

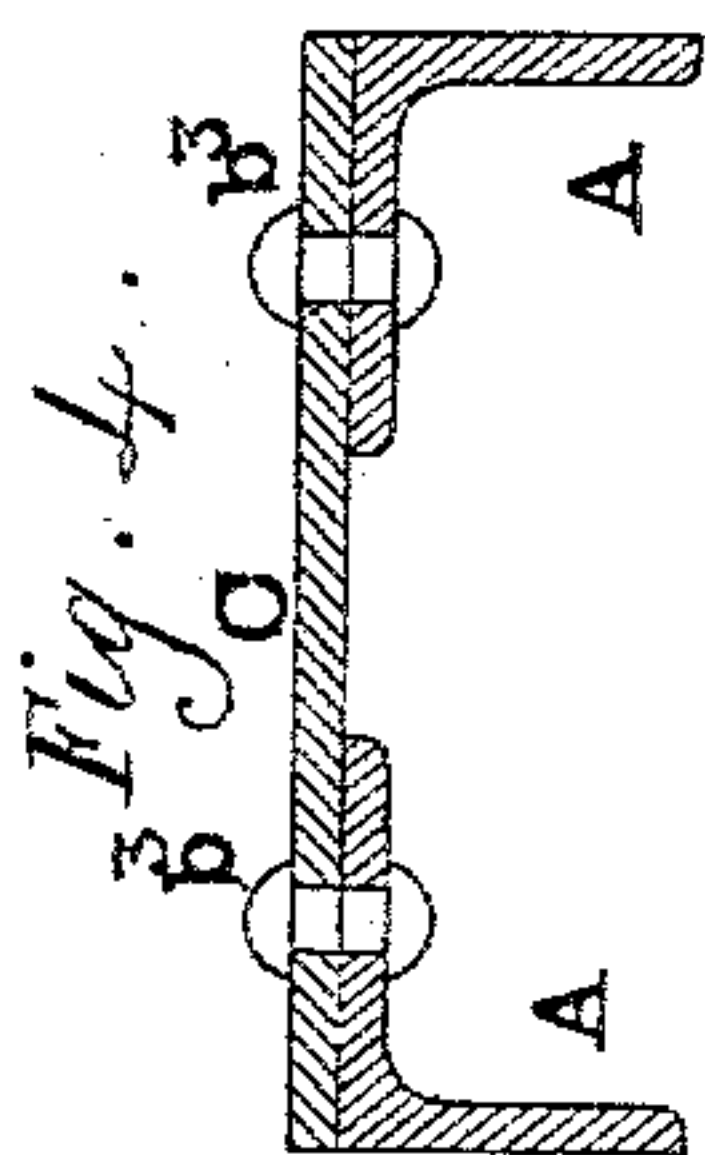
