J. ASHCROFT.
Grate-Bar.

No. 208,357. Patented Sept. 24, 1878.

Fig. 5.

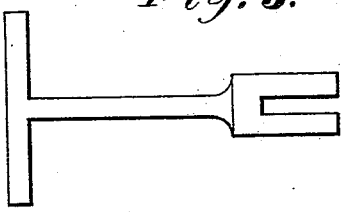


Fig. 6.

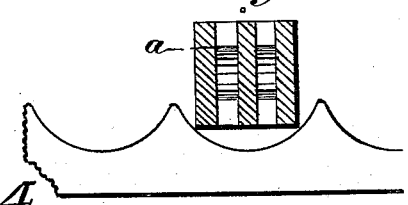


Fig. 4.

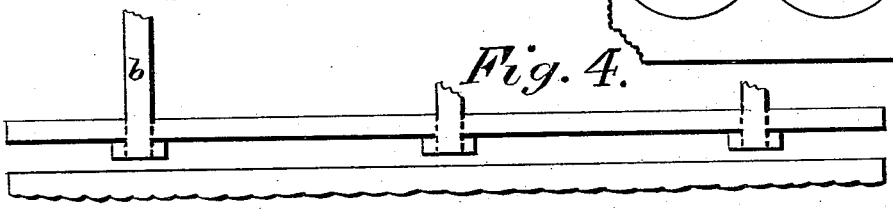


Fig. 3.

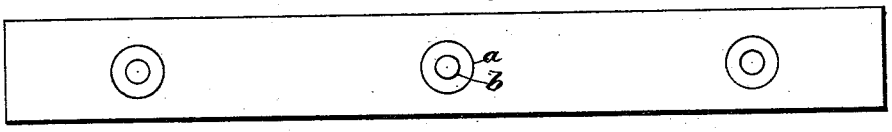


Fig. 1.

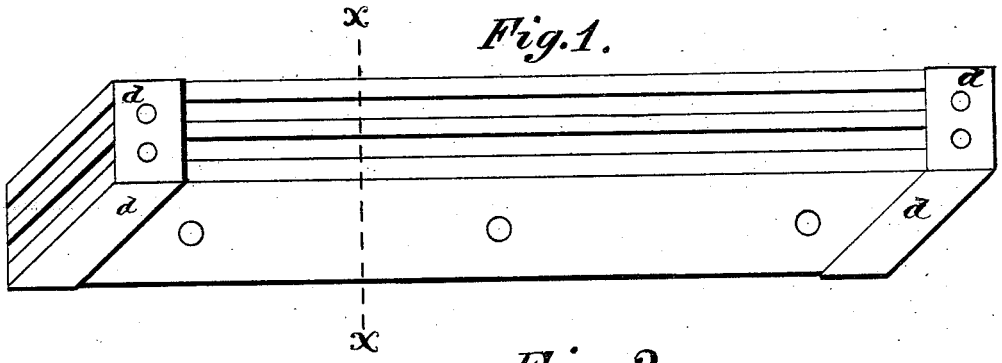
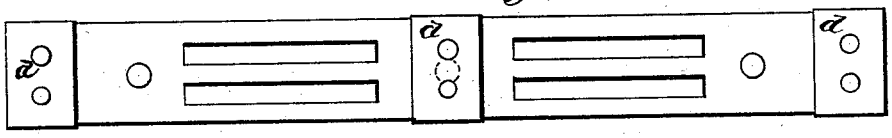


Fig. 2.



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UNITED STATES PATENT OFFICE.

JOHN ASHCROFT, OF BROOKLYN, NEW YORK.

IMPROVEMENT IN GRATE-BARS.

Specification forming part of Letters Patent No. **208,357**, dated September 24, 1878; application filed September 19, 1878.

To all whom it may concern:

Be it known that I, JOHN ASHCROFT, of the city of Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Revolving Square Sectional or Ribbed Grate-Bars; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

This invention relates to grate-bars known as "revolving bars," in which cheapness in first cost, simplicity in construction, and economy in material are combined; and it consists in combining and arranging together flat bars or plates of iron, or bars of any such material as will subserve the purpose, by bolting or fastening them through their sides, and keeping them apart at a proper distance, such as may be required, always taking into consideration the kind of fuel to be used. The distance or air-space between the bars may be from one-eighth of an inch to one-half or even five-eighths of an inch with equally good results. Of course, for burning coal-dust or refuse the former is preferred; but coal-dust may be burned with the bars set one-quarter of an inch apart, which is the distance I prefer, and which produces good results.

