

C. H. LATROBE.

Improvement in Iron-Girders.

No. 132,087.

Patented Oct. 8, 1872.

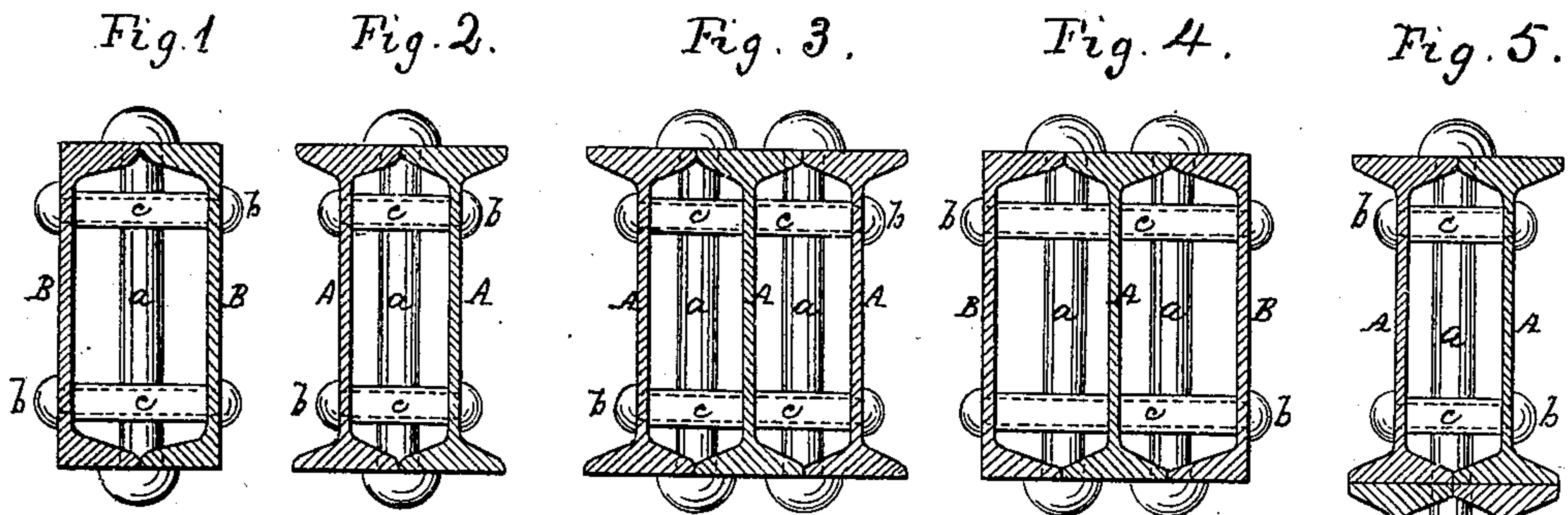


Fig. 6.

