

J. ASHCROFT.
Grate-Bar.

No. 213,730.

Patented April 1, 1879.

FIG. I.

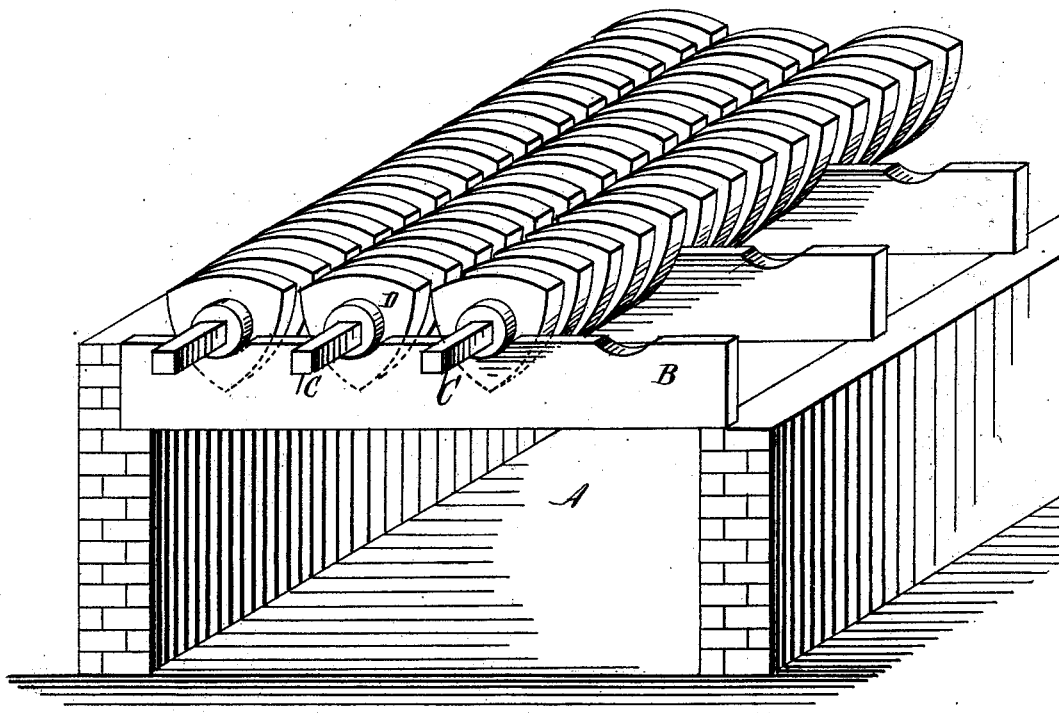
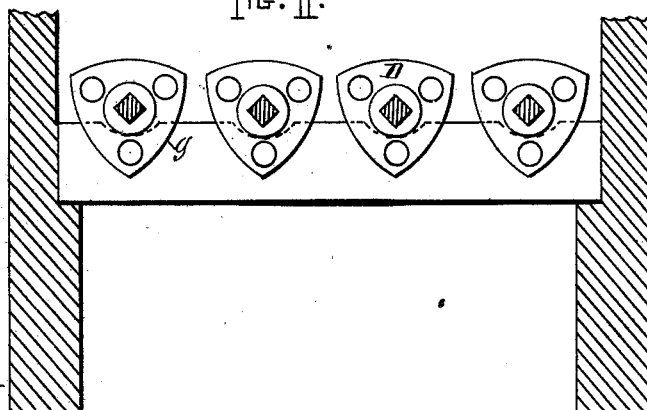


FIG. II.



WITNESSES:
W. H. Harmer
James H. H. H. H.

INVENTOR:

John Ashcroft

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FIG. III.

