(No Model.)

L. BANNISTER.

GRATE.

No. 261,898. Patented Aug. 1, 1882.

Fig. 1.

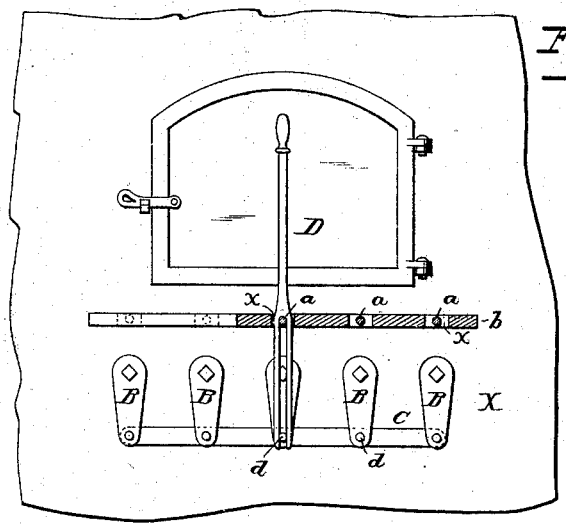


Fig. 2.

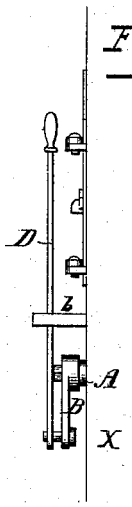


Fig. 3.

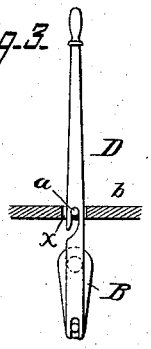


Fig. 5.

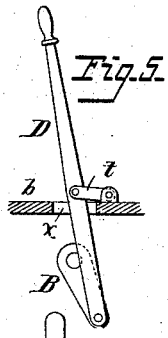


Fig. 4.

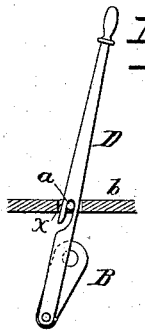
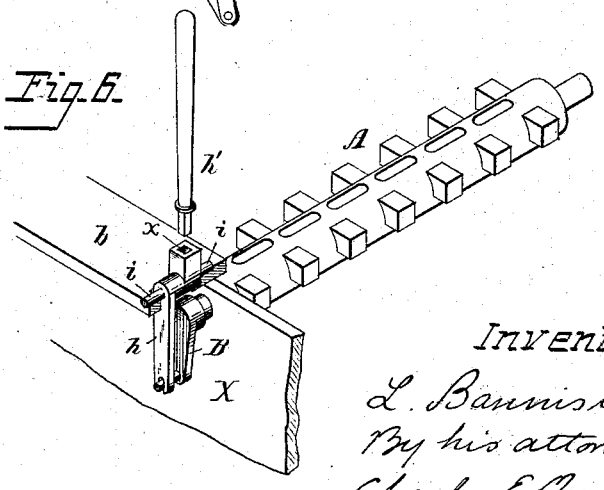


Fig. 6.



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UNITED STATES PATENT OFFICE.

LEMUEL BANNISTER, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO THE AMERICAN GRATE BAR COMPANY, OF SAME PLACE.

GRATE.

SPECIFICATION forming part of Letters Patent No. 261,898, dated August 1, 1882.

Application filed June 2, 1882. (No model.)

To all whom it may concern:

Be it known that I, LEMUEL BANNISTER, a citizen of the United States, and a resident of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Grates, of which the following is a specification.

My invention relates to that class of grates—such, for instance, as is illustrated in Letters Patent Nos. 180,616, 193,018, and 213,228, granted to G. B. Mershon—in which a series of bars is rocked in bearings by means of a lever at the front or side of the grate; and my invention consists in constructing the lever and attachments, as fully described hereinafter, so as to permit it to be readily applied and operated to impart a more extended motion than heretofore to the bars.

