H. M. BODINE.

RAILWAY TIE AND BRACE.

APPLICATION FILED JAN. 25, 1913.

1,119,232.

Patented Dec. 1, 1914.

2 SHEETS—SHEET 1.

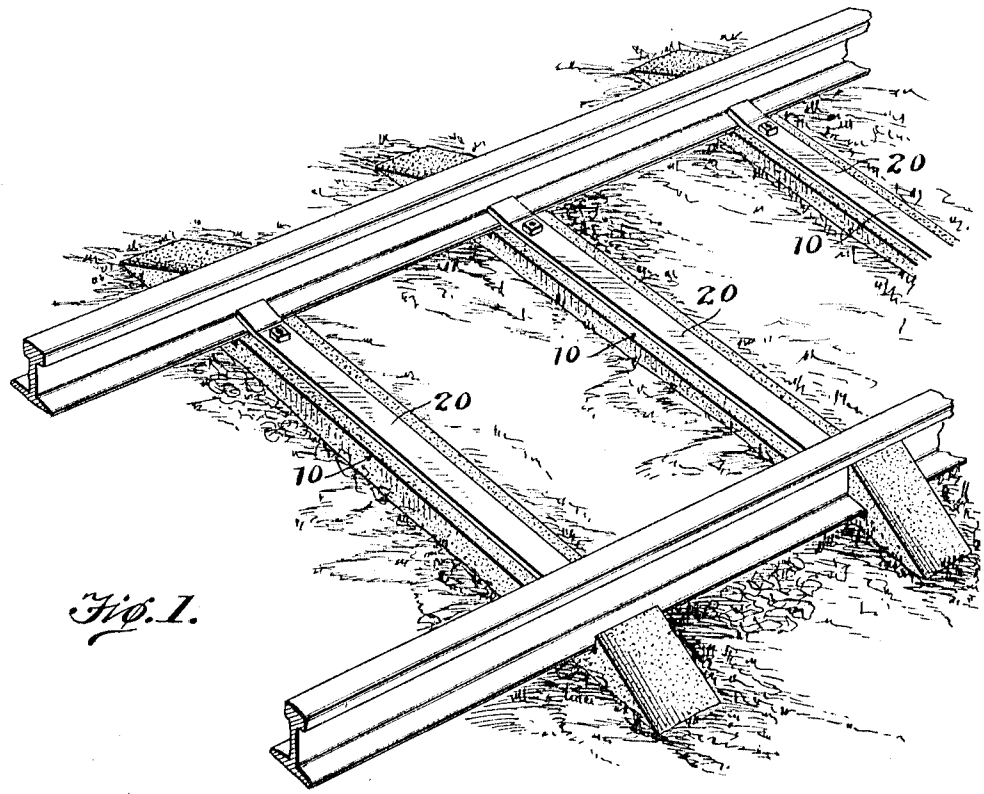
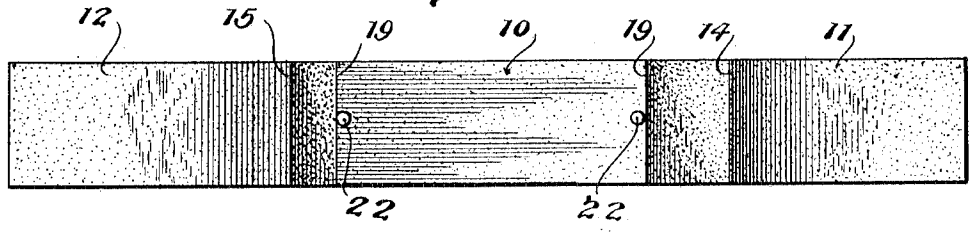


Fig. 1.

Fig. 2.



