2 Sheets—Sheet 1.

J. A. MOFFITT.

GRATE.

No. 190,236. Patented May 1, 1877.

Fig. 1.

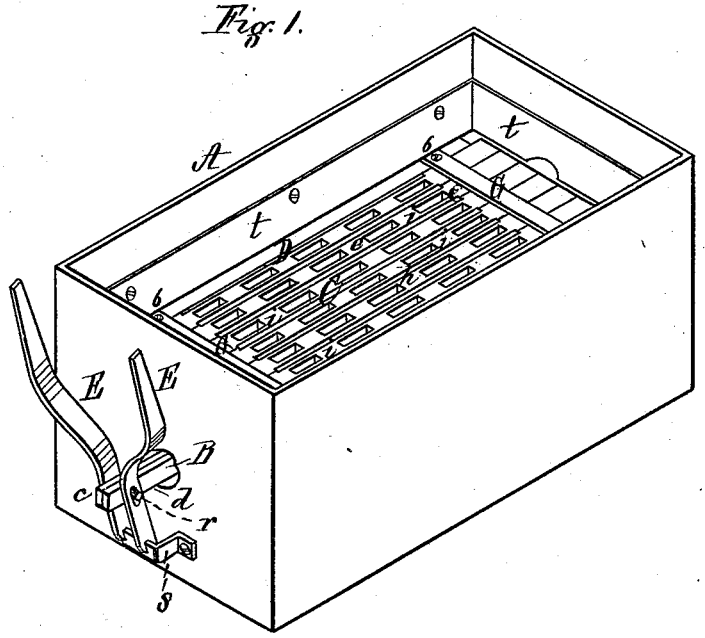
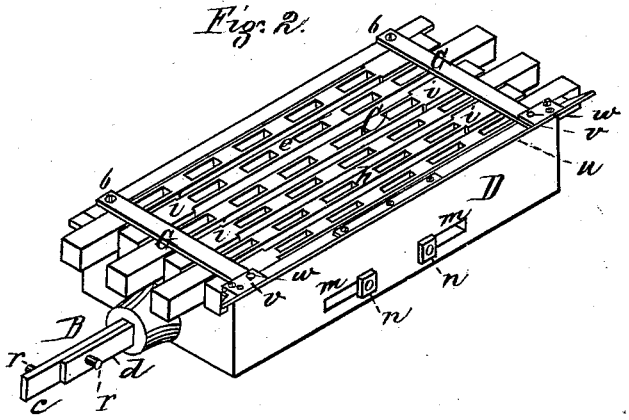


Fig. 2.



Witnesses,
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J. E. Cambridge

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Attorneys.

2 Sheets—Sheet 2.

J. A. MOFFITT.

GRATE.

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Fig. 3.