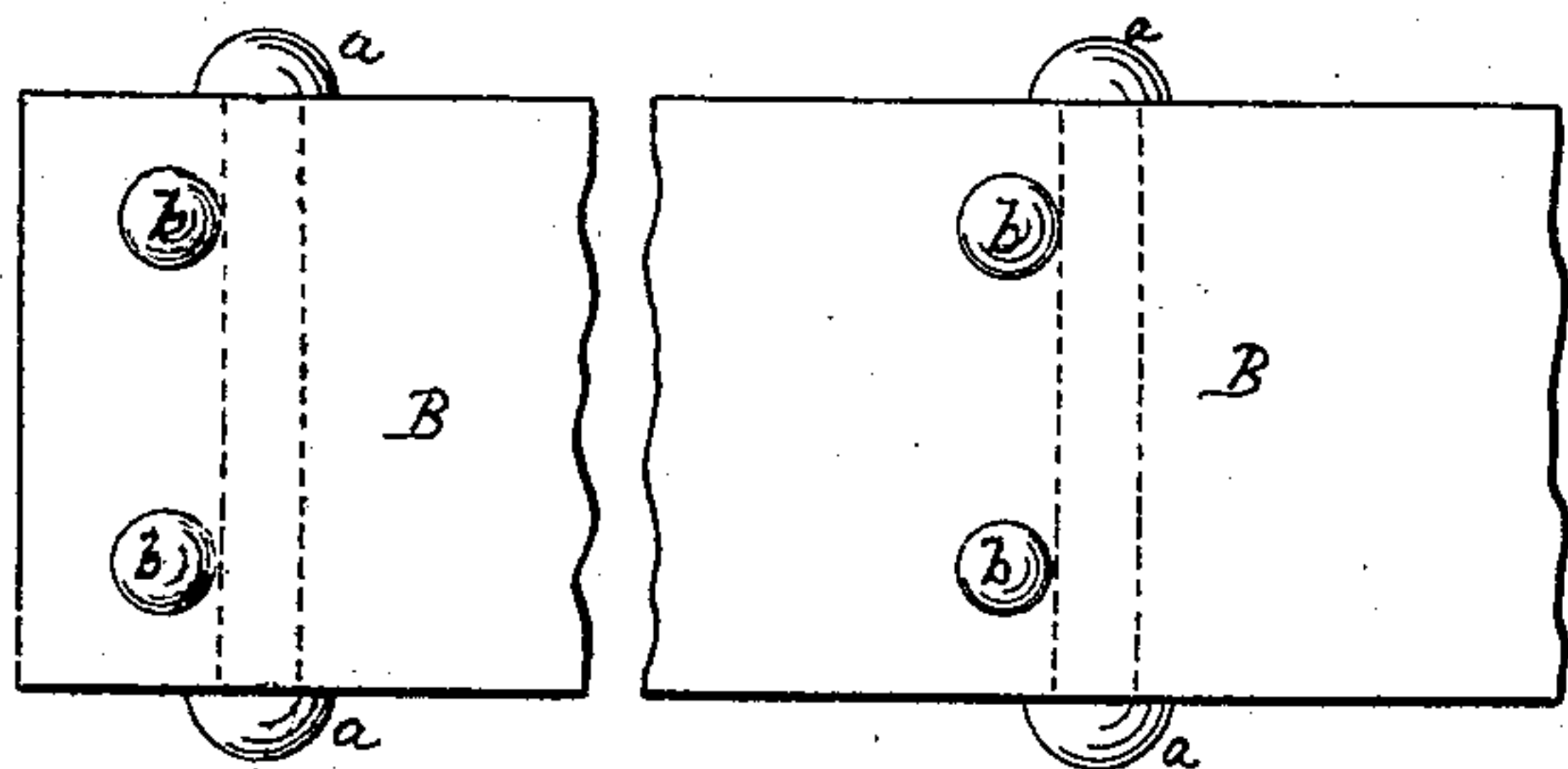


Fig. 7.

