

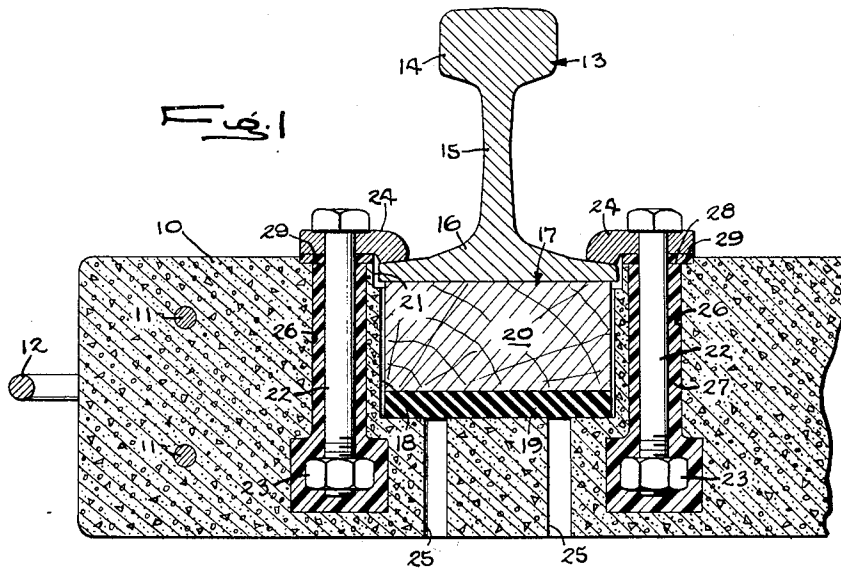
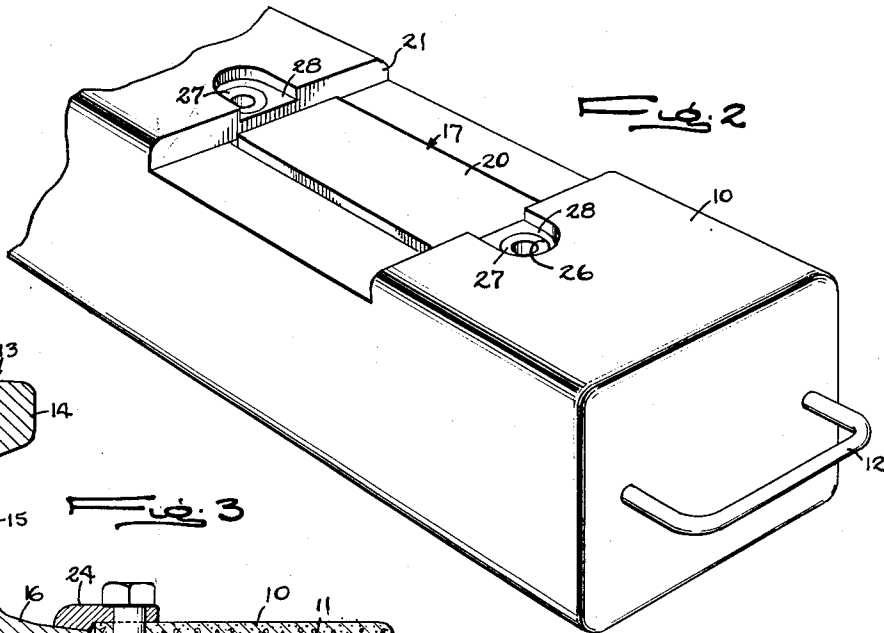
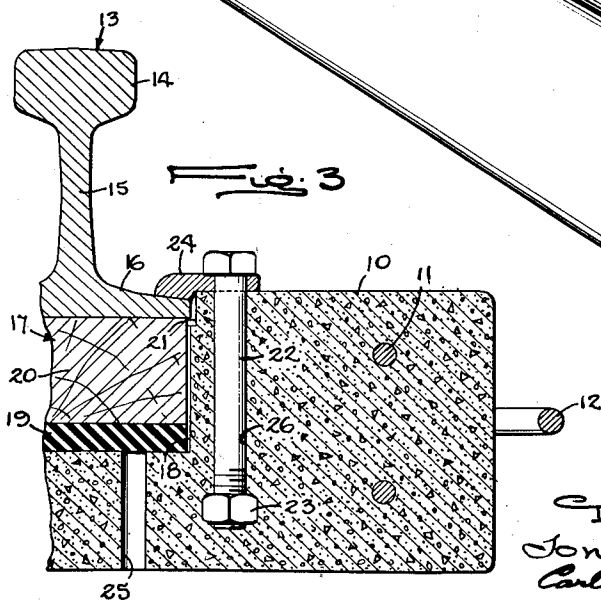
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RAILROAD TIE CONSTRUCTION

