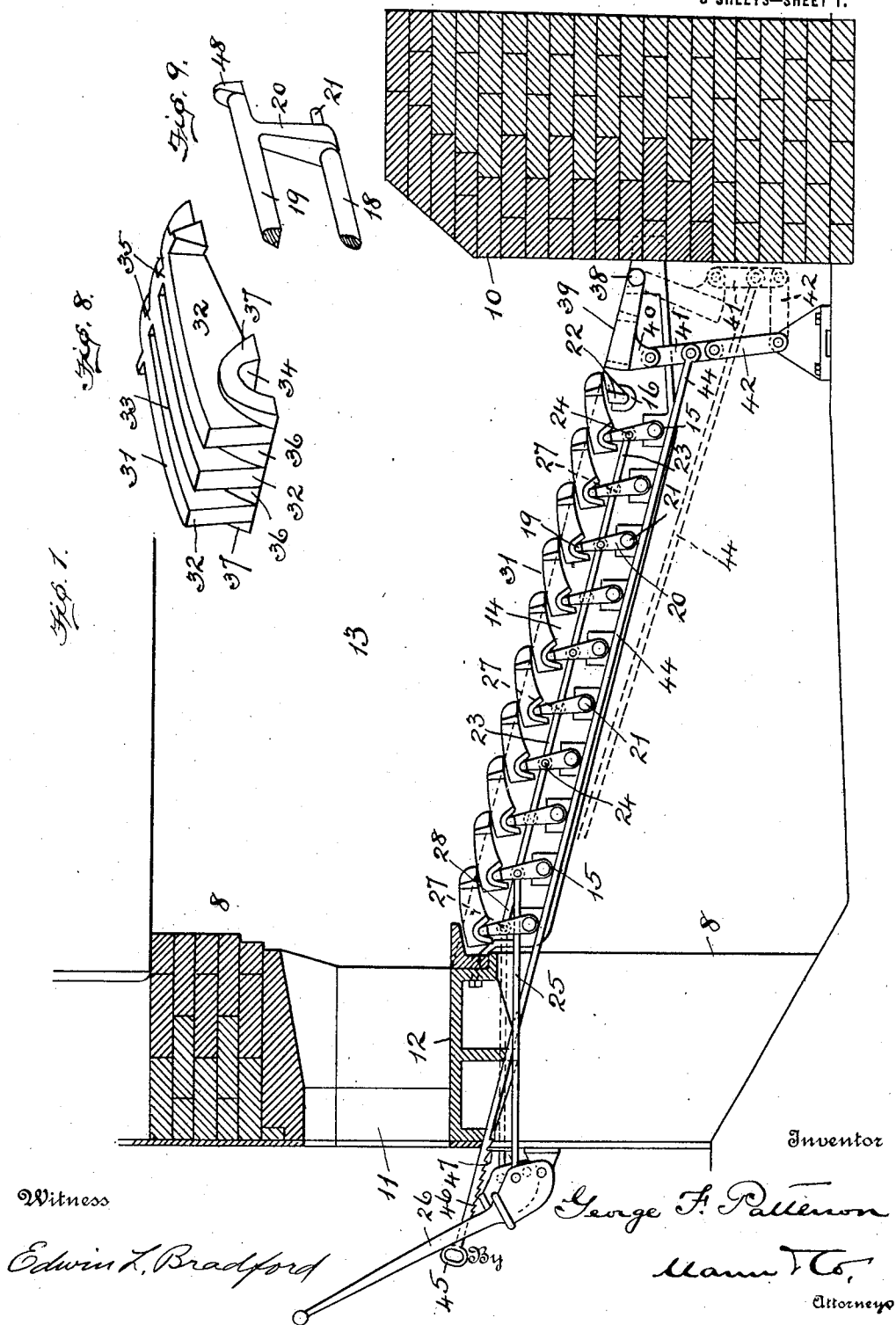


G. F. PATTERSON.
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APPLICATION FILED AUG. 13, 1918.

1,395,006.

Patented Oct. 25, 1921.

