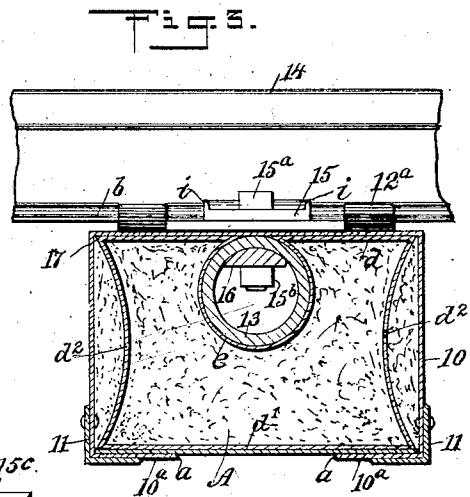
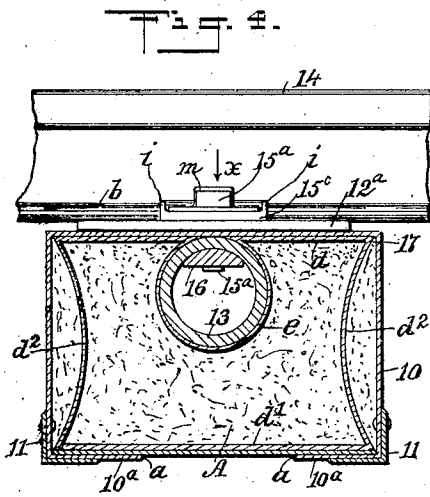
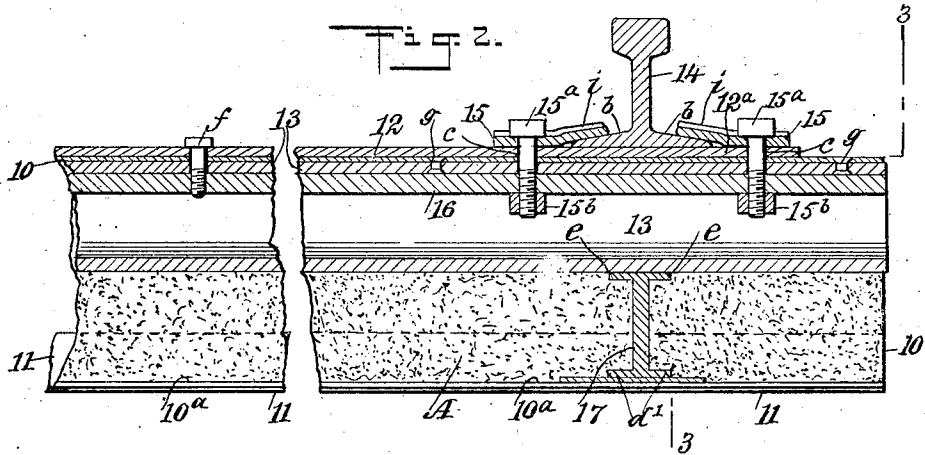
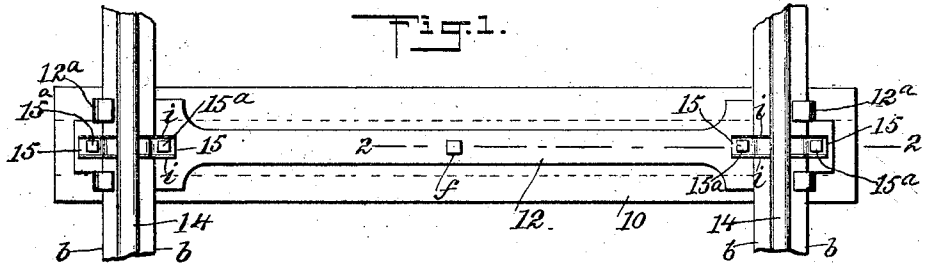


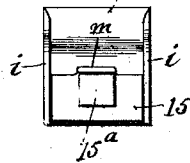
No. 889,028.

PATENTED MAY 26, 1908.

G. R. MAVIS.
RAILWAY CROSS TIE.
APPLICATION FILED AUG. 16, 1907.



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GEORGE ROBISON MAVIS, OF WYMORE, NEBRASKA.

RAILWAY CROSS-TIE.

No. 889,028.

Specification of Letters Patent.

Patented May 26, 1908.

Application filed August 16, 1907. Serial No. 388,754.

