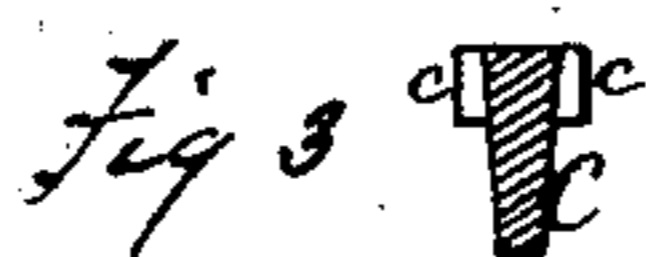
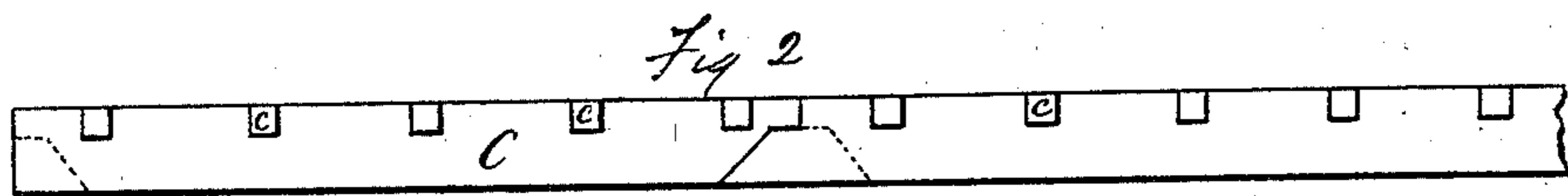
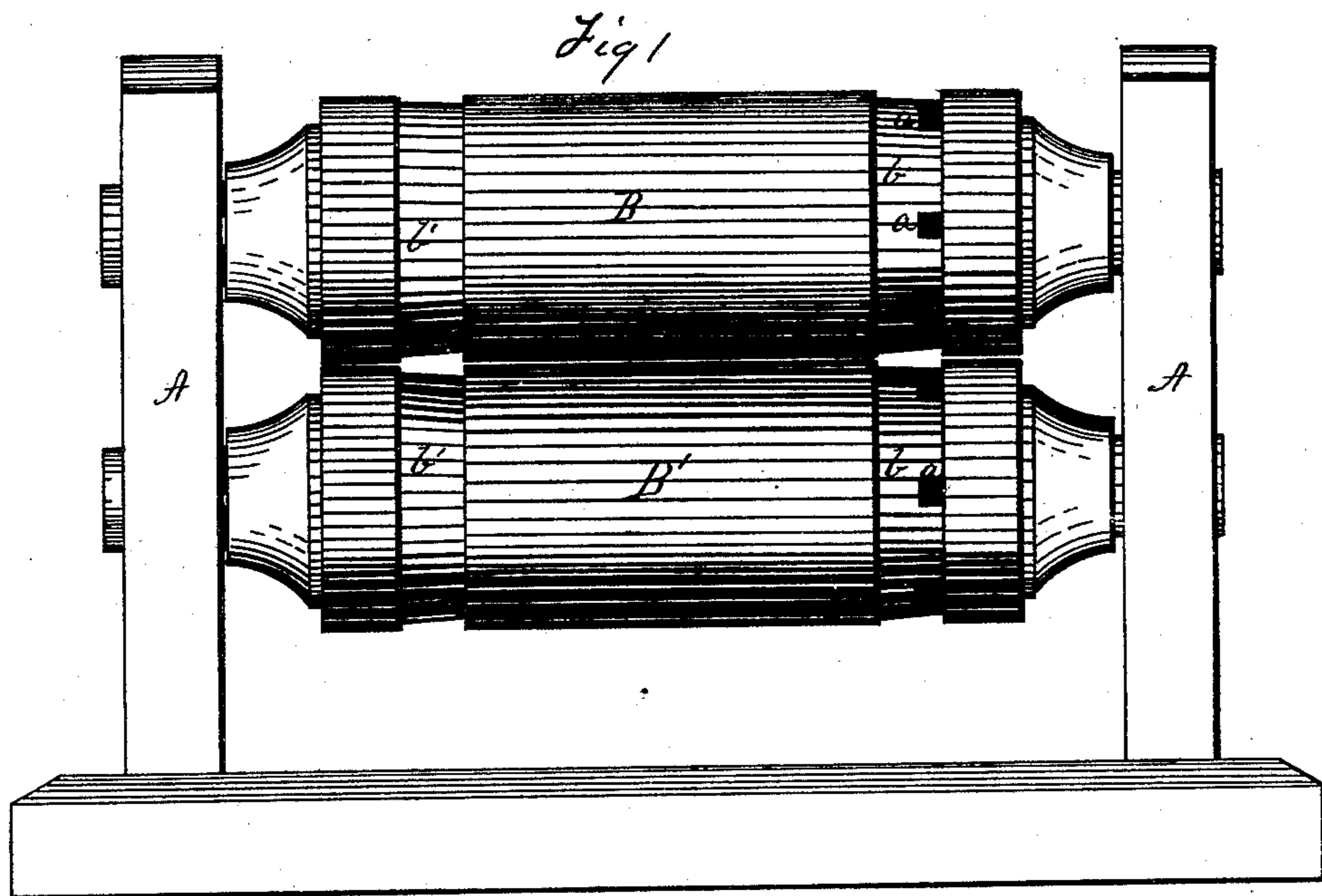


