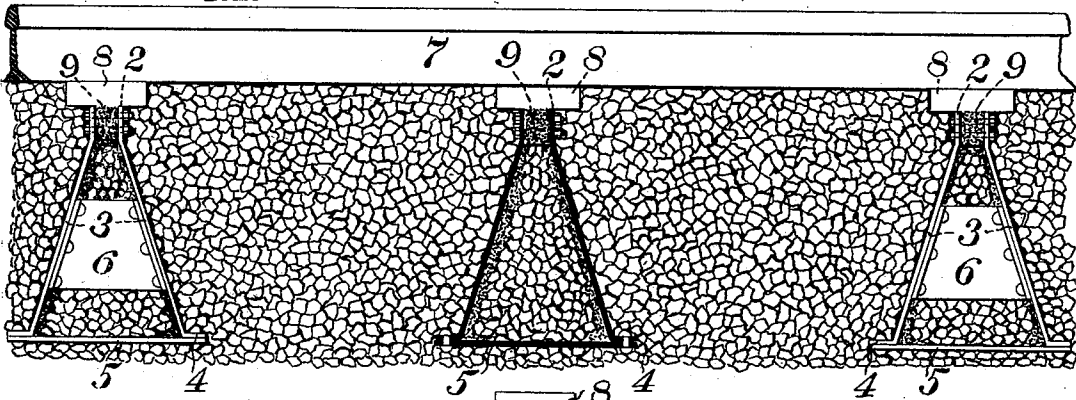
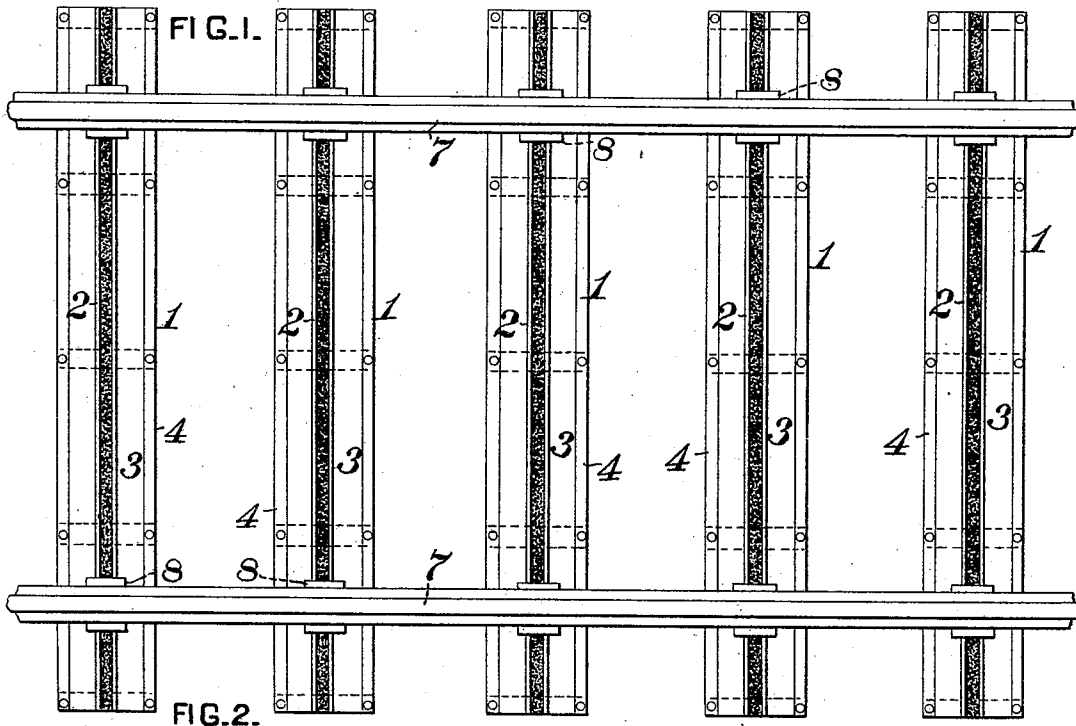


(No Model.)

G. LINDENTHAL.
RAILROAD CROSS TIE.

No. 500,266.

Patented June 27, 1893.



WITNESSES:

Danvers B. Wolcott
J. E. Gaither.

INVENTOR,

Gustav Lindenthal,
by George W. Christy

Att'y.

UNITED STATES PATENT OFFICE.

GUSTAV LINDENTHAL, OF PITTSBURG, PENNSYLVANIA.

RAILROAD CROSS-TIE.

SPECIFICATION forming part of Letters Patent No. 500,266, dated June 27, 1893.

Application filed May 16, 1892. Serial No. 433,167. (No model.)

To all whom it may concern:

Be it known that I, GUSTAV LINDENTHAL, a citizen of the United States, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented or discovered certain new and useful Improvements in Railroad Cross-Ties, of which improvements the following is a specification.

The invention described herein relates to certain improvements in metal cross-ties for railroads.

