

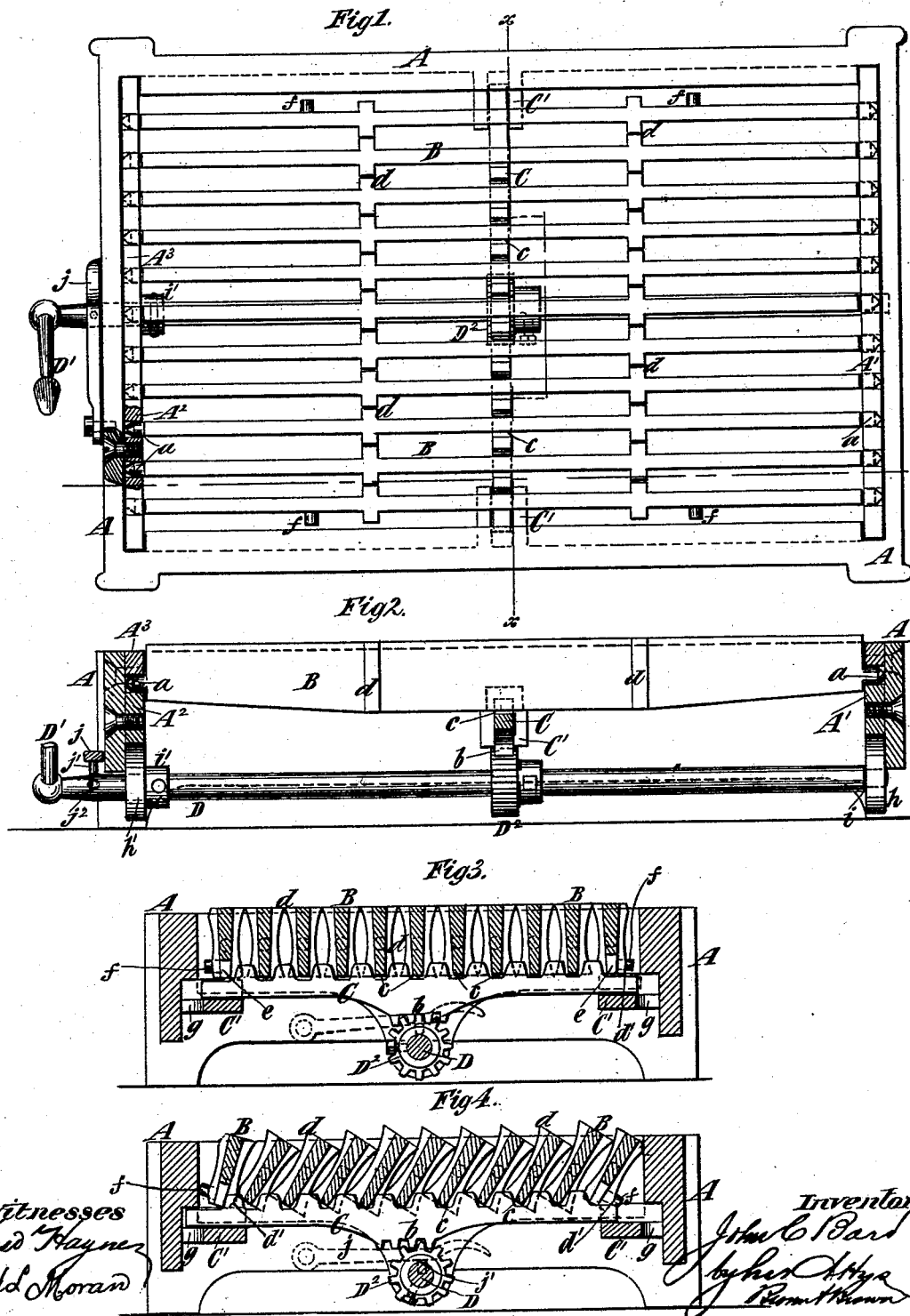
(No Model.)

J. C. BARD.

GRATE.

No. 267,129.

Patented Nov. 7, 1882.



UNITED STATES PATENT OFFICE.

