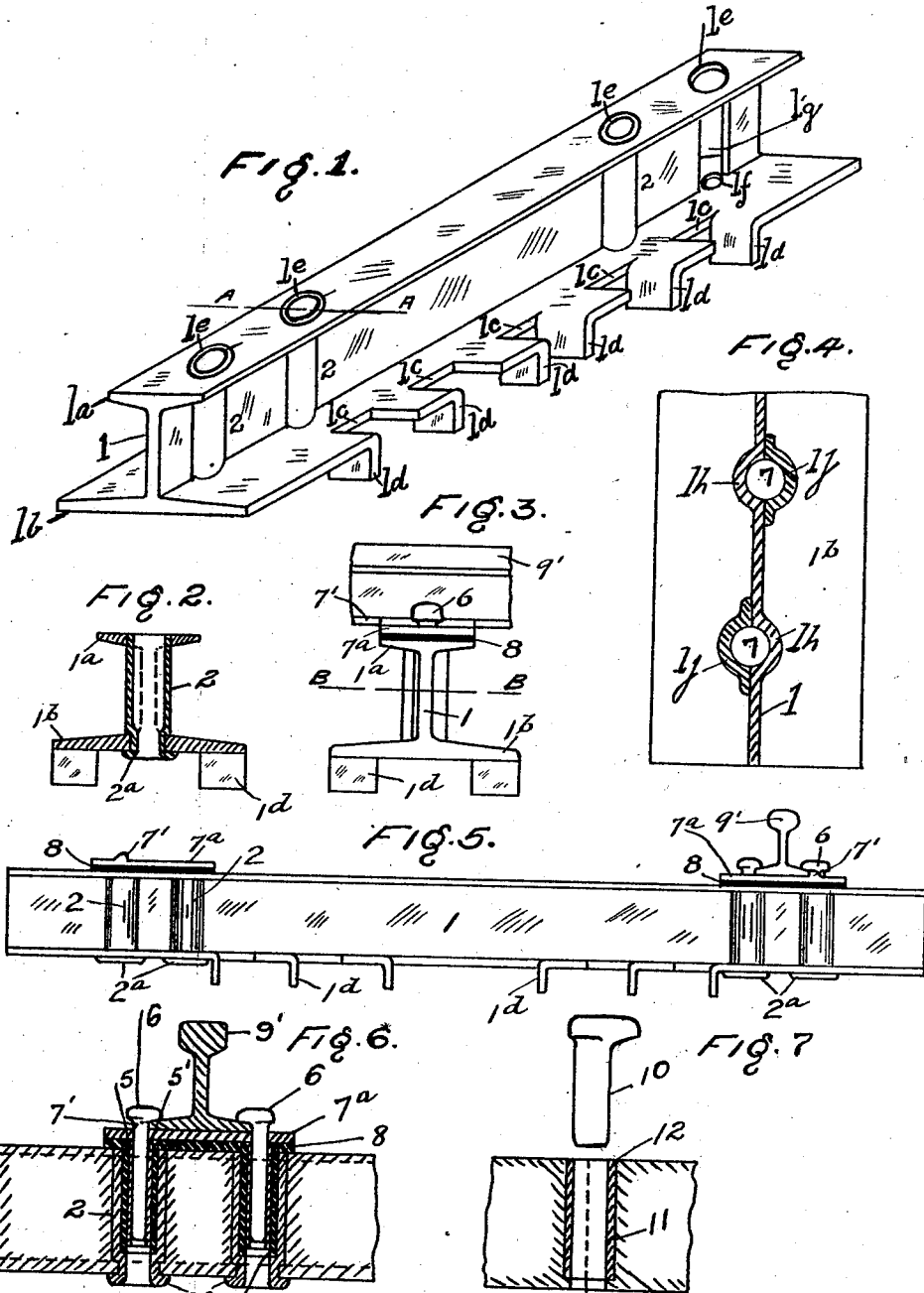


W. D. FORSYTH.  
 STEEL RAILWAY TIE.  
 APPLICATION FILED AUG. 23, 1909.

996,630.

Patented July 4, 1911.