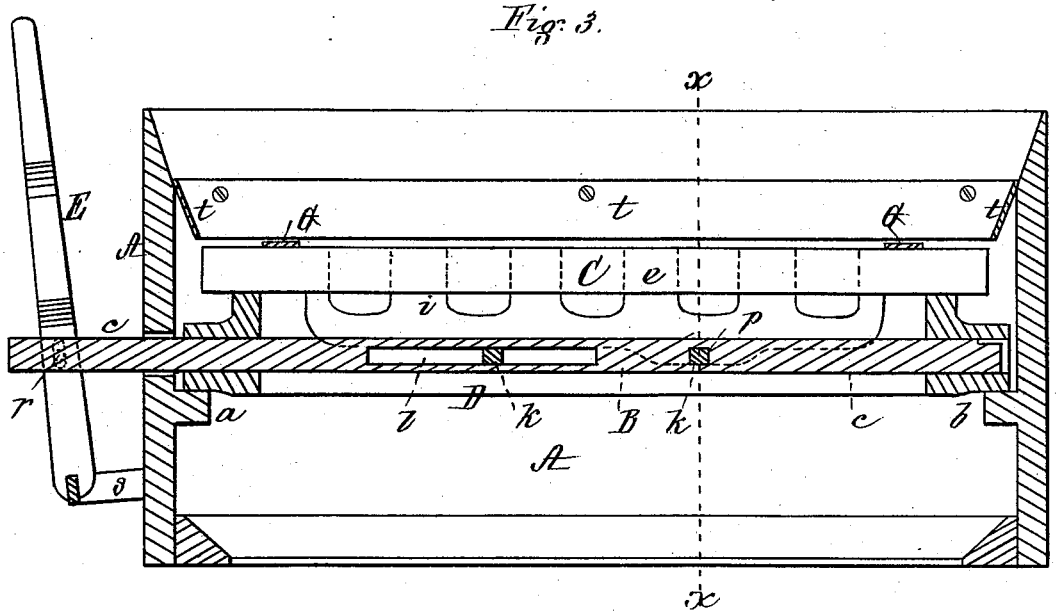


Fig. 4.

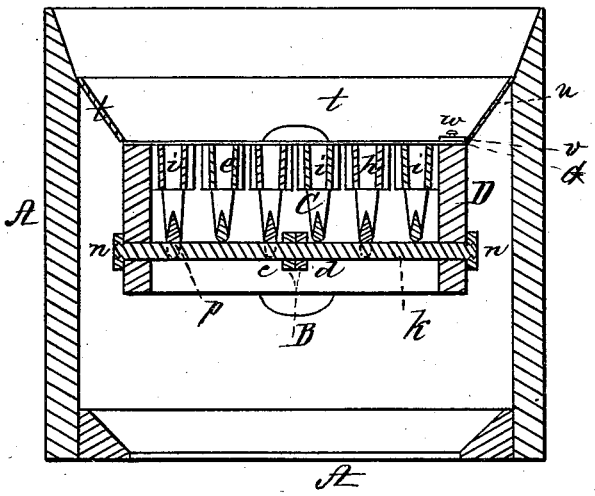
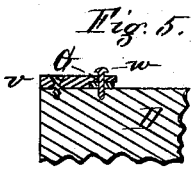


Fig. 5.



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UNITED STATES PATENT OFFICE.

JOHN A. MOFFITT, OF BOSTON, MASSACHUSETTS.

IMPROVEMENT IN GRATES.

Specification forming part of Letters Patent No. **190,236**, dated May 1, 1877; application filed March 26, 1877.

To all whom it may concern:

Be it known that I, JOHN A. MOFFITT, of Boston, in the county of Suffolk and State of Massachusetts, have invented a Sectional Reciprocating Grate for Stoves, Furnaces, &c., of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is a perspective view of a grate constructed in accordance with my invention and applied to a fire-box. Fig. 2 is a perspective view of my grate detached, the position of the alternate bars being changed. Fig. 3 is a longitudinal section through the grate and its fire-box. Fig. 4 is a transverse section on the line *x x* of Fig. 3; Fig. 5, a detail in section.

My invention has for its object to provide an effectual and reliable means of freeing a stove or furnace fire from clinkers and ashes; and consists in a grate composed of two sections, each provided with a series of separate bars, made removable independently of each other, and connected with one half or portion of a longitudinally-divided shaft, the alternate bars of the grate being connected with, and operated by, one-half of the shaft, and the other bars with the other portion of the said shaft, these portions being provided with independent handles, or with a common handle or device of peculiar construction, by which the contiguous bars are simultaneously moved in opposite directions, whereby clinkers are prevented from forming, or, if formed, are broken, and the ashes discharged with great facility, as desired.

To enable others skilled in the art to understand and use my invention, I will proceed to describe the manner in which I have carried it out.

In the said drawings, A represents the fire-box of a stove or furnace, provided with bearings *a b*, in which rest the ends of a longitudinally-divided shaft, B, to the two halves or portions *c d* of which are secured the sections *e h* of the grate C, composed of a series of longitudinal bars, *i*, arranged parallel to each other at a short distance apart upon a rectangular frame, D, the opposite ends of these bars resting on the front and rear transverse portions thereof, and not being secured thereto, by which construction each bar may be removed independently of each other, and may be moved in a longitudinal direction, in a manner and for a purpose now to be described.

