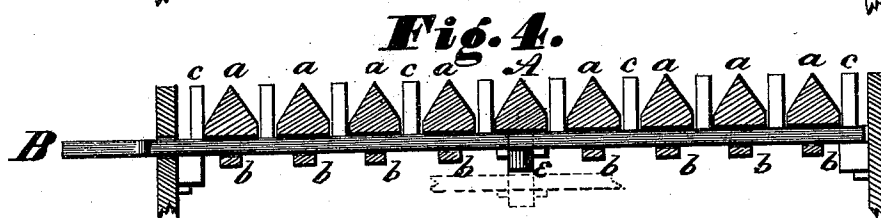
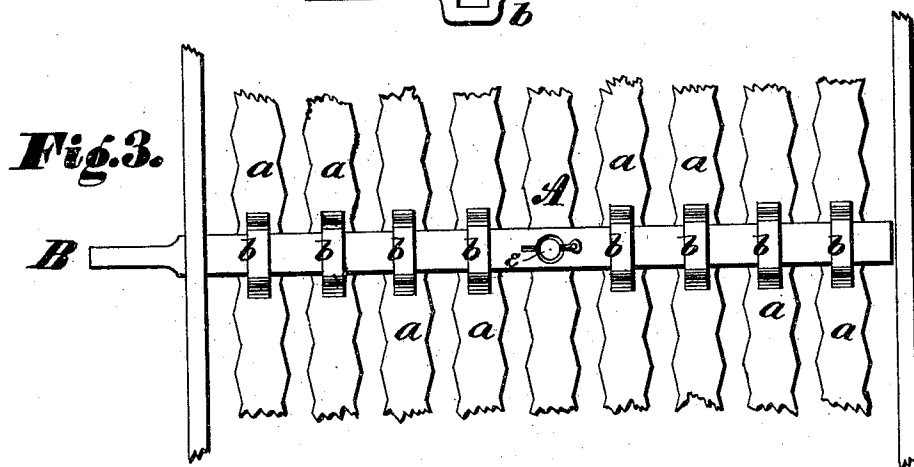
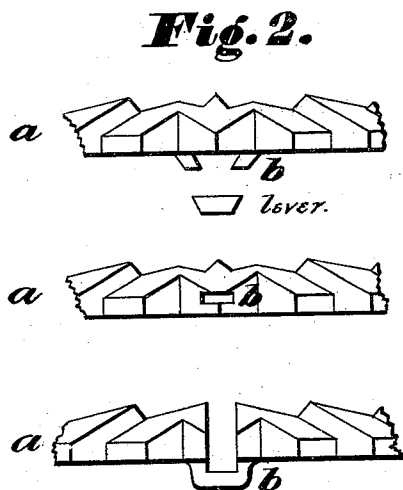


J. B. LARKIN.
GRATES FOR FURNACES.

No. 170,571.

Patented Nov. 30, 1875.



Witnesses
Frank A. Collock
J. A. Matterson

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UNITED STATES PATENT OFFICE.

JOHN B. LARKIN, OF PITTSBURG, PENNSYLVANIA.

IMPROVEMENT IN GRATES FOR FURNACES.

Specification forming part of Letters Patent No. **170,571**, dated November 30, 1875; application filed August 28, 1875.

To all whom it may concern:

Be it known that I, JOHN B. LARKIN, of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Grate-Bars; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use it, reference being had to the accompanying drawings, which form part of this specification, in which—

Figure 1 is a side elevation of the bar. Figs. 2 are modifications of the same. Fig. 3 is a bottom view of grate, showing the mode of attaching the lever. Fig. 4 is a transverse vertical section through the eyes of the bars.

This invention relates to certain improvements in Letters Patent No. 158,719, granted to me January 12, 1875, and has reference particularly to the construction and arrangement of the grate-bars, as hereinafter described, whereby the operation is rendered simpler, security against displacement in dumping or shaking obtained, and the strength of the whole increased. It consists in attaching the respective reciprocating bars to the lever in the manner hereinafter shown, so that the bars cannot become loose or disengaged, no matter how violent the shaking or how great the degree of dump given, and, in dumping, the bars cannot possibly slip or fall from their normal position. For these purposes I construct a grate-bar with an eye or socket either at or near its middle point, or at or near either end, through which the agitating-lever may pass. The eye or socket may be of any shape, the lever corresponding in section, but slightly smaller, to allow working-space. Instead of a depending eye, the opening may be directly through the body of the bar, as in Fig. 2, or it may be substituted by lugs, with their inner faces inclining into a dovetail, straight, bent, or so disposed as to prevent the removal of the bar otherwise than by withdrawal lengthwise. In each case the lever must correspond to a proper degree, or the bar may simply be constructed with a downward "dip" or elbow, in which the lever is merely allowed to rest, as seen in Fig. 2.

Although the shaking of the grate-bars may

be accomplished without having a fulcrum to the lever, yet, to have a regular and effective oscillation of the series, it is better to have one. This I do by having the middle, or one of the middle bars stationary, with a dependent pivot or bolt upon it, passing down through the agitating-lever, and fastened therein by a key or other device. The arrangement may be reversed, placing eyes in the lever and passing the bars through it. This, however, would necessitate the use of stops to catch the lever, so that the bars would reciprocate with it.

Referring to the drawings, A is the bar at or about the middle of the series, with or without the socket, and provided with the dependent pin or key-bolt *e* as a fulcrum for the lever B. The other bars *a* are constructed with the described eyes, perforations, lugs, or dipping-elbows *b* for the reception of the lever B.

To mount the grate, take the two end rests or bridges *c*, (which are the same as described in my former patent—viz., supplementary cross-bars, grooved, ridged, perforated, or recessed, to guide the bars, and provided with extensions to serve as continuations of the grate-bars,) and slip them into the recesses or pockets in the front and back of the grate-frame. Then, placing the bars *a* in position, with their ends in line, insert the lever B through the eyes or sockets *b* in the grate-bars, after which the middle bar A is adjusted by passing its pin or bolt *e* down through the perforated lever B, and there fixing it by a key or other device.

This mode of adjusting the bar A may be dispensed with, in the manner before stated; but in that case its operation and result are not quite as effective.

The advantages of this construction are, greater strength, reliability, ease of operation, and perfect security against displacement while dumping the grate or shaking the bars.

I am aware that numerous grate-bars have been patented showing openings or bearings at the ends for rocking shafts or other similar operating devices; but in none of them are the openings or bearings of such a nature that the rock-shaft or operating device can be withdrawn at any time, and by that the bars disconnected, and in readiness for removal without any further trouble. Especially true would this be of a simple lever. In the above-de-

scribed invention, however, the openings, whether at the middle or any other point of the bar, are of such a nature that the lever not only operates them, but also retains them firmly in position to allow of dumping, as well as being capable of instant withdrawal and attachment. The difference lies in the operation and result. The distinction is marked by the retaining function of the simple lever. I therefore do not claim, broadly, a grate-bar with any kind of opening for any purpose; but

I do claim—

1. In combination with the horizontally-reciprocating bars of a grate, having openings formed therein, as described, the detachable vi-

brating and retaining lever B, passing through said openings from the front.

2. The combination of the fulcrum-bar A, horizontally-reciprocating bars *a*, having openings *b*, and the vibrating and retaining lever B, pivoted to the bar A, passing through the openings *b* from the front, and detachable from the grate, substantially as described.

In testimony that I claim the foregoing, I have hereunto set my hand this 25th day of August, 1875.

JOHN B. LARKIN.

Witnesses:

D. H. YARLETT,
J. BATTENFELDER.