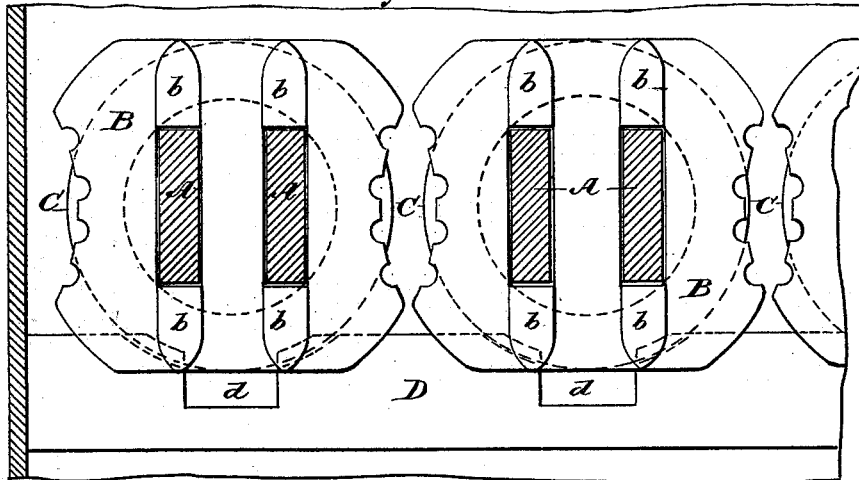


J. ASHCROFT.  
Grates and Grate-Bars for Furnaces.

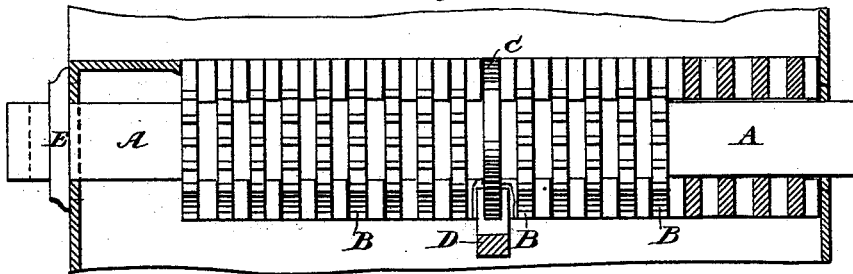
No. 221,657.

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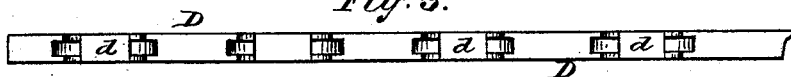
*Fig. 1.*



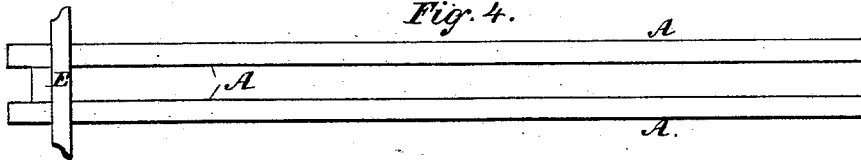
*Fig. 2.*



*Fig. 3.*



*Fig. 4.*



WITNESSES:

*E. B. Barnum*  
*Theo. Munger*

INVENTOR:

*John Ashcroft*

# UNITED STATES PATENT OFFICE.

JOHN ASHCROFT, OF BROOKLYN, NEW YORK.

## IMPROVEMENT IN GRATES AND GRATE-BARS FOR FURNACES.

Specification forming part of Letters Patent No. **221,657**, 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, county of Kings, and State of New York, have invented new and useful Improvements in Grates and Grate-Bars for Furnaces; and I do hereby declare that the following is a correct and true specification thereof, reference being had to the accompanying drawings, wherein—

Figure 1 is an enlarged cross-section of the grate-bars and a longitudinal view of the bearing-bar. Fig. 2 is a plan view of a grate-bar with part thereof and the bearing-bar in section. Fig. 3 is a top view of the bearing-bar. Fig. 4 is a top view of the double core supporting the sections.

