

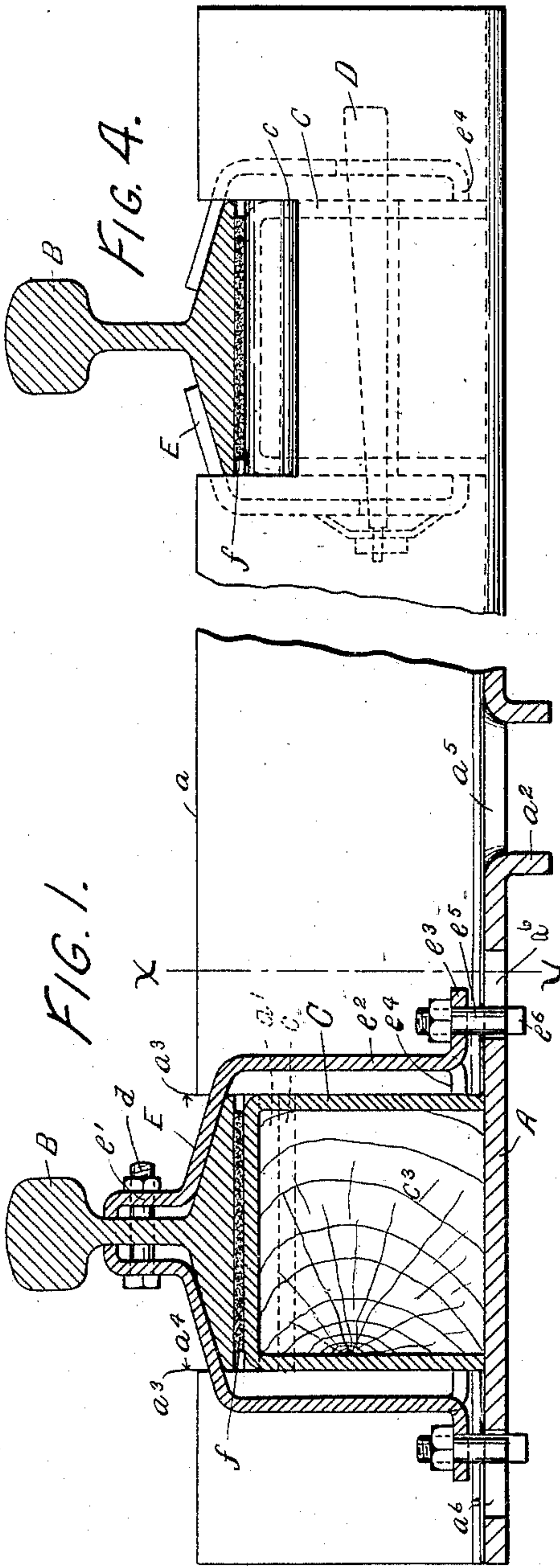
(No Model.)