To all whom it may concern:

Be it known that I, GEORGE ROBISON MAVIS, a citizen of the United States, and a resident of Wymore, in the county of Gage and State of Nebraska, have invented a new and Improved Railway Cross-Tie, of which the following is a full, clear, and exact description.

This invention relates to a type of railroad cross ties that are formed of plate metal and concrete, and has for its object to provide novel details of construction for a cross tie of the character indicated, which afford a strong, shapely tie, well adapted for railroad tracks or street railway road bed construction.

The invention consists in novel details and their combination and arrangement, as is hereinafter described and defined in the appended claims:

Reference is to be had to the accompanying drawings and the characters of reference marked thereon; similar characters indicating corresponding parts in all the views.

Figure 1 is a plan view of the improved cross tie, and of portions of track rails clamped thereon; Fig. 2 is an enlarged sectional side view, substantially on the line 2—2 in Fig. 1; Fig. 3 is a vertical transverse section, substantially on the line 3—3 of Fig. 2; Fig. 4 is a transverse sectional view showing modified means for holding track rails on the tie, and Fig. 5 is a plan view of a modified rail clamp, seen in direction of the arrow *x* in Fig. 4.

A rectangular plate metal tie body 10 is provided, which is of a suitable length and other dimensions for service, the body or shell 10 being formed with a central longitudinal slot *a*, therein at the bottom, leaving two flanges 1¹ of an equal width stand. As shown, angle iron corner bands 11 are secured at the lower corners of the shell 10 and serve to reinforce the flanges 10^a. Upon the flat upper surface of the shell 10, a flat tie bar 12 is seated and secured at the transverse center by bolts, one being shown in Fig. 2, said tie bar having such length as will permit its ends to extend near the ends of the body or shell 10, and have flanges 12^a on said ends bent up, so as to contact with track rails that are seated upon the tie bar as hereinafter more fully described. A

tubular core 13, preferably formed of a piece of galvanized pipe having a suitable diameter and a length preferably equal with that of the shell 10, is inserted in the shell and supported therein at its transverse center and in contact with the top wall thereof, by bolts and other means which will be described.

The track rails 14 shown to illustrate the cooperation of the improved ties for the production of a railroad or street railway track, are of the T rail type, but said track rails may be of a different form, such as are specially adapted for street railway construction. The ends of the tie bar 12, are widened sufficiently to afford base supports for the track rails 14, the base flanges *b* of the latter being seated on these ends of the tie bar. Two clamping plates 15, of ordinary construction are imposed at one end of each, upon the opposite flanges *b*, the remaining ends of the clamping plates being seated on the tie bar portions 12^a. A reinforcing clamping bar 16, is introduced within the core 13, and preferably is convexed upon its upper face for a close contact with the inner surface of the core tube. Alined perforations *c*, are formed in the clamping plates, the tie bar 12, the upper wall of the shell 10, the core tube 13, and the clamping bar 16. Preferably the perforations in the clamping bar are threaded, and receive the threaded bodies of clamping bolts 15^a, which pass down through these alined perforations, and when screwed into the clamping bar, bind the clamping plates upon the flanges *b* of the track rails 14, at the same time drawing the parts through which said bolts pass, firmly together, as is indicated in Fig. 2.

To facilitate the alinement of the bolt holes in the tie bars 12 and 16, a bolt *f* is preferably inserted down through alined perforations in the outer tie bar 12, the top wall of the shell 10 and the core tube 13, screwing into a threaded perforation in the reinforcing clamping bar 16, thereby holding the latter in place, and properly alining the perforations for the clamping bolts 15^a to permit the insertion of said bolts. To prevent any of the bolts 15^a from unscrewing after they have been adjusted as hereinbefore explained, a jam nut 15^b is screwed upon the inner threaded end of each bolt, and tightly

adjusted, the diameter of the tube 13 permitting an insertion of a hand and arm together with a wrench for effecting such an adjustment. Centrally below each track rail 14, a truss plate 17 is inserted within the shell 10, said similar plates each having parallel top and bottom walls d , d' , joined integrally to preferably curved side walls d^2 , the top walls d at their centers merging into thimbles e , that encircle the core tube 13, as shown in Figs. 3 and 4.

It will be noted in Fig. 2, that the walls d' project as lateral ribs from the truss plate 17 and greatly stiffen it, and it will be evident that the support afforded by said truss plates will render the cross tie very durable and exceedingly strong where this is essential, adapting the tie to support the impact of heavy rolling stock that may traverse the track rails.

