

No. 769,730.

PATENTED SEPT. 13, 1904.

S. E. DUFF.
RAILWAY SUBSTRUCTURE.
APPLICATION FILED DEC. 23, 1903.

NO MODEL.

2 SHEETS—SHEET 1.

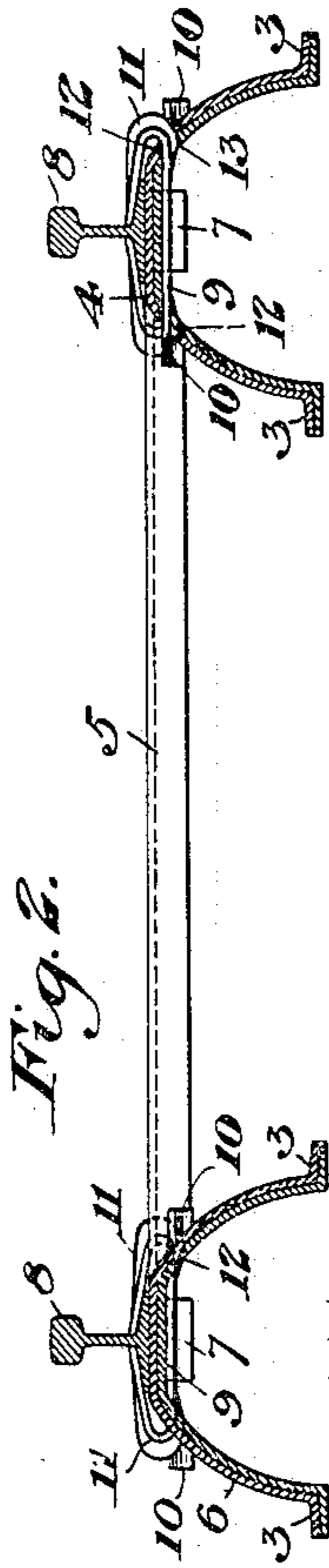
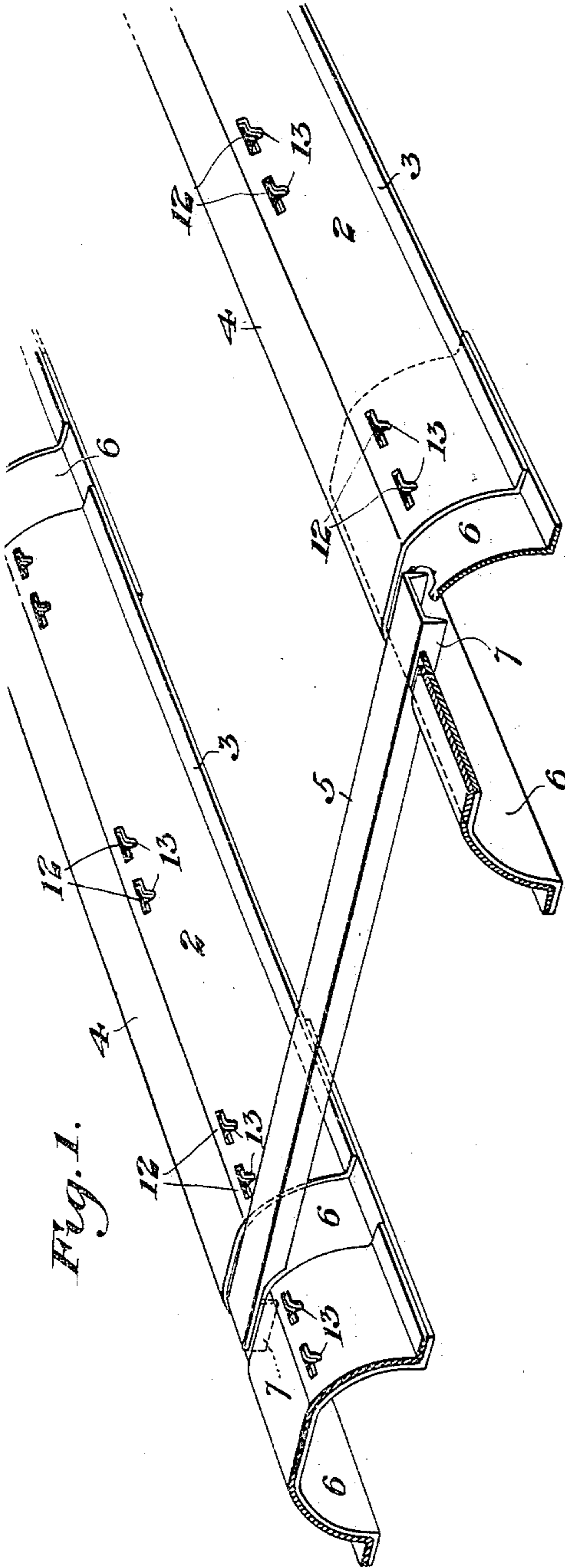
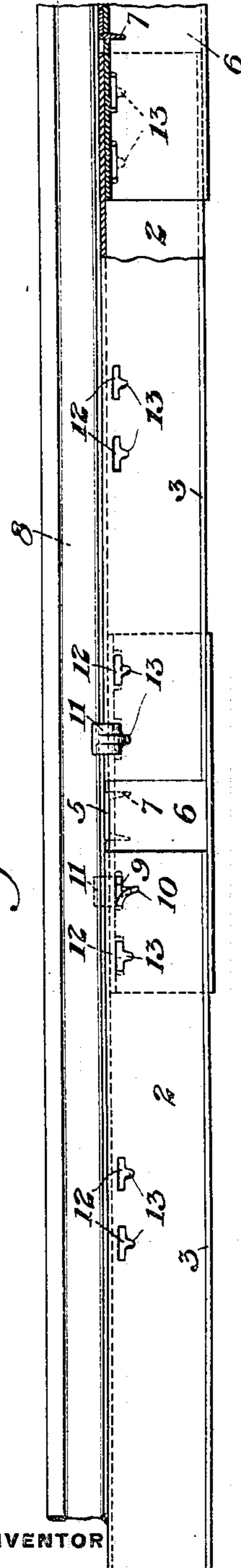