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Witnesses

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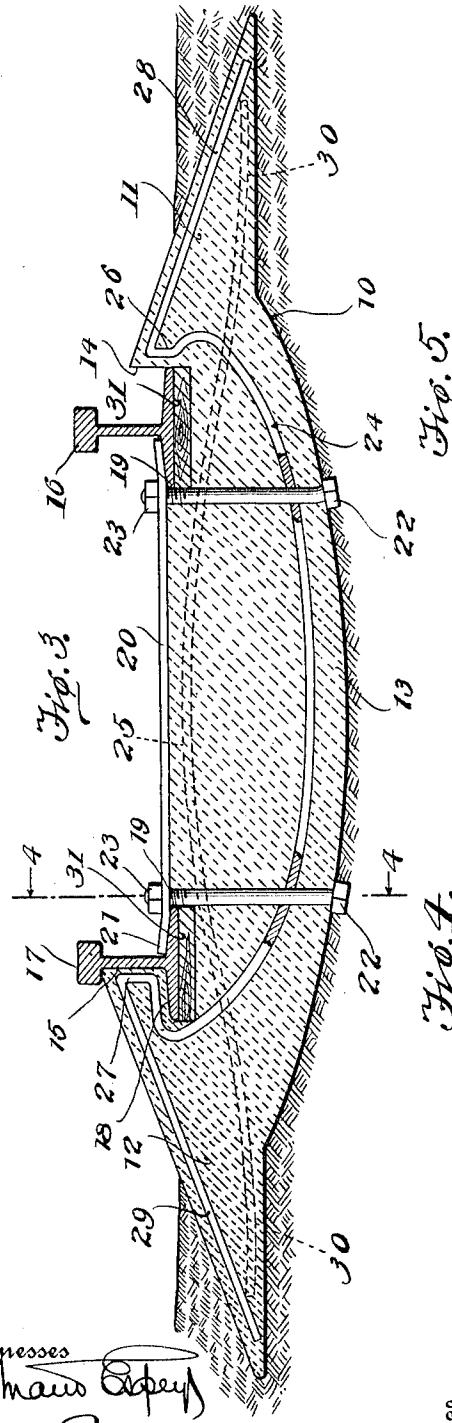


Fig. 3.

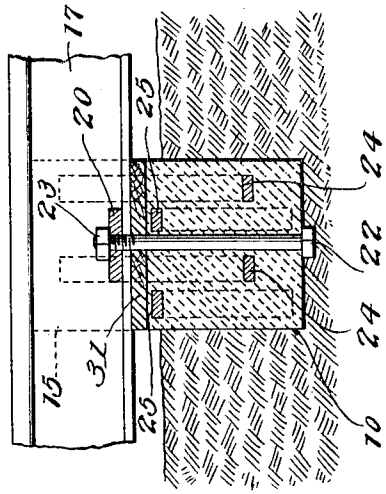


Fig. 5.

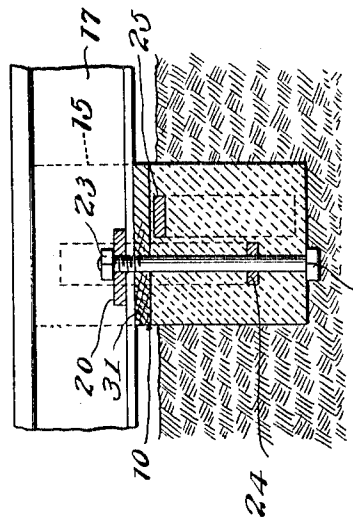


Fig. 4.

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UNITED STATES PATENT OFFICE.

HENRY M. BODINE, OF WICHITA, KANSAS.

RAILWAY-TIE AND BRACE.

1,119,232. Specification of Letters Patent. Patented Dec. 1, 1914.

Application filed January 25, 1913. Serial No. 744,185.

To all whom it may concern:

Be it known that I, HENRY M. BODINE, citizen of the United States, residing at Wichita, in the county of Sedgwick and State of Kansas, have invented certain new and useful Improvements in Railway-Ties and Braces, of which the following is a specification.