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GRATE.

SPECIFICATION forming part of Letters Patent No. 267,129, dated November 7, 1882.

Application filed September 7, 1882. (No model.)

To all whom it may concern:

Be it known that I, JOHN C. BARD, of the city of Albany, in the county of Albany and State of New York, have invented a new and useful Improvement in Grates, of which the following is a specification.

My invention relates to grates comprising a number of pivoted bars adapted to be rocked or turned in opposite directions, and more particularly to grates in which the pivoted bars are rocked or turned by an agitator or bar extending transversely to and below the grate-bars and engaging with them, so that when reciprocated it will effect the rocking of the grate-bars.

The invention consists in a novel construction of the pivots or trunnions of such grate-bars, and of the bearings wherein they are supported, and in lugs of novel form projecting from the sides of the bars, whereby a greater movement of the bars is obtained and the lugs are rendered more effective in crushing the cinders.

The invention also consists in various combinations of parts and details of construction, hereinafter described and claimed.

In the accompanying drawings, Figure 1 represents a plan of my improved grate. Fig. 2 represents a longitudinal vertical section thereof. Fig. 3 represents a transverse vertical section on the dotted line *xx*, Fig. 1, showing the bars in an upright position; and Fig. 4 represents a similar section, showing the bars in their tilted position, or the position which they occupy at the end of their rocking motion.

Similar letters of reference designate corresponding parts in all the figures.

A designates a rectangular frame, which is to be supported at a proper height from the bottom of the ash-pit, and B designates the grate-bars, which are provided at the ends with pivots or trunnions *a*. At one end of the frame A, in this instance the rear end, it has secured to its inner side a piece, A', wherein are formed the cylindric bearings for the pivots or trunnions *a* at one end of the grate-bars, and the bearings for the pivots or trunnions *a* at the opposite ends of the grate-bars are formed by two pieces, A² A³, having the bearings formed between them and themselves secured to the

frame A. By removing the piece or bar A³, which constitutes a cap, the bars may be taken out, if desired. It will be observed that the bars B are supported at both ends in closed bearings, which are desirable, as they tend to prevent ashes from getting into the bearings. The ends of the pivots or trunnions *a* are here represented as pointed or beveled, as shown clearly in Fig. 2. If any ashes do get into the bearings, the pivots or trunnions, as the bars elongate by heat, tend to loosen the ashes and cause them to pass between the bearings and the pivots or trunnions out of the bearings, and do not pack the ashes in the end of the bearings, as would a pivot or trunnion having a square end.

C designates the agitator, which consists of a bar extending transversely to and under the grate-bars B, and provided with a rack, *b*.

D designates a shaft extending lengthwise of the grate, and provided with a handle, D', whereby it may be rocked, and a pinion, D², which engages with the rack *b*. By rocking the shaft the agitator is reciprocated, and as the agitator is provided with the notches *c*, which receive the lower edges of all the bars except the outside bars, the bars are rocked to and fro as the said agitator is reciprocated. As clearly shown in Fig. 2, the pivots or trunnions *a* are placed at a distance below the upper surfaces of the bars B, and therefore it will be seen that as the bars are rocked their tops will have a considerable movement to and fro, and hence will act more effectively than if the pivots were nearer the upper surfaces of the bars. It will also be seen that when the bars are in an upright position, as shown in Fig. 3, their upper surfaces project above the frame A, and therefore ashes will accumulate on the said frame and keep it comparatively cool.

Upon the sides of the bars B are lugs *d*, which extend nearly or quite to the lower edge of the bars, and the faces of the lugs are concave and their greatest projection is at their upper and lower edges, as shown in Figs. 3 and 4, so that when the bars are rocked in their extreme position in either direction the point or end of each lug will enter or slide upon the concave face of the adjacent lug, and thus allow the bars a greater range of movement than could

