

UNITED STATES PATENT OFFICE.

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RAILWAY-TIE.

SPECIFICATION forming part of Letters Patent No. 706,808, dated August 12, 1902.

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To all whom it may concern:

Be it known that we, JOHN DOYLE, residing at Grand Rapids, county of Kent, and GEORGE H. KIMBALL, residing at Detroit, in the county of Wayne, State of Michigan, citizens of the United States, have invented certain new and useful Improvements in Railway-Ties, of which the following is a specification, reference being had therein to the accompanying drawings.

The invention consists in the construction of a railway-tie in which the body portion is of cement or concrete; and it consists in the novel construction of the various parts whereby the construction of the tie is improved, cheapened, simplified, and rendered more durable and practically efficient for modern railroad-service, all as more fully hereinafter described, and pointed out in the claims.

In the drawings, Figure 1 is a side elevation of a railway-tie embodying our invention, showing at opposite ends different rail-securing means. Fig. 2 is a plan view thereof. Fig. 3 is a vertical section on line *xx* of Fig. 1. Fig. 4 is a vertical section on line *yy* of Fig. 1. Fig. 5 is a side elevation illustrating a modified form of rail-block.

The present practice on railroads in the United States is to lay wooden ties on the road-bed and spike the rails thereto, the tie being of substantially uniform size throughout. The bearing of the tie on the road-bed is hardened by "tamping" the earth beneath the tie. In such ties the rails are supported near the ends. The result is that the part of the tie which is between the rails has a much longer bearing on the road-bed than that which extends outward beyond the rails—in other words, that the center of load is much to one side of the center of form of the tie. To get a good bearing for the tie, the tamping should graduate the compactness of the earth toward the center. This cannot be accomplished, however, and the greater bearing length in the middle causes the load to tend to bow the ties, depressing the ends and elevating the middle. We propose to obviate this difficulty by making the tie in two sections, which we call "sleepers," each having its center of load in the center of form, and

connect or tie these sleepers together. In making these sleepers of cement it is desirable to have a cushioning-block to receive the rail. These blocks should be of such a length and thickness as to distribute the load from the rail uniformly throughout the base of the sleeper. By using separated sleepers of equal length on opposite sides of the rail-bearing and tied together the load is equally distributed throughout the base, and the tendency to tip or bend is overcome. The tamping can be done more quickly, readily, and uniformly.

In making our improved tie of cement or concrete and metal we proceed as follows: A pair of flanged bars A, (and which we call the "tie members,") preferably channel-bars, as shown, are supported side by side and preferably with the flanges extending outwardly. These bars are of a length substantially equal to the total length of the tie that is to be made. Around each end of the bars, and so as to embed the end thereof completely within cement, we mold the cement sections B, (which we call "sleepers,") the relation between the cement and metal bars being clearly shown by the drawings. We may, and preferably do, fill in the space C between the ends of the sleepers B and between the bars A with cement, as shown in Fig. 4. We also preferably tie together these two bars A between the sleepers by the use of rivets D, which pass through spacing-thimbles E, as shown in Fig. 4. The sleepers we provide on the top with a transverse gain formed between the shoulders *a*. Instead of making the top flush, with the depressed portion between the shoulders, the gain or recess may be formed by raising ribs *b*, as shown in dotted lines (lettered *d*) in Fig. 1. Only the outer rib on the sleeper is required, as the rail-block only tends to move outwardly, as the strain on the rails is outward. Seated in these gains or beside the rib are the rail-blocks F, which are preferably of wood. These rail-blocks are secured to the sleepers of the tie in any suitable manner, but preferably by means of anchor-bolts G, which have their heads molded in the sleepers, their upper ends projecting above the surface a sufficient dis-

tance to pass through apertures in the rail-blocks and receive clamping-nuts H at their upper ends to tightly clamp the rail-blocks in position. These bolts G are preferably square bolts and pass through squared apertures in the rail-block to prevent their turning when the nut is being applied.