Through each portion of the shaft *c* and *d* passes a cross-rod, *k*, the cross-rod of one portion of the shaft fitting snugly within that portion and extending through a long slot, *l*, formed longitudinally within the other portion of the shaft, and the outer ends of these rods projecting through slots *m* formed in the sides of the grate-frame, and having screw-threads cut thereon for the reception of nuts *n*, by which means the cross-rods are prevented from moving out of place. The under side of each bar is provided with a notch, *p*, of a size and form corresponding to that of one of the rods in cross-section, the alternate bars forming one section, *e*, of the grate, resting on, and moving with, one cross-rod, and the contiguous bars forming the other section, *h*, resting on, and moving with, the other cross-rod as they are carried back and forth in opposite directions by the portions of the shaft to which they are respectively secured, the front end of each half of the divided shaft projecting outside of the front of the fire-box and being provided with a pin or projection, *r*, for the reception of a lever, which serves as a handle, E, Figs. 1 and 3, the lower end of which fits over a guide, which serves as a fulcrum, *s*, secured to the front of the fire-box, by which means the attendant moves both handles simultaneously, one toward and the other from him, whereby the grate-bars of the sections are moved in opposite directions at the same time in a ready and convenient manner.

From the foregoing it will be seen that motion is imparted in opposite directions to the alternate grate-bars at one and the same operation, thus discharging the ashes without the use of a poker, and preventing the liability of clinkers being formed, and in the event of neglect to shake the grate as often as is usually the custom, and clinkers commence to form and adhere to the bars, these clinkers may be instantly broken and detached therefrom by a slight movement of the handles of the grate. The interior of the fire-box, at its front and rear, and at one of its sides, is pro-

vided with a fire-brick lining, *t*, which inclines down toward the top of the grate-frame and the side of the latter, opposite the side of the fire-box, having the said inclined lining, is provided with an inclined metal guard, *u*, of corresponding shape to the lining of the fire-box, the object of this construction being to prevent the coal from dropping down between the sides of the grate-frame and the interior of the fire-box, and obstructing the working of the grate. G G are transverse pieces extending over and across the opposite ends of the grate-bars and their frame, one end of each piece being pivoted at 6 to the top of one end of the frame, and the other end of the piece fitting into a recess formed under a cleat, *v*, secured to the opposite side of the frame, being kept in this position by a pin, *w*, by which means, when the grate is being dumped, the bars are prevented from being displaced, and in the event of one or more bars being burnt or worn out they may be readily removed by first swinging the transverse pieces to one side, when new bars may be substituted therefor. Previous to dumping the grate the ends of the grate-bars should be brought in line with each other by bringing the outer ends of the portions of the shaft together, in which position the ends of the grate-bars will not be brought into contact with the inclined lining *t* at the front and rear of the interior of the fire-box.

It is evident that my invention may be applied with great advantage to stoves, ordinary heating-furnaces, and stationary or locomotive steam-boiler furnaces, and in these latter, where the size of the grate is necessarily large, its sections may be so constructed and arranged as to dump independently in opposite directions from or toward each other. Instead of two handles, as shown, one only, provided with a cross-bar or other device, may be employed, the two halves of this shaft being secured to the opposite ends thereof, whereby the movement of the sections of the grate in opposite directions is secured, as desired.

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

1. A reciprocating grate, composed of movable sections *e h*, each provided with a series of alternate and independently-removable bars, connected with and operated by a longitudinally-divided shaft, whereby the alternate grate-bars are adapted to move in opposite directions, substantially as and for the purpose described.

2. The longitudinally-divided shaft B, cross-rods *k*, and independently-removable bars *i* of the sectional reciprocating grate C, with its frame D, and fire-box A, in combination with a single or double shaking lever or handle, E, substantially as and for the purpose set forth.

3. The transverse pieces G, with the cleat *v* and pin *w*, in combination with the grate-frame D and a series of independently-removable bars, *i*, constructed substantially as described, for the purpose set forth.

Witness my hand this 21st day of March, 1877.

JOHN A. MOFFITT.

In presence of—
N. W. STEARNS,
P. E. TESCHEMACHER.