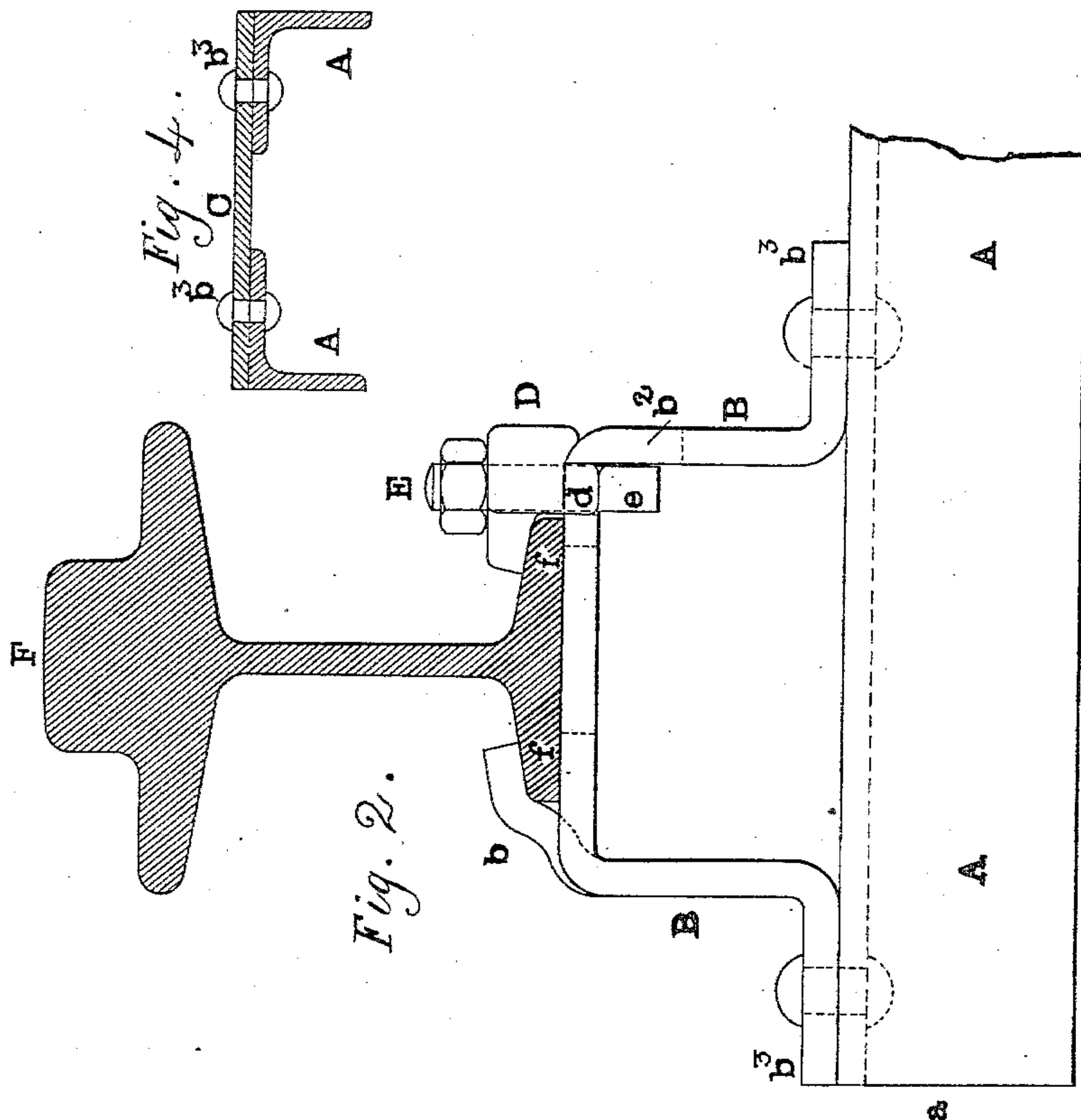
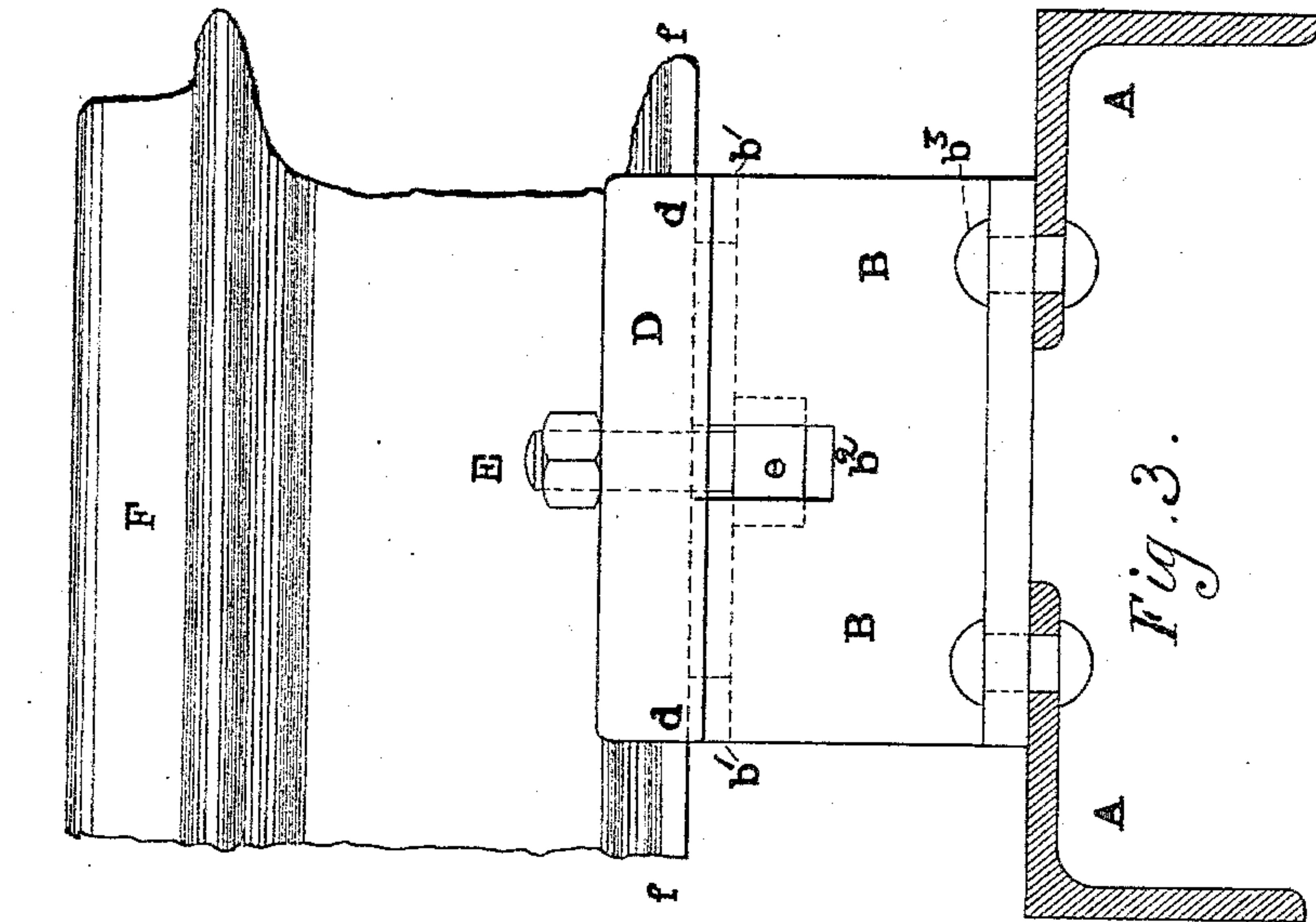