D. VANAMAN.

# RAILWAY CROSS TIE AND RAIL FASTENING.

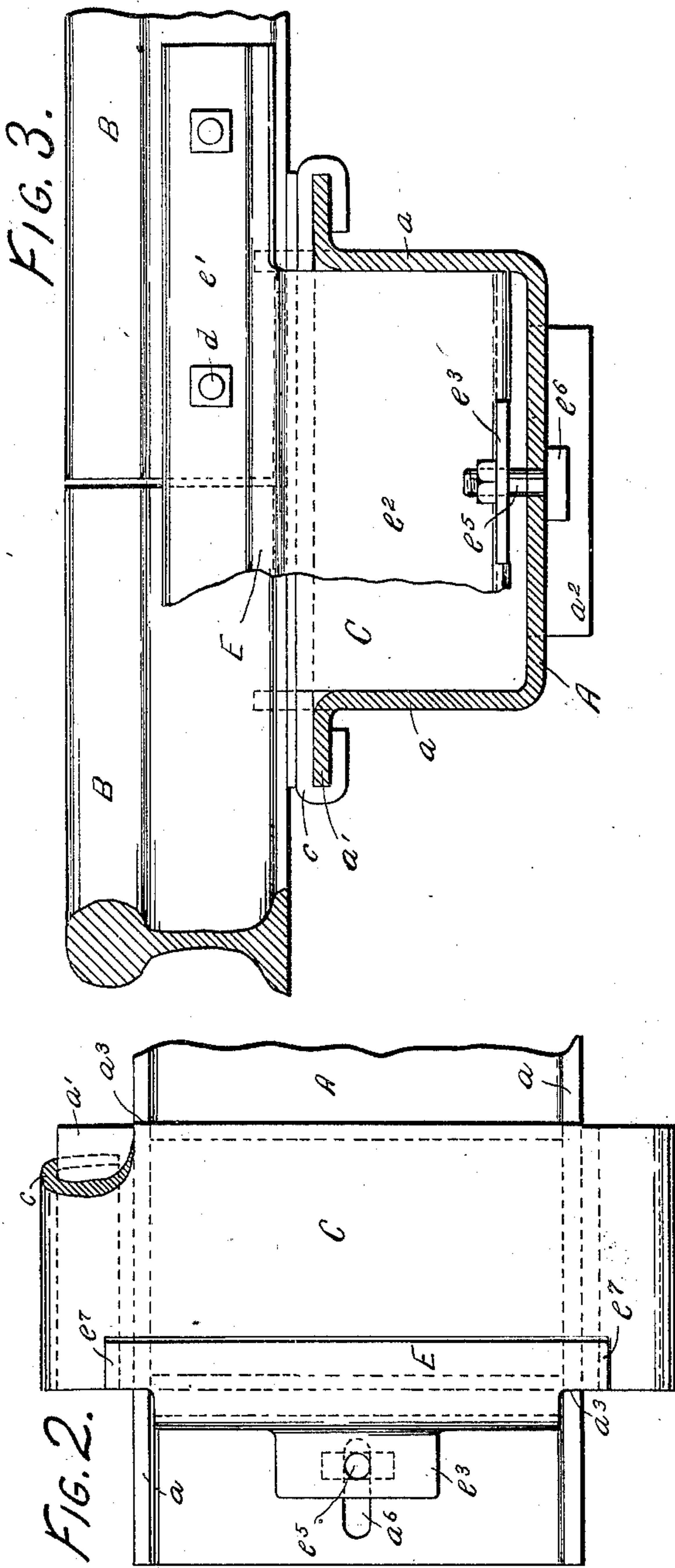
No. 435,162.

Patented Aug. 26, 1890.



Witnesses

E. J. Kelly.  
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By his Attorney *J. Stewart*



# UNITED STATES PATENT OFFICE.

DAVID VANAMAN, OF BIRDSBOROUGH, PENNSYLVANIA.

## RAILWAY CROSS-TIE AND RAIL-FASTENING.

SPECIFICATION forming part of Letters Patent No. 435,162, dated August 26, 1890.

Application filed December 12, 1889. Serial No. 333,413. (No model.)

*To all whom it may concern:*

Be it known that I, DAVID VANAMAN, a citizen of the United States, residing at Birdsborough, in the county of Berks and State of Pennsylvania, have invented certain new and useful Improvements in Railway Cross-Ties and Rail-Fastenings; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to certain improvements in metallic cross-ties and in means for fastening the rails thereto.

It is fully described hereinafter in connection with the accompanying drawings, and is specifically set forth in the claims.

Figure 1 is a longitudinal section of one end of the tie, showing the rail in cross-section and means for securing it to the tie. The clip-pieces are represented with fish-plate extensions. Fig. 2 is a plan view showing the rail-chair and a clip-piece secured to the tie, a portion of the chair being broken away to show the lip or flange  $a'$  of the tie. Fig. 3 is a cross-section of the tie through X Y of Fig. 1, showing a rail-joint and a portion of the clip-piece and its fish-plate extension broken away to illustrate more clearly the rail-chair. Fig. 4 is a full side view of the other end of the tie, showing the rail in cross-section and a modified means of securing it to the tie.

The cross-tie A is preferably formed of sheet metal into a channel or trough section having upturned sides  $a$  and openings  $a^5$  in the web or base made by cutting the metal and turning downward lugs  $a^2$ , these latter being intended to prevent any possible sliding of the tie, thus greatly increasing the firmness and stability of the road-bed. The upturned sides  $a$  are cut and turned outward, so as to form flanges  $a'$  and recesses  $a^4$  between shoulders  $a^3$ . Rail-chairs C, also formed of sheet metal and of similar U-shaped section, are placed in an inverted position in the channel of the tie between the upturned sides of the latter and are provided with wings  $c$ , which fit in the recesses  $a^4$  and rest upon the lips  $a'$ , around which their outer

ends are folded, as shown in Figs. 2 and 3, thus firmly securing the chair to the tie. A block of wood or equivalent semi-elastic material  $c^3$  is preferably inclosed by the chair for the purpose of increasing the strength and yet permitting a certain desirable elasticity.

