W. S. Lorr,

Furnace-Grate Bar.

No. 24,316. Patented June 7, 1859.

Fig. 1.

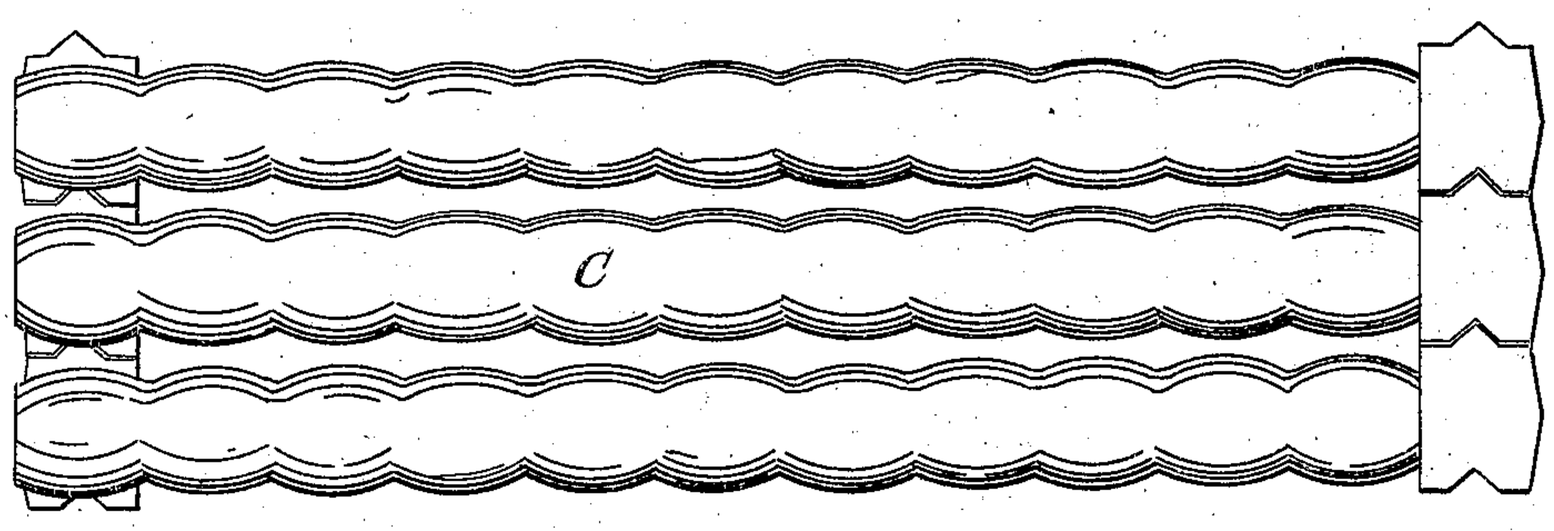

Fig. 2.

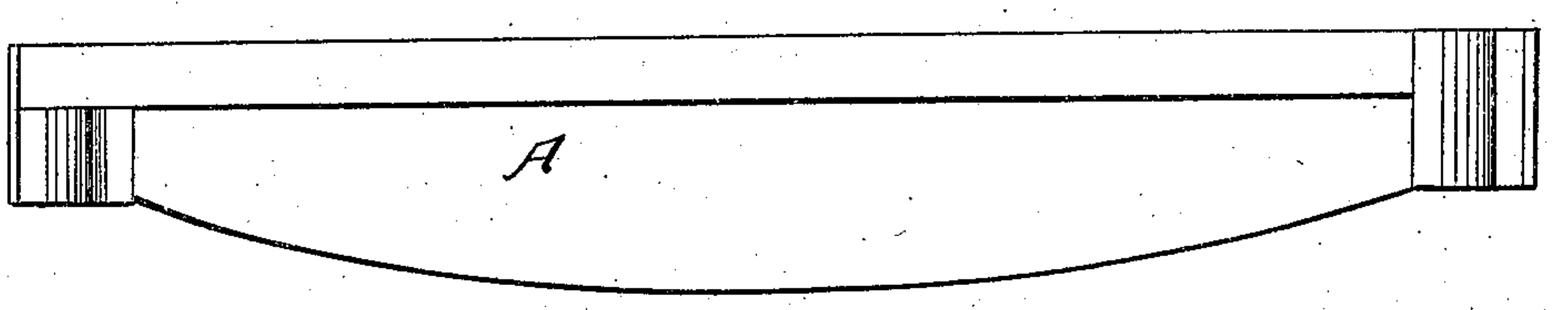

Fig. 3.

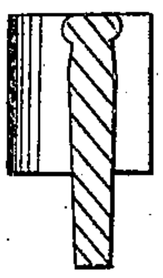

Fig. 4.

