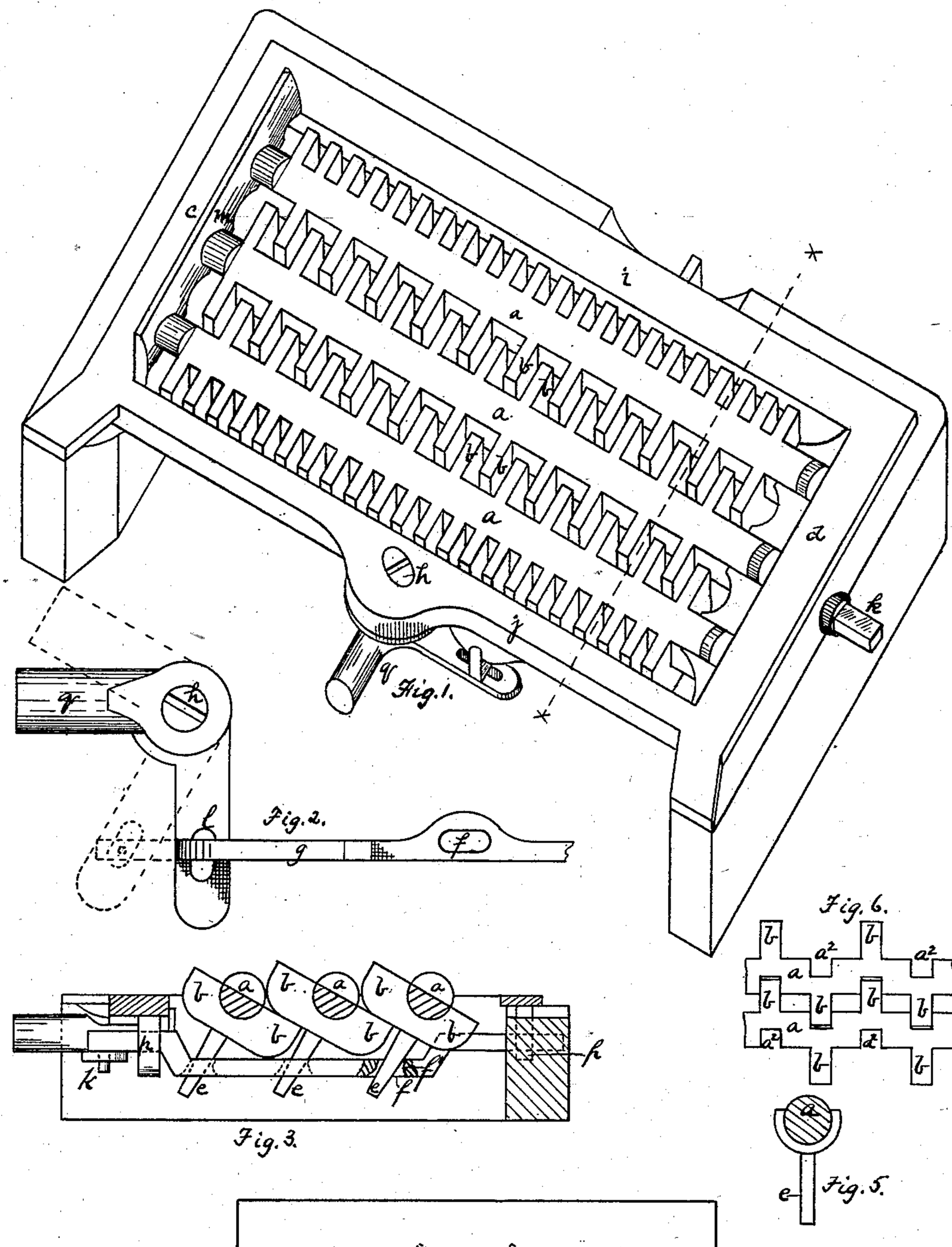
(No Model.)

F. E. TAYLOR & H. R. PALMER.

SHAKING GRATE.

No. 264,370. Patented Sept. 12, 1882.



