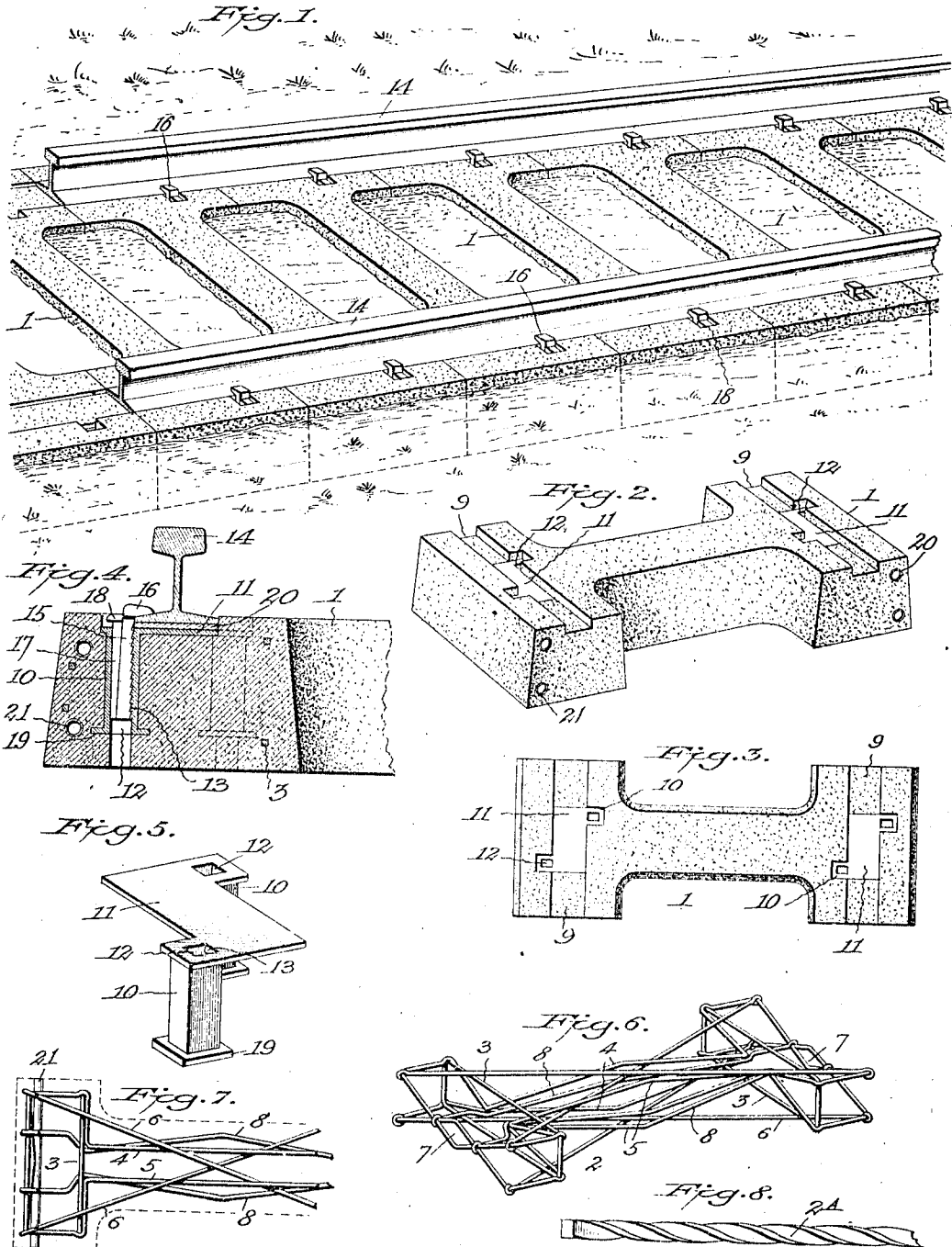


W. W. FRISHOLM.
CONCRETE RAILWAY CROSS TIE.
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Patented Mar. 26, 1912.



Witnesses:
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UNITED STATES PATENT OFFICE.