In the drawings, Figure 1 is a front view of part of a furnace, showing the bar-rocking attachment partly in section. Fig. 2 is a side view of Fig. 1. Figs. 3, 4, 5, and 6 are views showing modifications.

My improvement is applicable to grates in which the bars have either crank-arms or pinions at their forward ends, the motion to be imparted to the bars being the same as in the grates described in the aforesaid patents, and with like effect.

I have shown the bars A as having crank-arms B, which may all be connected to one transverse bar, C, so that movement imparted to one bar will be transmitted to all; but I contemplate dividing the connecting-bar into sections, so that in large grates the bars A may be connected in gangs rocking independently of each other. The bars are rocked by means of a lever, D, which may be slotted, as shown in Figs. 1, 3, so as to receive a fulcrum-pin, *a*, extending across an opening, *x*, in a flange, *b*, of the frame X, this flange projecting forward below the feed-door in a furnace or stove, or being about level with the floor in case of an open grate. The lower end of the lever D is also slotted to receive or embrace one of the crank-pins, *d*, connecting the arms B with the bar C, so that upon vibrating the lever on its fulcrum the crank-arm will be swung, communicating motion to all the others of the grate or gang, the slot in the end of the lever permitting the vertical play of the pin *d* resulting from the different positions of the fulcra of the arm and lever. The same result may be secured by making an opening in the lower end of the lever to receive the end or shank of the crank-pin, as in Fig. 4, or allowing the lever to slide vertically on its pivot *a*, as in Fig. 3; or in this case the pin *a* may be dispensed with, the lever sliding in the opening *x;* or the lever may be hung to a link, *t*, Fig. 5, so as to permit it to move vertically while vibrating. By the different arrangement of the fulcra of the lever and crank-arms I am enabled to secure a more extended rocking movement of said arms, so as to revolve the bars to a greater degree without imparting so extended a vibration to the upper end of the lever.

Where the bars are geared together, as in Letters Patent No. 180,616, I provide each pinion with a crank-pin, to which the lower end of the lever is applied, as above described.

The connection of the lever with the crank-pin may be permanent; or, as described, it may be such as to permit the detaching of the lever, the latter being preferable, for in such case the same lever may be used to move separate bars or separate gangs of bars by providing the frame with a series of fulcra, *a*, Fig. 1, either in the shape of pins or of openings or notches in the flange *b*. The lever may then be applied to any one of the arms having a fulcrum above it.

In some cases the lever is made in two parts, thus one portion, *h*, slotted to receive the crank-pins at the lower end, may be provided with trunnions *i*, fitting detachably bearings in the flange *b*, and with a socket, *x*, to receive the end of the other part, *h'*, which may be readily applied to and removed from the section *h*. This secures the different arrangement of fulcra as shown in the constructions before described, and is of special advantage in some applications. If desired, the section *h* may be permanently attached to rock in its bearings.

Without limiting myself to the precise construction of parts shown, I claim—

1. The combination, with the rock-bars A,

provided with crank-arms or wheels having pins *d*, of a rock-lever adapted to be connected at one end to one of said pins, and having a fulcrum at a point above the axis of the bars, substantially as set forth.

2. The combination of the bars, arms having pins *d*, and lever D, adapted to a fulcrum above the axis of the grate-bar to have a vertical as well as a swinging movement, substantially as and for the purposes set forth.

3. The combination, in a grate, of the rocking bars having crank-arms, and a frame constructed to afford a series of fulcra for the detachable lever D, substantially as set forth.

4. The combination of the bars having crank-arms, and the flange *b*, having one or more fulcrum-openings to receive the lever D, substantially as set forth.

5. The combination, with the bars and arms, of a lever in two sections, one having its fulcrum above the axis of the bars and connected to one of the crank-pins, and the other being fitted detachably to the lower section, substantially as specified.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

LEMUEL BANNISTER.

Witnesses:
C. H. WILLIAMSON,
CHAS. E. HENRY.