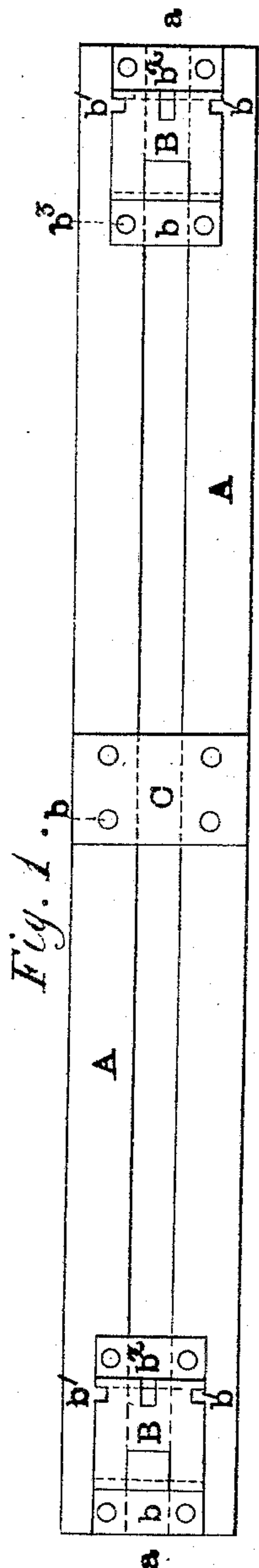
(No Model.)