My invention relates to new and useful improvements in railway ties and more particularly to metallic or concrete ties and means for securing the rails in place upon the tie, and the object of my invention is to provide a tie having wedge shaped terminals adapted to be partially buried under the ballast of the road-bed and having their bottom portions bellied downwardly to seat deeply in the road bed, this construction strengthening the central portion of the tie and at the same time giving it a tendency to work down into the road-bed, forcing the earth or ballast toward the ends of the tie to provide a strong foundation, instead of allowing the earth or ballast to work from the ends toward the middle as it does with the usual flat bottom ties.

A further object of my invention is to provide a tie of the above described character provided with rail receiving seats, the rail receiving seat at one end of each tie being provided with an undercut shoulder engaging over the outer flange of the rail to hold the same against all upward movement or movement toward the adjacent end of the tie. And a further object of my invention is to provide a simple and effective fastening device, adapted to be employed in connection with these rail seats for securing the rails in place upon the tie. And a still further object of my invention is to provide a novel arrangement of metallic reinforcing and bracing elements in the tie when the latter is constructed of concrete.

With these and other objects in view, my invention will be more fully described, illustrated in the accompanying drawings, and then specifically pointed out in the claims which are attached to and form a part of this application.

In the drawings: Figure 1 is a perspective view of a portion of railway track, showing my improved ties in use; Fig. 2 is a top plan view of one of the ties; Fig. 3 is a central longitudinal sectional view of a concrete tie constructed in accordance with my invention, showing the positioning of the reinforcing elements; Fig. 4 is a transverse section on the line 4—4 of Fig. 3; Fig. 5 is a similar section, showing a modified form of construction.

Corresponding and like parts are referred to in the following description and indicated in all the views of the drawings by the same reference characters.

The preferred form of my improved tie, which as a whole is indicated by the numeral 10, is rectangular in plan view, as shown, with the end portions of its upper face inclined downwardly to provide wedge-shaped terminals 11 and 12 which may be partially buried in the ballast of the road-bed and with its bottom portion bellied downwardly centrally, as shown at 13.

The top of the tie is provided with a transverse channel equal in width to the gage of the track and providing spaced apart vertical shoulders 14 and 15 against which the rails, conventionally shown at 16 and 17, bear when in place. As shown, the wedge-shaped terminal 12 is thicker than the opposite terminal 11 and the shoulder 15 is therefore higher than the shoulder 14. That rail seating against the shoulder 14 engages against the same by its outer flange, while that rail seating against the shoulder 15 engages said shoulder by its web portion, the shoulder being undercut as shown at 18 to receive the outer flange of said rail.

As shown in Fig. 3 of the drawings, the channeled face of the tie is further channeled to form rail seats in conjunction with the shoulders 14 and 15 providing spaced, vertical shoulders 19 against which the inner flanges of the rails bear and the rails are secured in place in their seats by means of a locking plate 20 formed of metal, this plate being positioned upon the top of the tie with its upwardly curved end portions 21 bearing upon the upper face of the inner rail flanges and with its central portion bearing upon the upper face of the tie, one or more bolts 22 being passed through the tie and plate adjacent each end of the plate and secured in place by nuts 23. In laying a track with this form of tie, the alternate ties are reversed end for end in such a man-

ner that while the rail 17 seats beneath the undercut shoulder 15 of one tie, the rail 16 will seat beneath the undercut shoulders 15 of adjacent ties. By this arrangement, the rails are firmly secured to the tie without the necessity of providing both ends of the tie with the undercut shoulders.

