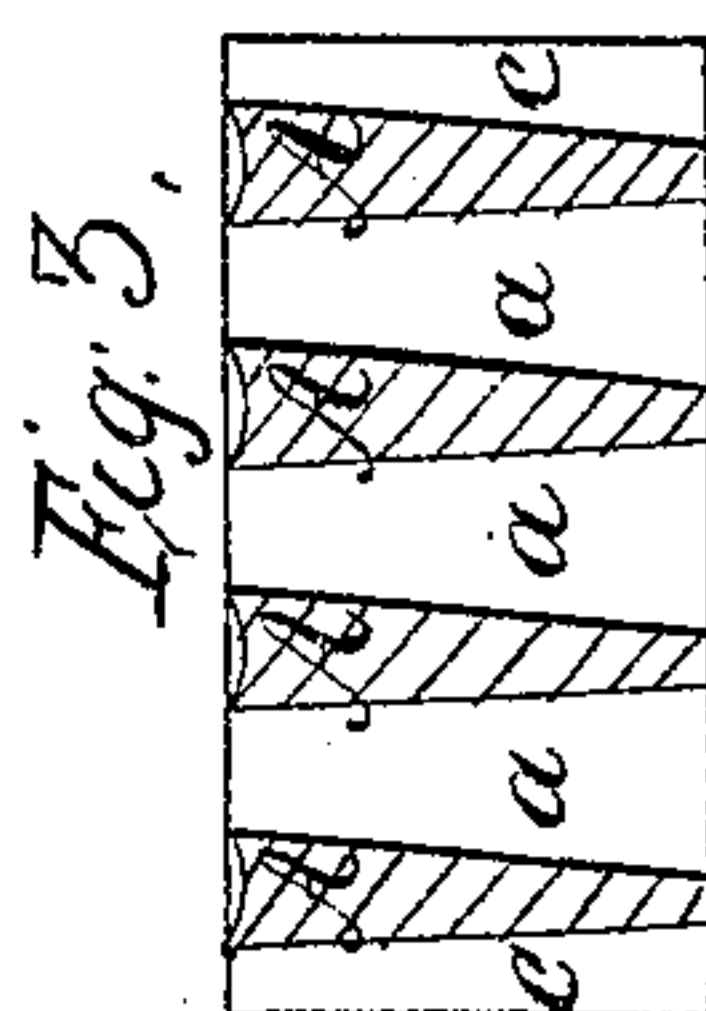
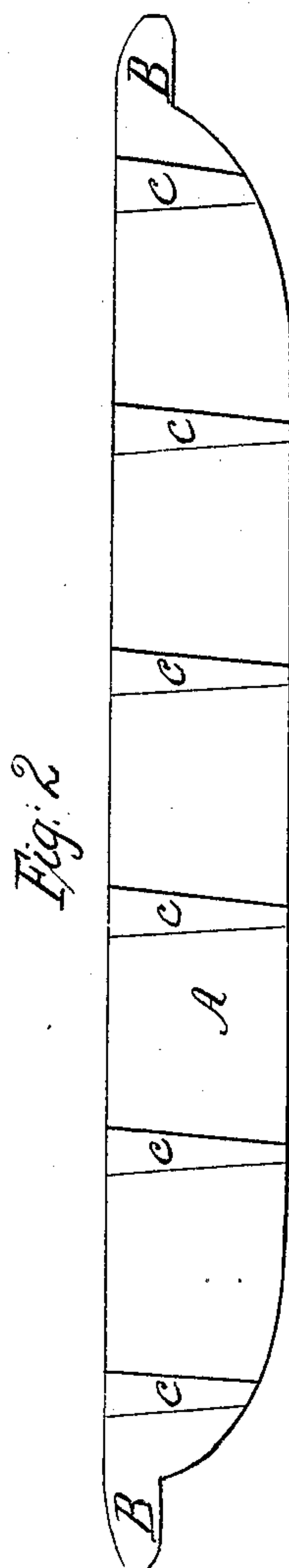
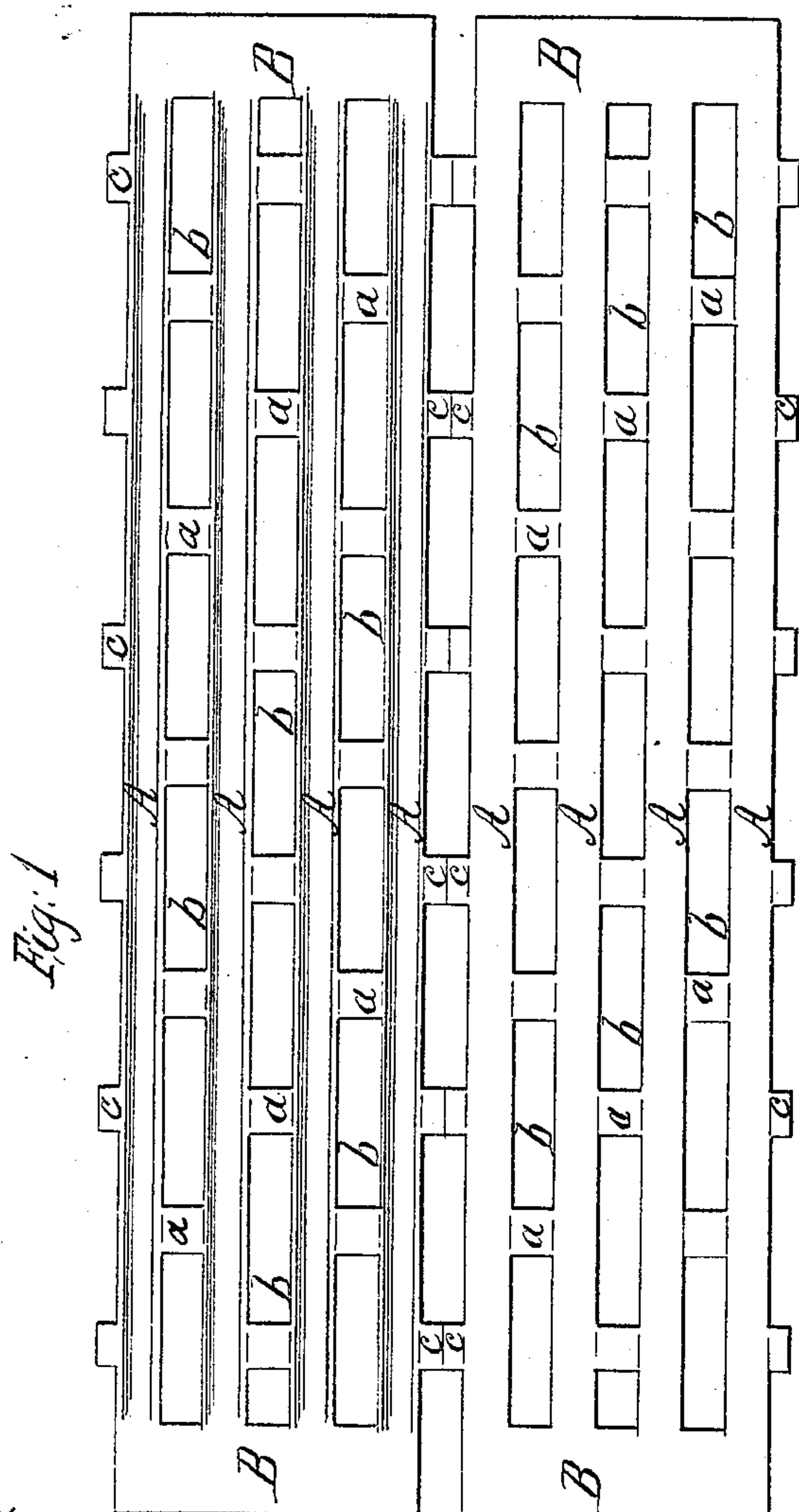