3 SHEETS—SHEET 1.

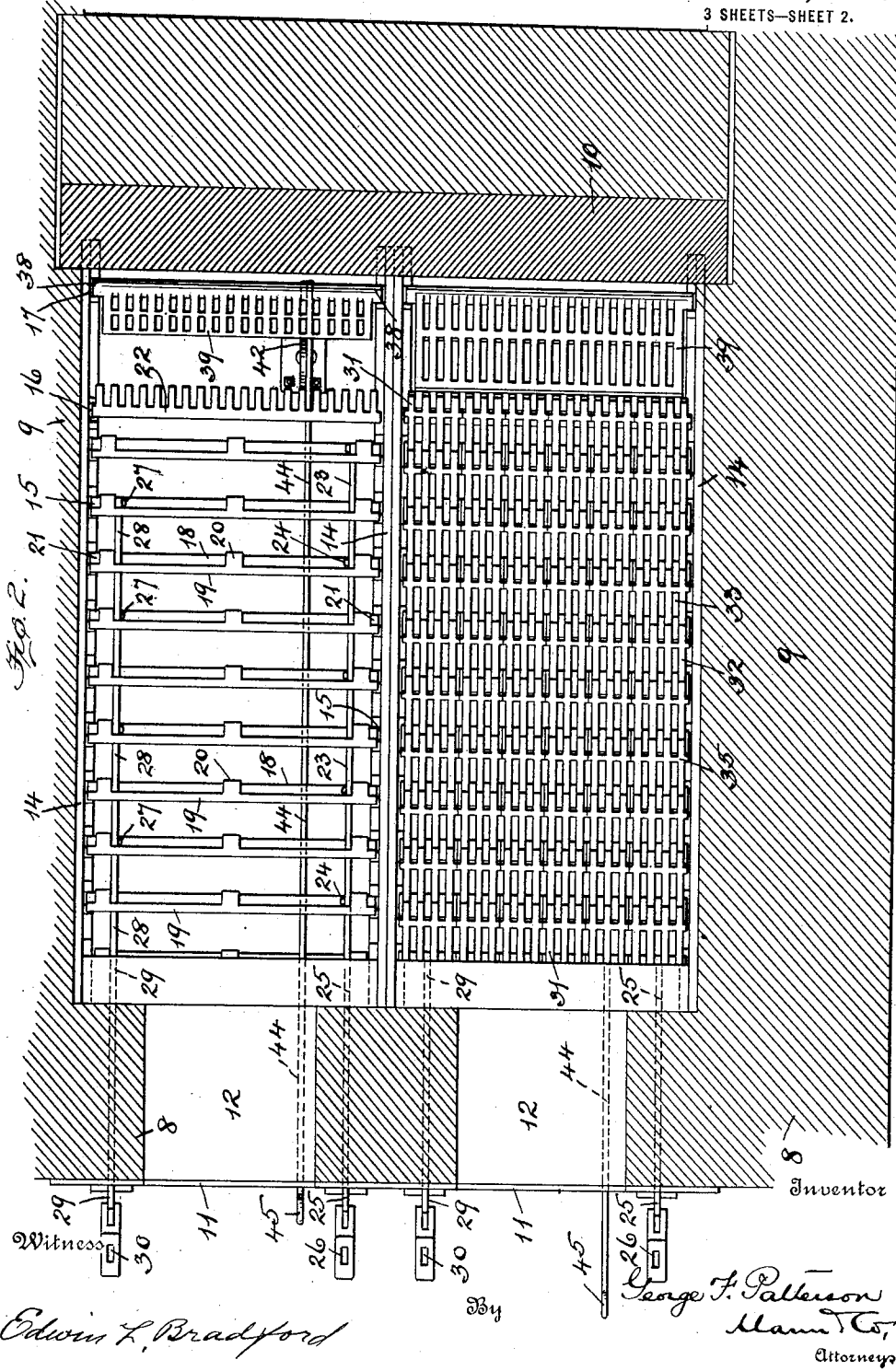


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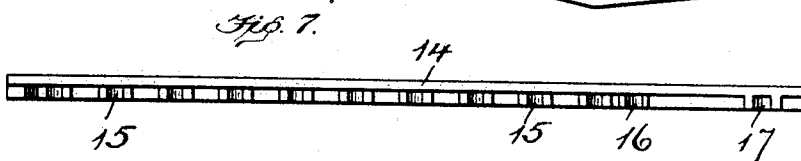
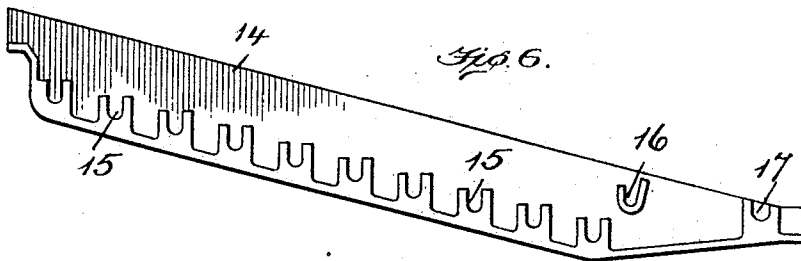
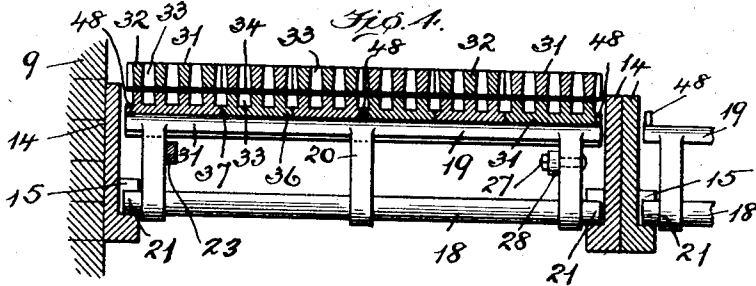
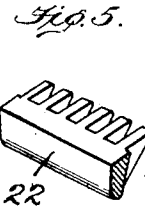
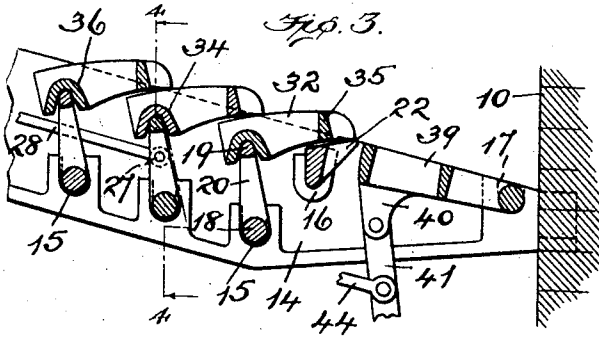


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3 SHEETS—SHEET 3.



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STOKER-GRATE.

1,395,006.

Specification of Letters Patent.

Patented Oct. 25, 1921.

Application filed August 13, 1918. Serial No. 249,617.

To all whom it may concern:

Be it known that I, GEORGE F. PATTERSON, a citizen of the United States, residing at Baltimore, in the State of Maryland, have
5 invented certain new and useful Improvements in Stoker-Grates, of which the following is a specification.

This invention relates to improvements in grates for furnaces and has particular reference to a stoker grate in which the fuel
10 may be fed along the grate to the end that a uniform distribution of the fuel may be attained and the fire maintained in accordance with the heat units required.

15 The objects of the invention are to provide an improved stoker grate in which all the stoker bars are formed in sections that are interchangeable and may be dropped into working position or lifted therefrom;
20 in which the bearing bars and trunnions are sufficiently spaced below the grate surface to prevent burning out and are so related with respect to each other that during the stoking operation the movement is a
25 sliding one under the bed of coals and avoids the necessity of lifting the coal bed during the operation of stoking.

Other objects and advantages will become apparent from the following specification.