The nature of my invention relates to improvements on former inventions of mine of a similar nature heretofore patented, and is directed especially to such an arrangement, more particularly, as will admit of the use of fine coal or coal-dust, although in several respects some of its features are capable of general application; and it consists in the construction and arrangement of the parts, as will be hereinafter more fully and particularly described.

In the drawings, A represents the double core of the bar, made of two flat bars of iron, extending from the front to the rear of the furnace, and arranged in pairs at such spaces between the core as may be found most convenient in adjusting the sections.

B represents the sections, which are strung upon this double core, and are made of flat pieces of metal pierced in the center with holes to fit the double core. They are flat upon two opposite edges and concaved on the other two opposite edges, and have the corners rounded off on the arc of a circle sufficient to enable the section to clear the adjoining sections of the next bar when revolved. The flat edges may also be concaved, and may be corrugated, if desired, and the other opposite concaved edges of the section may also be corrugated.

Upon one side of the section are arranged lugs *b*, preferably in line with the double core, so as not to obstruct the passage of the air through the bar, which lugs are used to main-

tain a proper distance between the sections and to form air-spaces.

At the points upon the bar where it rests upon the bearers I place a section, C, with a circular periphery of a diameter slightly shorter than the longest diameter of the other section. This section is arranged to rest upon and in recesses in the bearing-bar D and to revolve thereon. This bearing-bar D extends from side to side in the furnace, and is cut out at proper intervals to receive the circular section C, and is recessed in the hollow in order that the section C may be maintained in position. On the bottom of the part hollowed out a further depression is made in order to reduce the bearing-points to the smallest possible face and to supply an additional air-space under the section C.

At the outer end of the double core, which extends through and outside of the furnace-front through circular holes made for the purpose of permitting a free revolution of the bars, and against the furnace-front, is provided a washer, E, which is pierced with the necessary holes to allow the passage of the double core.

The washer prevents the passage of air either into or out of the furnace, as well as fine coal, ashes, and soot, which, especially when a blast is used, is very advantageous.

The advantages gained by the arrangement of the bars as described consist, among other things, first, in an increased air-space by reason of the use of a double core; second, in a decreased weight of model and consequent economy by the substitution of the double for a single core, such as has been heretofore used; third, in the fact that the bars can be placed in such close proximity as to prevent the escape of fine coal or dust between them, which fact is due to the concavity of the edges of the sections and the rounding of the corners; fourth, in the increased air-space obtained by the arrangement of the lugs; fifth, also, in the increase of air-space obtained by the depression of the bearing-bar; sixth, by the prevention of escape of air, soot, &c., from, or the undesired introduction of air into the furnace, ac-

complished by the use of the washer on the end of the double-core.

While this arrangement has been described, and its advantages pointed out with reference to the use of fine coal or other fine fuel, it will be readily seen that it is equally capable of use with large fuel of any kind.

The use of more than two bars in the core would not affect the character of my invention, as it would simply involve additional slots in the sections and washer.

Having described my said invention, I claim as new—

1. In a furnace, a double-core consisting of two bars of metal, upon which are strung sections also of metal, the whole constituting a revolving grate-bar, substantially as described.

2. In a furnace grate-bar, the double core *a*, upon which are strung suitable sections, substantially as described.

3. In a grate-bar, the section B, with concave edges, by which a revolution of the bars is possible with their close proximity, substantially as described.

4. In a sectional grate-bar, a section with a circular periphery, which periphery rests upon and is supported by the bearing-bar, and in turn supports the grate-bar, substantially as described.

5. In a furnace-grate, a bearing-bar provided with recesses for supporting a revolving sectional grate-bar, substantially as described.

6. In a furnace-grate, a bearing-bar provided with a depression therein at suitable intervals to permit an increased circulation of air under the grate-bars at the bearing-points, substantially as described.

7. In a furnace-grate, the washer E, strung upon the end of the bar and placed against the front of the furnace, as and for the purposes described.

JOHN ASHCROFT.

Witnesses:

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