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RAILROAD TIE CONSTRUCTION

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1 Claim. (Cl. 238—86)

The present invention relates to cross ties for railway rails and more particularly to specially fabricated cross ties which will have very substantially superior qualities as compared to the familiar, simple wooden ties commonly used in railroads today.

More particularly, it is an object of the invention to provide a permanently durable railway tie embodying an arrangement for securing the rails to it in a manner that obviates the difficulties of loosened hold-down bolts or spikes that usually come in prior arrangements with heavy traffic pounding on rails.

An important object of the invention is the provision of a strong, durable railway tie which, however, affords a cushioned support for the rail rather than one transmitting shocks and vibration directly to the tie through a rigid joint, and which is constructed to eliminate excessive compression of cushioning means or undue deflection of rails when exceptionally heavy loads pass over the latter.

Another object of the invention is to provide such a railway tie fabricated of a molded material such as reinforced concrete together with rail attaching means for supporting and holding rails such that electrical currents carried by the latter are not grounded through the tie even though the latter is electrically conductive to an appreciable degree.

Still another object of the invention is to provide such a railway tie which is conveniently manipulated when it is set in place on or removed from the railbed.

A further object of the invention is to provide a railway tie of the generally improved character indicated which may be made at sufficiently low cost to make feasible its use in place of wooden ties.

Further objects and advantages of the invention will become apparent as the following description proceeds, taken in connection with the accompanying drawing, in which:

Figure 1 is a longitudinal sectional view of one end portion of a railroad tie, constructed in accordance with the invention, and supporting a rail;

Fig. 2 is a fragmentary perspective view of the other end portion of the railroad tie shown in Fig. 1; and

Fig. 3 is a view similar to Fig. 1 of a modified form of tie embodying the invention.

Although certain particular embodiments of the invention have been shown and described in some detail, there is no intention thereby to limit the invention to the details of such embodiments. On the contrary, the intention is to cover all alterations, modifications, and equivalents falling within the scope of the invention as defined in the appended claims.

Referring now more particularly to the drawing, there is shown a railway tie 10 which, in accordance with a preferred embodiment of the invention, is formed as a hard, durable beam of concrete or the like. It may conveniently be molded to the desired configuration, with steel reinforcing rods 11 if necessary. The reinforcing

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rods may be formed to extend in a loop 12 from either end of the elongated beam and constitutes convenient handles for use in lifting and positioning the tie.

As shown in Figs. 1 and 3, the tie is adapted to support a metal rail 13 which may be of conventional form, having an upper or track portion 14 for the rolling support of rail car wheels (not shown), a vertical web portion 15, and a horizontal base portion or foot 16. It will be understood that the tie 10 is adapted to support a rail running transversely across each end thereof to form the usual two-rail railway track, but it will be understood also that any number of spaced rails may be supported along the length of the tie.

Interposed between the rail and the hard and somewhat brittle concrete tie is a yieldable insert 17 of generally block form or shape. The tie is cast or molded in a similar manner at each end to define a generally rectangular recess 18 in its upper surface. Each recess 18 is shaped to receive one of the inserts 17 and with the latter located to underlie a rail foot 16.

The illustrated insert or padding block may be formed of numerous suitable materials. It can be a single block but is desirably constituted as a stack of blocks of different materials. Thus, it may be constituted by a lower block 19 of semi-hard rubber or similarly yieldable, resilient plastic or other material with a superimposed block 20 of wood. The inserts 17 protrude a sufficient distance above the adjacent surfaces of the tie so that even when compressed under normal load the rails will not actually touch the tie.

The recesses open into floors of the transverse slots 21 in the tie face. Such slots are dimensioned to receive the rail foot 16 with only a small side clearance, thus serving as guides for locating the rails and restraining them against lateral displacement in a longitudinal direction along the tie beam.

