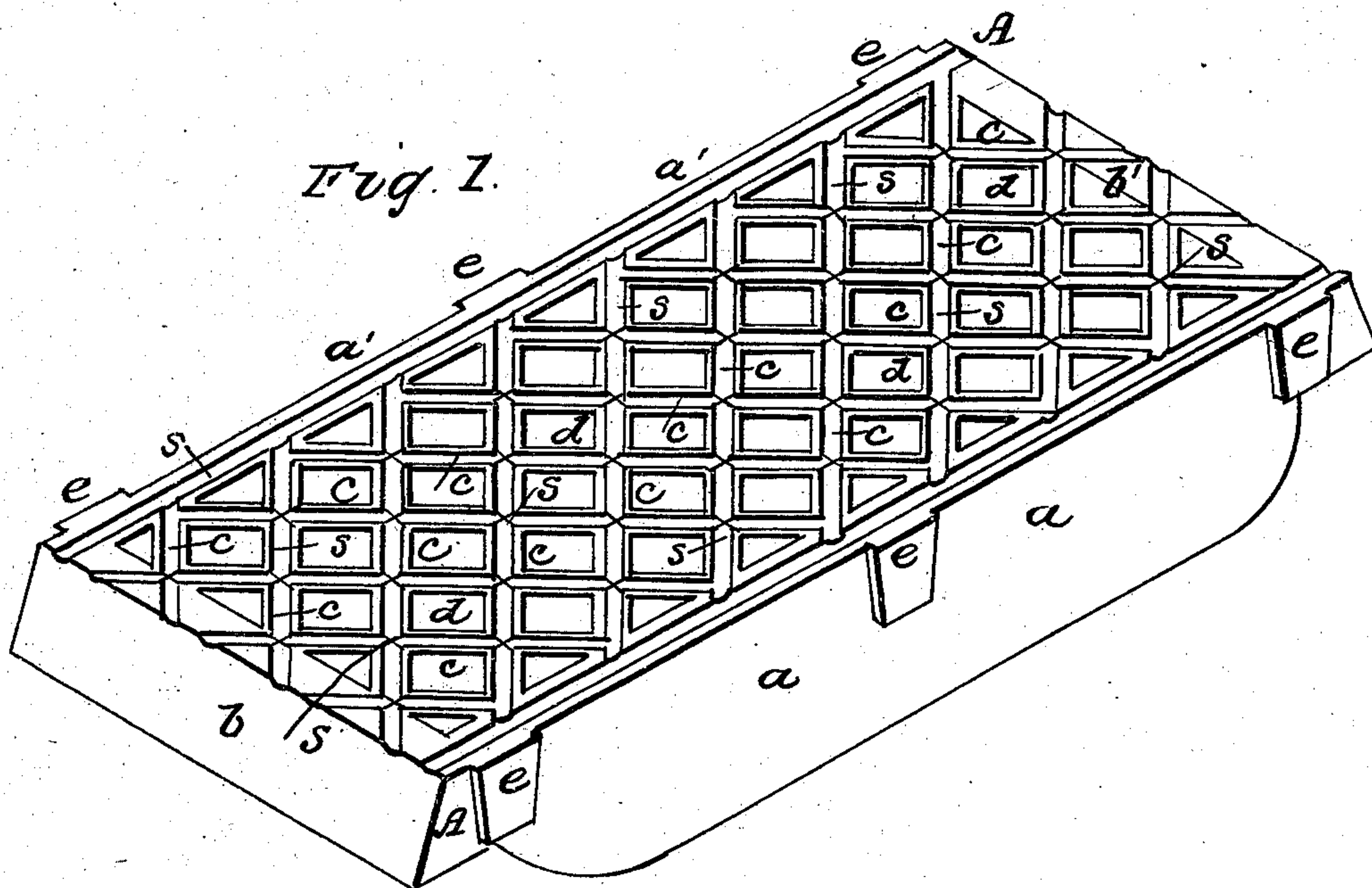


M. HELBLING.

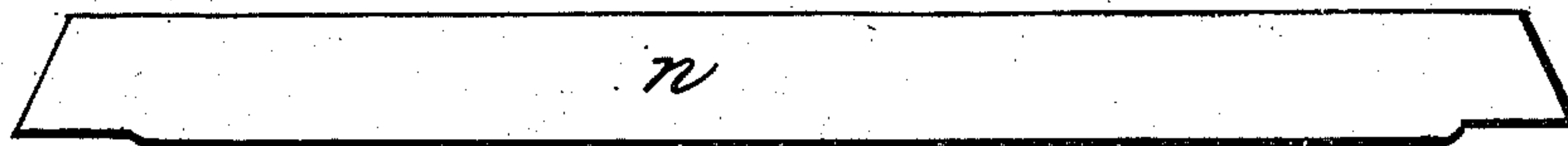
Grate Bar.

