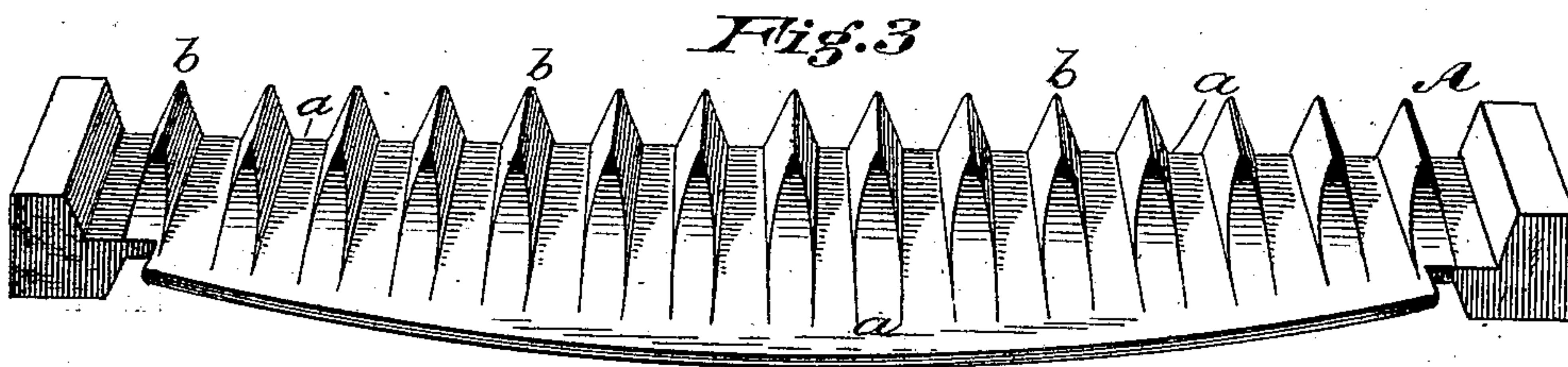
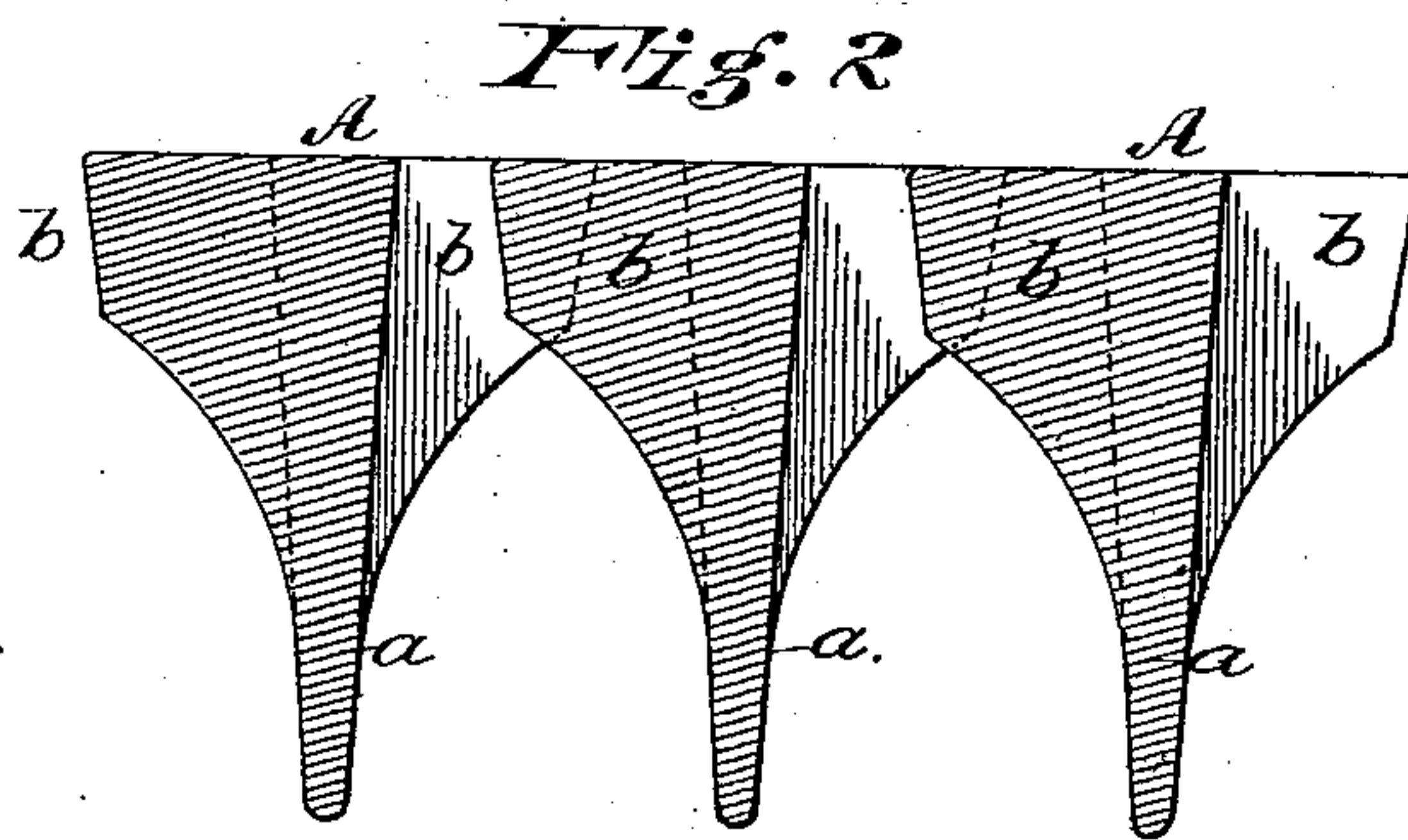