30

The invention is illustrated in the accompanying drawings, wherein,—

Figure 1, shows a vertical longitudinal section through a furnace and illustrates
35 my improved stoker grate in side elevation.

Fig. 2 illustrates the same in top plan,—the stoker-bar sections on one-half of the grate being omitted to show the supporting and actuating devices for the stoker-bar sections.
40

Fig. 3, shows an enlarged vertical longitudinal section through the lower end of the grate.

Fig. 4, illustrates a cross-sectional detail through the same,—the section being taken on the line 4—4 of Fig. 3, looking in the direction of the darts.
45

Fig. 5, shows in perspective a fragment or portion of the rest-bar employed near the
50 lower end of the grate.

Fig. 6, illustrates one of the side bearing bars in side elevation.

Fig. 7, shows the same in top edge view.

Fig. 8, illustrates one of the stoke-bar sections in perspective, and
55

Fig. 9, an end of the oscillating support in perspective.

Referring to the drawings by numerals, 8 designates the front wall of the furnace 9 the side walls and 10 the bridge wall there-
60 of. The usual fuel-door openings 11, are provided in the front wall together with the ordinary plates 12, at the bottoms of said openings.

In the furnace chamber 13, and at opposite sides of the door openings 11, I provide
65 inclined bearing bars 14, the upper ends of which are suitably secured at the inner side of the front wall and the lower ends of which bars are secured in the bridge wall
70 10. The precise number of these bearing bars is determined by the size of the furnace and the number of grates to be employed, but there are two bearing bars for each
75 grate.

