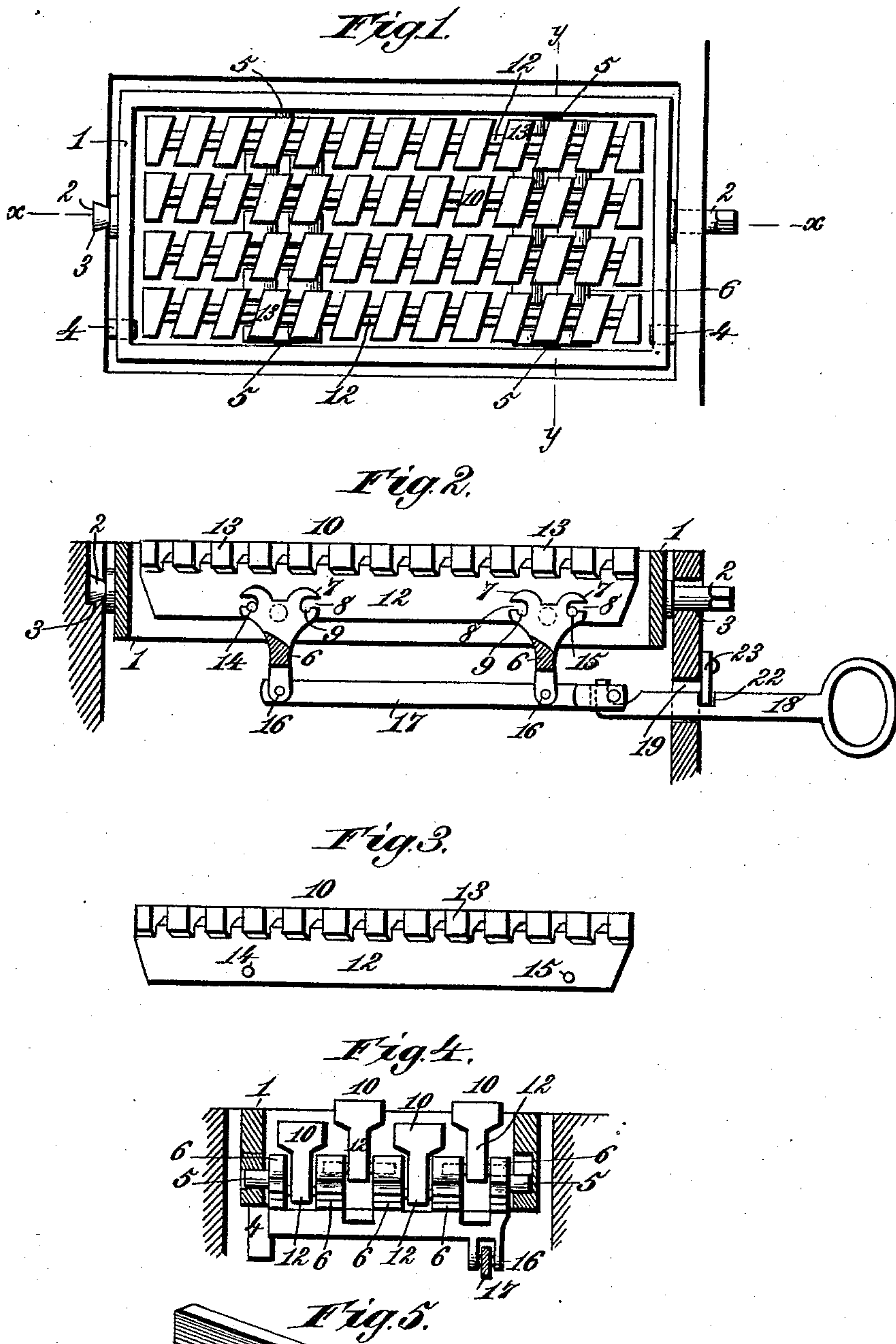


(No Model.)

J. THURELL.
DUMPING GRATE.

No. 437,529.

Patented Sept. 30, 1890.



Witnesses:
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UNITED STATES PATENT OFFICE.

JOHN THURELL, OF ZYLONITE, MASSACHUSETTS.

DUMPING-GRATE.

SPECIFICATION forming part of Letters Patent No. 437,529, dated September 30, 1890.

Application filed May 31, 1890. Serial No. 353,774. (No model.)

To all whom it may concern:

Be it known that I, JOHN THURELL, a citizen of the United States, residing at Zylonite, in the county of Berkshire and State of Massachusetts, have invented new and useful Improvements in Dumping-Grates, of which the following is a specification.

My invention relates to that class of dumping-grates for stoves, ranges, and steam-furnaces in which the grate-bars are loosely mounted upon and are removable from cam-shafts or rock-shafts to enable the bars to be agitated to remove accumulations of ashes, means of a simple character being provided for dumping the grate and for locking the same.

It is one purpose of my invention to provide novel means whereby the continuous bars of the grate may be journaled in the alternating seats of V-shaped rocking cams, whereby the rocking of the cam-shafts in the same direction shall raise each alternate grate-bar and lower the remaining bars simultaneously, a slight longitudinal movement in opposite directions being imparted to the alternating bars.

