

(No Model.)

A. HAARLANDER.

GRATE BAR.

No. 305,589.

Patented Sept. 23, 1884.

Fig. 1.

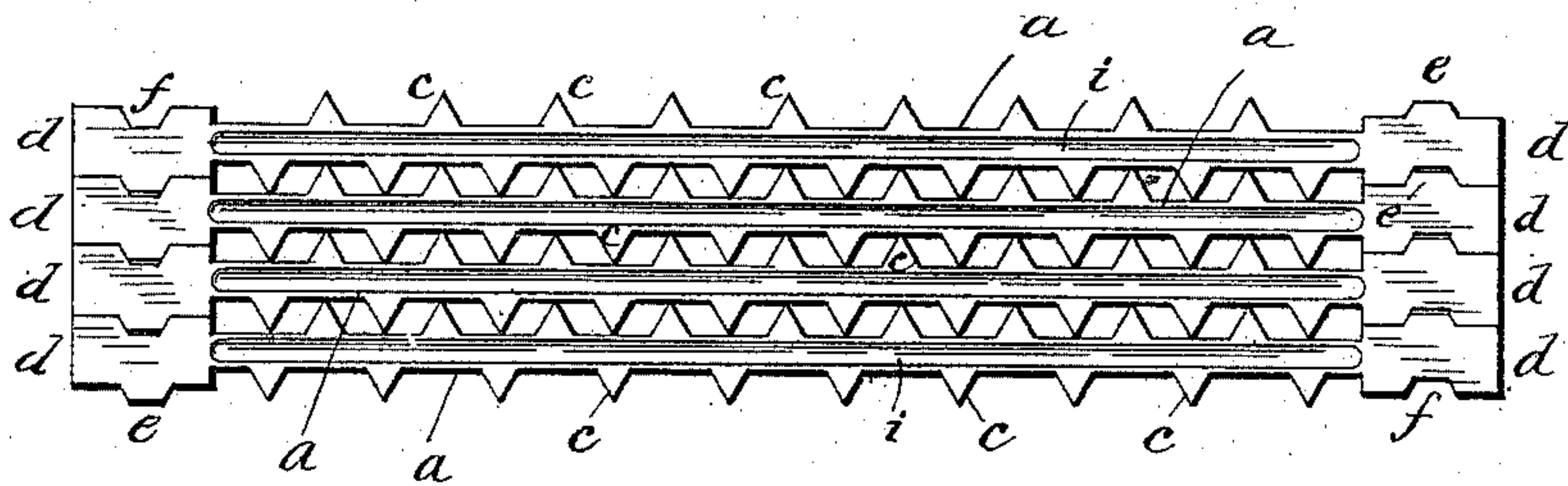


Fig. 2.

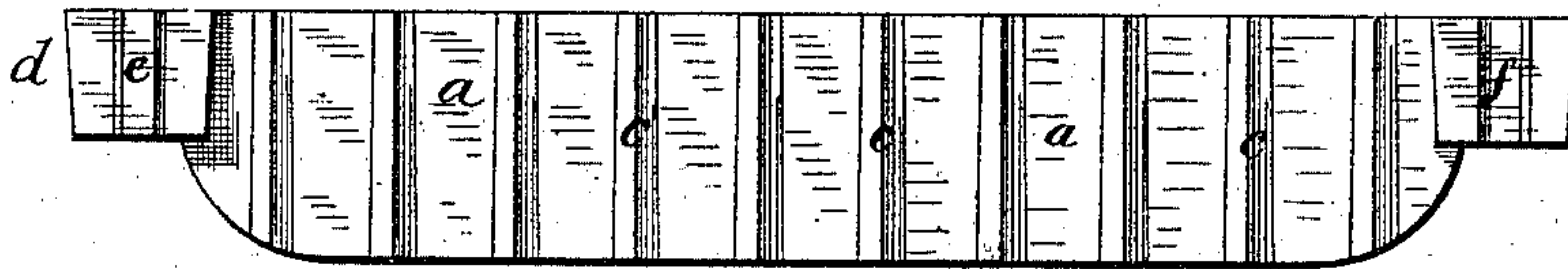
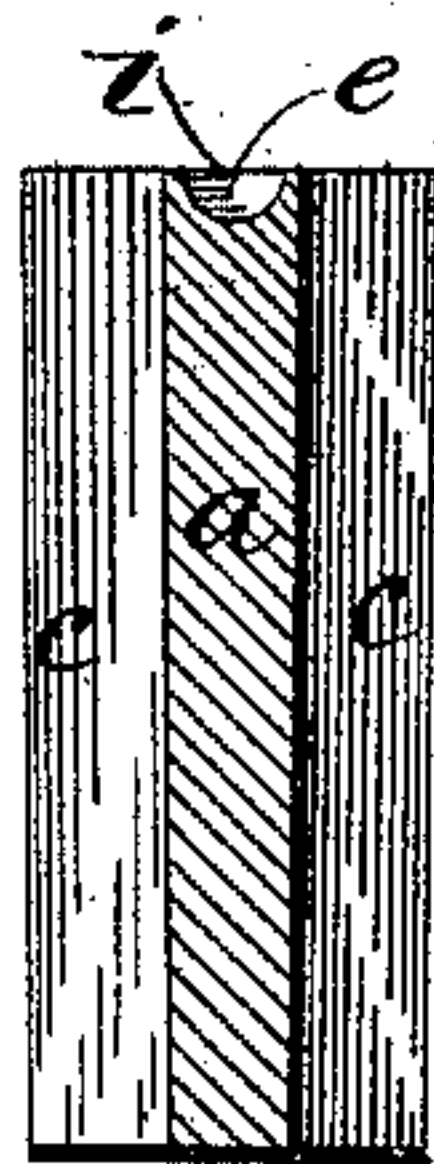