In the top wall of the shell 10, a plurality of perforations are formed at intervals in alinement at the transverse center thereof, these perforations being disposed opposite similar perforations in the upper side of the core tube 13 and receive rivets g , that when affixed therein cooperate with the bolt f for holding the core tube stationary at the center of the top wall of the shell 10, which is very essential for stability of the tube 13 and the convenient assembling of other details that have been described.

The body or shell 10 is filled with a suitable mixture of concrete A, that will become rigid in a short time, and thus affords a tie body which co-acts with the shell and truss plates 17 to produce a strong, durable cross tie at a moderate cost.

In the construction of the road bed for a street railway track, the rails and cross ties are embedded in the ground so that the rails are disposed substantially on a level with the surface of the road, consequently it will not be possible to place jam nuts on ends of the clamping bolts 15^a. To prevent the bolts from unscrewing it is preferred to employ a keeper plate 15^c, shown in Figs. 4 and 5, in connection with each clamping plate 15. The clamping plates 15 are all formed with ribs or flanges along their side edges as shown at i , to give them strength, and between these ribs on each plate 15, a keeper plate 15^c is seated and held by a bolt 15^a, that passes through a perforation therein. When the clamping bolts 15^a are screwed tight enough to properly bind the clamping plates 15 upon the base flanges of the track rails, and the keeper plates 15^c are likewise secured in place, an end portion m of each keeper plate is bent so as to bear against the side of the head of a corresponding bolt 15^a and thus prevent the bolt from unscrewing.

While it is preferred to give the body of the cross tie rectangular form, I do not confine

its construction to such a form, as it will be as efficient and in some cases may be preferred, to have the base portion of the cross tie widened, and thus have more bearing surface where it is seated on the road bed.

The main portion of the bottom of the cross tie is of concrete, which is of advantage in that the contact of the concrete body with the ground will prevent creeping of the tie in any direction, owing to its friction on the ground it rests upon.

The tie bar 12, not only prevents the spreading apart of the rails 14, but also prevents wear on the bolt of the tie, where the track rails seat thereon. It is feasible however, in some cases, to employ only the end portions 12^a, of the tie bar, whereon the track rails bear, and dispense with the intervening portion of the tie bar.

Having described my invention I claim as new, and desire to secure by Letters Patent:

1. A cross tie, comprising a four-sided metal shell, a core tube therein, and reinforcing truss plates engaging the shell and tube.

2. A cross tie, comprising a four-sided metal shell, a core tube extended longitudinally therein, reinforcing truss plates engaging the shell and core tube, and concrete material filling the shell.

3. A cross tie, comprising a four-sided plate metal shell open in the bottom wall, angle iron plates on the lower corners of the shell, a core tube extended longitudinally in the shell, reinforcing truss plates held in the shell and engaging the core tube for holding it in place, a tie bar mounted on the upper side of the shell, a reinforcing tie bar within the core tube, and means for clamping said tube and tie bars upon the shell.

4. A cross tie, comprising a four-sided shell, a core tube therein, clamping means on the shell and within the tube, and a concrete filling in the shell.

5. A cross tie, comprising a four-walled plate metal shell open on the lower side, a core tube within the shell extended longitudinally, a tie bar extended lengthwise on the top wall of the shell, a reinforcing tie bar in the core tube, clamps and bolts adapted for securing the tie bars clamped toward each other, a plurality of transverse truss plates engaging the inner walls of the shell and encircling the core tube, and a concrete filling in the shell.

6. The combination, with a cross tie comprising a four-sided plate metal shell open in the lower side, a longitudinally extended tie bar on the upper side of the shell, a core tube within the shell, a plurality of reinforcing truss plates having laterally flanged edges, engaging the inner surfaces of the shell and encircling the core tube, a reinforcing tie bar in the core tube, and a filling of concrete in

the shell, of track rails mounted upon the
outer tie plate, clamping plates engaging the
base flanges of the track rails, and screw
bolts adapted for drawing the clamps and
5 both the tie bars toward the top wall of the
shell.

name to this specification in the presence of
two subscribing witnesses.

GEORGE ROBISON MAVIS.

Witnesses:

LEWIS L. DIKE,
FRANK C. SNOOK.

In testimony whereof I have signed my