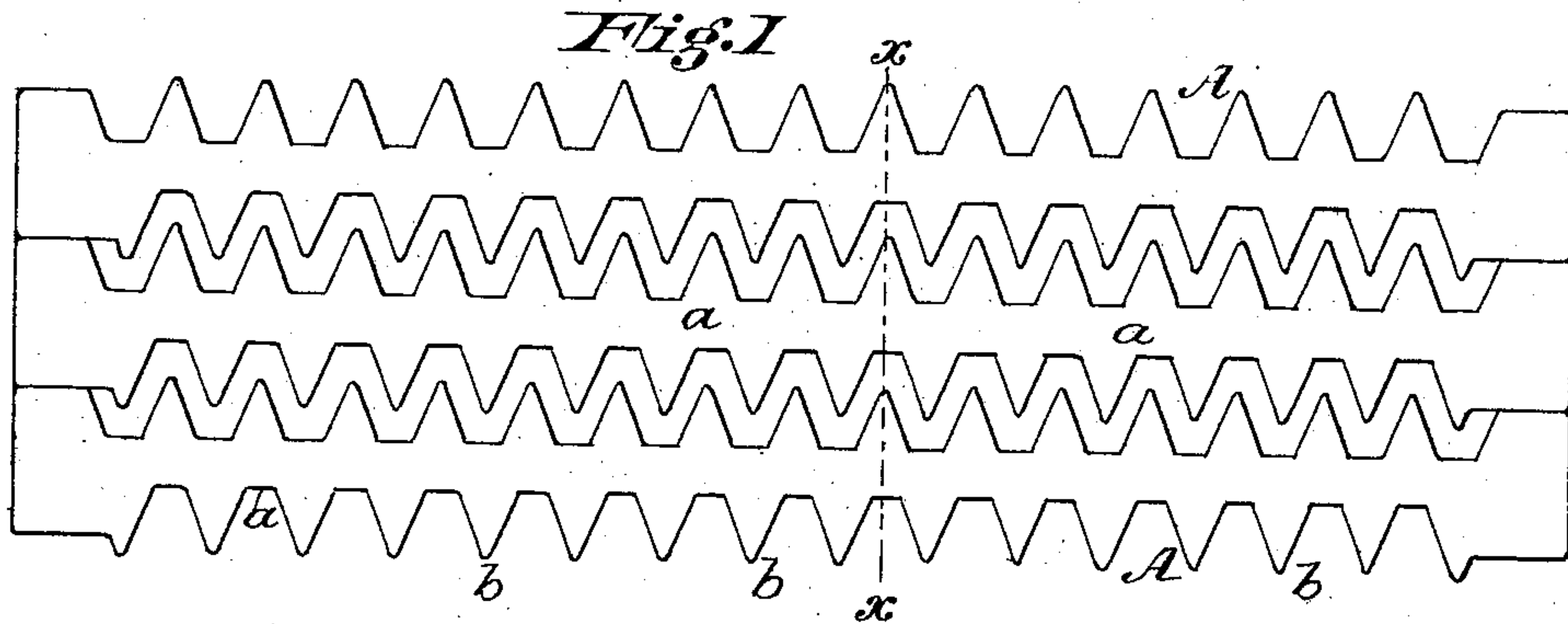