Each bearing bar 14, see particularly Figs. 3, 4, 6, and 7 of the drawings, is provided along its inner side with a series of concave sockets or bearing recesses 15, which are
80 uniformly spaced and which are open at their upper sides. Near the lower end, each bearing bar also has a concave bearing lug 16, at its inner side and at the lower end and adjacent to the inner side of the bridge
85 wall 10, each bearing bar 14, is provided with a bearing recess 17, at the inner side of its upper edge.

Between each pair of bearing-bars I provide a series of oscillating supports. These supports in the present instance, comprise
90 a lower horizontal bar 18; an upper horizontal bar 19, arms 20, which connect the two bars and a trunnion 21, at each end of the lower bar which trunnions seat in bearing recesses 15, on the inner sides of the
95 bearing bars.

It is thus to be understood that the upper horizontal bars 19, are sustained in an elevated position with respect to the bearing recesses 15, and are so supported as to be
100 capable of oscillating between the spaced-apart bearing-bars. It is also to be noted that the trunnions 21, of the oscillating supports may simply be dropped down into the

bearing recesses 15, and be retained in rocking position therein without the aid of fastening means.

The concave bearing lugs 16, near the lower end of the bearing-bars 14, sustain a horizontal grate bar 22. This grate bar is rigid between the bearing-bars in that it has no movement during the stoking operation, as will presently be seen.

The oscillating supports, including the lower and upper bars 18, 19, are arranged in the present instance, in two sets so that one set may be oscillated independently of the other.

In the arrangement illustrated, see particularly Figs. 1 and 2 of the drawings, the second, fourth, sixth, eighth, and tenth, supports are connected by a bar 23, which extends between the lower and upper bars 18 and 19 of the supports and this connecting bar extends along the inner side of the arms 20, at one end of the supports so that a bolt or pin 24, may serve as a pivot between each support and said bar.

An operating rod 25, extends through the front wall 8, of the furnace and has its inner end pivotally connected to the second oscillating support, and the outer end of this rod, 25, is connected to an actuating lever 26, on the outer side of the front wall so that when said lever is rocked, the set of oscillating supports, including in this instance the second, fourth, sixth, eighth, and tenth supports, may be rocked forward and back.

In a similar manner the first, third, fifth, seventh, and ninth oscillating supports, are pivotally connected at 27, to a bar 28, and a rod 29, extends from the first or uppermost oscillating support through the front wall of the furnace and is connected to an actuating lever 30, on the outer front wall of the furnace. Through these latter connections the second set of supports may be oscillated.

The plural sets of oscillating supports are utilized to sustain the stoke-bar sections, which will now be described.

By reference to Figs. 1, 2, 3 and 8 of the drawings it will be noted that the grate surface is made up of a series of stoke-bar sections 31, each of which comprises a plurality of separated short bars 32, with slots 33, between said bars. At the front end each stoke-bar section is provided at its under side with a cross-wise concave bearing recess 34, while near the rear end its short bars are preferably connected by a cross-bar 35.

Between the front ends of the short bars 32, each stoke-bar section has an arched connection 36, which is integral therewith and at each end of the bearing-recess, each of said sections has a spacing flange 37, of a shape that conforms to the shape of the bearing recess, and which together with a

similar flange on the next stoke-bar section serves to space one section from another.

These stoke-bar sections 31, are simply dropped into position, the lowermost row of such sections being placed in position first. By reference to Fig. 3, it will be seen that the lowermost row of sections are seated on the upper bar 19, of the lowermost oscillating supports, the bottom concave recess 34, at the front end of the section seating on said bar 19, and the rear end of each of those sections simply resting upon the rigid grate bar 22. The second row of sections is then dropped into place with their front bottom recesses seating on the bar 19, of the next to the lowermost oscillating support and their free rear ends resting by gravity only upon the front ends of the lowermost row of sections. This arrangement of rows of loose stoke-bar sections with the free rear ends of one row resting upon the front pivoted ends of the row next in the rear, produces an overlapping of one row of sections with another row of sections, but leaves the lapped sections free to be rocked one with respect to the other.