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METAL CROSS TIE FOR RAILROADS.

No. 319,010.

Patented June 2, 1885.



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ARTHUR J. MOXHAM, OF JOHNSTOWN, PENNSYLVANIA.

METAL CROSS-TIE FOR RAILROADS.

SPECIFICATION forming part of Letters Patent No. 319,010, dated June 2, 1885.

Application filed February 11, 1885. (No model.)

To all whom it may concern:

Be it known that I, ARTHUR J. MOXHAM, of Johnstown, in the county of Cambria and State of Pennsylvania, have invented a new and useful improvement in metal cross-ties for street-railroads and means of securing the rails of the track thereto, which improvement or invention is fully set forth and illustrated in the following specification and accompanying drawings.

The object of this invention is to provide a metal cross-tie of cheap construction and capable of being cheaply laid, each of which objects is attained by the form and structure of the tie, and chairs secured thereto which permit the earth or ballast to be tamped tightly in and around the tie without digging a trench larger than the external dimensions of the tie itself, said tie being built up of the ordinary merchantable mill-product known in commerce as "angle-bars" or "angle-iron."

The invention consists of the parts and combinations of parts hereinafter described, and set forth in the claims.

In the accompanying drawings, Figure 1 is a plan of the cross-tie, showing the means used to bind its parts together and for securing the rails to said tie. Fig. 2 is a side view of a cross-tie, showing a rail in cross-section secured to said tie by a box-chair, hereinafter more particularly described. Fig. 3 is a view in side elevation of the rail and chair shown in Fig. 2, showing the cross-tie in cross-section. Fig. 4 is a cross-section of the tie and its spacing-plate C, taken through the center of Fig. 1 at the point C.

In said figures the several parts are indicated by letters, as follows:

A A indicate the two angle-pieces of which the cross-tie is composed; B B, box-chairs for the rails at each end of the tie, which chairs also assist in tying said pieces together.

C indicates a spacing-plate intermediate between the chairs, which plate ties the angle-pieces of the cross-tie together at the desired distance apart; D, a clamp, of either wrought or cast metal, forming a lug upon one side of the chair B, when secured in place; E, a bolt securing said clamp to the chair. Said bolt has a T-head, *e*, and is provided with a nut

on its opposite end, as seen in Fig. 2, for setting it tight in its place.

F indicates in cross-section a rail secured by its lower flanges, *ff*, under the lug *b* of the chair and under the clamp D secured to the chair. The chairs B are provided on their sides opposite the lugs *b* with two offset spaces or side slots, *b'*, and a slot, *b''*, between them, as clearly seen in plan in Fig. 1. Said spaces and slot are preferably made or punched in the metal plate before it is bent into the box-chair form, and the spaces *b'* are left near one side B of the chair, the slot *b''*, however, being cut in the angle, so as to be both on top and in one side, as shown in dotted lines at *b''*, Fig. 2.

The clamp D is provided with side lugs, *d d*, which are fitted into the spaces or side slots, *b'*. Said clamp is also provided with a hole which is made to register with the central slot, *b''*, in the chair. The clamp D being now put in place with its side lugs, *d d*, in the slots *b'*, and the bolt E inserted through the hole in the clamp and through the central slot, *b''*, and the nut on said bolt screwed hard down, it is evident that the clamp D will be securely fastened to the chair, and will securely clamp the flange of the rail F to the chair. The head *e* of the bolt E, being T-shaped, may be put through the slot *b''* from the top and then turned with its head across said slot, when the bolt E can be set hard in its place by screwing down on its nut, as before described, the T-head *e* preventing the bolt from further turning by bearing against the sides of the chair. The side lugs, *d d*, receive all lateral strain brought to bear upon the clamp D, and thus take all such strain from the bolt E.

The advantages of this construction and its morespecial application will now be described.

