G. H. PEGRAM.

COMPOSITE RAILWAY TIE.

APPLICATION FILED JULY 2, 1920.

1,425,686.

Patented Aug. 15, 1922.

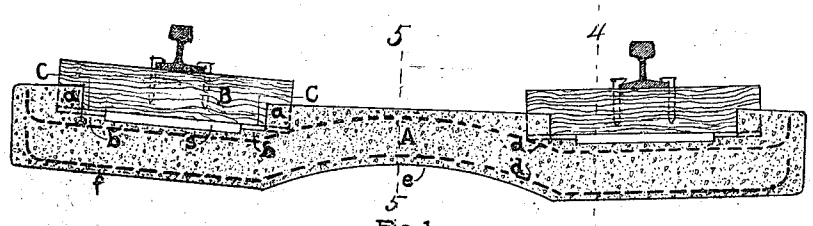


Fig. 1.

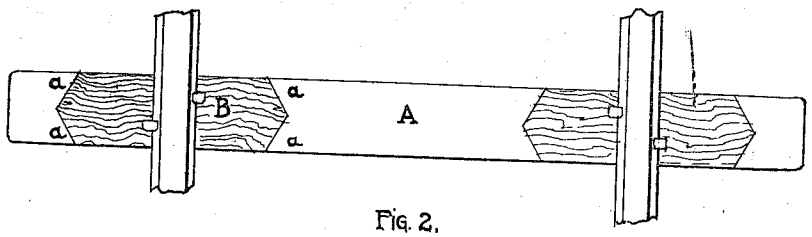


Fig. 2.

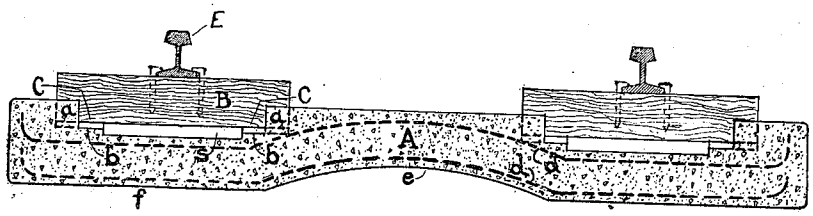


Fig. 3.

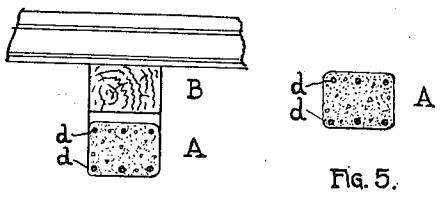


Fig. 4.

Fig. 5.

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COMPOSITE RAILWAY TIE.

1,425,686. Specification of Letters Patent. Patented Aug. 15, 1922.

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To all whom it may concern:

Be it known that I, GEORGE H. PEGRAM, a citizen of the United States, residing at South Orange, county of Essex, and State of New Jersey, have made a certain new and useful Invention in Composite Railway Ties, of which the following is a specification.

This invention relates to composite railway ties.

The object of the invention is to provide a composite wood and concrete railway tie which secures all the advantages and desirable characteristics but avoids the defects and disadvantages of both wood ties and concrete ties.

A further object is to provide a railway tie structure in which the stresses, strains, shocks and vibrations, due to the operation of cars thereover, are minimized and distributed.

A further object is to provide a railway tie structure which permits the leveling or surfacing of the track rails without disturbing the bedding of the ties in the road bed.

A further object is to provide a railway tie which permits the tilting or angular lateral adjustment of the track rails.

A further object is to provide a railway tie structure, which, when properly positioned in the road bed, resists the action of endwise thrust exerted thereon by the operation of cars along track rails supported thereby.

A further object is to provide a railway tie structure in which the pressure on the road-bed ballast is distributed and any tendency of the tie to be moved endwise is resisted.

A further object is to provide a composite railway cross-tie in which the track rails are mounted upon wooden members to secure a desirable resiliency and insulation, and these wooden members are supported upon concrete members to assist in taking the stresses and strains, and along which the stresses and strains are distributed, and wherein, in case of derailment of a car the concrete supporting member of the tie is guarded from the impact of the wheels of the derailed car.

A further object is to provide a composite cross-tie in which wooden members are seated in the concrete member to receive, cushion and distribute the weight and load of cars passing along track rails supported by the cross tie.