WILLIAM W. FRISHOLM, OF LEADVILLE, COLORADO.

CONCRETE RAILWAY CROSS-TIE.

1,020,973.

Specification of Letters Patent.

Patented Mar. 26, 1912.

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To all whom it may concern:

Be it known that I, WILLIAM W. FRISHOLM, a citizen of the United States of America, residing at Leadville, county of Lake, State of Colorado, have invented a new and useful Concrete Railway Cross-Tie, of which the following is a specification.

My invention relates to improvements in concrete railway cross ties, and the objects of my invention are: First—to produce a substantially reinforced concrete railway cross tie adapted to be laid close up against each other at the track supporting ends, each tie being provided with a concaved recess on its opposite sides so arranged as to form a large open space between each two adjacent ties. Second—to provide a reinforced concrete railway cross tie provided with a reinforced truss member consisting of a plurality of interlaced and interwoven twisted bars and provided with channels in which the rails sit that are adapted to receive a cushioning medium between the rails and the bottom of the channel, and provided with wedging and locking spikes and with sleeve portions adapted to receive said wedging and locking spikes; and third—to provide a reinforced concrete tie having tubular apertures arranged transversely through its ends and adapted to form openings through the tie for electric light, signal and other wires. I attain these objects by the mechanism illustrated in the accompanying drawings, in which:

Figure 1 is a perspective view of my completed concrete railway cross tie. Fig. 2 is a perspective view of one of the cross ties. Fig. 3 is a plan view of the same. Fig. 4 is a cross section of one end of the concrete ties showing the spike holding sockets in position in the tie. Fig. 5 is a perspective view of one of the spike holding sockets. Fig. 6 is a perspective view of one of the trusses. Fig. 7 is a plan view of a portion of one of the trusses. Fig. 8 is a view of a piece of rod from which the trusses are constructed.

Similar letters of reference refer to similar parts throughout the several views.

Referring to the drawings, the numeral 1 designates a concrete tie embodying my invention. This concrete tie comprises a re-

inforcing truss 2 made of interlaced and interwoven twisted bars 2^a. The truss 2 comprises a central member with a wing at each end. The inner end of each wing comprises a rectangular frame 3, around the corners of which rods 4 and 5 are bent. Each pair of these rods extend out beyond the frames and are bent at right angles and cross each other to form diamonds 7, as shown, at the extremities of the brace. From the corners of the frame the pairs of rods 4 and 5 are bent to converge toward the centers of the frame, as shown, whence the rods of each pair are then bent to form a diamond, and the two diamonds thus formed extend in parallel order and connect the wings, the construction of the wings being similar. The wings are connected by diagonally arranged rods 6, which extend from the outer, upper and lower corners of the wings and cross at the center. At the points where the rods 4 and 5 cross to form the diamonds 7 at the ends of the brace, are connected rods 8 which diverge in such a manner as to form a horizontally arranged diamond, as clearly shown in Fig. 7, thus making of the ends of the truss a skeleton form of a rectangular box, which box portion extends for an equal distance on each side of the center of the truss in a horizontal plane with the corner tie bars extending diagonally from the four corners of one end to the four corners of the opposite end. This truss is adapted to form the reinforcing core of my concrete tie and is adapted to be laid in a mold, which I do not illustrate, of the form of the tie shown in Fig. 2, and the concrete is poured around it.

In order to provide means for securing the rails to the tie, I cast channel portions 9 transversely across the cross tie and at the center portion of these channels I mold in the concrete tie spike holding sleeves 10, which preferably form part of a plate 11. These sleeves and their connecting plate are positioned between the bars of the end portions of the truss in such a manner that when they are cast in the concrete top surface of the tie they will be flush with the bottom of the channels 9 of the said tie. The sleeves 10 contain square apertures 12 through them, one side of which is provided with downwardly extending ratchet teeth 13