It has heretofore been customary to construct metal cross-ties with the same general cross-sectional shape as the wooden cross-tie, *i. e.*, approximately rectangular, the metal tie being trough shape, so as to include a body of ballast within it. Such cross-ties have slight stability for the reason that the friction between the ballast and the metal surfaces is very small; hence, the ordinary tamping will not prevent the lateral and longitudinal displacement of metal ties. And as such ties have as a general thing vertical sides, they are easily lifted out of their beds by the up and down deflections of the rail by trains. And further, the rectangular form of cross-tie, whether of wood or metal, is objectionable, as it is necessary to remove the ballast from between the ties whenever they require surfacing and tamping, thereby adding greatly to the expense of maintaining a good track.

The object of the present invention is to so construct metal cross-ties that they may be embedded in such manner in the ballast that the weight as well as the frictional bearing of the latter will resist any tendency to vertical movement of the ties.

It is a further object of said invention to provide for the surfacing of the ties without removing the ballast from between and without resorting to the ordinary tamping operations.

In the accompanying drawings forming a part of this specification, Figure 1 is a plan view of a portion of a railroad track having my improved cross-ties embodied therein. Fig. 2 is a sectional elevation of the same. Fig. 3 is a sectional elevation of a modified form of cross-tie, and Fig. 4 is a bottom plan view of a portion of the cross-tie.

In the practice of my invention the cross-ties 1 are made of two sheets of metal, which

are arranged in such relation to each other as to resemble in cross-section an inverted V. A portion 2 along the upper edges is bent outward at a slight angle to the body portion 3, thereby forming a vertical slot along the upper side of the tie. Portions 4 along the lower edges of the sheets are turned out so as to form horizontal flanges, and to these flanges, at suitable intervals, are secured the straps 5, which will prevent any lateral displacement of the sides of the ties. The ends of the ties are partially closed by plates 6 which are riveted to the sides of the ties, and serve not only to brace the sides, but also by bearing against the ballast included in the ties, to prevent any longitudinal displacement thereof. If desired, one or more plates 6 may be secured to the sides of the ties intermediate of its ends.

The rails 7 are secured by bolts or any other suitable means to shoes 8, which are provided with lugs 9 adapted to enter the slots in the upper faces of the ties and held therein by bolts or rivets passing through the lugs and walls of the slots.

The cross-ties are arranged on the road bed a suitable distance apart, and the interior thereof is filled with ballast either by forcing it under the edge of the ties, or if the ballast be broken sufficiently small by dropping through the slots in the tops of the ties. The space between the ties is then filled with the ballast to the under side of the rails 7. It will be observed that the ballast between the ties has the shape in cross-section of an inverted truncated cone, and that any tendency on the part of the ties to rise will be resisted not only by the weight of the ballast immediately above the sides of the ties, but also by the ties on either side, as the inclosed ballast must be displaced laterally by any upward movement of the ties.

As the conical body of ballast inclosed by each tie is compacted by the passage of trains, and the tie drops below the desired level, it can readily be brought back to the desired height by means of track-jacks placed under its ends, and the space so formed between the inner walls of the tie and compacted cone of ballast quickly filled by pouring sand in through the slot in the upper face of the tie. The sand poured through the slot will flow down the sides of the compacted cone and

form a firm bearing for the tie. In lieu of sand either gravel or finely broken stone which will flow down to fill the space between the compacted ballast and the raised tie, may

5 be employed.

It will readily be understood that this surfacing operation can be more quickly and easily effected than the practice now in vogue, wherein the ballast between ties is removed, the ties jacked up, ballast tamped under the
10 ties, and the ballast returned to the space between ties. Not only can the surfacing operation be facilitated by the use of my improved ties, but it can be done without materially disturbing the ballast which has become compacted in and around the ties.
15

If desired, the sides of the ties may be curved as shown in Fig. 3, and I include as within the scope of my invention such constructions of
20 hollow-metal ties as will by reason of their cross-sectional contour, *i. e.*, the convergence of the sides from the bottom to the top of the tie, so shape the ballast inclosed therein that a filling material poured in through the top of
25 the tie will fill the space between the compacted ballast and the walls of the tie, formed by raising the same in the surfacing operation.

I claim herein as my invention—

1. A hollow cross-tie having an opening in its under side for any desired portion of its
30 length for the insertion of ballast from below, and a narrower opening in its upper side for the insertion of a filling material, substantially as set forth.

2. A hollow cross-tie having an opening in
35 its under side for any desired portion of its length for the insertion of ballast from below, and an opening in its upper side for the insertion of a filling material, the sides of the tie converging from the bottom to the top,
40 substantially as set forth.

3. A hollow cross-tie having an opening in its under side for any desired portion of its
45 length for the insertion of ballast from below and an opening in its upper side for the insertion of a filling material, the sides of the tie converging from the bottom to the top, and plates transverse of the tie and having their ends secured to the sides thereof, substantially as
50 set forth.

In testimony whereof I have hereunto set my hand.

GUSTAV LINDENTHAL.

Witnesses:

SAML. REA,

M. B. SANFORD.