*J. Vandercar,*  
*Furnace-Grate Bar.*  
*N<sup>o</sup> 42,888.      Patented May 24, 1864.*



*Witnesses;*  
*Gilbert W. Barker*  
*James V. Hall*

*Inventor*  
*John W. Vandercar*

# UNITED STATES PATENT OFFICE.

JOHN VANDERCAR, OF BROOKLYN, NEW YORK.

## IMPROVEMENT IN GRATE-BARS FOR FURNACES.

Specification forming part of Letters Patent No. 42,888, dated May 24, 1864.

*To all whom it may concern :*

Be it known that I, JOHN VANDERCAR, of the city of Brooklyn, in the county of Kings and State of New York, have invented a new and useful Improvement in Grate-Bars for Furnaces; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, in which—

Figure 1 is a plan of two grate-bars constructed according to my invention. Fig. 2 is a side view of one of the bars. Fig. 3 is a transverse section of the same.

Similar letters of reference indicate corresponding parts in the several figures.

The object of my invention is to better prevent the warping of the bars, both laterally and vertically, and at the same time to provide effectually for draft and for the pricking and raking of the fire from below; and to this end it consists in the combination, in one casting, of three or more single bars with intermediate lateral connections alternating with each other in position so as to break joint, as hereinafter described with reference to the drawings.

The bars represented each consists of one casting, and are each composed of four single parallel bars, A A, connected together at each end by solid heads B B, and also connected in twos by means of intermediate lateral connections, *a a*, the said lateral connections extending the whole depth of the bar, and those at either side of each bar alternating in position with those on the other side, or, in other words, those on one side being opposite the centers of the spaces *b b*, between those on the other side, as shown in Fig. 1. On the exterior sides of the outermost of the series of single bars in each casting there are lateral projections *c c*, which are opposite the centers of the spaces *b b*, between the partitions *a a*, on the opposite sides of said bars, the said projections on two adjacent castings fitting together and keeping the two outermost bars of the two castings at a distance apart corresponding with the width of the spaces *b b*, as shown in Fig. 1, in which one of the two castings is tinted, and the other plain, for the sake

of distinction. The single bars A are tapered in a downward direction in their transverse direction, like ordinary single furnace-bars, as shown in Fig. 3, to give clearance to the cinders or ashes which pass between them. The upper surfaces of the bars are straight and their lower edges have an inverted arched form, as shown in Fig. 1, to give them stiffness in a longitudinal direction. The lateral connections *a a* between the several single bars not only prevent them from warping laterally, but from sinking vertically, as no one in a casting can sink without carrying down the whole. The arrangement of the connections *a a* to alternate or break joint with each other, as described, is a better preventive against warping than if they were arranged opposite each other, as with a given length of space *b* it forms connections at double the number of points in the length of each single bar, and this is an important feature of my invention.

A greater number than four parallel bars A A may be combined in one casting, but with a less number than three it is not possible to obtain the alternating arrangement of the lateral connections *a a*, as hereinabove described.

I do not claim, broadly, the casting of the several bars together with intermediate lateral connections when such connections are arranged otherwise than as herein specified; but

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

The combination, in one casting, of three or more parallel imperforate bars, A A A, tapering downward in thickness, each formed with a horizontal grooved top and a convex lower edge, the solid heads B B, connecting the said bars together at their ends, the alternating intermediate connections, *a a a*, and the lateral projections *c c c*, both extending from the upper to the lower edges of the bars, all as herein specified.

JOHN VANDERCAR.

Witnesses:

GILBERT W. BANKER,  
JAS. R. HALL.