The base of the rails B is adapted to enter the recesses  $a^4$  in the upturned edges of the tie between the shoulders  $a^3$  and to rest upon the chair C, a semi-elastic material  $f$ —such as compressed paper—being preferably interposed to prevent contact of the metallic surfaces. They are secured to the chair by means of clips E E, which hook over the wedge-shaped base of the rail on either side of its web. These clips have depending plates  $e^2$ , a portion of the bottom edges of which are bent inward, as shown at  $e^4$ , so as to come in contact with the sides of the chair, and another portion bent outward to form bolting-flanges  $e^3$ . T-headed bolts  $e^5$  pass through these flanges and through slots  $a^6$  in the base of the tie, the bodies of the bolts being made square near the heads  $e^6$  to prevent turning after the bolt is in position. The portion of the clips E which hooks over the base of the rail is provided with end extensions  $e^7$ , which engage the shoulders  $a^3$  of the tie, so as to hold the clips in position on the inclined base of the tie, while they are pulled down thereon by means of the bolts  $e^5$  in clamping the rail to the tie. When it is desired to form a rail-joint in connection with the fastening to the tie, it is only necessary to form the clips E with fish-plate extensions  $e'$ , which are secured to the rails by bolts  $d$  in the usual manner.

In the modified fastening shown in Fig. 4 the bolting-flanges  $e^3$  of the clips and the bolts  $e^5$  are dispensed with, and the fastening is effected by means of a bolt D, preferably wedge-shaped, as shown, passing through the clips and the rail-chair. The inwardly-bent edges  $e^4$  of the clips serve as fulcrums, while a clamping-pressure is put upon the rail, due to the incline of its base and also to the incline of the wedge-shaped bolts.

My invention is not limited to the exact construction indicated, other modifications being readily devisable.

What I claim is—

1. The combination, with the rails and the



open-top metallic cross-tie having recesses  $a^4$  for said rails, of inverted-U-shaped rail-chairs C, held in said recesses and between the upturned sides of the tie, substantially as described, clips E E, hooking over the base of the rails and having depending plates  $e^2$ , with bolting-lugs  $e^3$ , and means, as bolts  $e^6$ , for tightening said clips upon the rail-base, all arranged and adapted to operate substantially as set forth.

2. The combination, with the open-top metallic cross-ties having lips  $a'$  and rail-recesses  $a^4$ , of a rail-chair located in said recess and engaging the upturned sides of the tie, and clips E E, with tightening mechanism for clamping said rails to the rail-chair, all substantially as set forth.

3. The combination, with the abutting rails and the open-top metallic cross-tie having recesses  $a^4$  and inverted-U-shaped rail-chairs C secured thereto between the upturned sides of the tie, substantially as described, of clips E E, hooking over the base of the rails and having depending ends  $e^2$  and fish-plate extensions  $e'$ , said clips being secured to the abutting ends of the rails and to the tie, substantially as described, and all arranged and adapted to operate substantially as set forth.

4. The combination, with the rails and the open-top metallic cross-tie having recesses  $a^4$  for said rails, of rail-chairs C, secured to the tie, substantially as described, clips E E, hooking over the base of the rails and confined by the shoulders  $a^3$  of said recess, and

means, as bolting-flanges  $e^3$  and bolts  $e^5$ , for tightening said clips upon the rail-base, all arranged and adapted to operate substantially as set forth.

5. In a rail-fastening mechanism, the combination, with the rails and the open-top metallic cross-tie having rail-recesses  $a^4$ , of inverted-U-shaped rail-chairs secured to the tie with said recesses and having its downwardly-turned edges resting upon the base-plate of the tie between its upturned edges  $a$ , substantially as and for the purpose set forth.

6. In a rail-fastening mechanism, the combination, with the rails and the open-top metallic cross-ties having rail-recesses  $a^4$ , of inverted-U-shaped rail-chairs secured to the tie, substantially as described, and inclosing a semi-elastic material, and a semi-elastic material interposed between the base of the rails and the supporting-surface of said chair, all substantially as and for the purpose set forth.

7. In a rail-fastening mechanism, the combination, with the rails and the open-top metallic cross-ties having recesses  $a^4$  and projecting lips  $a'$ , of inverted-U-shaped rail-chairs located in said recesses and secured to said lips, substantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

DAVID VANAMAN.

Witnesses:

IRVIN HOHL,

WILLIAM G. VANAMAN.