J. C. FURNESS.

Grate-Bars for Furnaces.

No. 217,525. Patented July 15, 1879.

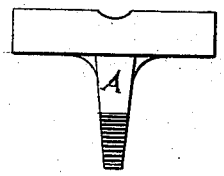

Fig.3.

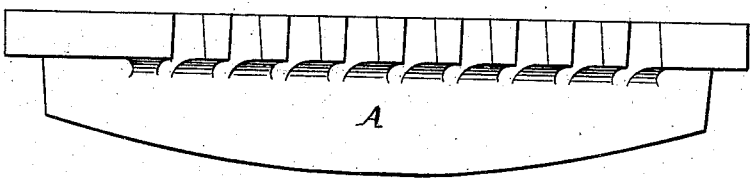

Fig.2.

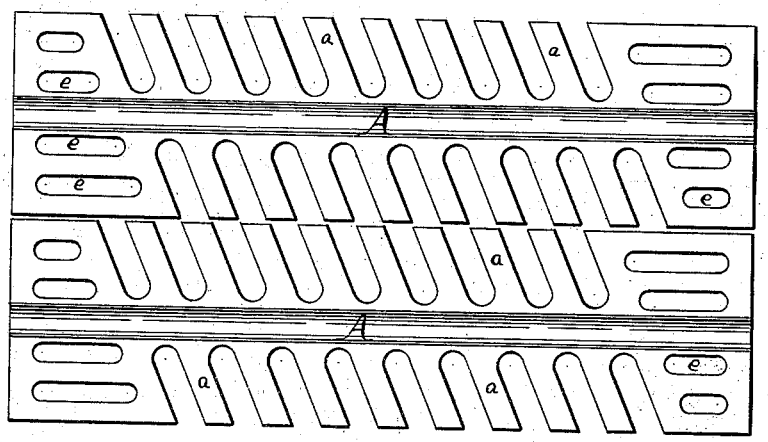

Fig.1.

Witnesses:

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JAMES C. FURNESS, OF BOSTON, MASSACHUSETTS.

IMPROVEMENT IN GRATE-BARS FOR FURNACES.

Specification forming part of Letters Patent No. **217,525**, dated July 15, 1879; application filed March 24, 1879.

To all whom it may concern:

Be it known that I, JAMES C. FURNESS, of Boston, in the State of Massachusetts, have invented a new and useful Improvement in Grate-Bars for Furnaces, of which the following is a specification.

The object of the invention is to interlock or break joints between the diagonally-projecting ribs of adjacent bars, and at the same time furnish sufficient air-space near the ends of the bars without weakening the ends.

The bar is cast in one piece; and consists of a single back, A, with ribs *a* projecting therefrom diagonally, as shown in the accompanying drawings, in which—

Figure 1 is a plan, representing two bars in juxtaposition as arranged in a furnace. Fig. 2 is a side elevation, and Fig. 3 an end elevation, of a single bar.

The back, as in ordinary grate-bars, is cast much deeper than the ribs; but the upper surfaces of the ribs and back are flush each with the other or others, although the back has a slight groove along the upper surface to hold ashes. Near the ends of the bar the ribs are discontinued, and the air-spaces consist of longitudinal slots *e*, on either side of the back, as shown. This is because the bars will become too weak at their ends if the ribs are continued, while without air-passages of some sort near the ends of the bars the air-supply would become too much diminished to sufficiently aid in the combustion or to prevent the bars from becoming too hot.

The object of my invention will not be attained unless the ribs project from the back at such an angle that when the several bars are placed in position to form the full grate the ribs break joints, as shown in Fig. 1. This allows the air to pass up by the end of the rib; and, moreover, when the bars expand by heat they slightly interlock, and the ribs of one bar will thus assist to prevent the back of the adjacent bar from warping.

My invention is embodied in a grate-bar to the most advantage when the ribs and spaces are of equal width and the ribs project from the back at the angle shown in the drawings—viz., at an angle of twenty-two and one-half degrees or sixty-seven and one-half degrees, according to the side of the rib upon which the angle is measured. The ribs of such a bar will break joints with those of a duplicate placed on either side of it, whichever way turned—that is, the position of the two bars shown at Fig. 1 may be reversed, or either of the bars may be turned end for end, and the ribs will still break joints, as shown in the figure; and at this angle the ribs can be continued nearer to the ends than at any other at which the reversible interlocking or breaking of joints can be obtained, and at the same time preserve sufficient supporting-strength at the ends. The diagonal setting of the ribs has also the effect, substantially, of bringing the ribs on one side of the back opposite spaces on the other side.

I claim—

A grate-bar consisting of a single back with diagonal ribs projecting therefrom for most of its length, at such an angle as to break joints with the ribs of a duplicate bar placed on either side in either direction, but having longitudinal air-passages near the ends, substantially as described.

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Witnesses:

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