

S. A. BARBER.
COMBINATION STEEL AND CONCRETE CROSS TIE.
APPLICATION FILED FEB. 25, 1911.

1,003,316.

Patented Sept. 12, 1911.

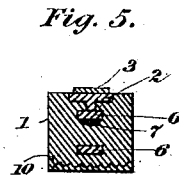
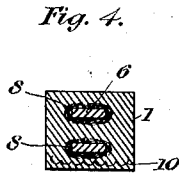
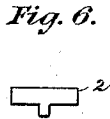
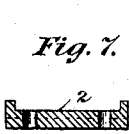
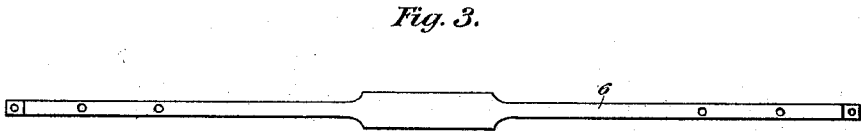
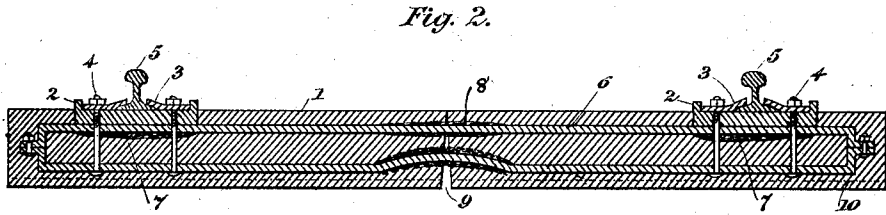
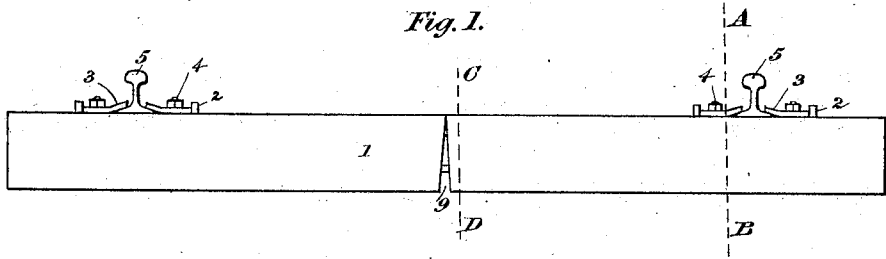


Fig. 8.



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COMBINATION STEEL AND CONCRETE CROSS-TIE.

1,003,316.

Specification of Letters Patent.

Patented Sept. 12, 1911.

Application filed February 25, 1911. Serial No. 610,870.

To all whom it may concern:

Be it known that I, SAMUEL A. BARBER, a citizen of the United States, residing at Louisville, in the county of Jefferson and State of Kentucky, have invented new and useful improvements in a combination steel and concrete cross-tie for use on steam and electric railroads or railways and for general use, of which the following is a specification.

My invention relates to improvements in railroad or railway ties but more particularly to the improvement in a combination steel and concrete crosstie and means whereby the rails are secured to the crossties.

This invention is designed to provide a combined steel and concrete crosstie having all the necessary characteristics of a wood crosstie for successful service, but not having the perishable nature of the wood crosstie in railroad or railway service.

Furthermore, this invention provides a simple and strong means for attaching and securely fastening the said crosstie to the rails whereby the said fastenings cannot be broken or destroyed without destroying the said crosstie, thus doing away with the necessity of rail braces on railroad curves.

This invention further provides that this combination steel and concrete crosstie may be of the same cross-section as a wood crosstie already in use on a railroad so that the combination steel and concrete crosstie may be used in conjunction with a wood crosstie; thus it is obvious that when a wood crosstie becomes rotten, or otherwise unfit for further service or use in the roadbed, it may be removed and the above mentioned combination steel and concrete crosstie substituted for the wood tie, as the combination steel and concrete crosstie is adapted for use with a wood crosstie, as well as adapted for exclusive use in a roadbed.

This invention permits of economical distribution of crossties in the roadbed, as the ties to which this invention refers may be put in the roadbed when necessary to remove an old wood tie, or ties, without any more expense than is necessary to lay new wood crossties and without disturbing the roadbed and without danger to the traveling public.

A special feature of this invention is the two solid steel plates that form the main body of the combination steel and concrete crosstie mentioned herein, one of which

plates will be in tension and the other in compression. Both of these plates are surrounded, as shown in the drawing, by an elastic material of sufficient length, at their center, where the maximum bending moment will occur, to allow them a certain spring without crystallizing the steel or breaking or disturbing the concrete.

