L. P. RIDER.

GRATES FOR FURNACES, &c.,

No. 193,181. Patented July 17, 1877.

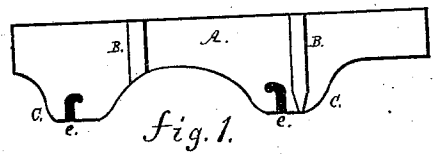


fig. 1.

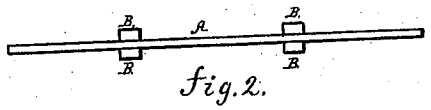


fig. 2.

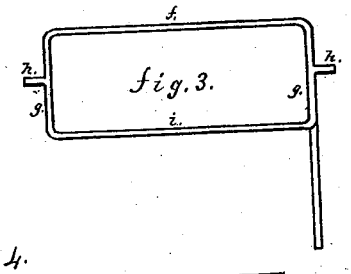


fig. 3.

fig. 4.

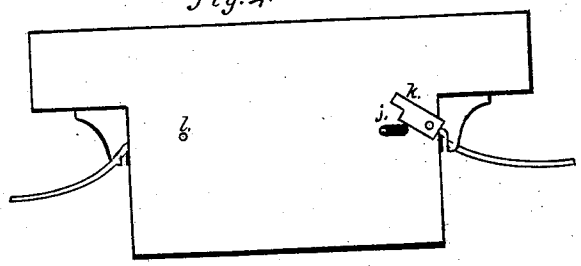
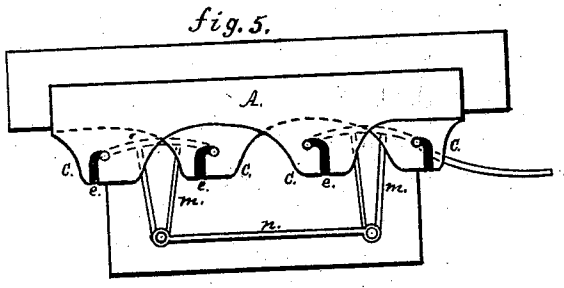


fig. 5.



Witnesses

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IMPROVEMENT IN GRATES FOR FURNACES, &c.

Specification forming part of Letters Patent No. **193,181**, dated July 17, 1877; application filed February 8, 1877.

CASE A.

To all whom it may concern:

Be it known that I, LEMAN P. RIDER, of Pittsburg, county of Allegheny, and State of Pennsylvania, have invented a new and useful Improvement in Grates for Furnaces, Fire-Places, and Stoves; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

My invention relates to an improvement in that class of grates for furnaces, fire-places, and stoves known as "agitating-grates;" and consists in the peculiar construction of the grate-bar, and in suspending them upon pivoted frames, the upper surface of the bars which support the grate-bars being on a horizontal plane with the axis of the trunnions of said supporting-frame, which frames are coupled together by a connecting-rod, whereby alternate bars of the grate can be elevated horizontally above their normal plane, and parallel therewith, for the purpose of stirring the burning fuel, freeing the grate from the refuse of combustion, whereby air will be freely admitted among the particles of the burning fuel and the gases generated therefrom.

To enable others skilled in the art to make and use my invention, I will proceed to describe its construction and operation.

In the accompanying drawings, which form part of my specification, Figure 1 is a side view of the grate-bar. Fig. 2 is a top view of the same. Fig. 3 is a top view of the frame used for suspending the grate-bars and agitating them. Fig. 4 is a side view of the furnace. Fig. 5 is a vertical section of the furnace.

In the accompanying drawings, A represents the grate-bars, having separating-ribs B and pendants C, in which are curved apertures *e* for the reception of the bars *f* and *i* of the frame represented in Fig. 3, which frame is pivoted in suitable bearings, *j* and *l*, in the furnace-wall by means of the trunnions *h*, projecting from the end bars *g* of the frame. The bearings *j* are elongated for the purpose of allowing one of the frames to be moved slightly back and forward for the purpose of placing the bars *f* and *g* in the apertures *e* of the pendant C of the grate-bar, and also for the purpose of removing the bars *i* and *f* from said apertures. The trunnions *h* are held in the bearings *j*, in the proper position, by means of a pivoted latch, *k*.

It will be observed that the aperture *e* of the pendants C of the grate-bars are curved, so that when the bars *i* and *f* (which form continuous bearings for any number of grate-bars) are in said apertures a positive action will be imparted to the bars in their downward movement after having been elevated.

When the grate-bars A are placed on the frame, with the bars *f* and *i* in the apertures *e* of the pendant C, and the trunnions *h* forced back in the elongated bearings *j*, it will be impossible for the bars A to become displaced. The same result may be obtained by making the elongated bearing *j* curved or angular, as represented, in the aperture *e* of the grate-bar A, which method of bearing will readily suggest itself to the skilled mechanic.

From the frames which support the bars project two pendants, *m*, which are pivoted to a rod or lever, *n*, whereby the operator can impart a vibrating motion to the frames represented in Fig. 3, thereby alternately elevating the grate-bars above the normal plane of the grate, the upper surface of the elevated bars being parallel with the normal plane of the grate, (which is about a horizontal plane.)

By suspending the grate-bars in the manner and by the means hereinbefore described, a free and unobstructed admission of air around and between the grate-bars is obtained, securing results which are fully described in the patent allowed me December 8, 1876, to which reference is made, my present invention being an improvement and modification of the invention allowed me, as above recited.

Other forms of grate-bars may be pivoted and suspended upon the frame represented in Fig. 3 without departing from the principle of operation hereinbefore described.

The width of the spaces between the bars will depend upon the thickness of the ribs B, which ribs are also used as a guide for the bars, and also for the purpose of diminishing friction; hence they should be made narrow, so that their rubbing-faces will be of small area.

The upper surfaces of the bars *f* and *i* of the frames represented in Fig. 3 are on a horizontal line with the axis of the trunnions *h*. By this arrangement of the bars with relation to the axis of oscillation of the supporting-frames, the grate-bars will be elevated and lowered horizontally and vertically with the least possible motion endwise.

The advantages of constructing a grate as hereinbefore described are fully and clearly set forth in my application, which has been allowed, and to which reference is made.

Having thus described my invention, what I claim is—

1. The grate-bars A, having ribs B, pendants C, curved apertures *e*, adapted to receive the supporting-frame, constructed as herein described, and for the purpose set forth.

2. The supporting-frame, constructed as shown, in combination with the grate-bars A, provided with curved apertures *e*, substantially as herein described, and for the purpose set forth.

3. The elongated bearing *j* and latch *k*, in combination with the trunnions *h* of the frame, as and for the purpose set forth.

L. P. RIDER.

Witnesses:

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WESLEY JOHNSTON.