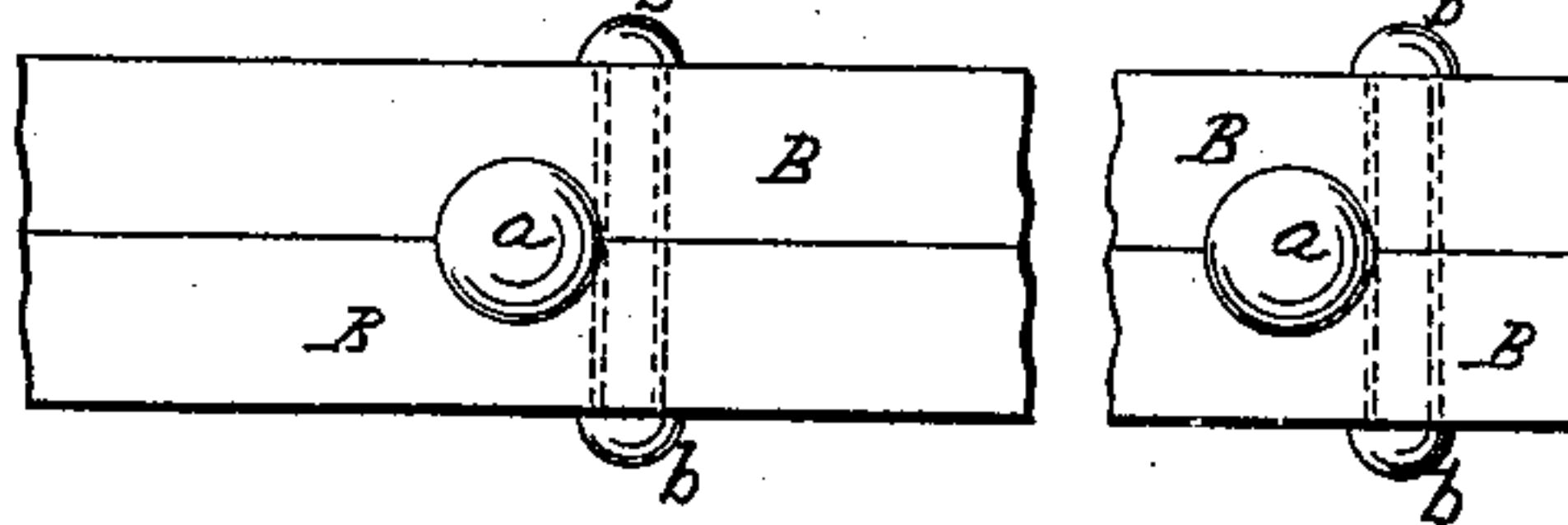
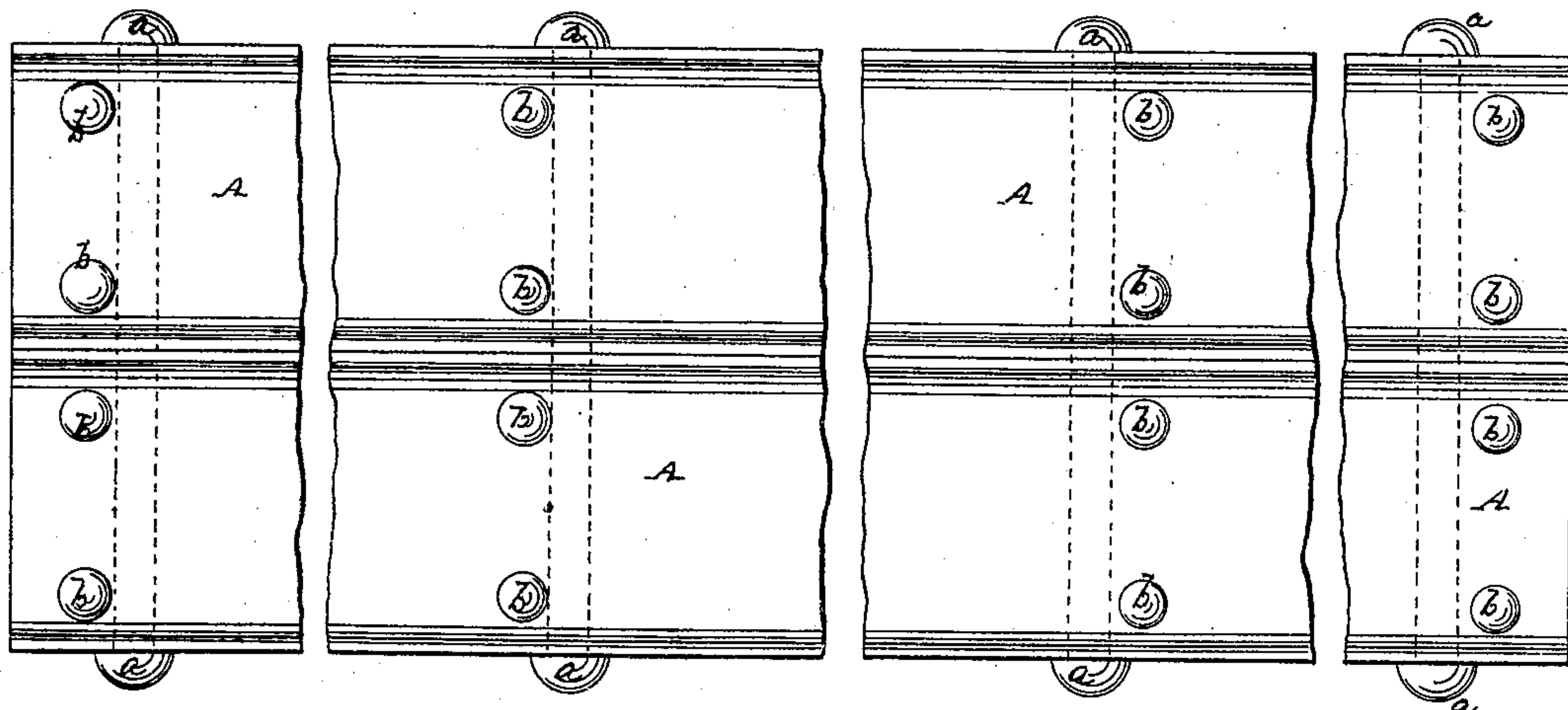


Fig. 8.