Fig. 3.



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# UNITED STATES PATENT OFFICE.

AUGUST HAARLANDER, OF ALLEGHENY, PENNSYLVANIA.

## GRATE-BAR.

SPECIFICATION forming part of Letters Patent No. 305,589, dated September 23, 1884.

Application filed December 4, 1883. (No model.)

*To all whom it may concern:*

Be it known that I, AUGUST HAARLANDER, of Allegheny, in the county of Allegheny and State of Pennsylvania, have invented certain  
5 new and useful Improvements in Grate-Bars; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and  
10 use the same, reference being had to the accompanying drawings, which form a part of this specification, in which—

Figure 1 is a plan view of a number of my grate-bars in position. Fig. 2 is a side elevation of one bar, and Fig. 3 is a transverse section of Fig. 2.

This invention has for its object an improved form of grate-bar designed to give a proper support for the fuel, while providing a  
20 large amount of air-space for combustion, and to effectually prevent all injurious warping of the bar and consequent disturbance of the original relations of one bar to its neighbors.

The invention consists in the peculiarities  
25 of form and arrangement hereinafter fully described and claimed.

The drawings show the form of the bars and their relations when placed in a group for use. Each bar is composed of a narrow  
30 central web, *a*, of considerable depth, having on its two sides or lateral faces the alternating vertical ribs *c*, of a triangular form, having the outer edge practically a knife-edge, that is made as sharp as can be done in casting.  
35 The ribs *c* thus alternate on the respective flat faces of the body or web *a*, the flat unribbed portion at one point having a rib on the opposite side of the bar. These ribs are made of a projecting width nearly or about  
40 equal to that of the body or web, and their extremities present a mere edge, as stated. Each bar has an enlarged end, *d*, or projection, formed with matching tongues *e* and  
45 grooves *f*, arranged reversely on the respective ends of the bar. The width of the ends *d* is such that when the bars are placed side by side to form the grate the projections or enlargements *d* touch each other and prevent any one bar from displacement laterally, and

the tongues *e* and grooves *f* prevent all end-  
wise creeping or motion of the respective bars  
of the grate. The width of the enlargements  
or projections *d* is such that when two bars  
are laid side by side in proper position the  
sharp-edged ribs of each bar reach over to and  
55 touch the flat surface of the other bar between its ribs throughout the length of the whole bar *a*. By such arrangement I create a large  
number of diamond-shaped air-spaces evenly  
distributed over the whole surface of the grate,  
60 with but a slight thickness of metal in all lateral and angular directions. The slight taper usually given the pattern, in order to draw  
from the sand in molding, gives all the required clearance below the top surface for the  
65 passage of ash. The ribs *c* of every bar are in contact with the face of the adjacent bar or bars, and hence the usual distortion and displacement of original conditions by intense  
heat cannot take place, and the tendency to  
70 such buckling or warping is lessened by the fact that the contact between bar and bar is on a mere line—the edges of ribs *c*, which are surrounded by air-spaces, and are kept comparatively cool.

I prefer to form each bar with a longitudinal groove, *i*, on the top surface of the web *a*,  
as shown, which reduces the surface in contact with the fuel and lessens the tendency of  
80 clinkers to adhere, and also forms a repository for fine ashes, and thus preserves the bar itself from the heat.

I claim as my invention—

The grate-bar herein described, comprising the narrow central web, *a*, having the alternatingly-disposed sharp-edged vertical ribs *c*  
85 and end enlargements, *d*, so proportioned, substantially as described, that when two or more bars are laid in position the sharp edges of the ribs of one bar will touch the flat intermediate portions of the adjacent bar.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in presence of two witnesses.

AUGUST HAARLANDER.

Witnesses:

T. J. MCTIGHE,  
T. J. PATTERSON.