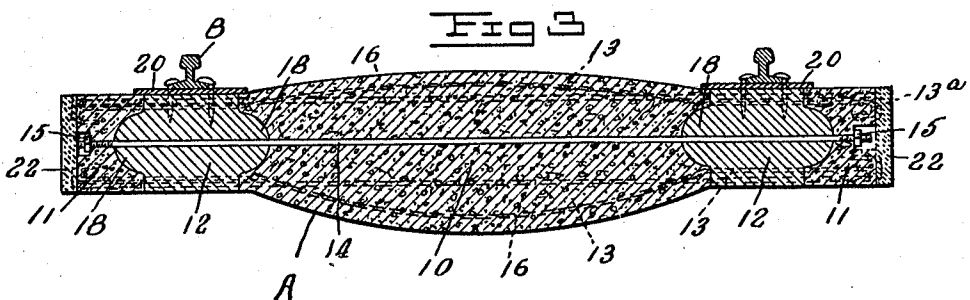
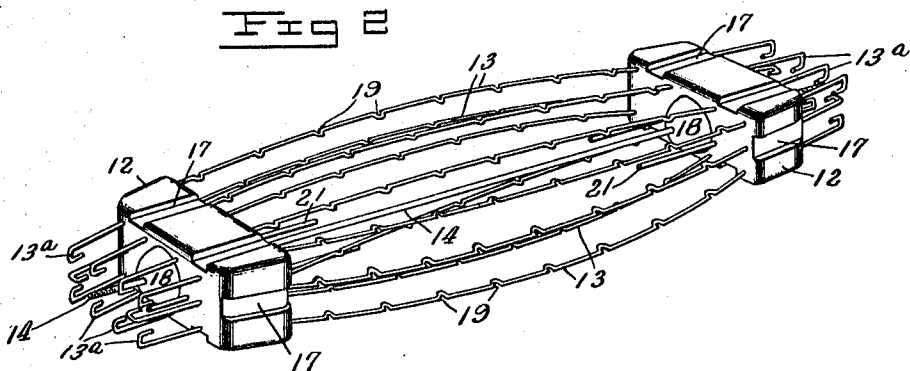
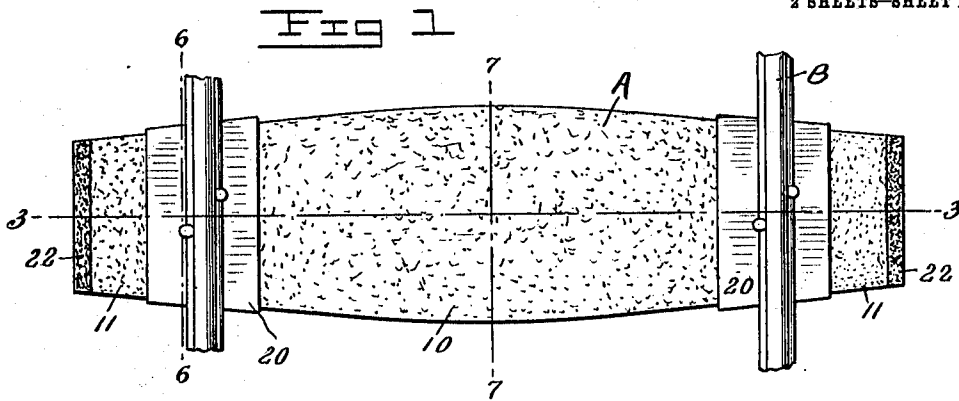


L. C. MOONEY.
CONCRETE RAILROAD TIE.
APPLICATION FILED JAN. 7, 1911.

1,004,583.

Patented Oct. 3, 1911.

2 SHEETS—SHEET 1.



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2 SHEETS-SHEET 2.