On either side of the slots fastening means are provided. In Fig. 1 such means comprise bolts 22 threaded in nuts 23 and carrying lugs 24 which overlie the rail foot 16. Tightening of the bolts 22 causes the lugs to draw down the foot 16 of the rail against the insert 17. The insert 17 is, at the same time, securely clamped in place. With such an arrangement, the rail 13 may be quickly clamped in place and is securely held, while the shock and vibration of wheels rolling over the rail is not transmitted directly to the tie 10. Due to the resiliency of the insert 17 the rail may sink somewhat when a heavy load passes, but the extent of this downward movement is limited by engagement of the rail foot 16 with the floor of the slot at either side of the recess. Moreover, sidewise forces on the rails, especially great on curves, are resisted by engagement of the rail foot with the vertical sides of the slot 21. Bending moments on the bolts 22 are eliminated and the bolts thus serve a purely hold-down function so that they are not loosened.

If desired, one or more drain holes 25 may be formed in the beam communicating between the bottom of the recess 18 and the lower side of the beam 10. By such provision, any moisture or precipitation which might enter the recess 18 is drained so that there is no tendency for the material of the insert 17 to become rotted or weakened.

As shown in Fig. 3, each of the openings 26 in the tie for receiving the fastening bolts 22 may have the cooperating nut 23 cast or otherwise secured directly in it with cored holes leading to the nuts so that after the rail is in place, the bolt 22 carrying the lug 24 may simply be inserted into the opening and threaded into the nut. However, in certain instances it is particularly desirable that the rails be kept electrically insulated from one another for electrical signal or power purposes. Should the material of the tie 10, and particularly the metal reinforcing

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11, provide a reasonably low resistance path between the two rails 13 at either end of the tie, sleeves 27 of insulating material are provided for the bolts 22 (Fig. 1). Certain concrete mixtures may have appreciable electrical conductivity due to unusual mineral components, and this coupled with the steel reinforcing members could ground current passed through one rail. The insulating sleeves 27 prevent such grounding. In this instance, the openings may have countersunk faces 28 defined at their tops and insulating washers 29 interposed between the bottom faces of the lugs 24 and the upper tie surface. The insulating material for the sleeves 27 may be of any suitable composition such as micarta or other laminar material impregnated with thermosetting plastic. If desired, the sleeves 27, with the nuts 23 secured in their lower portions, may be secured in place within the openings 26 at the time the beam is cast or molded.

From the foregoing description, it will now be apparent that the railway tie of the present invention is of a hard, permanent, and durable nature, yet easily handled and positioned. Rails can be positively supported and secured on them with great ease and convenience, and with a permanence eliminating the necessity for periodic maintenance and adjustment. Through the accurate spacing of the slots 21, recesses 18, and fastening openings 26 at either end of the elongated beam when the tie is formed, the spacing between the rails 13 may be accurately fixed so that careful measurements and adjustments need not be made to space properly the rails at the time the road is laid. By virtue of the padding material, such as wood, synthetic plastic, rubber, or combinations of these, interposed between the rail and the tie, jarring and perhaps destructive contact between the rails and the tie is eliminated, and a smooth, shock-absorbing support of the rails is provided which may accommodate great weight on wheels rolling over them.

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I claim as my invention:

A cross tie for use in supporting a rail having a flanged foot, said tie comprising, in combination, an elongated beam of cast concrete or the like, metal reinforcing members embedded in said beam and projecting from the ends of the latter to provide handles for manipulation, said beam having a transverse slot in its upper surface dimensioned to be only slightly wider than the rail foot so that sidewise shifting of the latter is resisted, a recess opening downwardly from the floor of said slot, a generally block-shaped resiliently yieldable insert including at least one layer of wood and one layer of hard rubber disposed in said recess and dimensioned to normally protrude slightly above the floor of said slot so that the rail foot resting thereon is cushioned but the degree of compression of said insert is limited by engagement of the rail foot with the floor of said slot, said beam also having a pair of downwardly extending openings on either side of said slot, a pair of sleeves of insulating material each held in one of said openings, and fastening means engageable within said sleeves and abutting the top of the rail foot for drawing the latter securely down against said insert while keeping the rail insulated from said beam.

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