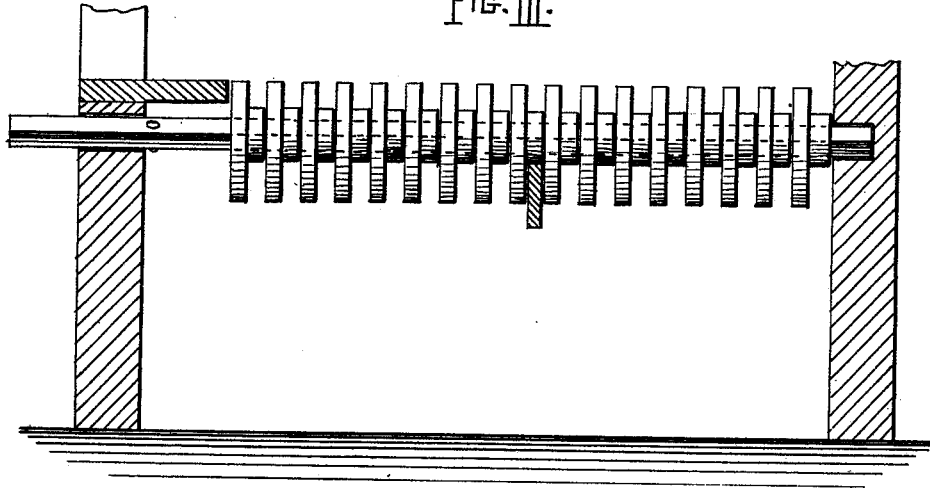


FIG. IV.

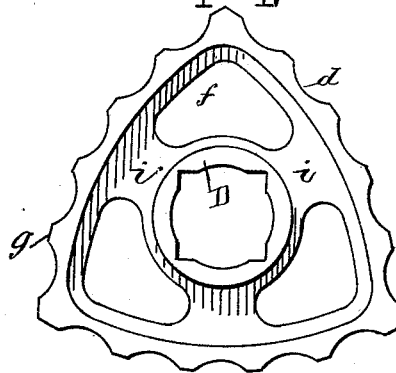
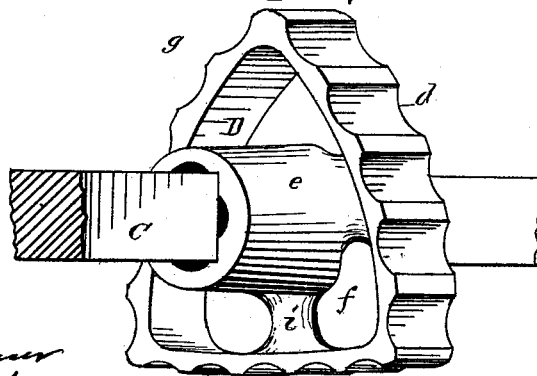


FIG. V.



WITNESSES:

G. W. Harman
James Mich^d Ballen

INVENTOR:

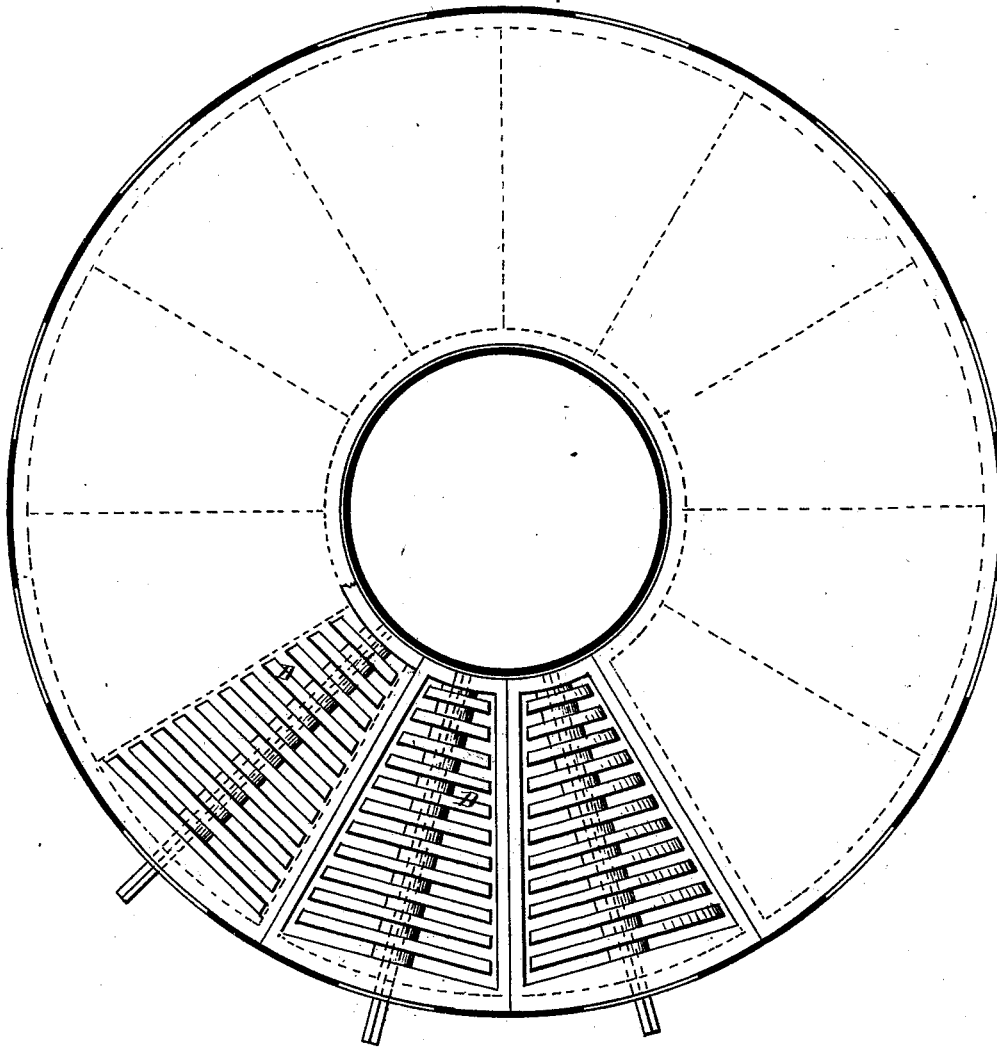
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FIG. VI.



WITNESSES:

G. W. Stevenson
James Mich. Ballan

INVENTOR

John Ashcroft

UNITED STATES PATENT OFFICE.

JOHN ASHCROFT, OF BROOKLYN, NEW YORK.

IMPROVEMENT IN GRATE-BARS.

Specification forming part of Letters Patent No. **213,730**, dated April 1, 1879; application filed February 17, 1879.

To all whom it may concern:

Be it known that I, JOHN ASHCROFT, of Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Grate-Bars; and I do hereby declare that the following is a full, clear, and exact description of the invention, 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 the letters of reference marked thereon, which form a part of this specification.

This invention relates to grate-bars; and it consists in forming a revolving grate-bar of a central shaft or spindle, upon which are strung a number of removable sections, which are curved or corrugated on their periphery, and which may be of triangular or other suitable exterior configuration. These sections are kept apart at suitable distances by projecting hubs or loose washers, and may be made solid, or be provided with spokes or arms, so as to tighten them, and at the same time allow a free circulation of air around the hubs as well as to the fuel. The bars may be arranged so as to be independently or simultaneously revolved.

It also consists in arranging the grate for a circular, hexagonal, or other shaped furnace, in such a manner that the grate diverges in a radial manner, the sections being made of tapering or increasing form in cross-sections radiating from a common center, all of which will be more fully described hereinafter.

In the accompanying drawings, Figure 1 is a perspective view of a portion of a furnace with my grate-bars in position. Fig. 2 is a vertical cross-section of the same. Fig. 3 is a longitudinal section of the same. Fig. 4 is a side view of one of the removable sections. Fig. 5 is a perspective view of the same. Fig. 6 is a plan view of a circular furnace provided with my grate-bars.