W. C. CHILDS.

GRATE-BAR.

No. 170,817.

Patented Dec. 7, 1875.



Witnesses.

R. C. Wmshale
H. E. Wmshale

Inventor.

Walter C. Childs
by Rakewell & Son
Attorneys

UNITED STATES PATENT OFFICE.

WALTER C. CHILDS, OF PITTSBURG, PENNSYLVANIA.

IMPROVEMENT IN GRATE-BARS.

Specification forming part of Letters Patent No. **170,817**, dated December 7, 1875; application filed August 23, 1875.

CASE B.

To all whom it may concern:

Be it known that I, WALTER C. CHILDS, of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in the Manufacture of 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 forming a part of this specification, in which—

Figure 1 is an elevation of a pair of rolls employed by me in carrying out my invention. Fig. 2 is a view of a blank, the dotted line indicating the line of cut in forming a grate-bar. Fig. 3 is a cross-section of the blank.

Like letters refer to like parts wherever they occur.

My invention relates to the manufacture of grate bars; and it consists in a rolled Bessemer-steel grate-bar provided with a series of lugs or projections for determining the distance between the bars when arranged as a grate.

Heretofore, in the manufacture of grate-bars, the common practice has been to cast the bar of the form desired, or in sets of two or more, having connecting lugs; and in no instance of which I am aware has a rolled-metal grate-bar been produced for the reason it has been deemed cheaper and easier to produce such an article from cast metal; but the specific object of the present invention is to obtain a grate-bar of less weight and diameter, which may be made to serve the purpose of the heavy castings now used. For this purpose steel is best adapted, but so far as I am aware has never been employed, first, on account of the cost of cast-steel; and, secondly, from the well-known fact that Bessemer steel, though not too high-priced, cannot be cast. Therefore, to obtain a grate-bar of Bessemer steel I proceed as follows: I roll a blank of proper cross-section, employing for that purpose a rolling-mill such as is illustrated in the drawings, in which—

A A are the usual housings, in which are journaled the rolls B B', provided with the usual housing-screws, and differing in no respect from the usual mills except in the grooves formed in the rolls. The rolls B B' are generally formed alike—*i. e.*, each with one or more grooves, *b b'*, having inclined bottoms, so as to give the triangular cross-

section to the bar produced. The groove *b* is countersunk at different points *a a*, to form projecting lugs upon the blank, and where small grate-bars are to be made the rolls may be geared so that the recesses *a a* of the two rolls register, whereby the lugs on the two sides of the blank will be directly opposite to each other; but this is generally admissible only on small bars or where small lugs are to be formed, for the reason that if the lug is to be of any considerable size enough metal cannot be swaged up by the rolls to form perfect lugs on both sides of the bar. Where large bars are to be formed, therefore, I prefer to alternate the lugs on the opposite sides of the bar, which can readily be done by properly gearing the rolls.

The groove *b'* is shown as a plain groove for forming a bar of the same cross-section as groove *b*, and produces a plain bar, to which lugs may be subsequently secured by slotting and inserting adjustable lugs, described in an application of even date herewith.

In producing a grate-bar an ingot of Bessemer steel is reduced by rolls in the usual manner until a bar approximating the size of the finished grate-bar is obtained. This bar is then passed between the rolls B B', which give to the bar the proper taper from side to side and swage up at intervals thereon lugs or projections, forming a blank such as is shown in Figs. 2 and 3.

C is the blank properly tapered by the rolls, and having lugs *c c* near the thickest edge, or the edge which will form the upper surface of the finished grate-bar.

Having obtained a blank in the manner and of the form shown, I divide it, as indicated in dotted lines, Fig. 2, cutting it into the lengths required, and thus obtaining a Bessemer steel grate-bar, which has great advantages over grate-bars heretofore known, being lighter, stronger, and more durable than the cast-iron bar.

Having thus described my invention, I claim—

A Bessemer steel grate-bar, substantially as specified.

In testimony whereof I, the said WALTER C. CHILDS, have hereunto set my hand.

WALTER C. CHILDS.

Witnesses:

T. B. KERR,

L. C. FITLER.