I is the rail. The sleepers are provided adjacent to each edge of the rail with openings or sockets J. (Shown in dotted lines in Fig. 1 and in section in Fig. 3.) These sockets are filled with fibrous material, preferably wooden plugs L, and they may have provided longitudinally through them a small aperture E' to somewhat guide the spikes M in being driven therein. The rail-block F is provided also with a small bore or aperture C opposite the plug, so as to guide the trackman in locating the spike so that its lower portion will pass into the block in the sleeper. We may strengthen the sleeper by increasing the thickness centrally by the bowed or truss-shaped bottom B', arranged beneath the rail.

A cement or concrete tie thus constructed will be a very light one and yet give ample bearing for the rail. The rail-blocks being gained into the top of the sleeper cannot move longitudinally thereon because of abutting against shoulders a, which shoulders will take off from the securing-bolts any tendency of the rails to spread. The rail-blocks also being of wood or other fibrous material give the necessary cushions for the track between the rail and the sleepers. The blocks J are easily replaced by simply removing the rail-blocks F and boring them out and driving in new ones. They will be held from withdrawal by the fact that the rail-blocks F are clamped over the top. By having the two separated sleepers connected by separated beams we get a tie between the sections which is quite perfect and which will prevent any tendency to twist or bend and yet under the heavy loads of heavy traffic will give sufficient resiliency to the intermediate portion of the tie, so that there is no tendency to crack the sleepers.

The blocks F may be treated with any suitable paint or composition to prevent rotting, and the exposed portions of the flanged bars may also be painted or treated with asphaltum to prevent rusting.

In Fig. 5 we have shown the rail-blocks of sufficient thickness so the rails may be spiked thereto without plugs in the sleepers. At the left hand of the tie we have shown the clamping-bolts engaging rail-clips T to secure the rails as well as to hold the rail-blocks.

Our sleepers may be made of cement or of concrete, and in this specification we use

these words interchangeably, and in the claims the word "cement" or "concrete" is supposed to refer to either.

What we claim as our invention is—

1. A railway-tie comprising a metallic tie member, of separated cement sleepers formed on the ends of the tie member, a cushioning rail-block on each sleeper, the sleepers extending substantially equal distances on opposite sides of the rail-bearing.

2. A railway-tie comprising a rigid metallic tie member, of two separated cement sleepers formed on the ends of the tie member, rail-blocks on the sleepers to support the rails, the sleepers extending a substantially equal distance on each side of the rail-bearing, and the rail-blocks being of such length and thickness as to distribute the load throughout the sleepers.

3. A railway-tie comprising a cement body having openings at the points where the spikes are to be driven, plugs therein, fibrous blocks thereon and bolts for securing the blocks on the body over the plugs.

4. A railway-tie comprising a cement body, wooden spike-plugs therein, and wooden blocks secured on the body, having apertures in line with the plugs.

5. A railway-tie, comprising a body formed of two separated cement sleepers, wooden rail-blocks secured to the sleepers, and flanged bars connecting the sleepers and extending therein beyond the blocks.

6. A railway-tie comprising two flanged bars spaced apart and tied, cement sleepers molded about the end portions thereof, and a cement filling between the intermediate faces thereof.

7. A railway-tie comprising two flanged bars spaced apart and tied, cement sleepers molded about the end portions thereof, having a transverse gain at each end on top, and rail-blocks secured in the gains.

8. A railway-tie comprising metallic bars spaced apart, cement sleepers molded about the end portions thereof, and an integral bowed truss-shaped bottom thereon.

9. The combination in a railway-tie, of longitudinal metallic tie members, separated cement sleepers molded about the ends thereof, wooden rail-blocks on the sleepers and vertical bolts for clamping the blocks to the sleepers.

In testimony whereof we affix our signatures in presence of two witnesses.

JOHN DOYLE.

GEORGE H. KIMBALL.

Witnesses:

M. B. O'DOHERTY,

H. C. SMITH.