2 SHEETS-SHEET 1.



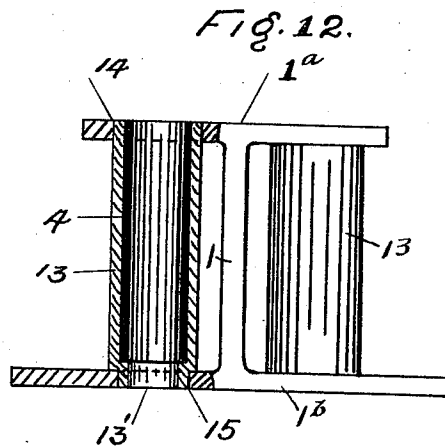
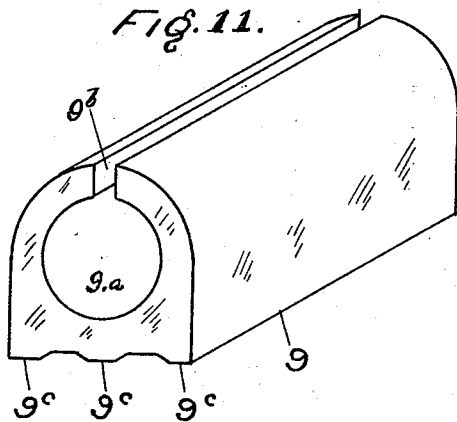
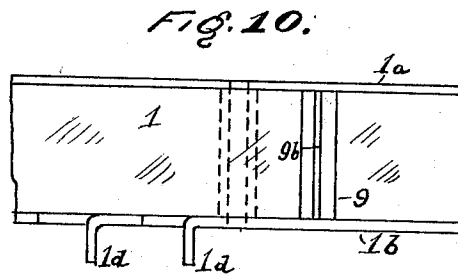
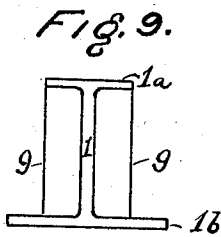
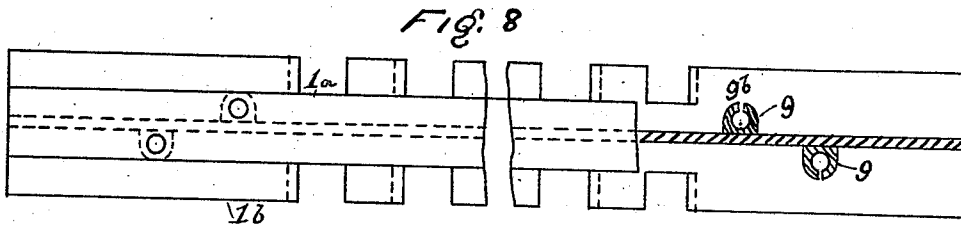
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# UNITED STATES PATENT OFFICE.

WILLIAM D. FORSYTH, OF YOUNGSTOWN, OHIO, ASSIGNOR TO A. M. NEEPER, OF  
PITTSBURG, PENNSYLVANIA.

## STEEL RAILWAY-TIE.

996,630.

Specification of Letters Patent.

Patented July 4, 1911.

Application filed August 23, 1909. Serial No. 514,142.

*To all whom it may concern:*

Be it known that I, WILLIAM D. FORSYTH, a citizen of the United States, and resident of the city of Youngstown, in the county of Mahoning and State of Ohio, have invented a new and useful Improvement in Steel Railway-Ties; and I do hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to metal railway ties, and the objects of my improvements are, to provide a strong, stiff tie with means to prevent longitudinal movement of the same on the road-bed; to provide such a tie with improved retainers for the rail fastening devices; and to provide such ties and retainers with proper insulation.

In the accompanying drawings which form part of the specification, like figures of reference refer to like parts throughout.

In the drawings: Figure 1 is a perspective view of my improved tie, showing one method of attaching the rail fastening devices to the tie. Fig. 2 is a cross section of

Fig. 1 on line A—A. Fig. 3 is an end view of Fig. 1 showing a section of rail attached to the cross tie; a spike fastening the same thereto; and insulation insulating said rail from the cross tie. Fig. 4 is a cross section

of Fig. 3 on line B—B. Fig. 5 is a side elevation of Fig. 1 showing the cross section of a rail; a spike fastening the same; a tie plate; and means of insulating the rail from the cross tie. Fig. 6 is a vertical section of

Fig. 3. Fig. 7 shows a modified spike retainer in section. Fig. 8 is a plan view of Fig. 1, modified, however, as to the spike or rail fastening retainer in that the spike retainer is constructed without distortion of

the web of the cross tie and with a spike retainer which is electrically welded to the sides of the web of the cross tie, one end being broken away by the removal of the top flange to show the position of the spike

retainers with relation to the web of the tie. Fig. 9 is an end view of Fig. 8 with the welded retainers attached to the web and top and bottom flanges of the cross tie. Fig. 10 is a partial side elevation of Fig. 8. Fig.

11 is a perspective view of the spike retainer without its accompanying bushings, hereinafter described. Fig. 12 is a cross section of the cross tie partly broken away, showing a spike retainer in section and one

not in section, as they would appear when welded in the flanges of the cross tie.

This improved cross tie is formed from an I beam shown in the drawings having a web 1, an upper flange 1<sup>a</sup> and a lower flange 1<sup>b</sup> of greater width than the upper, so as to give great bearing area. The lower flange may be sheared at the lines 1<sup>c</sup> and the tongues or flanges 1<sup>d</sup> bent downward so as to engage in the road-bed to prevent the cross ties from moving endwise, because of the centrifugal force of heavy trains on curves.

At proper points along the web, holes 1<sup>e</sup> are punched in the upper flange and smaller holes 1<sup>f</sup> in the lower flange, while slots 1<sup>g</sup> are formed in the web of the cross tie. Into these holes and slots are dropped the metallic sleeves 2, shown in cross section in Fig. 2, the sleeves being preferably so formed as to extend down below the lower surface of the lower flange so they may be riveted over to form the rings 2<sup>a</sup>, whereby they are held in position.