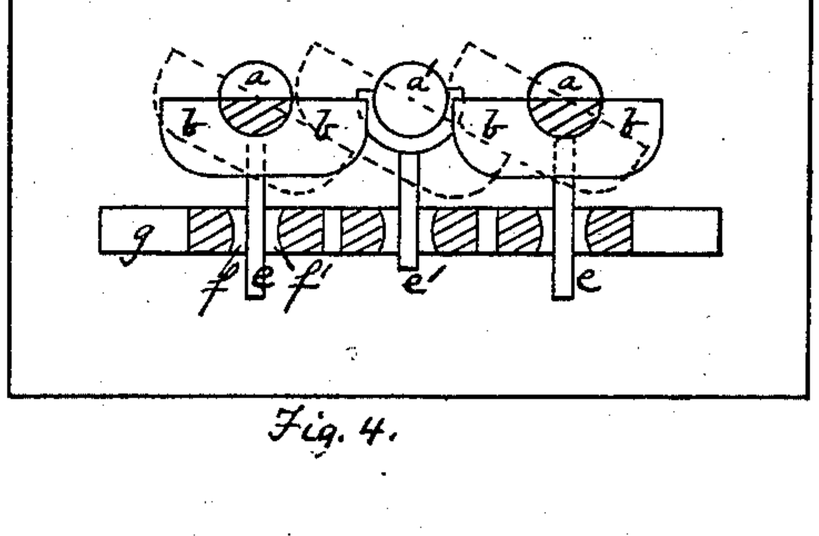


Fig. 4.

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FRANK E. TAYLOR AND HUGH R. PALMER, OF ALLEGHENY, PA.

SHAKING-GRATE.

SPECIFICATION forming part of Letters Patent No. 264,370, dated September 12, 1882.

Application filed May 3, 1882. (No model.)

To all whom it may concern:

Be it known that we, FRANK E. TAYLOR and HUGH R. PALMER, of Allegheny, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Shaking-Grates; and we do hereby declare the following to be a full, clear, and exact description thereof.

This invention relates to grates applicable to furnaces, steam-boilers, fire-places, stoves, &c.; and it consists in a grate composed of two or more rocking bars having a series of short arms or laterally-extended bars, and provided with levers depending from their under sides, to be engaged and operated by an oscillating bar having two or more elongated slots, in which the depending levers move, and a lever or other device to actuate the oscillating bar and impart through it a semi-rotative or rocking motion to the rocker-bars, as hereinafter more fully described.

To enable others skilled in the art to make and use our invention, we will now describe it by reference to the accompanying drawings, in which—

Figure 1 represents in perspective a grate embodying this invention; Fig. 2, a detail of the bell-crank and oscillating bar, showing the manner of connection; Fig. 3, a sectional view of Fig. 1 on the dotted line *x x*, the rocking bars and their lateral arms being in an inclined position. Fig. 4 is a modification of the invention. Fig. 5 is a detail of construction. Fig. 6 shows a modified form of grate-bar.

The rocker-bars *a*, journaled at their ends in suitable bearings in the side rails, *c d*, of the frame of the grate, are provided with a series of short arms or lateral bars, *b*, (herein shown as cast in part with the rocker-bars,) located at suitable distances one from the other, said arms of one rocker-bar being alternate with and interlapping those of the bar next adjoining it. The said rocker-bars *a* are semicircular in form, the upper half being flat, as shown in the drawings, thus providing a level surface next the fuel. The rocker-bars *a* are also provided with short depending levers *e* on their under sides, (see Fig. 3,) the free ends of which are extended through elongated slots *f*, having preferably rounded or beveled edges *f'* in a sliding link or bar, *g*, suitably supported at its either end by and sliding in bearings *p*, formed upon the back and front rails, *i j*, of the grate. At its front end the sliding bar *g* is loosely connected to one arm of a bell-crank, *q*, by means of a pin, *k*, on bar *g* entering an elongated slot, *l*, in said arm, the said bell-crank *q* having its fulcrum at *h*, where it is pivoted to the front rail of the grate. The free end of the bell-crank will be of suitable shape to be engaged and operated by the usual shaking-lever employed with grates of common construction. A plate or bar, *m*, will preferably be employed to form the upper half of the journal-bearing for one end of the rocker-bars *a*, thus permitting the easy removal of any of said bars when desired. It is obvious, however, that other equivalent means may be employed for this purpose.

