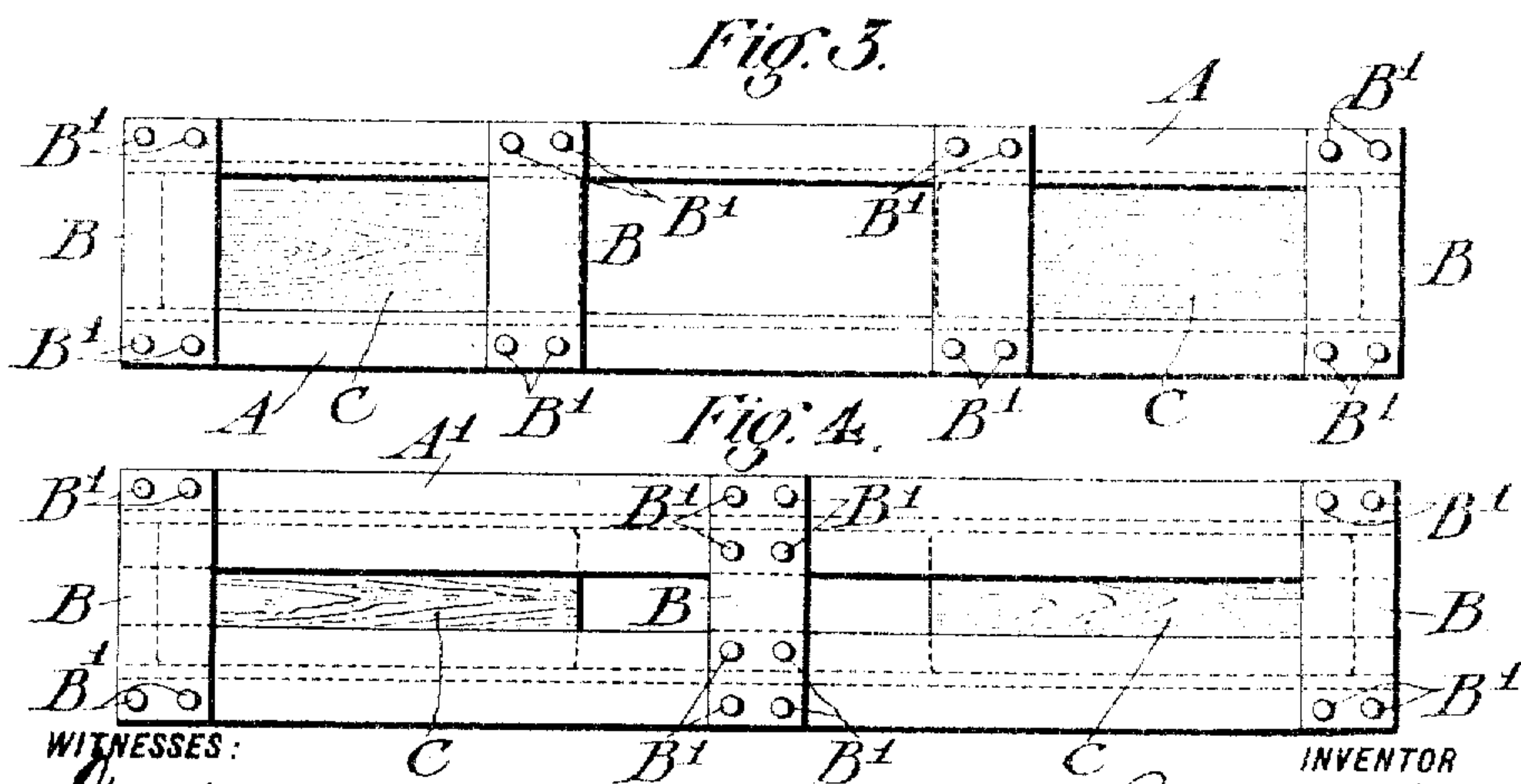