The rail-fastening spikes or bolts may be of such size as to be a tight driving fit into these sleeves 2, but it is more desirable to insert the bushings 4 of resilient material, preferably fiber, in these sleeves. These bushings are either entire cylinders or two semi-cylindrical halves, and are preferably non-conductors of electricity. Within these bushings are metallic bushings, preferably formed of two halves 5 and 5<sup>1</sup>, although a split bushing may be used. The spike 6 is of slightly larger cross section than the bore of the metallic bushing, so that when driven in, the spike will spread the bushing, compressing the wall of the fibrous body of the bushing 4. A rail 9<sup>1</sup> may rest on the tie-plate 7<sup>a</sup>, which has a ridge 7<sup>b</sup> to hold the rail from slipping. Between the tie-plate and the tie may be placed the plate 8 of insulating material.

In Figs. 3 and 4 a modified construction is shown. The web 1, flanges 1<sup>a</sup> and 1<sup>b</sup>, and tongues 1<sup>d</sup> are the same as just described. The upper and lower flanges are provided with holes to receive the fiber bushing 4, but instead of slotting the web, it is bent laterally to form the semi-cylinders 1<sup>h</sup>, on alternate sides of the general plane of the web. Substantially semi-cylindrical metal plates 1<sup>j</sup> whose length substantially equals

the distance between the flanges of the cross-tie, are provided with short lugs which may be secured to the web 1 in any suitable manner, preferably by electrical welding. The metallic bushings 5—5<sup>1</sup> may be inserted in the fiber bushing in the socket 7, as before described, and the tie-plate 7<sup>a</sup> and the insulating plate 8 may be employed if desired. As there is no slot through the web, the stiffness of the cross-tie is greater than that shown in Fig. 1.

In Fig. 11, 9 is a split sleeve having a slot 9<sup>b</sup>, a bore 9<sup>a</sup>, and a flat side on which are formed the longitudinal ribs 9<sup>c</sup>, although these ribs may be omitted. These sleeves may be secured to the web 1, Figs. 8, 9 and 10, in any desired manner, preferably by electrical welding.

The construction shown in Fig. 12 consists of the same web 1, upper flange 1<sup>a</sup> and lower flange 1<sup>b</sup> before described. The sleeve 13 fits a larger hole 14 in the upper flange and its lower end 13' is reduced to fit the smaller hole 15 in the lower flange. A two part fiber bushing 4 is placed within the sleeve 13, and, if desired, split metal bushings may be placed within the metal bushing.

The fiber bushing 4 and the metal bushing 5—5', if used, are the same in each of the four constructions shown in Figs. 1, 4, 8 and 12, and in each case, the rail fastening device 6 is firmly gripped, either by the metal bushing 5—5<sup>1</sup>, or, as shown in Fig. 7, directly engaged by the fiber sleeve 11 in the hole 12. This fiber sleeve 11 may be split on the line 12' if desired.

In each of the above cases, the I beam cross-tie has a broad flange, has sockets extending from the upper face to the lower face, has fibrous sleeves in these sockets, and whether these sockets be square or round in cross section, the split metal bushing can be formed to fit both the fiber bushing and the rail fastening device.

What I claim as my invention and desire to secure by Letters Patent is:

1. A metallic cross tie of substantially I shape cross section having holes of different diameters in its upper and lower flanges on both sides of the web thereof, and sleeves

mounted in said holes for the reception of means for receiving rail fastening devices, that the holes in said means being concentric with the holes punched in the flanges.

2. A metallic railway cross tie of substantially an I shaped cross section having holes punched through its upper and lower flanges for the reception of retainers for rail fasteners, metal sleeves secured in said holes to receive said fasteners, and insulating tubes within said sleeves.

3. A metallic railway cross tie of substantially I shaped cross section having holes punched through its upper and lower flanges, metal sleeves having their ends secured in said holes, fibrous tubes within the sleeves, and split metal bushings within the tubes adapted to receive rail fastening devices.

4. A metallic railway cross tie of substantially I shaped cross section having holes punched through its upper and lower flanges, metal sleeves having their ends secured in said holes, fibrous tubes within the sleeves, split metal bushings within the tubes adapted to receive rail fastening devices, and means for insulating the rail to be fastened to said cross tie from said cross-tie.

5. A metallic railway cross tie having a web and upper and lower flanges provided with holes, the holes in the lower flange being smaller than those in the upper, and sleeves extending between said flanges into said holes to form receptacles for the rail fastening devices, the shoulders formed on the sleeves by reason of the reduction to fit the holes in the lower flanges serving to support said sleeves.

6. A metallic railway cross tie of substantially I shaped cross section having holes in its upper and lower flanges, split sleeves mounted in said holes to receive the rail-retaining devices, tie-plates to be inserted between the rails and the cross tie, and means to insulate the rail from the cross tie.

In testimony whereof, I, the said WILLIAM D. FORSYTH, have hereunto set my hand.

WILLIAM D. FORSYTH.

Witnesses:

M. E. THOMAS,

A. M. NEPPER.