Witnesses.

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UNITED STATES PATENT OFFICE.

CHARLES H. LATROBE, OF BALTIMORE, MARYLAND.

IMPROVEMENT IN IRON GIRDERS.

Specification forming part of Letters Patent No. 132,087, dated October 8, 1872.

To all whom it may concern:

Be it known that I, CHARLES H. LATROBE, of Baltimore, in the county of Baltimore and State of Maryland, have invented certain new and useful Improvements in Wrought-Iron Chords, Braces, Posts, Floor-Beams, or Girders for bridge superstructures, bridge-piers, viaducts, and other purposes.

The object I have in view is to combine economically and effectively certain shapes, such as \square -channel and I -beam iron, to form chords, posts, or beams which shall resist compressive or transverse stress, or both, as though they were a unit or as nearly so as possible.

This combination is peculiarly adapted to the chords of deck-bridges, which often have to resist a compound strain, compressive and transverse, at the same time.

The manner in which my invention is or may be carried into effect, will be understood by reference to the annexed drawing, in which—

Figure 1 is a transverse section of a chord, beam, or post, composed of two \square -channels riveted or bolted together as hereinafter described; Fig. 2 is a like section of one composed of two I -beams; Fig. 3 is a like section of one made up of three I -beams; Fig. 4 is a like section of one composed of a central I -beam with a \square -channel on each side; Fig. 5 is a like section of one composed of two pairs of I -beams, the one pair resting on the other and united as hereinafter described; Fig. 6 is an elevation, and Fig. 7 a plan of a part of the chord represented in Fig. 1; and Fig. 8 is an elevation of the chord in Fig. 5.

Many other modifications and variations might be represented, but the shapes represented in the drawing are sufficient to indicate the various ways in which my invention may be carried into effect.

In all the examples given it will be seen that the I -beams A or \square -channels B, or channels and beams, as the case may be, are kept firmly in position by means of two systems of rivets or bolts, the one system vertical and the other system horizontal.

The vertical rivets or bolts *a*, or those rivets or bolts which extend between and bind together the flanges on the opposite ends of the

channels or beams, or both, should be large enough in diameter to resist the blows of the riveting-hammer during the upsetting process without springing, and also large enough and numerous enough to resist the shearing stress brought upon them by any tendency to an endwise parallel motion between the component beams or channels of the post or chord. Their heads or heads and nuts should also be large and well developed so as to prevent any tendency to vertical displacement of the component beams or channels. These rivets, as shown, pass through the seam or joint between the contiguous flanges of each two channels or beams, proper holes being drilled in the same for this purpose.

In a post or chord composed of two channels or beams but one row of the rivets *a* is needed. Two rows are required for a chord or post made up of three beams, or a beam and two channels, as shown in Figs. 3 and 4. The chord in Fig. 5 requires but one row of rivets or bolts, *a*, but these are twice as long as those in the preceding figures in order that they may extend through the two pairs of beams, placed the one on the other, as shown.

The horizontal or lateral rivets or bolts *b*, being subjected to a tensile strain only, may be lighter than the vertical rivets or bolts *a*, and should be run through gas-pipe thimbles or their equivalents, which act as separators, sustain the thin webs of the beams or channels, and prevent the injurious buckling of the rivets or bolts during the process of upsetting. The thimbles are represented at *c*, and the portions of the rivets passing through them are indicated by dotted lines.

It will be seen that any reasonable number of beams or channels, or both beams and channels, may thus be effectively combined in a post or chord, the two systems of bolts or rivets, as described, serving to thoroughly lock the component parts together and prevent motion in any direction.

The word "riveting" applies as well to bolts as to rivets from the fact that if bolts are used the end of the bolt, when the nut is set up tightly, will be riveted down to lock the nut.

Having described my invention and the manner in which the same is or may be carried into effect, what I claim, and desire to secure by Letters Patent, is—

A chord, post, brace, girder, or floor-beam for bridge superstructures, piers, viaducts, and other purposes, consisting of two or more **C**-channels or **I**-beams, or both **C**-channels and **I**-beams, combined with the two herein-described systems of rivets or bolts, substantially as and for the purposes set forth.

In testimony whereof I have signed my name to this specification before two subscribing witnesses.

CHARLES H. LATROBE.

Witnesses:

W. S. THOMPSON,
EDMOND NUGENT.