Fig. 3.



WITNESSES

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his Attorneys.

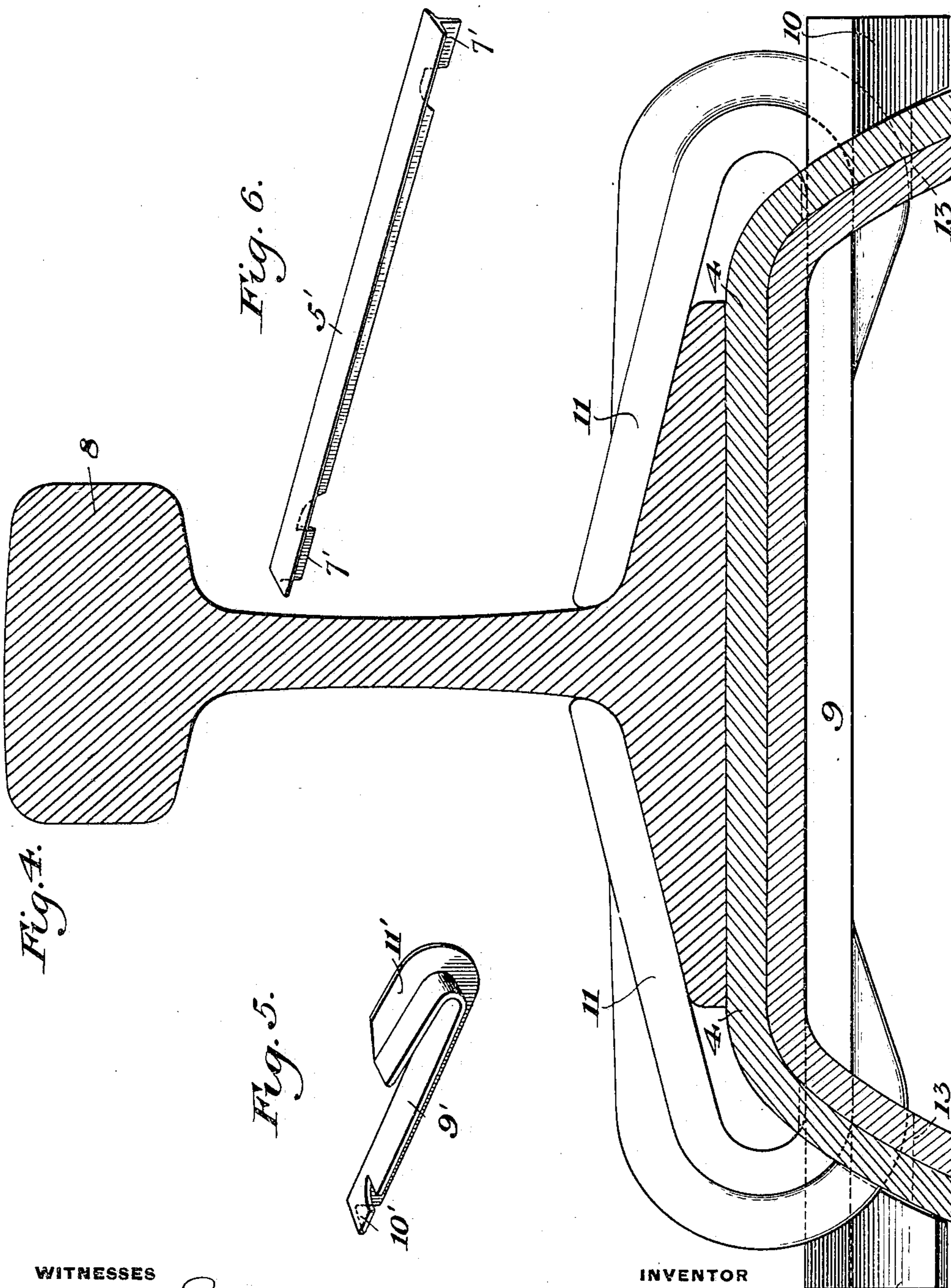
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2 SHEETS—SHEET 2.



WITNESSES

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UNITED STATES PATENT OFFICE.

SAMUEL E. DUFF, OF BELLEVUE, PENNSYLVANIA. ASSIGNOR OF ONE-THIRD TO HEZEKIAH N. DUFF, OF PITTSBURG, PENNSYLVANIA.

RAILWAY SUBSTRUCTURE.

SPECIFICATION forming part of Letters Patent No. 769,730, dated September 13, 1904.

Application filed December 23, 1903. Serial No. 186,322. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL E. DUFF, of Bellevue, Allegheny county, Pennsylvania, have invented a new and useful Railway Substructure, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a perspective view, partly broken away, showing my improved railway-track structure. Fig. 2 is a cross-section of the same, showing the rails in place. Fig. 3 is an enlarged side elevation, partly broken away, with the rail in position. Fig. 4 is a partial transverse section, on a larger scale, of the girder and connections. Fig. 5 is a perspective view of a modified form of clip, and Fig. 6 is a similar view of a tie-piece.

My invention relates to railway substructures of the general type disclosed in my re-issue Patent No. 12,126, dated June 23, 1903, and my later patent, No. 740,106, dated September 29, 1903.

The object of the invention is to provide a girder railway structure which may be made of rolled shapes, thus doing away with the pressing of the girders and the seats therein for the cross tie-pieces.

In the drawings, 2 2 represent the girders, which extend continuously beneath the rails and are formed of separate sections of inverted-trough shape and preferably having lower side flanges 3 3. These girder-sections may either be rolled or pressed, though rolled sections are preferred. The girders are preferably provided with a flat upper bearing portion 4, slightly wider than the base of the rail, the sides of the trough thence extending downwardly, preferably in a curve, as shown, to the flanges 3. The shape of the girder may be varied within the scope of my invention. The girders are connected and also preferably held at the proper distance apart by means of tie-pieces 5, which may be in the form of small channels, as shown. The flanges of the tie-pieces extend downwardly and are notched away near the ends to fit the contour of the short connectors 6, which fit beneath the registering ends of two of the main girder-sections.