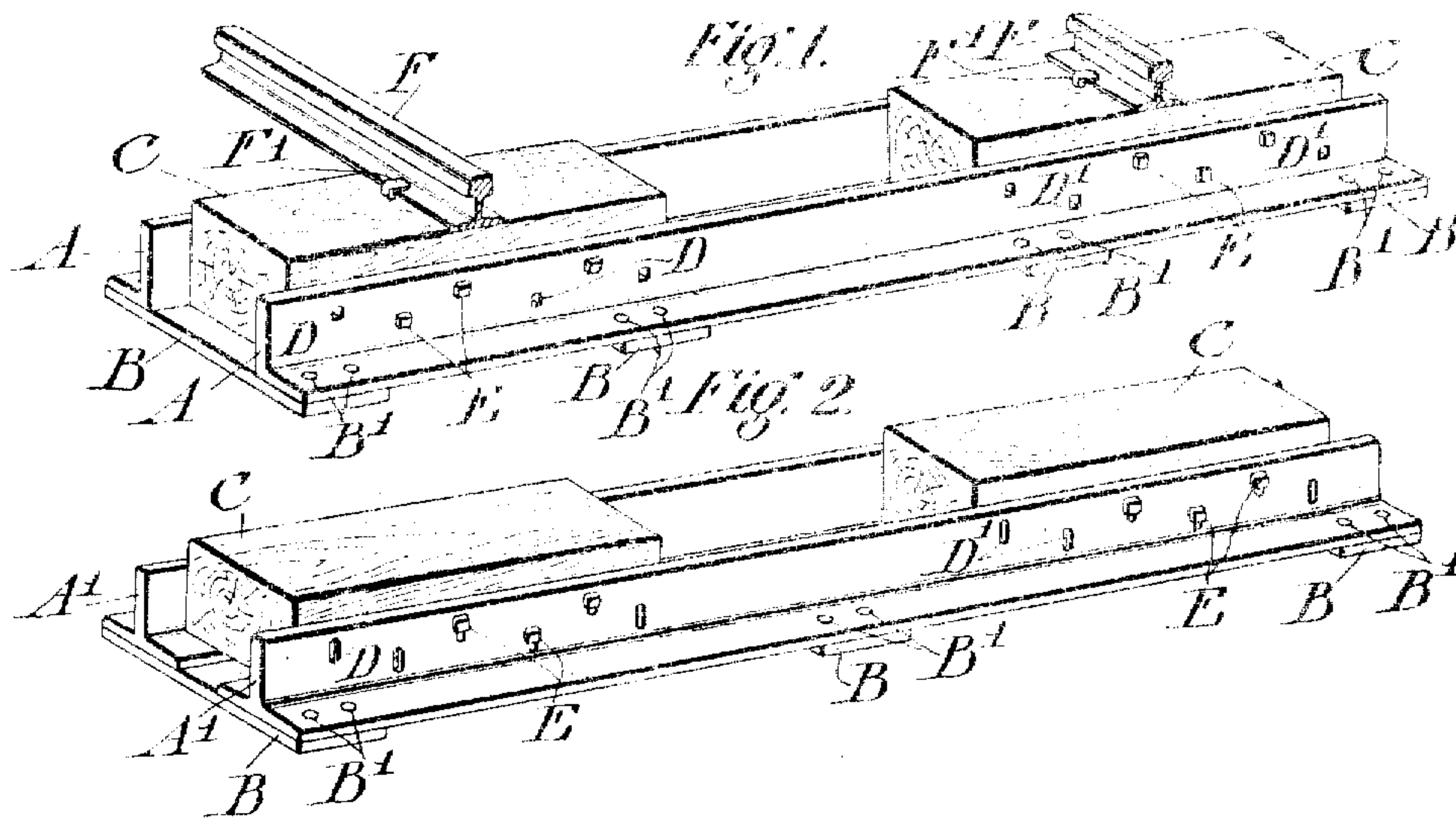


