(No Model.)

C. D. ROGERS.

GRATE BAR.

No. 344,203. Patented June 22, 1886.

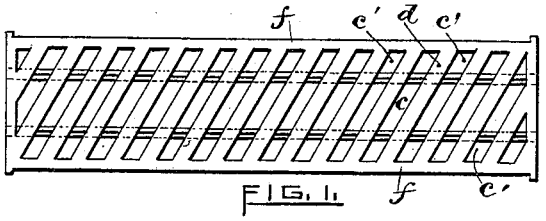

FIG. 1.

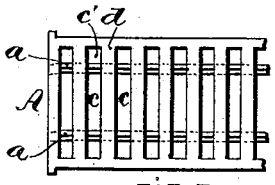

FIG. 7.

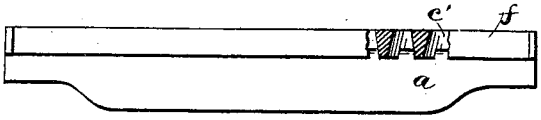

FIG. 2.

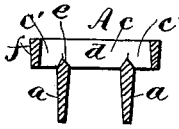

FIG. 3.

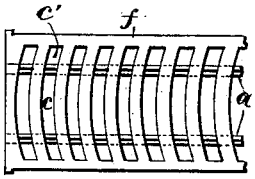

FIG. 8.

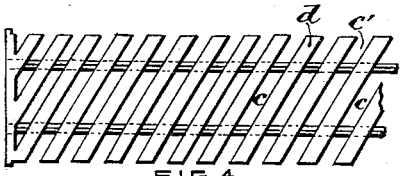

FIG. 4.

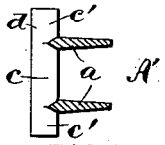

FIG. 5.

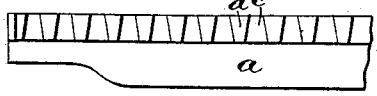

FIG. 6.

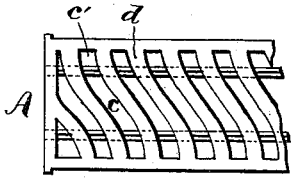

FIG. 9.

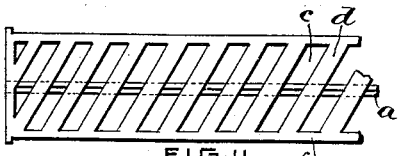

FIG. 11.

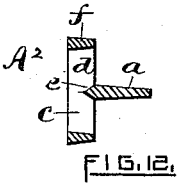

FIG. 12.

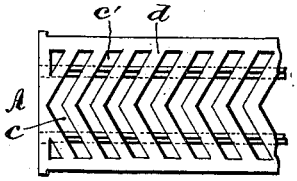

FIG. 10.

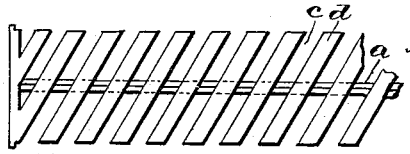

FIG. 13.

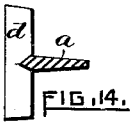

FIG. 14.

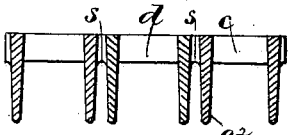

FIG. 16.

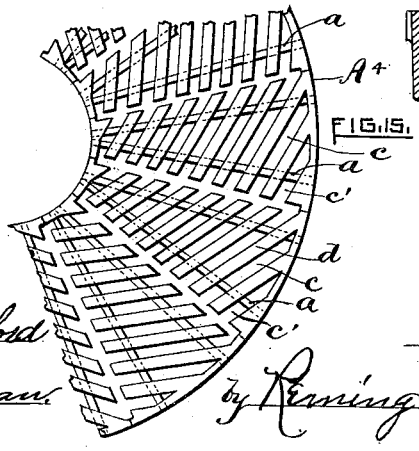

FIG. 15.

WITNESSES.

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Charles Cannigan.

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UNITED STATES PATENT OFFICE.

CHARLES D. ROGERS, OF PROVIDENCE, RHODE ISLAND, ASSIGNOR TO GEORGE H. CLARKE, OF BROOKLYN, NEW YORK.

GRATE-BAR.

SPECIFICATION forming part of Letters Patent No. 344,203, dated June 22, 1886.

Application filed April 9, 1886. Serial No. 198,355. (No model.)

To all whom it may concern:

Be it known that I, CHARLES D. ROGERS, a citizen of the United States, residing at Providence, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Grate-Bars; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as 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 or figures of reference marked thereon, which form a part of this specification.

The invention illustrated herewith, and hereinafter claimed, relates especially to grate-bars; and it consists, essentially, in the novel construction and arrangement of the longitudinal ribs and the short lateral bars constituting the grate-bar, by means of which an air-space is produced between the outer side of the longitudinal rib and the end of each lateral bar, all as will be more fully hereinafter set forth.