Other objects of the invention will appear more fully hereinafter.

The invention consists substantially in the construction, combination, location and relative arrangement of parts, all as will be more fully hereinafter set forth, as shown in the accompanying drawing, and finally pointed out in the appended claims.

Referring to the accompanying drawing, wherein I have shown constructions embodying the principles above outlined,

Fig. 1 is a view in front elevation of a composite tie embodying the principles of my invention, showing an arrangement which secures an inclined or tilted position of the track rails.

Fig. 2 is a top plan view of the same.

Fig. 3 is a view similar to Fig. 1 showing a structure in which the track rails are not inclined or tilted.

Fig. 4 is a view in section transversely of the tie on the line 4, 4, Figs. 1 and 3.

Fig. 5 is a similar view on the line 5, 5, Fig. 1.

The same part is designated by the same reference character wherever it appears throughout the several views.

Concrete ties as heretofore constructed are open to many and serious disadvantages. They require complicated and difficult fastenings for securing the track rails thereto. It is difficult and expensive to effectively insulate the track rails, this usually requiring the use of pads of fibre or other insulating material, and insulating bushings for the securing bolts. Such pads and bushings wear out rapidly and require constant care and attention and frequent repair and replacement. In the use of concrete ties the blows, shocks and vibrations, due to the pounding of the car wheels upon the rail joints, are transmitted more or less directly to the ties since there is little to secure a cushioning action, and this causes fatigue and rapid disintegration in a crystalline structure like concrete. Moreover, in order to distribute the pressure over the road bed large sizes of ties are required, and this means great weight and consequent difficulty in handling the ties.

It is among the special purposes of my present invention to provide a combined wood and concrete tie which secures all the advantages and benefits of both types of ties

and which at the same time avoids the disadvantages of either.

In carrying out my invention, and in one embodiment thereof, I propose to employ a concrete tie, which, if desired, may be reinforced in the usual manner with steel or other rods, bars, or the like, and which is bedded transversely across the road bed in the usual way, and I construct or form the concrete tie with a seat in the upper surface thereof adjacent each end, each seat extending longitudinally of the tie and being formed at its ends with raised shoulders to receive and support the ends of short wooden members, the end walls of the seats in the concrete tie being shaped to retain the wooden members against longitudinal and lateral displacement. The track rails are mounted upon and fastened to the wooden members in the usual way. By thus supporting the short wooden members by resting their ends upon the raised shoulders at the ends of the seats in the concrete ties, a clearance is provided between the central portions of the wooden members and the bottoms of the seats. This permits a desirable yielding or bending of the wooden members under the action of loads passing along the track rails supported thereby, which absorbs the shocks and vibrations, thereby relieving the concrete portion of the composite ties of the effects thereof. Moreover, I am enabled by this arrangement to secure a desirable distribution of the load not only to adjacent ties but also along the length of each tie, thereby reducing the stresses in the tie and permitting the use of smaller sizes of ties than would otherwise be possible or practicable. Since the wooden members are coextensive in width with the concrete sub-ties, and also extend on each side of the rails, they provide protection for the concrete against damage from derailed wheels.

In the operation of railway cars or trains along track rails, the flanges on the wheels operating along the inner sides of the rails exert a lateral outward thrust upon the rails which thrust is transmitted, of course, to the cross ties. In order to counteract the effects of this lateral thrust and to transmit the pressures to the road bed at an angle it has been proposed to set the track rails at an angle inclined inwardly from the vertical. To accomplish this result in a structure embodying my invention the shoulder at the outer end of each seat in the concrete tie upon which rests the outer end of the track supporting member is inclined upwardly and outwardly with reference to the shoulders at the inner ends of the seats. This arrangement positions the wooden member in an inclined position, thereby securing the desired tilt or angular inclination of the track rails. In this connection, and in further carrying out this feature of my invention, I may also correspondingly incline upwardly and outwardly the under surfaces of the ends of the concrete ties, thereby securing a better distributed resistance of the road bed to the thrust exerted upon the track rails by the car wheel flanges. The inclined position of the track rails causes the top surfaces of the rails to conform more closely to the coning of the wheel treads, thereby bringing the wheel pressure more nearly to the lateral central line of the rail. This increases the life of the rail by reducing the wear to which the rail is subjected, and by centralizing the pressure with reference to the transverse width of the rail fracture from transverse fissures is in a measure prevented.