B. P. PERRY.
Furnace Grate Bars.

No. 227,124.

Patented May 4, 1880.



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UNITED STATES PATENT OFFICE.

BENJAMIN P. PERRY, OF RICHMOND, INDIANA.

FURNACE GRATE-BARS.

SPECIFICATION forming part of Letters Patent No. 227,124, dated May 4, 1880.

Application filed February 24, 1880.

To all whom it may concern:

Be it known that I, BENJAMIN P. PERRY, a citizen of the United States, residing at Richmond, Wayne county, Indiana, have invented new and useful Improvements in Furnace Grate-Bars, of which the following is a specification.

My invention relates to improvements in grate-bars, and is designed to render them more durable and efficient for the purposes for which they are employed.

Heretofore grate-bars have been constructed in corrugated form with a view of exposing a large surface of the iron to the currents of air as a means of protection against the heat of the fire, and also to divide the currents of air ascending between them, and thus attain a more beneficial effect upon the fuel.

This form of grate-bar, however, in practice, is found to be subject to certain disadvantages, especially when made thin, as necessary. The weight of the superincumbent-fuel is very apt, when the bars are heated, to twist them and destroy their proper alignment, and when such occurs they are soon destroyed by the action of the fire and impeded air-drafts.

In my improvement I employ a grate-bar with a straight and thin web, and attain the beneficial results of a corrugated bar by suitably disposed and formed projections, as fully hereinafter described, whereby the currents of air ascending to the fuel between the bars are accelerated and their beneficial action on the fuel enhanced, while at the same time they impinge upon the iron at every point and effectually prevent overheating.

These and other advantages of my improvements will be more fully set forth in the following specification.

My invention is embodied in a grate-bar shown in the accompanying drawings, in which Figure 1 is a plan view of a grate composed of a number of my improved bars, showing their relative disposition. Fig. 2 is an end sectional view through the line *xx*. Fig. 3 is a perspective view of a single bar.

Similar letters of reference indicate similar parts in the drawings.

A in the drawings represents my improved grate-bar, which consists of a straight web, *a*, made thin and wide in the middle to give sufficient strength to withstand the weight of

superimposed fuel, and angular projections *b*, disposed alternately upon opposite sides.

In form the projection *b* approximates a half pyramid or conical prism, as fully shown in the drawings, forming a sort of buttress or bracket resting against the straight web and supporting the fuel. This not only disposes the metal so as to give the greatest strength to bear the weight upon it, but also forms air-channels, which widen uniformly from the upper edge of the bar downward between adjacent bars.

The object and result of this construction are threefold: first, the vertical air-currents impinge against the iron at every point and keep the latter cool; second, the space between the bars, being least at the upper edge, cannot become clogged with ashes; and, third, the currents of air passing upward between the bars are discharged through a somewhat contracted orifice formed by the upper edges of the bars, and, being expanded by heat strike with greater velocity and force against the fuel.

These advantages result from my peculiar construction of the bar in the particulars before stated, in which it differs from previous constructions, which all exhibit air-passages narrowing at points below the upper surface.

The advantage of the straight web is that greater strength is secured and the liability of warping avoided. In case the bar should become overheated it sags in a vertical line, and the relative contour of the air-passages is not materially affected.

The form of projections *b* is that which I deem best for the purpose after numerous and careful experiments; but I do not confine myself strictly thereto, as certain variations may be made without departing from the essential spirit of my invention.

I am aware that grate-bars consisting of a central web provided with prismatic projections are not new; but in these the projections have been made of uniform thickness from their top surfaces toward the under side of the web; and also that they have been arranged alternating with each other on opposite sides of the web, and therefore I do not claim such broadly; but,

Having described my invention, I claim and desire to secure by Letters Patent—

The furnace grate-bars A herein described,

consisting of a straight thin web, *a*, provided
with prismoidal lateral projections *b*, arranged
alternately with each other on the opposite
sides of said web, and diminishing in thickness
5 from their top surfaces toward the under side
of the web, in which they gradually vanish,
whereby the air-channels between them will be
gradually increased in area toward the lower
side, all constructed as shown and specified.

In testimony whereof I have hereunto set to
my hand in the presence of two subscribing
witnesses.

BENJAMIN P. PERRY.

Witnesses:

JOHN C. WHITRIDGE,
JOHN L. YARYAN.