The most desirable features of a grate bar are, first, the necessary strength with the least possible weight of metal; the greatest possible facility for the entrance of air through or between them, with the necessary surface to hold the fuel; the greatest possible capacity for cleaning the fire and keeping the air-interstices

free from ashes and clinker, and the greatest economy in their use.

The object of my invention is to secure the best results in all these particulars.

In the drawings, A represents a portion of a furnace; B B, the bearing-bars to support the grate-bars, the construction of which is particularly described in my Letters Patent No. 202,323, dated April 16, 1878.

The spindle or shaft C C of my grate-bars may be of any desired shape in cross-section, although I have shown it in square cross-section in my drawings. The shape is, however, immaterial, provided the spindle be of sufficient strength and means are used to hold the section in position on it.

The shaft or spindle is, or may be, made of cast or wrought metal, extends from the front to the rear of the furnace, and is supported on the ends by the front and rear walls thereof. They are of such size and are placed at such distances apart as may be desired with reference to the kind of furnace and the character of the fuel to be used.

D is a removable section of the grate-bar, of which a sufficient number are strung or slipped upon the spindle or shaft to make a continuous series extending the length of the furnace. The peripheries of these sections may in their general outline be square, circular, triangular, or polygonal, and the surface may be corrugated, as shown by the letters *d d* in Figs. 4 and 5.

I prefer to make these sections open on their sides, the rims *g g* being attached to a central hub and fitting on spindle or shaft C by stays, arms, or spokes *i i*. In casting these sections D, of course the rim, spokes, and hub can be cast together in one piece.

In the drawings the hub is shown as extending beyond the section, to regulate the spacing between the sections. This purpose, however, may be effected by loose washers interposed between the sections.

f f are spaces or interstices in the sections, intended both to reduce the amount of metal required, and also to facilitate the entrance of air to the fuel, and also to permit its circulation under the rims to keep them from burning out. These sections, when in position on the spindle, will constitute a grate-bar whose

exterior surface is constantly broken, leaving interstices for the admission of air through so the bars as well as between them. The bars made rest upon and are supported by bearers B, whose upper surfaces are scalloped, and are so adjusted that the outer surface of the extended hub *e* (or the washer, if used) shall revolve in its respective recess in the bearing-bar.

The spindle or shafts may project through and beyond the front of the furnace, so that with the use of a key each bar may be completely revolved; or the bars may be so arranged as to revolve simultaneously.

The form and shape of the sections, as will readily be seen, are admirably calculated to grind the clinker and to reduce and carry below any ashes which may rest upon them. In case any of the sections should become broken or burned, the bar may be quickly removed, another section readily substituted, and the bar replaced at a trifling cost.

It is desirable that the sections should fit loosely upon the spindle or shaft, in order that the expansion and contraction of the metal shall be amply provided for and the danger of warping prevented.

The bar described will be sufficiently strong, and will weigh but from one-quarter to one-half of an ordinary solid bar.

Sufficient bearing-surface and the greatest practical air-interstices are provided.

The fire will be kept clean by the revolution of the bars, and in case of destruction of a

portion of the bar by long use, the portion destroyed only need be replaced. I may arrange them, as shown in Fig. 6, for a circular, hexagonal, or other shaped furnace, in which the grate-bars diverge in a radial manner. In this instance I make the sections of gradually tapering or increasing form in cross-section radiating from a common center.

Having described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A revolving grate consisting of a spindle or shaft and removable sections triangular in cross-section, curved and corrugated on their periphery, as shown and described.

2. A revolving grate-bar consisting of a central spindle or shaft, and triangular sections having curved faces and removable, the rims being supported on a hub by means of stays, arms, or spokes, as described.

3. In a furnace of circular, hexagonal, or similar shape, a grate-bar consisting of a central spindle or shaft and removable sections, made of square, triangular, or other similar shape on their periphery, and gradually tapering or increasing size in cross-sections from a common center, substantially as specified.

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

JOHN ASHCROFT.

Witnesses:

JAMES NICHES. CALLAN,

C. W. HAVENNER.