The object of my invention is to so construct grate-bars that the action of the heat thereon in use will be less destructive than in grate-bars as heretofore constructed.

By means of my invention the grate-bars will be more serviceable, and at the same time permit the air to flow through them in a more uniform manner.

In order to fully describe and point out the peculiarities of my invention, I have prepared the accompanying sheet of drawings, in which—

Figure 1 represents a plan view of a grate-bar provided with my improvements. Fig. 2 is a side view of the same, a portion of the outer tie being broken away. Fig. 3 is a transverse sectional view. Fig. 4 is a partial plan view of the grate, having the outer or edge tie removed. Fig. 5 is a cross-sectional view. Fig. 6 is a partial side view of the same. Figs. 7, 8, 9, and 10 are partial plan views showing various forms of openings or air-spaces as combined in my improved grate-bar. Fig. 11 is a partial plan view of the grate as provided with a single longitudinal center tie and lateral bars whose ends are united by side ties. Fig. 12 is a cross-sectional view of the same. Fig. 13 is a plan view of a single tie-bar with the side ties removed. Fig. 14 is a cross-sectional view. Fig. 15 is a partial plan view of a circular grate made in sections and embodying my improvements, and Fig. 16 represents a cross-sectional view of three grate-bars as usually constructed and set.

The following is a detailed description of my invention, including the manner of its construction and operation.

A, again referring to the drawings, designates a cast-metal grate-bar embodying my improvements, *a a'* being the longitudinal or supporting ribs uniting the lateral bars *d* on their under side, as clearly shown in Fig. 3. It will be observed that the upper edge, *c*, of said ribs *a* extends but slightly above the lower side of the cross-bars, by means of which I not only increase the air-space *c*, but also am enabled to reduce the weight of the bars A. Another advantage of this construction is that by so lowering the tops of the ribs *a* below the face of the grate the ribs are less subject to the action of the fire burning upon said grates, thereby increasing the "life" of the bars.

f indicates a very thin tie, which extends along each side of the grate-bar, to connect the outer ends of the bars *d*, as shown. The ribs *a* are placed with reference to the ties *f* so as to form a series of narrow outer air-spaces, *c'*, on each side thereof, opening into or communicating with the main air-spaces *c*, as shown in Figs. 1, 3, &c.

In Figs. 4, 5, and 6 the ties *f* have been omitted. The openings *c c'*, however, are practically retained.

Figs. 11 to 14 indicate a grate-bar constructed substantially as shown in the preceding figures, except that a single longitudinal central supporting-rib, *a*, is employed in lieu of the double ribs before described.

It is obvious that various shaped bars *d* and air-spaces *c* may be adopted, as shown in Figs. 7, 8, 9, 10, &c., without departing from the spirit of the invention.

In Fig. 15 a portion of a circular grate embodying my improvements is represented. In grates of this class the bars *d* and air-spaces *c c'* may also be modified in form, substantially as indicated in said Figs. 7, 8, &c.

In Fig. 16 is represented a cross-sectional

view of grate-bars as usually made and arranged. In this construction the longitudinal ribs a^2 of adjacent bars are brought so close together that the air is practically prevented from circulating freely between them, thereby resulting in the overheating of the ribs, and the consequent warping of the grate-bars after a comparatively short use, and necessitating frequent renewals of the grate.

By means of the hereinbefore-described improvements I am enabled to produce a grate-bar which, in a very great degree, overcomes the disadvantages named in the preceding paragraph, as by locating the ribs *a* farther in from the ends of the laterals *d*, I provide a series of outer air-spaces, *c'*, which communicate with the main air-spaces *c*, as clearly indicated in the several figures. I would not be understood, however, as claiming, broadly, a grate-bar having the ends of its lateral bars extending beyond the longitudinal ribs or supporting-ties.

Now, having thus described my invention, what I claim as new, and desire to secure by United States Letters Patent, is—

1. The improved grate-bar hereinbefore described, consisting of the apertured top having a circumscribing band or tie, and one or more bars connected with the under side of said top and extending longitudinally thereof, thereby forming a series of air-passages on each side between said band and longitudinal bars, as set forth.

2. As an improved article of manufacture, the grate-bar A, hereinbefore described, consisting of the lateral bars *d*, connected at their outer ends by continuous ties *f*, and longitudinal ribs *a a*, connecting the under side of said bars *d*, the whole arranged to form a series of central or main air-spaces, *c*, and connecting side spaces, *c'*, as set forth.

In testimony whereof I have affixed my signature in presence of two witnesses.

CHARLES D. ROGERS.

Witnesses:
GEO. H. REMINGTON,
WM. R. DUTEMPLE.