Fig 4

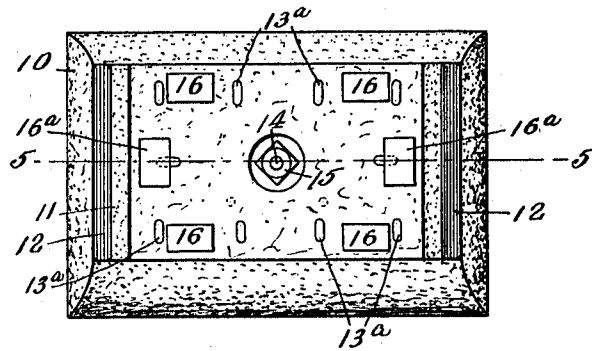


Fig 5

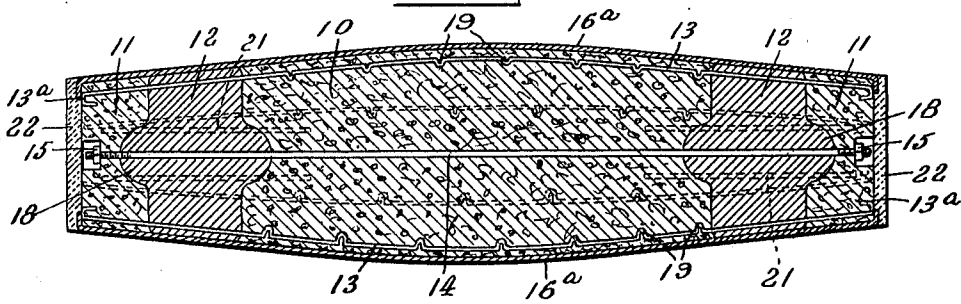
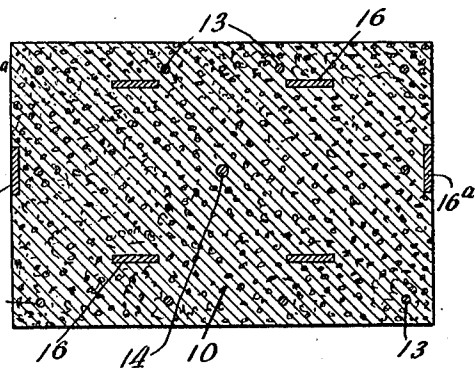


Fig 7



B

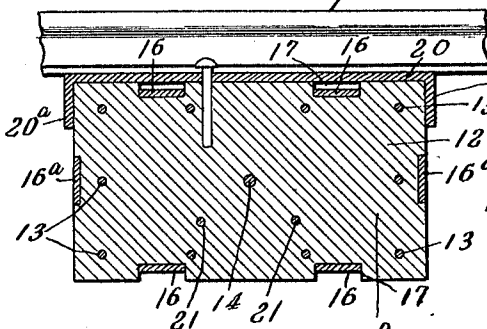


Fig 6

A

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UNITED STATES PATENT OFFICE.

LAWRENCE C. MOONEY, OF MONTGOMERY, ALABAMA.

CONCRETE RAILROAD-TIE.

1,004,583.

Specification of Letters Patent.

Patented Oct. 3, 1911.

Application filed January 7, 1911. Serial No. 601,341.

To all whom it may concern:

Be it known that I, LAWRENCE C. MOONEY, a citizen of the United States, residing at Montgomery, in the county of Montgomery and State of Alabama, have invented new and useful Improvements in Concrete Railroad-Ties, of which the following is a specification.

This invention relates to an improved cross-tie for the permanent way of a railroad which shall be stronger, relatively cheaper and more durable than cross-ties now in common use.

The object of this invention is to construct a cross-tie of concrete or other suitable plastic material reinforced by metal bars, rods, wires, or strips, and wooden blocks near each end of said tie on which the rails of the track bear.

The growing scarcity of timber suitable for cross-ties has so greatly increased the cost of manufacture of such ties that a substitute for wood which shall have all the advantages thereof, among which may be mentioned inexpensiveness, a limited elasticity, and rapidity, ease and simplicity of fastening the rails to the ties, is being sought by those whose business needs demand the use of cross-ties.

In view of the above recited facts the present invention has been designed to meet all the requirements called for, whereby a cross-tie is produced which, although admitting a greater first cost, will be practically indestructible and therefore, its length of service so much greater than a wooden tie, that in the end it will prove the cheaper.

A cross-tie constructed after this invention comprises a central part and two ends made of concrete, and an intermediate wooden section or pillow-block between each concrete end and the adjacent ends of the central part, the whole being tied together in a sufficiently rigid manner by tension rods or bars extending through the several parts from end to end, and by preferably flat strips or plates of iron or steel, recessed into the four sides of the pillow-blocks and passing from end to end of the tie. Overlying each wooden section or pillow-block is a steel or iron plate which forms a rail seat, said plate projecting a short distance beyond the pillow-block longitudinally of the tie onto the concrete sections, and transversely of the tie the sides of the plate are flanged downwardly over said block, there-

by protecting the same from moisture. The wooden sections are, for further protection, thoroughly saturated with creosote or any other well known preservative.

The shape of this cross-tie is an important feature of the invention, the tie being wider at its center than at its ends, each side being preferably a regular convex curve from end to end. The top of the tie is flat transversely, but has a slight upward curve between the pillow-blocks, while the latter and the concrete end sections are flat and lie preferably in the same plane. The under side of the middle section has a downward curve of a shorter radius than its top and, therefore, projects a greater distance below the flat bottoms of the pillow-blocks and end sections than its upper side does above the top surface of the same parts.

Another feature of the invention is directed to the novel means of manufacturing the cross-tie. This is done by forming a cage of the wooden sections or pillow blocks and the rods or bars, the latter being curved parallel to the adjacent sides of the concrete sections and after passing through said blocks are continued to the extreme ends of the tie and bent upon themselves. There are also shorter rods or bars passing through and extending from each side of the pillow blocks, and one or more straight rods or bars as long as the cross-ties threaded at their ends to receive nuts. As a rule, but one of these straight rods or bars is used and in this case the rod is placed in the center of the cross-tie, running through the center of the pillow-block. Finally, the flat strips or plates are secured in place in the recesses cut in the sides of the pillow-block and their ends turned inwardly. The cage-like skeleton or frame as thus formed is placed in a mold of the proper size and shape of the desired cross-tie and filled with concrete thoroughly packed around the exposed parts and left to dry. After sufficient time has been given the tie to harden, it is removed from the mold, nuts screwed on the threaded ends of the straight rod or rods and a thin coating of a different grade of concrete spread over the ends of the tie to cover the ends of all the rods, strips, and other exposed parts.