In street-railways the cross-ties are buried and are thus relieved from the shocks of passing loaded vehicles, which shocks are taken up by the road-bed; but as these ties are generally laid in trenches excavated for the purpose, it would be difficult to properly tamp them if made in solid form, such as is usual in steam-railroads. Of course the whole surface of the road-bed could be excavated to

the level of the bottom of the ties, thus permitting of necessary room for filling up and tamping the earth or ballast around the cross-ties; but this would be a very costly operation.

The ties herein described and claimed, being made in two sections properly spaced apart, leaving an opening or openings of from two to three inches in width on top of the tie and between its parts, the ballast of gravelly or other earth can be thoroughly tamped within, as well as around the ties, by means of a tamping-tool, the ballast being thus tightly packed between the angle-pieces A A the whole length of the tie.

It is evident that although the ties may be hollow or of box-form merely, yet, if not open at top, it would be a very difficult and imperfect operation to tamp the ballast in from their ends.

The supporting force of the road-bed due to the flat surface of tie exposed is supplemented by the friction of the solidly-packed ballast between the angle-pieces against the vertical sides of the tie. Ample resistance is thus obtained to any tendency in the ties to work or settle downward with a minimum of metal and without any addition of metal for such special supporting purpose. The opening in the top between the angle-pieces is therefore an important factor. If too wide, the ties will settle regardless of tamping. The opening should therefore be limited to the minimum that will permit of using a tamping-tool.

The angle form of the two parts of the tie is well known to the trade, and is manufactured and sold at a lower cost than the channel-iron ordinarily used for metallic ties in street-railway construction. The flanges of the angle-irons composing these ties should not vary in width more than from two and one-half by two and one-half inches maximum to one and one-half by one and one-half inch minimum.

The box-chairs are made of a depth suitable for sinking the ties deep enough below the rail to permit of the necessary depth of paving to be laid above the ties; and the object of bolting the clamps D to the chairs is as follows: By placing the solid lugs *b b* of the chairs always so that for each opposite rail said lugs shall be on the same side of said rails—that is, either both to the left or both to the right of each rail on each tie—the tie can be slipped under the rails with the lugs *b b* over their lower flanges on one side, even when the rails are set in track, when the clamps D can then be screwed hard

over the lower flanges on the other side, as already explained, thus securely binding rail and cross-tie together, the slot *b²* permitting of the adjustment of the clamp D. Said clamp may be bolted in place after the rails are set and just before the paving is laid.

It is of advantage to be able to put in the bolt E from the side of the chair, because the transverse trenches excavated for the ties are not wide enough to permit of easy access from the ends of the chair, for when the tie is in place the sides of the chair are the only points entirely exposed, and so remaining until the paving is laid.

The chairs B and distance-piece C may be either riveted or bolted to the angle-pieces A A, as may be preferred, as shown at *b³*.

Having thus fully described my said improvements as of my invention, I claim—

1. A hollow or skeleton metal cross-tie for street-railways built up of angle-pieces of the proportions substantially as described and with the edges of their horizontal flanges juxtaposed, said flanges being tied together and leaving between said edges sufficient width only for the admission of a tamping-tool for tamping earth or ballast between the inner sides of the vertical flanges, substantially as and for the purposes set forth.

2. A built-up metal cross-tie composed of two angle-pieces, spaced apart, as described, and tied together at top by end rail-chairs and a center tie-plate, leaving an opening or openings longitudinally in the top of the cross-tie between the juxtaposed edges of its horizontal flanges, substantially as and for the purposes set forth.

3. A built-up metal cross-tie composed of two angle-pieces having horizontal flanges juxtaposed and spaced apart, as described, and tied together by a center piece and two end rail-chairs, each chair provided with one fixed and one movable lug for clamping the rails to said cross-tie, substantially as and for the purposes set forth.

4. A skeleton metal cross-tie having its ends tied together by a box-chair of plate-metal provided with one fixed lug for clamping the flange of a rail and a movable lug for the same purpose, set in two side slots in said chair and bolted thereto through a central slot, substantially as and for the purposes set forth.

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Witnesses:

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