J. ASHCROFT.

Grate-Bars for Furnaces.

No. 221,656. Patented Nov. 18, 1879.

*Fig. 1.*

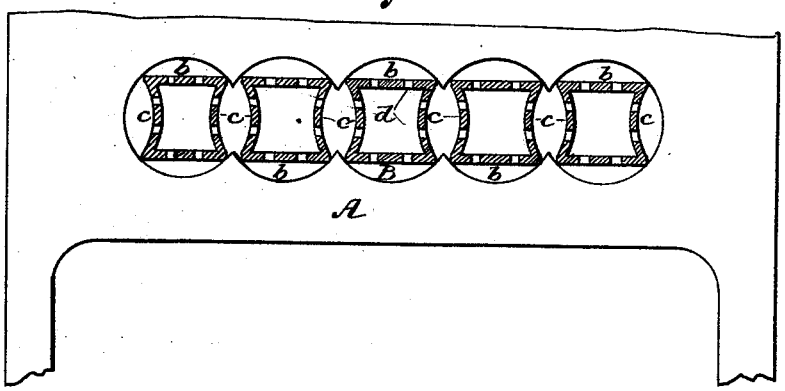



*Fig. 2.*

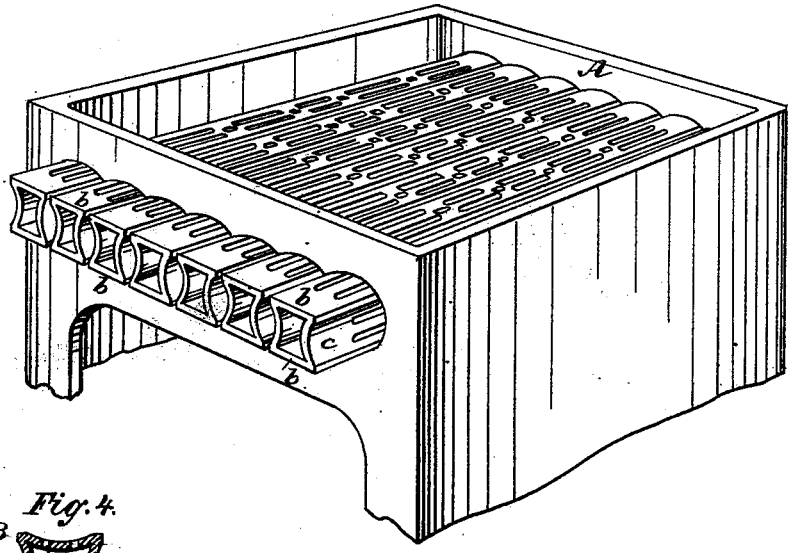



*Fig. 4.*

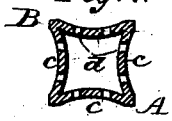
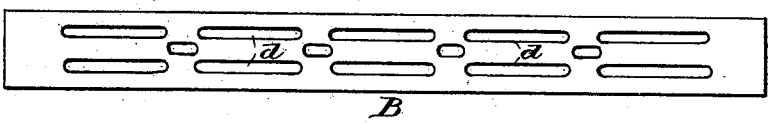



*Fig. 3.*




WITNESSES

E B Barnum

Theo. Mungen.

By

INVENTOR

John Ashcroft

# UNITED STATES PATENT OFFICE.

JOHN ASHCROFT, OF BROOKLYN, NEW YORK.

## IMPROVEMENT IN GRATE-BARS FOR FURNACES.

Specification forming part of Letters Patent No. **221,656**, dated November 18, 1879; application filed September 29, 1879.

*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 new and useful Improvements in Grate-Bars for Furnaces; and I do declare the following to be a true and perfect specification thereof, reference being had to the accompanying drawings, wherein—

Figure 1 is a cross-section of a furnace-grate containing my improved grate-bars. Fig. 2 is a perspective view of the same. Fig. 3 is a top view of a grate-bar detached. Fig. 4 is a cross-section of a modification of the same.

The object of my invention is to construct a hollow grate-bar in such manner that the greatest amount of air-space and interstices and the closest possible proximity of the bars shall be obtained.

The nature of my invention consists in a hollow grate-bar whose opposite faces are respectively straight and concave, and whose faces are perforated at suitable intervals with numerous openings, which are preferably of an elongated character.

By arranging the bars so that they present their concave surfaces to each other they may be placed much nearer together, and still revolve, than is possible with bars of a similar cross-section without concave surfaces, as will be hereinafter more particularly described.

In the drawings, A represents the rear wall of a furnace, provided with suitable recesses to support the ends of the bars and permit them to revolve. B is one of the bars, having its upper and lower faces, *b b*, made flat and its side faces, *c c*, concave. This bar is hollow, and is perforated with longitudinal or other suitable openings *d d* on all its faces for the free admission of air.

Where revolving bars of square cross-section are employed the intervals between the next adjoining bars on either side of each bar must be equal to the diameter of a circle described around it. These intervals are too great for small fuel; and in order to overcome this difficulty I concave at least two of the faces which are to be presented to the adjoining bars, so that such adjoining bars in revolving will describe a circle closely following the contour of the said concave.

It will be seen that by this arrangement, instead of each bar needing a space equal to the diameter of its diagonal to describe its circle, its circle so described can and does impinge upon and lap over the space covered by the adjoining bars.

In the modification shown in Fig. 4 all the faces are shown concaved.

I do not wish to confine myself to a hollow bar; but such a bar as I have described may be made of solid metal of the cross-sections described.

Having described my invention, what I claim to be new is—

1. In a furnace, the grate-bars, with at least two of their opposite faces concaved and arranged in such manner that the edges of each bar, when revolved, enter into the concaved parts of the adjoining bars, substantially as and for the purposes set forth.

2. In a furnace, a hollow grate-bar, with perforations to admit the free circulation of air, having at least two of its opposite faces concaved, substantially as described.

JOHN ASHCROFT.

Witnesses:
E. B. BARNUM,
THEO. MUNGEN.