The connectors 6 are preferably of rolled material similar in cross-section to the main girder-sections, so that they fit neatly beneath the ends. The ends of the main sections are spaced apart on the connectors a sufficient distance to allow the cross-piece 5 to enter the gap between them, the end sections 7 of the tie-piece flanges entering the vertical slots in the connectors, as shown in Figs. 1 and 2.

The rails 8 may be held in position upon the girders by any suitable means, though I preferably employ the clips 9 of the general form shown in my Patent No. 740,106. Each of the clips is provided with a shank which is notched at one end to provide an end lug 10, as shown in Fig. 3. The other end of the lug is bent into a hook 11, which is preferably provided with a struck-up rib, as shown. The clip may be made of pressed steel, the rib being formed by the pressing operation. These clips are arranged in pairs with the hooks engaging the opposite sides of the rail-base, the shanks extending through pairs of slots 12 in the end portions of the main girder and also in the connectors 6, on which they lie. The slots are notched downwardly, as shown at 13, to fit the rib of the hook. In applying the clips their shanks are slipped through the slots 12, and the lugs 10 are then bent down to engage the side face of the main girder. Each clip is preferably formed as shown in Fig. 3, so that the inner end of the hook fits against the fillet between the web and flange, being beveled on the curve shown at 14 for this purpose. This serves to support and brace the rail in place by bearing on the web.

The thickness of the web of the tie-piece 5 is such that when the parts are assembled its upper face is preferably substantially flush with the upper face of the main girders, thus giving a substantially continuous bearing-surface to the rail. The slots in the connectors 6 are preferably longer than the slots in the main girder-sections, so as to provide a slip-joint which will allow endwise expansion and contraction of the main girders. The clip 9' of Fig. 4 is the same as that of Fig. 3, except

that it is formed from an angle, and in Fig. 5 I show a tie-piece formed from a T 5' instead of a channel. Curved girder-sections are preferably used for short curves of the road.

5 The advantages of my invention result from the use of the underlying girders, which do away with the necessity for pressing or forming the seats in the main girder-sections. I am thus enabled to use rolled material, if desired, for the girders. The connectors in
10 the form shown also serve to support and strengthen the joints between the main girder-sections.

The trough-girders may be formed without
15 the flanges, the connectors may be used without joining or connecting them to the girders, and many other variations may be made in the form of the girders, the connectors, the tie-pieces, &c., without departing from my invention.
20

I claim—

1. In railway substructures a longitudinal girder formed of separate sections with connectors between their ends, the adjacent ends
25 being spaced apart; substantially as described.

2. In railway substructures longitudinal girders formed of separate sections with their ends spaced apart and fitting upon connectors, and cross tie-pieces engaging the connectors
30 between the ends of the main girder-sections; substantially as described.

3. In railway substructures longitudinal girders formed in separate sections with their ends spaced apart and secured to connectors

beneath these ends, and cross tie-pieces engaging the connectors between the ends of the
35 girder-sections, the upper faces of the tie-pieces being substantially flush with the upper faces of the girder-sections; substantially as described.
40

4. In railway substructures a longitudinal girder formed of separate sections with their ends spaced apart and joined by connectors and rail-securing devices extending through
45 the ends of the girder-sections and through the connectors; substantially as described.

5. In railway substructures a longitudinal girder formed in separate sections of inverted-trough shape with their ends spaced apart and
50 lying upon short connecting-sections of similar trough shape, and cross tie-pieces engaging the short sections between the ends of the main girder-sections; substantially as described.

6. In railway substructures a longitudinal
55 girder formed of separate rolled sections, having their ends spaced apart and resting upon short rolled sections of similar shape, and tie-pieces engaging the short sections between the ends of the main girder-sections; substantially
60 as described.

In testimony whereof I have hereunto set my hand.

SAMUEL E. DUFF.

Witnesses:

JOHN MILLER,
H. M. CORWIN.