The invention further provides that the aforesaid crosstie may be cast as one piece and solid, with the exception as shown in the drawing. The strength of the aforesaid combination steel and concrete crosstie will depend solely upon the strength of the steel, the concrete being used only to give it sufficient cross-section.

The invention provides for a tie that will not cost any more than a first-class wood tie, and will last much longer than a first-class wood crosstie.

With the foregoing and other objects in view, the invention consists in the method of arranging the details of construction, and in the arrangement and combination of parts to be hereinafter more fully set forth and claimed.

In describing the invention in detail, reference will be had to the accompanying drawing forming part of this specification wherein like characters denote corresponding parts in the several views, in which—

Figure 1 is a view, in elevation, of a crosstie embodying the invention with the rails in section. Fig. 2 is a longitudinal sectional view, showing a method of construction. Various changes may be made in the construction and arrangement of the parts without departing from the spirit or sacrificing any of the advantages of the invention. Fig. 3 is a view in plan of one of the steel plates, both being alike in the main. One view will answer for both. They are reduced toward the ends in order to reduce the expense in the construction of the crosstie, while, if necessary, they will be made full width throughout their whole extent. The top plate will have a cross-section sufficient to give it the tensile strength required. It is evident that the flexibility of the crosstie depends on the cross-section of the lower plate and the amount of curvature given it at its center, both of which will be varied to suit the demands. I do not confine myself solely to the method of fastening the plates together as shown in Fig. 2 which is only one of the many ways,

that it can be done. Fig. 4 is a cross-section of the crosstie on the line C D, Fig. 1. Fig. 5 is a cross-section of the tie on the line A B, Fig. 1. Fig. 6 is an end view of the rail plate. Fig. 7 is a longitudinal section of the rail plate. Fig. 8 is a longitudinal section of a lug, or plate, to hold the rails.

Referring to the figures by characters of reference, 1 designates the body of the tie which is a combination steel and concrete crosstie.

2 is a metal plate, which is also shown in section by Figs. 6 and 7, to support and help to fasten the rails to the tie. It has a slight vertical projection across each of its ends against which the end of the rail fastening shown at Fig. 8 will fit. This arrangement will always hold the tie at right angles across the roadbed. This plate also has a central longitudinal rib, shown in Figs. 5, 6 and 7, which will extend down through the concrete and rest on the top steel plate for a purpose hereinafter stated.

4 represents the bolts headed on the underneath side of the lower plate and passing through the lower plate, top plate, rail plate and lug, and, with the help of the nut, binding them all securely together. They are also cast solid in the concrete and form an integral part with the tie.

5 is the rail.

6 indicates the two steel plates described above. For further details of these plates see Figs. 2 and 3 of the drawing.

7 is a material somewhat softer than concrete, such as asphalt, mineral tar, or some combination of materials to be placed around the top steel plate immediately underneath the rails and on which the longitudinal rib, referred to above, of the rail plate will rest, thus giving the cushioning effect that is claimed for a wood crosstie.

8 is an elastic material which will be placed around the top and bottom plates at their centers for a certain distance before the concrete is cast around them. This will prevent the concrete from taking hold of the steel plates for that distance and will allow the plates the necessary flexibility without danger of breaking them or disturbing the concrete, or, in other words, this

arrangement provides for two flexible steel plates inside of a concrete block.

9 is an opening in the concrete at its center; it will be about $\frac{1}{4}$ inch wide at the bottom, and nothing at the top. This opening is not absolutely necessary as the maximum bending moment occurring half way between the two rails, will cause the concrete to rupture somewhere near the center, and, of course, will not break smooth; so to avoid this I choose to make the opening when the concrete is cast rather than to let it break after it is placed in the road-bed and leave a ragged line as that is all the consequence that would occur on its breaking, for I do not depend upon the concrete for any strength but merely to give the crosstie the necessary cross-section.

10 is a wire mesh cast in the concrete near the bottom of the tie to protect it from the picks of the workmen while tamping same.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. A railway crosstie composed of concrete and two steel plates running longitudinally through the concrete and partially embedded therein, and joined together at their ends, having the greatest cross-section of the steel at the center of the crosstie.

2. A railway crosstie composed of concrete and two steel plates, having the top and bottom plates wrapped with a pliable material for the distance of 10 or 12 inches on each side of the center opening in the concrete, thereby providing flexible steel plates inside a concrete block.

3. A railway crosstie composed of concrete and two steel plates, the top steel plate wrapped with a pliable material at the point under each rail so as to form a cushion for the rail.

In testimony of the fact that I claim the foregoing as my own, I have hereunto affixed my signature in the presence of two witnesses.

SAMUEL A. BARBER.

Witnesses:

G. E. PORTER,
H. W. WILLEN.