In stating that the bars are fastened through their sides, I do not wish to be understood that they cannot be united by other means, for any simple contrivance may be resorted to, the gist of my invention being to construct a revolving grate-bar, of square or other form, made up of sections, separated or spaced by any well-known means, but preferably as shown.

It further consists in securing to each other the plates or bars of which each grate-bar is composed by means of bands made of any suitable metal, and which may be placed on the ends of the bars, and also at any position throughout the entire length of said bar, as will hereinafter more fully appear. This bar may be cast, but, however, retaining its identity of being a square bar, and naming the sections "ribs," preserving the four equal sides.

I am aware that revolving grate-bars have been made of solid iron of square, round, and other cross-section, as shown by patents granted to me bearing date, respectively, November 27, 1877, No. 197,510, and April 16, 1878, No. 202,323; and, while grate-bars of the above construction give satisfaction and produce good and valuable results, I find by experience and practical tests that the sectional bar above described can be made at less cost, is much lighter and more easily handled, allows a better and a freer circulation of air to the fuel by reason of the air-spaces or interstices between the sections, will last longer, is less liable to contraction and expansion, and is in general an improvement.

In referring to the drawings, Figure 1 illustrates a perspective view of my improved grate-bar ready for use. Fig. 2 shows a plan view of the side of one of the plates, in which air-apertures are plainly seen. All the plates may be thus perforated, so that, if found necessary, the side of the bar may be used as the upper fuel-bearing surface. Fig. 3 shows a solid side view of one of the bar-plates, in which the ends of the stay-bolts *b* protrude, also showing the spacing or separating pieces *a*, resting on the ends of said bolts. These pieces *a* may be made of any shape, and, while they are shown round, the upper surface may present a knife-edge, so that the ashes will not rest upon them, which would, in a measure, prevent the air-draft. Fig. 4 shows a top view of the edge of the bars, also showing the spacing-pieces and the bolts extended to receive additional bars. The plates composing the grate-bars are parallel, and the same depth, width, and thickness, so that when any of the plates are worn out a new one may be replaced in its stead, thus utilizing the remaining bars. This is also important in their construction, as there is no fitting to be done—simply putting the bars together as they come. Fig. 5 shows the wrench, which is made to be inserted between the plates at their front ends for the purpose of revolving the bars; and Fig. 6 clearly shows a cross-section on the line *x x*, Fig. 1, illustrating the position of the separating or spacing pieces *a*. It will be seen that they are a considerable distance below

the fire-surface, and are, therefore, less liable to be affected by the heat.

The bands *d*, which secure all the plates of each bar together, are shown on Figs. 1 and 2. These bands are perforated to allow a freer circulation of air through them.

The bearing-bars, in which the grate-bars revolve, are shown at Fig. 6; but it is obvious that they may be rested on any ordinary bearing-bar, if found necessary, as they can be made to take the place of an ordinary grate-bar.

The operation is obvious—viz., that when the bars are revolved the ashes and clinkers fall through, clearing the air-apertures of any extraneous matter, thereby allowing a full, free, and uniform admission of air to all parts of the grate-surface and thence to the fuel.

Having now fully described my invention, its construction, and operation, what I claim as new, and desire to secure by Letters Patent, is—

1. A square sectional or ribbed grate-bar, constructed as shown, and adapted to revolve, substantially as set forth and described.

2. The combination of a square or sectional ribbed grate-bar with a grooved bearing-bar, the grate-bars being adapted to revolve, whereby they are cleared of ashes and cinders, in the manner substantially set forth and described.

3. The combination of the square sectional grate-bar, the tie or stay bolts, and the spacing or separating pieces with a grooved bearing-bar, the grate-bars adapted to revolve in said grooves, as set forth.

4. The combination, with a sectional revolving grate-bar of square cross-section, of the tie or stay bolts, the spacing-pieces, and the binding-bands *d*, constructed and arranged to revolve in suitable bearings, substantially as set forth and described.

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

JOHN ASHCROFT.

Witnesses:
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M. S. CALLAN.