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COMBINATION WOOD AND METAL CROSS TIE.
APPLICATION FILED DEC. 4, 1907.

907,125.

Patented Dec 22, 1908.



WITNESSES:

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COMBINATION WOOD AND METAL CROSS-TIE.

No. 907,125.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, LEWIS P. BUCK, a citizen of the United States of America, residing in the city of Wilmington, in the county of Newcastle, in the State of Delaware, have invented a certain new and useful Improvement in a Combination Wood and Metal Cross-Tie, of which the following is a true and exact description, reference being had to the accompanying drawings, which form a part thereof.

The present invention relates to railway cross ties, and has for its object the production of a combination wood and metal cross tie so constructed as to have the resiliency and other desirable characteristics of the usual all wood cross tie while at the same time possessing the advantages of durability, strength, and large bearing surface of the metal cross tie.

The various features of novelty which characterize the invention I have aimed to point out with particularity in the claims annexed to and forming a part of this specification. For a better understanding of the invention, however, and the advantages by which it is characterized, reference may be had to the accompanying drawings and descriptive matter in which I have illustrated and described one of the forms in which the invention may be embodied.

Of the drawings, Figure 1 is a perspective view of a cross tie in which angle bars are used as the side bars or rails of the tie. Fig. 2 is a perspective view of the cross tie in which the side bars of the tie are made of inverted T bars. Fig. 3 is an inverted plan view of the cross tie shown in Fig. 1, and Fig. 4 is an inverted plan view of the tie shown in Fig. 2.

The cross tie of Fig. 1 comprises a pair of metal side bars A in the form of rolled angle bars which are placed with one flange of each bar vertical and facing the corresponding flange of the other bar, and with the horizontal flange of each bar extending away from the side of the tie. The bars A are connected together by the cross pieces B, each riveted or otherwise secured at one end to the horizontal flange of the corresponding side bar A. Between the bars A are located adjacent each end a block C of wood which projects well above the upper edges of the bars A and to which the track rails F are secured by the usual spikes F' driven into

the wood blocks C. The blocks C, which are of a width substantially equal to the distance between the vertical flanges of the two bars A, are secured in place by spikes E driven through the previously formed and suitably shaped apertures D and D' in the vertical flanges of the side bars. By preference, the apertures D and D' are arranged in a pair of horizontal rows one above the other with the openings in one row staggered with respect to the openings in the other row. By preference also, as shown, the opening of the set of openings D closest the corresponding end of the bar A is in the upper row of openings, while the opening in the set of openings D' closest the other end of the bar is in the lower row of openings. In consequence, when as in practice the cross ties are made up of bars A which are all alike and are formed by cutting and punching lengths from stock bars of indefinite length, the openings D' of one bar will come at the same end of the tie as the openings D of the other bar, and the openings D and D' in the two bars at the same end of the cross tie will be staggered with respect to each other, so that there is no possibility of the spikes E driven into the corresponding blocks C through the openings in one of the bars A coming into contact with the spikes driven into the block through the openings into the other bar A regardless of the length of the spikes used.

In order to obtain the best results I have found it essential that each block C should have a cross section substantially equal to the cross section of the ordinary wood cross tie and should be of a length not less than a quarter of the length of the usual cross tie, and may well be larger. Such dimensions are necessary in order to obtain the desired resiliency characteristic of the ordinary wood cross tie and to prevent the blocks from being split by the spikes driven into them.

While a very good combination wood and metal tie may be obtained by employing with the metal structure of Fig. 1 a wooden tie of the usual length, the use of the relatively short blocks C as shown is as satisfactory in most respects, and more so in some, and is very much cheaper as it makes available for tie purposes many short lengths of wood which have heretofore been next to useless for any practical purpose. For instance, if

permits the use of the sound middle portions of the ordinary wooden ties which have been used until the portions of the ties beneath the track have deteriorated to such an extent that the ties are no longer safe for use in the ordinary way.

The exact shape of the wooden blocks is not essential, that is, either sawed or hewn blocks may be used. While the blocks should be of a width substantially equal to the distance between the side bars, they do not require to be accurately fitted since each block is of sufficient bulk and strength to resist crushing under the pressure of the track rails independent of any support from the side bars. The metal structures of the cross ties may be made in assorted sizes, that is, the spaces between the vertical flanges may be made of different widths to accommodate different widths of wooden blocks. This is of particular advantage where sections of old hewn ties are used for the blocks C. Furthermore, the metal portions may be made of different lengths, where as in connection with switches one tie extends under more than two rails, when a wooden block C for each rail may be provided or some of the blocks may each be engaged by more than one rail.