The operation of the structure just described is effected through the actuating levers 26 or 30 as follows:

When lever 26 is rocked or pushed inwardly, rod 25, will be moved inwardly and push rearwardly on the second oscillating support. This support together with the fourth, sixth, eighth and tenth supports being pivotally connected in a set by bar 23, will all rock or swing rearwardly and this rearward movement of the several supports will cause the second, fourth, sixth and eighth and tenth rows of stoke-bar sections 31, to slide rearwardly over the intermediate rows of sections on which their rear free ends loosely rest. This rearward movement of the alternate stoke-bar sections serves to push the fuel, ashes or cinders rearwardly at each stroke and to disturb the fuel to the extent desired, the movement being an exceedingly easy one to make because it does not involve the direct lifting of the fuel. The operation of first one set and then the other of the stoke-bar sections may be readily effected, and in each operation, the rearward feeding of the fuel and the release of the ashes is accomplished.

By reason of the fact that the stoke-bar sections lap and have their rear ends freely resting upon the front ends of the sections next behind them, the rearward feeding of the fuel will be effected even when there is little or no inclination to the grate surface.

At the lower end of the grate the bearing bars 14, have bearing recesses 17, at their inner sides adjacent to the bridge wall 10. These bearing recesses receive trunnions 38, on the opposite ends of a dump grate 39, and

the latter is thereby pivotally sustained between the rigid grate bar 22, and the bridge-wall, the edge of the dump grate adjacent to the rigid bar having the free swinging edge of the dump grate.

A lug 40, is provided on the bottom of the dump grate and the upper end of a link 41, is pivoted to said bottom lug while the lower end of said link is pivoted to the upper end of a second link 42. Link 42, has its lower end pivotally connected to a bracket plate 43, which is rigidly mounted or bolted in the bottom of the furnace.

An operating rod 44, has its inner end pivotally connected to link 41, and extends all the way under the grate to and through the front wall of the furnace and the projecting end of this rod 44, has an eye 45, by which it may be conveniently grasped by the hand for longitudinal movement.

By reference to Fig. 1, of the drawing it will be seen that the two links 41, 42, form a toggle so that when the grate is in the lowered or dumping position, as shown in broken lines the link 41, will have a vertical position while link 42, will assume a horizontal position. To raise the grate from the dotted to the full line position the rod 44, will be drawn outwardly and during the initial or first part of this movement the link 41, will swing forward lifting the free edge of the grate until it assumes an inclined position but with the link 41, at right angles to the dump grate surface,—the link 42, remaining horizontal during this preliminary movement. The further outward movement of the rod 44, will then lift the link 42, and swing the latter from the horizontal to an upright position carrying the grate up with it,—the operation of the links being that of a toggle which movement, in practice is found to be effected with comparative ease.

The outer end of the rod 44, is preferably provided on its under side with a series of teeth or notches 46, whereby to engage the bar with a plate 47, on the front of the furnace so the rod and the dump grate may be held in any desired position.

By reference, particularly to Figs. 4 and 9, of the drawings, it will be noted that each upper bar 19, of the several oscillating supports is provided at each end with a stop lug 48, which latter project upwardly so as to engage the endmost stoke-bar sections and

prevents lateral shifting of the sections along the bar.

Having described my invention, what I claim is,—

1. In a furnace grate, the combination with two spaced-apart bearing bars each having vertical inner and outer faces and adjacent to the lower edge of the inner vertical face, each of said bars being provided with a series of upwardly-opening bearings which latter are considerably below the upper edge of the bearing bars, of a series of oscillating supports each having a lower horizontal bar with trunnions that seat in said bearings in the bearing bars and an upper horizontal bar that has position below the upper edge of and is between the two spaced bearing bars; a plurality of stoker-bar sections each section having a plurality of short bars with slots between the latter, and also having a concave bearing recess extending continuously in a direction cross-wise of its bars and at the under side thereof to seat on the upper horizontal bar of an oscillating support whereby to completely cover and protect the said upper horizontal bar which supports it, and means for rocking said supports.

2. A stoker-bar section for grates comprising a plurality of short bars with slots between the latter and said section having a concave bearing recess extending continuously in a direction crosswise of the bars and at the under side thereof.

3. A stoker-bar section for grates comprising a plurality of short bars with slots between the latter and said section having a continuous concave bearing recess extending in a direction cross-wise of the bars and at the under side thereof and said short bars being connected in a cross-wise direction by a cross-bar.

4. A stoker-bar section for grates comprising a plurality of short bars with slots between the latter said section having integral arched connections between the bars and the under side of said arched connections having a continuous concave bearing surface from one side of the section to the other which bearing surface opens downwardly.

In testimony whereof I affix my signature.

GEORGE F. PATTERSON.