be obtained by bars having lugs with straight faces and set at an equal distance apart. The lugs having concave faces are also advantageous, because they operate more effectively on the cinders and clinker than would lugs having straight faces. The two outside bars B are not operated by the agitator C, because if they were rocked an equal distance with the other bars such a wide space would be left between the said outside bars and the frame A as would allow coal to drop down between said outside bars and the frame, and prevent the proper operation of the grate. The said outside bars B are provided with notches *e* in their lower edges, through which the agitator C moves without operating them, and each bar has projecting from its outer side one or more stop-pins, *f*. The lug *d* on the inner side of each outside bar B is cut away or chamfered at its lower corner, *d'*, as shown in Figs. 3 and 4. When the bars are rocked to the right, as shown in Fig. 4, the right-hand outside bar is moved toward and against the frame A by the upper end of the lug *d* on the adjacent bar acting upon the lug of the outside bar; but the left-hand outside bar is rocked to the right by the lower corner of the lug of the adjacent bar acting on the chamfered corner *d'* of the lug on the outside bar, and hence said outside bar is not moved so far as it would be if its lug were not cut away or chamfered. The stop-pins *f* strike upon the frame A, as shown at the left hand in Fig. 4, and prevent too great movement of the outside bars. These stop-pins might be upon the frame, if desired.

The agitator C as it is reciprocated slides in rigid blocks or bearings *O'*, which project from the inner sides of the frame A, and at their inner ends these bearings are preferably provided with holes or openings *g*, through which any ashes which fall into the bearings may escape.

The pinion *D*² is more desirable than a sector for reciprocating the agitator C, because if any of its teeth break it might be turned on the shaft and secured in a new position, so that its other teeth will be brought into use. The shaft D is supported in the bearings *h h'*, depending from the frame A. The rear end of the shaft is shouldered at *i*, which prevents longitudinal movement in one direction, and the shaft is provided with a collar, *i'*, which bears against the bearing *h'* and prevents longitudinal movement in the other direction.

In order to hold the shaft D against being accidentally turned after the bars B are shifted into the desired position, I provide a lever or arm, *j*, carrying a pin or tooth, *j'*, which is adapted to enter a hole, *j²*, in the shaft, as shown in Fig. 2, and dotted in Fig. 3; but any other form of catch may be employed.

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

1. The combination, with a grate-frame comprising cylindric bearings, of the rocking bars provided with pointed or beveled pivots or trunnions fitting in said bearings, substantially as specified.

2. The combination of a grate-frame, grate-bars pivoted therein, and provided on their sides with lugs *d*, having their greatest projection at their upper and lower edges, and concave faces between said edges, and devices for rocking said bars, substantially as specified.

3. The combination, with a grate-frame, of grate-bars provided with pivots or trunnions at a considerable distance below their upper surfaces, and also provided on their sides with lugs *d*, having their greatest projection at their upper and lower edges, and concave faces between said edges, substantially as specified.

4. The combination, with a grate frame provided with closed or covered bearings at one end and bearings having a removable cap at the other end, of grate-bars provided with pivots or trunnions fitting in said bearings, and the upper surfaces of which project above the frame, so that ashes will collect on the latter and keep it comparatively cool, substantially as specified.

5. The combination, with the pivoted bars B, provided with lugs *d*, of the reciprocating agitator engaging with all said bars except the two outside bars, and stops *f* for arresting the rocking movement of said outside bars away from the frame, substantially as specified.

6. The combination of the frame A, the pivoted bars B, the reciprocating agitator C, and the rigid blocks *O'*, forming bearings for the agitator, and provided with escape-openings *g* for ashes, substantially as specified.

7. The combination of the frame A, the pivoted bars B, the reciprocating agitator C, provided with a rack, *b*, and the shaft D, provided with the pinion *D*², which is adapted to be turned on the shaft to bring new teeth into engagement with said rack, substantially as specified.

8. The combination of the frame A, the bars B, the agitator C, the pinion *D*², and the shaft D, supported in bearings *h h'*, and provided at the one end with the shoulder *i* and at the other end with a collar, *i'*, substantially as specified.

9. The combination of the frame A, the pivoted bars B, the agitator C, the shaft D, provided with a pinion, and a locking device applied to said shaft, substantially as specified.

JOHN C. BARD.

Witnesses:

ELIAS P. HALE,
ED. P. H. KIMBALL.