It is a further purpose of my invention to so construct and organize the supports for the grate-bars that the latter may be interchangeable not only end for end, but in the double seats formed in the V-shaped cam-bars, whereby a fracture or injury to any one of said seats or bearings may be remedied by simply turning the bars end for end and inserting their journals in the alternating seats of the V-shaped cams. Hence the series of grate-bars which may, if preferred, be plain or continuous bars, or provided with transverse bar-sections, may be reversed end for end and journaled in either one of the duplex seats provided in each double cam-block; or, in other words, their journals may be rendered interchangeable from side to side of the cam-blocks carried by the rock-shafts at each end of the grate.

The invention consists in the several novel features of construction and new combinations of parts, hereinafter fully set forth, and then definitely pointed out in the claims which follow this specification.

To enable others skilled in the art to understand and practice this my said inven-

tion, I will proceed to describe the same in detail, reference being had to the accompanying drawings, in which—

Figure 1 is a plan view showing my invention. Fig. 2 is a vertical longitudinal section of Fig. 1 upon the line *x x* in the latter figure. Fig. 3 is a side elevation of one of the grate-bars shown in Fig. 1, showing the arrangement of the journal-pins and of the grate-blocks. Fig. 4 is a sectional elevation on the line *y y*, Fig. 1. Fig. 5 is a detail perspective showing a modified form of grate-bar.

In the said drawings, the reference-numeral 1 designates the frame of the grate, which may be of any desired form. This grate-frame is arranged within the fire-box and is supported by journals 2, having bearing in seats 3, one of said journals projecting outwardly beyond the walls of the fire-box and being squared to receive a key by which the grate may be dumped. These journals are arranged a little to one side of the longitudinal center of the grate, that it may normally assume and retain a horizontal position, the heavier side being supported by brackets 4, mounted on the interior face of the wall inclosing the grate.

Within the frame which incloses the grate I arrange two transverse rock-shafts 5, journaled in the longer parallel members of said frame. Upon each of these rock-shafts I mount rigidly a series of duplex cams 6, each being substantially heart-shaped, or, in other words, having lobes 7 lying upon each side of the axis of the rock-shaft. In each of these lobes I form open slots 8, cut from the opposite faces of said lobes toward the central dividing-line, each slot terminating in a seat 9.

The numeral 10 denotes the grate-bars, which may, and preferably do, consist of a straight plate or bar 12, upon the upper edge of which are arranged grate-blocks 13, usually arranged diagonally, or slightly so, to the bar 10. Upon the latter part are arranged journal-pins 14 and 15, which project equally, or substantially so, from the opposite faces of the bar 10, being either cast upon said bars or inserted in openings formed therein. It will be noted that the journal-pins 14 are arranged quite near the end of the bar 10, while the journals 15 are at some distance from the opposite end of the same bar. The distance be-

tween the axes of the journal-pins 14 and 15 is equal to the distance between any two of the seats 9 upon the same sides of the rock-shafts 5. It will be seen that by simply reversing these grate-bars end for end the journal-pins may be shifted from the seats 9 on one side of the rock-shafts to the corresponding seats upon the other side.

In place of the form of bar already described I may employ the plain straight bar shown in Fig. 4; but the construction in other respects is the same.

Pivotaly mounted upon ears or lugs 16, hanging from the rock-shafts, is a shaking-bar 17, having a detachable connection with a key 18, inserted through an opening 19 in the wall of the fire-box. This key has a hooked end 20, which engages a pin 21, passing through the bifurcated end of the shaking-bar 17, the shank of the key being provided with a notch 22, with which a turn-button 23, pivoted on the end of the fire-box, may be engaged to hold the key in place or lock the grate, while at the same time it is readily detachable to permit the dumping of the grate.

These grates are applicable to all kinds of furnaces and stoves and will not warp. They may be used with any kind of fuel and will give a materially-increased air-space.

By means of the double cams any injury to one of the duplex seats 9 may be remedied by simply reversing the bars end for end, thereby avoiding the delay and expense of removing the rock-shaft and substituting a new cam.

What I claim is—

1. In a furnace or other grate, the combination, with two separate parallel rock-shafts, each having a series of duplex cams comprising open slots cut from opposite front and rear edges toward the central dividing-line and terminating in seats, of a series of grate-bars, each provided with grate-blocks and with journal-pins projecting laterally from the opposite faces of the grate-bars at a point

below the grate-blocks and arranged at a distance apart equal to the distance between the seats in the duplex cams on the same side of the rock-shafts, said laterally-projecting journal-pins engaging the front and rear seats of the slots and arranged at different distances from the respective ends of the bars to render the latter reversible, substantially as described.

2. In a furnace or other grate, the combination, with a rotating dumping grate-frame supported by journals, of two separate rock-shafts journaled in the rotating grate-frame and each having a series of duplex cams provided with open slots cut in the opposite front and rear edges toward the central dividing-line and terminating in seats, and a series of grate-bars having journals placed at different distances from the respective ends of such grate-bars and projecting laterally from the sides of the latter to engage the seats of the front and rear slots, whereby the grate-bars may be reversed from end to end, substantially as described.

3. In a furnace or other grate, the combination, with a dumping-frame, of a series of grate-bars having journal-pins seating in cams upon the alternate sides of rock-shafts carrying said cams, a shaking-bar pivoted to lugs on said rock-shafts and having a bifurcated end provided with a cross-pin, and a key insertible through an opening in the wall of the fire-box and provided with a hooked end engaging said cross-pin, the shank of the key having a notch engaging the turn-button pivoted on the said wall, whereby the key and grate are locked, substantially as described.

In testimony whereof I have affixed my signature in presence of two witnesses.

JOHN THURELL.

Witnesses:

CESAR CESANA,
W. F. PACK.