In the operation of this improved grate, when it is desired to clear the grate of ashes or cinders the bell-crank *q* is moved forward and backward in a horizontal plane, which imparts an oscillating motion to the bar *g*, which, through the depending levers *e*, rocks the bars *a* first in one and then a reverse direction, one series of lateral bars *b* being rotated in one direction, while the series next to it on the adjoining rocker-bar moves in the opposite direction, interlapping and passing in close proximity to, though not touching, each other. This causes the fuel and ashes to roll upon the surfaces of the bars *a* and arms *b* and the clinkers to fall between and be crushed and broken by the arms *b*, which have a shearing action upon each other, and to pass through the interstices of the grate with the dust.

It will be observed that the mechanism which actuates and governs the movement of the rocker-bars moves in a horizontal plane, while the rocker-bars themselves oscillate in a plane vertical to their center of motion.

Instead of using the bell-crank for moving the bar *g*, the end of the latter may be extended beyond the front bar of the grate and be operated by a simple lever. In some cases it is desirable to have the bar *g* placed at the side of the grate and operated there by a hook or by a lever pivoted to the jamb. In other cases the end of one of the bars *a* may be extended through the side of the grate or stove, as shown at *k* in Fig. 1, and there provided with a square

or other suitable hub, so as to be operated by a lever placed thereon. The movement of the grate-bar by means of the said lever is communicated to the other grate-bars by means of the sliding bar *g*, the latter being moved by the lever *e* extending down from the central grate-bar. A cross-section of this construction is shown in Fig. 4, in which *a'* is the actuating grate-bar, and *e'* its lever, which moves the sliding bar *g*, and thereby oscillates the other grate-bars.

A modification of the construction of the grate-bar is to have the recesses between the lateral bars *g* extending into the web of the grate-bars, as at a^2 in Fig. 6. The lateral bars *b* of each grate-bar extend and oscillate in the recesses a^2, and thereby prevent the lodgment upon the solid face of grate-bar of ashes, dust, &c., which, in the construction shown in Fig. 1, might have a tendency to make a dead surface.

In case of a shallow grate one bar, *a*, alone may be used. In such case its arms *b* could be made to interlap with similar arms on the front and back bars of the grate.

We are aware that a series of rocking or oscillating bars having dependent crank-arms provided with wrist-pins have been operated by a sliding bar having inclined slots for the reception of the wrist-pins, and do not claim the same, for the reason that such a construction is liable to become deranged by the warping of the parts and the accumulation of ashes, &c., in the slots of the sliding bar. Such derangements are avoided in our construction, as the slots of the sliding bar are in a horizontal plane, so that the ashes, &c., pass through the same, and as the pendent stems of the bars pass loosely through the slots the warping of the bars cannot affect the relation of the parts so as to render the devices inoperative.

What we claim as our invention, and desire to secure by Letters Patent, is—

1. A shaking-grate composed of bars having lateral arms and recesses extending from and into the web, so arranged that the arms shall extend and oscillate in the recesses of adjacent bars, substantially as and for the purposes described.

2. The combination, in a grate, of rocking bars *a*, having pendent levers *e*, and the sliding bar *g*, having the elongated slots *f*, which receive the free ends of the pendent levers *e*, substantially as shown and described.

3. In a shaking-grate, the combination, with a series of journaled rocker-bars having laterally-projecting interlapping arms and pendent levers, of a horizontally reciprocating or sliding bar having elongated slots for the reception of the pendent levers of the rocker-bars, and a pivoted agitating bar or bell-crank having an elongated slot for the reception of a pin on the sliding bar, substantially as specified.

In testimony whereof we have hereunto set our hands this 1st day of May, A. D. 1882.

FRANK E. TAYLOR.
HUGH R. PALMER.

Witnesses:
T. B. KERR,
W. B. CORWIN.