One of the advantages possessed by my tie is found in the increased bearing surface on the ballast obtained by the horizontal flanges of the metal side bars, enabling each to sustain a much greater weight than heretofore. A further advantage of the construction is found in the fact that the reduced bearing surface between the ends of the tie relative to the bearing surface at the ends of the tie resulting from the space between the adjacent ends of the blocks C diminishes the liability of the ends of the tie rocking up and down about the middle portion of the tie as a fulcrum. The ballast between the blocks C also forms an anchor holding the tie in place, and in particular, preventing the tie from movement in the direction of its length. The ties are also held against movement in any direction when in service by the great weight of the ballast bearing on the horizontal flanges of the metal bars. A further advantage of the invention is found in the fact that a block C may be adjusted in the direction of its length, turned end for end or upside down, or be replaced by a new block on the removal of enough of the ballast between the tie and the adjacent ties to permit the spikes E to be drawn and driven and without disturbing the bulk of the ballast by which the tie as a whole is held in its place. This greatly facilitates repairs, both by reducing the labor necessary to make repairs and by the minimum disturbance of the road bed made necessary to accomplish the repairs. It is, of course, obvious that with the staggered arrangement of spike openings E

that after each adjustment of any block C it may be effectively secured in place again, since more holes D and D' are provided than are ordinarily in use at any one time the spikes may be driven through different holes E with different adjustments of the block, thus avoiding too close proximity between new and old spike holes in the block.

The cross tie shown in Figs. 2 and 4 differs from that of Figs. 1 and 3 in that the side bars A are made of inverted T bars instead of angle bars, so that the blocks C rest upon the horizontal flange of each bar which extends toward the other bar. This construction is mechanically somewhat more advantageous than the construction first described but is more expensive to manufacture on account of the greater weight of metal necessary. In this form as well as that of Figs. 1 and 3 a large proportion of the under surface of each wooden block C is exposed and bears directly on the ballast. In the construction shown in Figs. 2 and 4 the spike openings D and D' formed in the side bars A are vertically elongated so that the blocks are free to yield to some extent when trains pass over them without any tendency to shear the spikes E or to loosen these spikes in the blocks. These elongated openings may also be provided in the side bars of Figs. 1 and 3. I prefer, however, to have the spike openings D formed as shown in Fig. 1.

In the construction shown, it will be observed the block receiving channel, or space between the radial flange or portions of the metal side-bars, which is of substantial extent and substantially uniform from top to bottom, is open at the top. This not only facilitates removal and insertion of the wooden blocks, but permits the use of blocks which may vary somewhat in thickness, measured in the vertical direction, since the blocks do not require to be adjusted or fitted between top and bottom parts of the tie, though of course the blocks should be of sufficient thickness so that the track rails are supported by the blocks and not by the metal side-bars.

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

1. A railway crosstie comprising a pair of metal side bars spaced apart forming between them a block receiving channel open at the top and provided with horizontal flanges projecting from opposite sides of the tie, metallic cross pieces connecting the side bars at their lower edges and one or more rail supporting wood blocks located in said channel and spiked to said bars, each block having a portion of its under surface exposed, and being of sufficient cross-sectional area and length to resist splitting by the spikes driven in it and to resist crushing

under the pressure exerted on it by the rail or rails engaging it independently of the support afforded to it by said side bars.

2. A railway cross tie comprising a pair
5 of metal side bars spaced apart provided with horizontal flanges projecting from opposite sides of the tie and provided each with spike holes adjacent each end, the spike holes in one bar being out of line with the
10 spike holes in the other, metallic cross pieces connecting the side-bars at their lower edges and one or more rail supporting wood blocks located between and spiked to said side bars by spikes passing through said holes, each
15 block having a portion of its under surface exposed and being of sufficient cross-sectional area and length to resist splitting by the spikes driven in it and to resist crushing under the pressure exerted on it by the rail
20 or rails engaging it independently of the support afforded to it by said side bars.

3. A combination wood and metal cross tie, comprising a pair of side bars formed of inverted metal T rails having their adjacent flange edges spaced apart and having spike
25 holes in their vertical flanges, metal cross pieces connecting the side bars at their lower edges, and a pair of rail supporting wood blocks, one at each end of the tie between and spiked to said side bars through said holes, 30 each block having a considerable proportion of its under surface exposed and being of sufficient length and cross-sectional area to resiliently support the rail bearing on it and to resist splitting by the spikes driven in it 35 or crushing by the rail independent of the support to the block formed by the side bars.

LEWIS P. BUCK.

Witnesses:

ARNOLD KATZ,
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