





# UNITED STATES PATENT OFFICE.

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## RAILROAD-TIE.

No. 795,414.

Specification of Letters Patent.

Patented July 25, 1905.

Application filed July 11, 1904. Serial No. 215,974.

*To all whom it may concern:*

Be it known that I, HERBERT E. PERCIVAL, a citizen of the United States, and a resident of Galveston, in the county of Galveston and State of Texas, have invented a new and useful Improvement in Railroad-Ties, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification, in explaining its nature.

My invention relates to an improvement in railroad-ties and to that kind of tie known as a "cement" tie, or, more specifically, one made of concrete.

The essential object of my invention is to make a tie which will not become center-bound, also the construction of improved means by which the rails may be secured to the cement tie, which means include a locking device by which the rails may be secured to the tie without the direct use of spikes, bolts, or means of a similar nature having a direct connection with the tie.

The formation of my improved tie, as also the means by which the rails may be secured to it, may best be seen and understood by reference to the drawings, in which—

Figure 1 shows the improved tie and locking device in side elevation. Fig. 2 shows the same in plan. Fig. 3 shows in plan a section on the line 3 3 of Fig. 1. Fig. 4 shows a section on the line 4 4 of Fig. 1. Fig. 5 shows a section on the line 5 5 of Fig. 1. Fig. 6 shows in plan the different parts comprising the locking device. Fig. 7 shows in plan a slight modification of the locking device, to which reference will hereinafter be made.

Referring to the drawings, A represents the improved tie, B the rail, and C the locking device for securing the rail to the tie, a description of which device will hereinafter be made.

Referring to the construction of the tie, the head  $a$  of the tie is made relatively broad, so as to present a stable base for the rails, and is preferably made also with a flat top surface. The sides of the body of the tie converge or incline inwardly. At the ends of the tie where the rails come the inclination of the portions  $a'$   $a''$  of its sides is not too pronounced or with such degree of convergence that the tie may have relatively broad bottom edge portions  $a^3$   $a^3$ . These portions are preferably made relatively rounding and thus

broad in order that the ends of the tie when weight is applied may withstand the pressure of the same without undue sinkage. Passing in from the ends of the tie the convergence of its body sides rapidly increases until all along the center of the tie the convergence of its side portions  $a^4$   $a^5$ , sloping inwardly from the very top of the tie, is such that they meet to form a narrow bottom edge  $a^6$ , which presents an almost sharp or cutting edge or surface to the filling or ballast in which the tie is laid. This formation of the tie along the center as contrasted with its end portions can best be seen in Fig. 5, where it is shown that the tie when made with a flat top surface is substantially triangular in cross-section at its center. Moreover, it is to this peculiar shape of the tie along its center to prevent the center-binding that the improvement in the tie more essentially pertains. The prevention of center-binding is obtained not only by reason of the sharp bottom edge along the center of the tie, which allows it to cut or sink into the ballasting correspondingly as either or both ends of the tie become depressed by the weight to which it is subjected, but also, and perhaps more essentially, from the fact that the sides slope or converge from the very head of the tie; otherwise, though the bottom along the center of the tie be made relatively sharp and narrow, it would be of little avail.

With reference now to the locking device C, by which the rail B is secured to the concrete tie, there are arranged upon the ends of the tie where the rail comes adjacent clamp members  $c$   $c'$ . These members are made of metal plate, and in form they are substantially identical. Each comprises a top plate  $c^2$  and depending side plates  $c^3$   $c^4$ , oppositely arranged, the inwardly-bent edges of which sides conform to the shape of and are adapted to engage with or grip the inwardly-inclined sides of the tie. In this connection it is to be noted that I reinforce the upper corners of the tie where the side edges of the locking device make their engagement with the angular reinforcements or guards  $a^7$ . It is also to be noted that when these clamp members are properly arranged upon the tie there remains a space between the top plate  $c^2$  of the respective members and the top surface of the tie, and these spaces are filled, preferably, with a cushion-block D, which sits into a



slight recess  $a^8$ , formed in the top of the cement tie. The clamp members rest upon this block, but with the side plates  $c^3 c^4$  depending to engage with the tie, as just described. The clamp members  $c c'$  thus in conjunction with the tie can be moved longitudinally with respect to it or to and from one another. On the top plate  $c^2$  of each of the respective members is formed a tongue or clip  $c^5$ , punched or stamped out of the metal of the plates. These clips are oppositely arranged and are adapted when the clamp members  $c c'$  are moved, or rather shoved into conjunction with each other end to end, to engage with the respective flanges  $b b'$  of the rail B, which rests upon the meeting top plates  $c^2$  of the respective members when in conjunction.