The above described tie may be formed of wood, metal or other suitable material, but is preferably formed of concrete and when so formed is reinforced in a manner which will be hereinafter fully explained. The reinforcing elements of the tie, when constructed of concrete, consist of two rods or bars of resilient metal of suitable strength, and of any desired cross sectional shape, these reinforcing elements being designated as a whole by the numerals 24 and 25. As best shown in Fig. 3 of the drawings, each of these elements extends substantially throughout the entire length of the tie, being completely embedded in the concrete forming the body thereof. The first of these elements is bowed centrally and embedded in the concrete with its bowed portion spaced slightly above the bottom of the tie and with the end portions curved upwardly and extending inwardly as shown at 26 and 27 to reinforce the rail engaging shoulders 14 and 15. The free end portions of this element are then extended in parallel spaced relation to the inclined faces of the wedge-shaped terminals 11 and 12 of the tie as shown at 28 and 29 to strengthen said portions. The second reinforcing element 25 is also bowed centrally and is embedded in the concrete structure of the tie with its bowed or arched portion directed upwardly and spaced but a slight distance below the upper face of the tie and with its end portions extending outwardly into the wedge-shaped terminals of the tie, said end portions being spaced slightly above the lower face of the tie, as shown at 30.

From the foregoing description, it will be apparent that these two reinforcing elements form a double arch which double arch strengthens the tie, making it practically impossible to break or crack the same, these elements not only strengthening the wedge-shaped ends of the tie and the middle of the tie, but also reinforcing the rail engaging shoulders thereof.

Although I have described the tie as formed with but two reinforcing elements, 24 and 25, it will be understood that each of these elements, may, if desired, consist of a number of spaced rods or bars, all similarly bent and embedded in the concrete in spaced relation, as shown in Fig. 5 of the drawings. For laying tracks where traffic is particularly heavy, this latter form is preferable and in this form the reinforcing elements 24 and 25 are preferably alternately arranged.

The bolts 22 employed in securing the locking plate in position may be passed through both the concrete of the tie and the reinforcing elements as shown in Fig. 4 or through the concrete alone as shown in Fig. 5, the latter construction being preferable as it does not weaken the reinforcing elements or affect their elasticity.

From the foregoing description it will be apparent that I have provided an extremely simple and effective form of tie construction and that a tie constructed in the manner described and reinforced as set forth will be exceptionally strong and possess the further advantage of working into the roadbed and forcing the ballast from the center toward the ends of the tie to bring it directly under the pressure exerted upon the tie by the passing trains.

It will of course be understood that I do not wish in any way to limit myself to the specific tie structure illustrated in the drawings and described in the specification as changes may at any time be made without departing from the spirit of my invention.

The channels forming the rail seats of the tie are preferably made deep enough to receive blocks of wood or plates of metal 31 upon which the rails seat, these blocks forming a firm rest for the rails even though the cement crumbles slightly from exposure to the weather.

Having thus described the invention, what is claimed as new is:

1. A tie including a body member having upwardly directed rail engaging shoulders, and an arcuate reinforcing element embedded in the tie with its ceneral portion spaced above the bottom thereof and its end portions extending upwardly, said end portions being bent inwardly to reinforce the shoulders and the terminals being then extended outwardly and downwardly into the terminals of the body.

2. A tie including a body member having rail engaging shoulders and wedge-shaped terminals, the central portion of the body member being bellied downwardly, a resilient reinforcing element extending longitudinally throughout the length of the tie and with its central portion bowed upwardly, and a second resilient reinforcing member extending longitudinally of the tie with its central portion bowed downwardly, the end portions of said latter element being inclined in spaced relation to the inclined faces of the wedge-shaped terminals of the tie and certain portions of said element being extended into the shoulders of the tie to reinforce the same.

3. A tie including a body member having rail engaging shoulders spaced apart and adapted to engage against the outer flanges of the rails, and a resilient reinforcing element extending longitudinally of the tie and

entirely enveloped therein, said element having its end portions passed beneath those portions of the tie which support the rails and extended upwardly and then inwardly into the rail engaging shoulders and then outwardly and downwardly therefrom into the end portions of the tie.

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

HENRY M. BODINE. [L. S.]

Witnesses:
E. S. BRODIE,
FRED. E. REMMERS.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."