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UNITED STATES PATENT OFFICE.

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CEMENT AND STEEL RAILROAD-TIE.

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To all whom it may concern:

Be it known that I, WILLIAM J. HORN, a citizen of the United States, and a resident of Lamar, in the county of Barton and State of Missouri, have invented certain new and useful Improvements in Cement and Steel Railroad-Ties, of which the following is a specification.

This invention is an improvement in railroad ties and has for an object, among others, to provide a novel construction of reinforced concrete railroad tie; and the invention consists in certain novel constructions and combinations of parts as will be hereinafter described and claimed.

In the drawing Figure 1 is a side elevation of the steel skeleton frame, the concrete being indicated in dotted lines. Fig. 2 is a top plan view of the tie. Fig. 3 is a detail cross section on about line 3—3 of Fig. 2. Fig. 4 is a cross section of the frame on about line 4—4 of Fig. 1. Fig. 5 is a cross section on about line 5—5 of Fig. 1. Fig. 6 is a horizontal section on about line 6—6 of Fig. 1, showing the cross sectional form of one of the uprights. Fig. 7 is a detail perspective view of one of the keys for securing the tie holding wedges in place. Fig. 8 is a cross section on about line 8—8 of Fig. 2, and Fig. 9 is a detail perspective view of one of the stay bolts.

In carrying out the invention, the tie A may be made of the regulation length of the concrete B and the skeleton reinforcing frame C which is embedded in the concrete or cement, the latter being molded on the skeleton frame and entirely inclosing the same except the upper or top bar C' which rests on the upper surface of the cement, the cement on the bottom of the tie being just flush with the bottom edge of the lower bar C² of the frame, the frame having at its ends extensions C¹² which taper toward their extremity C³ and are reinforced at such point by blocks C⁴ forming heads and avoiding any point like formations at the ends of the frame.

Between the top bar and the base bar, I provide a series of uprights D and strut braces E disposed as best shown in Fig. 1, and the uprights D are grooved or channeled in their opposite faces at D' as shown in Figs. 1, 4 and 6 and the strut braces extend diagonally between the lower end of one upright and the upper end of the adjacent upright, as best shown in Fig. 1, giving

strength and rigidity to the frame and affording openings through the frame for the passage of the cement or concrete so the integrity of the mass of concrete or cement will be maintained and the cement or concrete will be strengthened throughout by the frame when the latter is embedded therein as shown and before described.

The top bar C' is curved upwardly at its center producing an arch-like form, thus increasing the strength of the frame which is preferably of steel and of a medium soft nature to prevent breaking under strain.

The tie may be made of the usual or any desired length and the ties being alike as to concrete body and reinforcing frame, may be substituted one for the other whenever for any reason one tie becomes broken or otherwise impaired.

Adjacent its ends the frame is provided with rail seats F which, as shown in Fig. 1, are directly above one of the uprights D so the weight exerted upon the rail G fitted to the seat F will be borne in the direction of length of the said upright underlying the rail seat. The opposite sides of the rail seat are formed with upwardly projecting lugs H which have transverse openings H' for the passage of the wedges I which are inserted from the outer side of the lugs H through the openings H' to bear at their inner tapered ends I' upon the rail base G' as best shown in Fig. 3 of the drawing. When driven home to the position shown in Fig. 3, the wedges I may be fastened in position by a key J driven below the outer end of the wedge I, the latter being notched at I² for the reception of the key J, the said notch forming a seat for the key as will be understood from Fig. 3, and the frame C being provided with a shoulder at C⁵ as best shown in Figs. 2 and 8 alongside of which is bent the key J when the latter is driven to position as shown in Fig. 2 for holding its wedge, the said key being made of wrought iron or other suitable material which can be bent into engagement with the shoulder C⁵ when the parts are fitted for use, as shown at the right in Fig. 1 and in Fig. 3.

The lugs H on opposite sides of the rail seat are made heavy to render them strong and durable in use.

By the described construction the steel reinforcing frame is protected from rust and decay and the tie has the desired size and

strength and the skeleton reinforcing frame is so constructed as to reduce the liability of breaking the cement ties. Furthermore the tie is comparatively cheap when its longevity is considered.

The rail securing devices are so constructed as to securely hold the rails and prevent spreading such as is apt to result from the loosening of spikes and rotting of ties.

The fastening devices are such that they can be quickly operated in placing and removing the rails and when the tie is complete for use it presents a solid reinforced body of concrete which is simple, easily operated, durable and designed to efficiently serve the purpose for which it is intended.

I prefer to employ transverse stay bolts K headed at K' as shown in Fig. 9 and arranged transversely within the concrete tie extending from side to side thereof and nearly to the opposite sides and placed at suitable points, such as indicated by dotted lines in Figs. 1 and 2 to prevent the tie from splitting or from dividing or separating from the reinforcing frame.

Manifestly the proportional construction may be varied and the parts so proportioned as to secure the desired result from the practical use of the invention.

I claim:

1. A railroad tie consisting of a body and a reinforcing frame therein, the latter having a base bar and a top bar, and upright and strut braces between the base and top bars and having at its ends extensions taper-

ing toward their extremities and having head like formations at such extremities, the top bar being arched upwardly at its middle and being provided adjacent its ends with rail seats located directly above certain of the uprights and having on opposite sides of said rail seats upwardly projecting lugs provided with transverse openings leading to the rail seats, rail securing wedges operating in said openings and having at their inner adjacent ends inclined surfaces to engage upon a rail base and having their outer ends notched on their under sides and keys driven beneath said notched ends of the wedges, substantially as set forth.

2. A railroad tie consisting of a body and a reinforcing frame therein, the latter having a base bar and a top bar, uprights between the base and top bars, the top bar being provided adjacent its ends with rail seats and having on opposite sides of said rail seats upwardly projecting lugs provided with transverse openings leading to the rail seats, rail securing wedges operating in said openings and having at their inner adjacent ends inclined surfaces to engage upon a rail base and having their outer ends notched on their under sides, and keys driven beneath said notched ends of the wedges, substantially as set forth.

WILLIAM J. HORN.

Witnesses:

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