Again, in order to surface or level up the track rails, it is a common expedient, according to present practice, to tamp the cross ties. This operation disturbs more or less the bedding of the ties in the road bed, and since a railway track is a continuous connected up structure the disturbance in the bedding of a tie when tamped is transmitted to other adjacent ties for a considerable distance on opposite sides of the tie that is tamped. This is particularly undesirable and in accordance with my invention this trouble is wholly obviated by employing suitable shims which are inserted under the ends of the track supporting members, by which means the track rails are easily surfaced or leveled up without disturbing the bedding of the ties. The adjustment secured by the use of the shims localizes the effect of surfacing the track rails and permits such work to be accomplished without difficulty even when the road bed may be frozen and the ordinary tamping consequently impossible. This also enables the concrete ties to be left undisturbed in their bedding in the road-bed for longer periods which is conducive to the maintenance of a good road-bed.

In the drawing reference letter A designates a cross tie, which, in accordance with my invention, is constructed of concrete, and, if desired, and as shown, which may be reinforced by means of metal rods or other reinforcing members, indicated at *d*, in the usual manner. This cross tie with its reinforcements imbedded therein is cast in a suitable form according to the usual method of concrete beam constructions. The tie is formed with an arched bottom portion *e* for preserving the centering of the tie laterally in the roadbed. In the upper surface of the tie and at each end thereof is formed a depressed seat to receive the member B, which, if desired, and preferably, is a wooden beam. In this connection, however, I wish it to be understood that my invention is not to be limited or restricted to a wooden member, as

a rail beam of any desired material may be employed. The rails E are positioned transversely across and are secured to the members B in the usual or any suitable manner. The ends of the seats in which the rail carrying members B are received are formed at each end thereof with raised shoulders *b* upon which the shims C rest for adjusting the rail and to receive the ends of the members B. This arrangement provides a space *e* between the central portions of the members B and the bottoms of the seats, thereby causing these members to be supported at their ends and leaving the middle portions thereof free to bend or flex under the weights imposed thereon. In order to retain the members B against displacement in their seats in the concrete tie, said seats are formed at their ends with engaging walls, or lugs *a*, *a*, for each end of the beams, or members B, and the ends of these members are shaped to the complementary form of the lugs or end walls *a*, so that their interengagement therewith when the members B are positioned in the seats, serves to retain said members against displacement horizontally as well as laterally.

Where it is desired to cant or tilt the track rails laterally and inwardly as indicated in Fig. 1 in order to more satisfactorily take and transmit the outward thrust of the car wheel flanges, the seating surfaces of the shoulders *b* which receive and support the ends of the members B are formed to lie in planes which are inclined upwardly and outwardly towards the respective ends of the cross tie, and to the required or desired angle of inclination, as is shown at *f* for example. My invention therefore, efficiently lends itself readily and easily to the laying of inclined rail tracks. If the rails are not to be inclined, as indicated in Fig. 3, then the cross ties are formed with the seating surfaces *b*, *b*, of the seats lying level or in the same horizontal plane.

Having now set forth the objects and nature of my invention, what I claim as new and useful, and of my own invention, and desire to secure by Letters Patent is,—

1. A composite railway tie comprising a cross member of reinforced concrete and rail supporting cross beams adjustably embedded near the ends thereof, said beams being supported at their ends only and terminating in wedge-shaped ends for retention in correspondingly shaped recesses.

2. A composite railway tie comprising a cross member of reinforced concrete having upwardly inclined end portions, said inclined end portions having recesses forming seats in combination with rail supporting members seated and supported at their ends only in said recesses and retained by the side and end walls thereof against longitudinal and lateral displacement.

3. A composite tie for railway rails comprising a cross member of reinforced concrete having its end portions longitudinally inclned to give a tilt to the rail, said inclined end portions having depressions in the upper surfaces thereof with raised ledges at the ends of said depressions, and rail supporting members seated in said depressions and supported at their ends on said ledges, said depressions having side and end walls, the side wall portions thereof engaging portions only of the sides of said rail supporting members, whereby said supporting members are retained against both lateral and longitudinal displacement.

In testimony whereof I have hereunto set my hand on this 8th day of June A. D., 1920.

GEORGE H. PEGRAM.