on the side of the aperture facing the rail 14, the opposite side of the aperture being smooth. These apertures are adapted to receive wedge shaped spikes 15 that are provided with upwardly extending ratchet teeth on their edges that lie below their rail engaging heads 16, which are arranged to register with the ratchet teeth of the sockets. These spikes taper divergently from the head of the spike to its inner end, which is the thickest part of the spike. The body of the spike is of about the same length as common railway spikes and the apertures are made enough wider than the thickness of the spikes to receive in addition to the spike a wedge key 17, one side of which fits against the opposite side of the recess from the ratchet teeth, and the opposite side of which is tapered to register with the taper of the spike. This wedge key is provided with a head portion 18, which projects from it in opposite direction from the rail spike and enables a pinch bar to be inserted under it to raise it out of the apertures of the sleeves, which locks the spikes in the ratchet teeth after they have been set down against the side flanges of the rail. The lower ends of the sockets are provided with flange portions 19, which when embedded in the concrete prevent them from being drawn up out of it. The rails are placed in the channels 9 and a cushioning material 20 is placed under them along the full length of the channels. This cushioning material may be of wood or any other suitable material. These sockets are positioned to extend down through the rods of the ends of the truss.

The operation of assembling the various parts of my concrete tie is as follows: The truss is positioned in a mold, which I do not illustrate, but which is arranged to cast a concrete tie like that shown in Fig. 2. The sockets are also placed in the ends of the truss so that spike apertures stand in offset positions on opposite sides of the rail receiving channels in the top of the tie. Electric wire conduit tubes 21 are also placed in the ends of the mold, and the mold is then poured with concrete, and when it has hardened a cross tie like that shown in Fig. 2 is produced, the tubes 21 extending through opposite ends of the same, as shown in Figs. 2 and 4.

My invention forms a trussed and reinforced cross tie of great strength and durability; and, while I have illustrated and described the preferred embodiment of my improved railway cross tie, I do not wish to be limited to the construction and arrangement shown, as many changes might be made without departing from the scope of the appended claims.

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

1. In concrete railway ties, a truss comprising a group of interlaced, longitudinally arranged bars, so arranged as to have an enlarged central portion by bending the center portions of their length outwardly to form with oppositely and similarly bent bars diamond shaped forms and having their ends converging to end portions smaller than their central portion and having rectangular shaped box portions extending from said smaller end portions, said central group of bars being extended to and connected to some portion of said end box shaped members.

2. In concrete railway ties, a truss comprising a group of interlaced, longitudinally arranged bars, so arranged as to have an enlarged central portion by bending the center portions of their length outwardly to form with oppositely and similarly bent bars diamond shaped forms and having their ends converging to end portions smaller than their central portion and having rectangular shaped box portions extending from said smaller end portions, said central group of bars being extended to and connected to some portion of said end box shaped members, said concrete railway tie being provided with a rail receiving plate arranged to secure rails in operative positions to said concrete tie.

3. In concrete railway ties, the combination of the interlaced truss composed of twisted concrete reinforcing bars connected together, said truss comprising a plurality of bars adapted to form the longitudinal core of the central body portion of the concrete tie and arranged to comprise a central group of bars that are bent to form a center portion of larger size than its portions that are at equal distances from its central portion, said small portions of this central longitudinal body portion being bent at right angles to their lengths and extending in oppositely diverging lines to the corners of cross bars to which they are secured, said cross bars being arranged to form rectangular box shaped ends at the ends of said truss, said box shaped ends being provided with diagonally arranged bars extending from each outward corner of said box form of ends to the opposite outer ends of the opposite box form of end portion of said truss, and means for securing rails to said concrete tie, the said ends of said concrete ties being arranged to be placed in abutting side edge relation on the road bed of a railway so as to form a continuous concrete road bed at their box shaped ends with apertures between the central longitudinal portions,

said tie being provided with channels extending transversely across the box portions of said tie adapted to receive said rail securing means, and said concrete ties being
5 provided with tubular apertures transversely through the ends of said concrete ties adapted to receive electric current wires.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIAM W. FRISHOLM.

Witnesses:

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