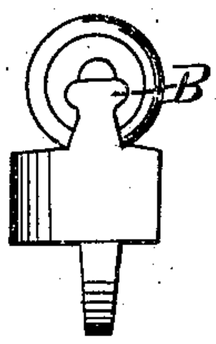

Fig. 5.

Witnesses.
James Lyons.
A. Sparhawk.

Inventor.
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UNITED STATES PATENT OFFICE.

WARREN S. LOW, OF ALBANY, NEW YORK.

FURNACE GRATE-BAR.

Specification of Letters Patent No. 24,316, dated June 7, 1859.

To all whom it may concern:

Be it known that I, WARREN S. LOW, of the city and county of Albany and State of New York, have invented a certain new and useful Improvement in Furnace Grate-Bars; and I do hereby declare that the following is a full and exact description of the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, in which—

Figure 1 is a plan view, showing the manner in which the bars lie in position in the furnace, and also showing the form of the removable face or top portion of the bar which is subjected to the action of the fire. Fig. 2 is a side view of the bar, with its face removed. Fig. 3 is a transverse section taken through the center of the length of Fig. 2. Fig. 4 is an end view of the bar, complete, and Fig. 5 a transverse section of the face of the bar, detached.

The furnace grate-bars of ordinary construction are subject to become "warped" or "sprung" out of shape, and finally to be rendered worthless by becoming "burned out," through the upper portion or face of them (upon which the fire lies) being intensely heated, while the lower portion or body of them is protected from the effect of the heat by the current of air—which constitutes the draft of the furnace—passing between them. This unequal heating of the face and body of the bar creates an unequal expansion of it, which soon throws it out of shape, and injures its efficiency by creating openings of too great size between some of the bars, and of too small size between others; in the first case allowing the fuel to be wasted by its dropping through the space thus made, and in the other, to prevent the admission of the proper supply of air between them, rendering them liable to be rapidly burned out. Besides, the bars are subject to be rapidly burned out, even if they remain in shape, and are not warped or sprung, as the faces of them are not protected by the air coming in contact with them, as the air cannot get to the faces, and being thus unprotected the "life of the iron" in them is soon destroyed, and they are rendered worthless for use.

The object of my invention is to obviate, as far as possible, all the above described defects of the ordinary furnace grate-bar, which object I effect by making the face, or upper part of the bar, in a separate piece, which is secured in place on the body of the bar by a dove-tail or groove, and which allows that part of the bar to expand freely upon the other when it becomes the most highly heated, and which can be readily removed, and another piece be substituted in its place, when it does finally become burned out. The face of the bar is also made of the corrugated and circular form shown in the drawings, to give to it greater durability, through the corrugations permitting the current of air produced by the draft of the furnace to pass over the most of the whole surface of it to protect it from the action of the intense heat.

A is the base, or body of the bar; differing from the ordinary form only in having the beaded or dove-tailed projection B upon its top part, in place of the common flat face. The ends of the bar may be made as shown, to lock into each other to prevent the movement of the bars endwise, or with the ordinary square end more commonly used.

C is the removable top piece, or face of the bar, upon and against which the fire lies. It is cast with a groove in its underside, as shown more clearly in Fig. 5, to fit the dove-tailed projection on the top of the body of the bar to secure it to place. It is formed circular in its section, and is corrugated in the direction of its length, to admit the current of air produced by the draft of the furnace to reach all or most all of its upper surface to protect it from the effects of the heat. The groove in it, and the projection on the top of the body of the bar are so relatively proportioned to each other as to allow it to slip over and upon the bar readily, in order that it may expand and move upon the bar when subjected to heat. The diameter of the corrugated projections on it are also so proportioned to the width of the ends of the bar as to allow a proper space between the faces of the bars for the passage between them of the requisite amount of air to produce the draft in the furnace.

By the face of the bar being formed of the shape shown, and by its being placed loosely upon the top of the bar, all danger of the bar being warped or sprung is avoided, without requiring for that purpose the use of the intermediate stops or stays between the ends of it, as ordinarily used, so that the bars can be "sliced," when a coal

fire is used upon them, with much greater facility than is possible to be attained with the ordinary bar.

When the face is burned out—which will require a much greater length of time to effect than is required for the destruction of the ordinary bar—the bar can be taken out of the furnace, and a new face be put upon it, and be replaced to be as effective as when first put in use. The face being but a small portion of the bar in weight renders the renewal of it a matter of much greater economy than the renewal of the ordinary bar, independent of all other considerations of superiority above named.

What I claim as my invention and desire to secure by Letters Patent is—

The combination of the corrugated and circular removable face-piece C with the body A of a furnace grate-bar, in the manner and for the purposes herein set forth.

WARREN S. LOW.

Witnesses:
JAMES A. GREIG,
A. S. SPARHAWK.