For holding the respective clamp members thus in conjunction, holding the rail in place, and at the same time locking the rail to the tie in any adjusted position there are provided the fish-plates  $c^6 c^7$  and the tie-rod or bolt  $c^8$ . These plates  $c^6 c^7$  are made substantially alike to correspond in form with the side plates of the respective clamp members, against which they are placed one on one side and the other on the other side of said members after the same have been brought into proper conjunction to hold the rail, as before stated. It is to be noted also that the respective plates have tongues or clips  $c^9 c^{10}$ , punched or stamped out of their metal, which enter into holes  $c^{11} c^{12}$ , formed in the side plates  $c^3 c^4$  of the respective clamp members, by which clips the members are held from being drawn apart from one another. The members being thus arranged are tied together by the bolt  $c^8$ , passed through the fish-plates  $c^6 c^7$  by means of holes  $c^{13}$  cut in them, whereby the bolt will pass between the meeting ends of the clamp members and also through the cushion-block D on the inside, the meeting edges of the clamp members being reamed out at the points  $c^{14}$  to form a bolt-hole, which is also formed through the block. A locking-nut  $c^{15}$  is arranged on the end of the bolt or tie-rod, and by turning up this nut the clamp members are not only retained in such manner as to hold the rail, but as the nut is turned up pressure will be exerted to draw the engaging side plates of the respective members fast against the sides of the tie, by which means the clamp members, and so the rails, become immovably locked in place without the use of any spikes or other means having direct connection with the tie.

In Fig. 7 there is shown a slight modification in the construction of the locking device in the fact that the fish-plates are dispensed with and the clamp members  $c$  and  $c'$  are provided with flanges  $c^{16}$  and  $c^{17}$ , respectively, which lap by one another and through which overlapping flanges the bolt  $c^8$  is passed.

Having thus fully described my invention, I claim and desire to secure by Letters Patent of the United States—

1. A cement tie of the character specified, having a broad head, inwardly-inclined sides for the body, the respective ends of the tie made to present a relatively broad bearing-base, and between the ends of the tie the body sides thereof inclining from the very head of the tie and converged to form a base presenting a narrow cutting surface or edge.

2. A cement tie of the character specified, having a broad head, inwardly-inclined sides for the body varying in the amount of their inclination from the ends of the tie formed with a relatively broad bearing-base toward the center thereof by the inclined body sides between the ends converged to form a base presenting a narrow cutting surface or edge.

3. A cement tie of the character specified, having relatively broad bearing end bases, and along the middle of the tie the sides of the body thereof inclined inward and converging to form a base presenting a narrow cutting surface or edge.

4. A cement tie having in combination therewith a rail-fastening means comprising two adjacent clamp members, the same having depending sides adapted to engage flange-like with the opposite sides of the tie in a manner to permit of a longitudinal adjustment of said members with respect to said tie, means carried by said members for engagement with the opposite flanges of a rail, means for locking said members together and for drawing the depending sides thereof fast against the sides of the tie, and cushioning means inserted between said clamp members and said tie.

5. A cement tie having in combination therewith a rail-fastening means comprising two opposing clamp members, the same having depending sides adapted to engage flange-like the sides of the tie, opposing clips borne by said adjacent members for engaging with the opposite flanges of a rail when said members are brought into conjunction, means joining the depending sides of said clamp members when thus in conjunction and a bolt for tying them together and for binding the depending sides thereof fast against the sides of the tie.

6. A cement tie having in combination therewith a rail-fastening means comprising two adjacent clamp members, the same having depending sides adapted to engage flange-like the opposite sides of the tie, means carried by said members for engagement with the opposite flanges of a rail, and means for locking said members together and for drawing the depending sides thereof fast against the sides of the tie, substantially as described.

7. A cement tie of the character specified having inwardly-inclined sides and in combination therewith a rail-fastening means com-

prising two adjacent clamp members, the same having depending sides adapted to engage flange-like with the inwardly-inclined sides of the tie, means carried by said members for engagement with the opposite flanges of a rail, and means for locking said members together and for drawing the depending sides

thereof fast against the inwardly-inclined sides of the tie.

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In presence of—

M. C. PERCIVAL,  
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