No. 87,564.

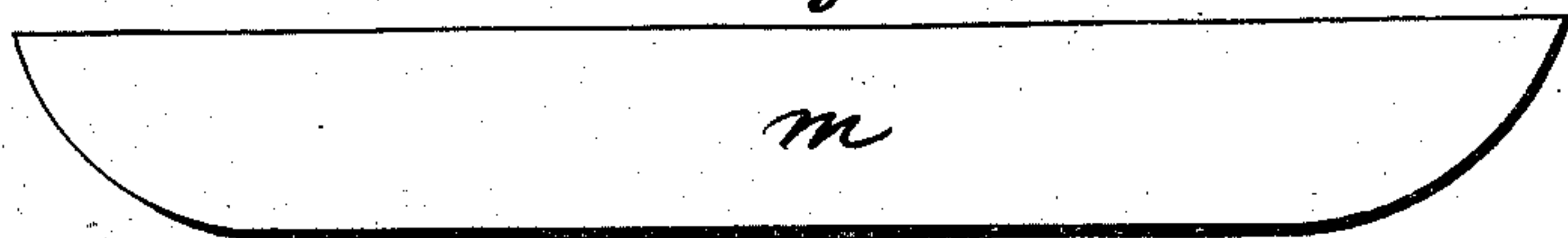
Patented March 9, 1869.



*Fig. 3*



*Fig. 2*



Witnesses  
Thos. B. Kerr  
Geo. B. Cullum

Inventor  
Michael Helbling  
by Bakewell & Christy  
his attys.

# UNITED STATES PATENT OFFICE.

MICHAEL HELBLING, OF ALLEGHENY CITY, PENNSYLVANIA, ASSIGNOR TO HIMSELF AND JOHN F. MCKINNEY, OF SAME PLACE.

## IMPROVEMENT IN GRATE-BARS.

Specification forming part of Letters Patent No. 87,564, dated March 9, 1869.

*To all whom it may concern:*

Be it known that I, MICHAEL HELBLING, of Allegheny City, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Grate-Bars; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawing, making a part of this specification, in which—

Figure 1 is a perspective view of my improved grate-bar, and Figs. 2 and 3 are side views of molding strips or patterns used in making the mold when a bar is required of less than the usual width.

Like letters of reference indicate like parts in each.

The nature of my invention consists in making grate-bars or grating for fire-places and furnaces of a greatly-improved form, whereby the required bearing-surfaces and air-apertures are secured, and at the same time a bar is made of more than usual strength and durability.

To enable others skilled in the art to make and use my invention, I will proceed to describe the same.

A is a grate-bar or grating for a furnace, molded and cast in the usual way. In form it consists of two side or main ribs, *a a'*, of sufficient vertical depth to secure the required strength, of ends *b b'*, and of cross-ribs *c c*, the latter running, as shown, diagonally across from one side, *a*, or end *b*, to the other end, *b'*, or side *a'*, or vice versa.

It will be observed that the diagonal ribs *c* intersect each other so as to leave square or diamond shaped apertures *d* for the admission of air to the fuel. The size of these apertures *d*, as well as the thickness of the diagonal ribs *c*, may be varied at pleasure.

The upper faces of all the ribs are guttered or grooved, as at *s*, so that, such gutters or grooves being filled with ashes, the faces of the ribs themselves will be, in part, protected against the destructive action of the fire above.

On the outer faces of the side ribs *a a'* ears *e* are cast, by which the desired apertures between bars are preserved. The grating described rests by its ends *b b'* on properly-shaped bearings.

Among other advantages I claim an easily and cheaply cast and durable bar, having the required strength, and not liable to be broken or warped by the expansion and contraction resulting from a high degree of furnace-heat, especially since such expansion and contraction will be uniform in all directions.

I am aware that grate-bars have been made with short cross-bars projecting from the main bar and connected at their ends; but such bars are liable to warp and sag—an objection which is obviated by my improvement.

I am also aware that web-shaped gratings have been used; but such gratings lack the side ribs described, which are essential to my improved grate-bar.

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

A reticulated grate-bar or grating for furnaces consisting of side ribs *a a'*, ends *b b'*, and diagonal cross-ribs *c*, intersecting each other, substantially as and for the purposes hereinbefore set forth.

In testimony whereof I, the said MICHAEL HELBLING, have hereunto set my hand.

MICHAEL HELBLING.

Witnesses:

ELL TORRENCE,  
G. H. CHRISTY.