To more fully disclose the nature of this invention, attention is directed to the following detail description of the parts, including their arrangement and combination, illus-

trated by the accompanying drawings, in which,—

Figure 1 is a top plan view of one of the improved cross-ties. Fig. 2 is a perspective view of the skeleton cage or frame around which the concrete is molded. Fig. 3 is a longitudinal, vertical sectional view on the line 3—3 of Fig. 1. Fig. 4 is an enlarged view of one end of the cross-tie as it appears when removed from the mold. Fig. 5 is a horizontal sectional view on the line 5—5 of Fig. 4. Fig. 6 is an enlarged cross sectional view on the line 6—6 of Fig. 1, and Fig. 7 is a similar view on the line 7—7 of the same figure.

In the drawings, in which like reference characters are used for the same parts in all the figures, A indicates the cross-tie as a whole, made of plastic material, such as cement concrete, strengthened by metal rods or bars and provided with wooden sections to support the rails and receive the fastening spikes. The improved cross-tie is of the usual length, but its width and height differ therefrom in certain important respects. This change consists in making the width of the cross-tie greater at its center than at its ends by convexly curving the sides thereof equally, or tapering the same from the center toward each end. The upper face of the cross-tie is substantially flat, but between the wooden sections there is preferably a slight rise toward the center of the tie. The under face of the cross-tie between said wooden sections has a pronounced downward curve or inclination toward the center of the tie. The lower faces of the ends of the tie, including the wooden sections, are flat and parallel to the upper faces. A cross-tie of this shape is very strong and mechanically designed in the form of a truss, the point of greatest strain under usual conditions being at the center where the tie is thickest.

Turning now to the structure of the cross-tie, 10 indicates a central section made of concrete, 11, 11 indicate the end sections also of concrete construction, between which end sections and the ends of the central section are placed wooden sections or pillow-blocks 12, the five sections being firmly connected by a plurality of longitudinally disposed tension rods or bars 13 extending through said sections from one end of the tie to the other, a straight rod or bar 14 in the center of said tie, or a plurality of such straight rods, as long as the tie and threaded at the ends for tensioning nuts 15, and a number of flat strips or plates 16, 16^a inserted in outwardly opening recesses 17 made in the sides of the pillow-blocks 12, as shown particularly in Fig. 2.

The wooden sections or pillow-blocks 12 are of the same height and width as the adjoining concrete sections 10 and 11 with

flush sides and, therefore, uncoated with concrete. To protect these blocks from the elements and other destructive agencies, they are thoroughly treated with creosote or other suitable wood preservative. On opposite sides of the block 12, and in the center thereof, are projections 18, preferably hemispherical, which fit each into a depression of like shape formed respectively in the concrete sections during the process of manufacture. The projections 18 tend to and do bind and more firmly connect the pillow-blocks to the adjacent sections 10 and 11. The recesses 17 in the outer ends of the blocks 12 are shallower than those in the top and bottom, for a purpose to be hereinafter described. The tension rods or bars 13 are disposed in four rows, a top row, a bottom row, and a row on each side, the number of rods or bars in each row being immaterial, depending primarily on the use to which the cross-tie is put, that is to say, whether for a trunk line with heavy rolling stock, short lines, switch tracks, street railways, etc. The rods 13 are a short distance within the adjacent sides of the cross-tie and lie parallel therewith and are preferably, although not necessarily, provided with spaced loops 19 between the pillow-blocks, and, as heretofore stated, their ends are made with return bends 13^a to more firmly anchor the rods in the concrete.

The strips or plates 16 at the top and bottom of the cross-tie extend in a straight line from one end of the tie to the other, their ends being bent at right angles as shown. The recesses 17 in the pillow-blocks 12 for these strips are made sufficiently deep to lie below the surface of the end sections 11 of the tie and be covered by concrete, between the pillow-blocks said strips being, of course, incased by the curved top and bottom of the section 10. The side strips 16^a follow the curve of the tie and lie flush therewith. As a further means for reinforcing the cross-tie, a number of short rods or bars 21 run through each pillow-block and project a suitable distance beyond the same.

Supported on each pillow-block 12 is a rail plate 20 entirely covering the same and projecting a short distance over the concrete sections 10 and 11. Flanges 20^a are formed on the other edges of the plate 20 and lie against the exposed sides of the pillow-block. By means of these plates, the pillow-blocks are further protected from the elements. Holes are made in each plate at suitable places for the fastening spikes of the rail B. The ends of the ties are finished by a layer 22 of concrete of a different quality to cover the exposed ends of the several reinforcing elements.

In the manufacture of concrete cross ties, the usual method employed is to place within the mold as the latter is being filled with

the plastic material, the various reinforcing and rail sustaining elements, individually, at the proper places; and to prevent these several parts from becoming displaced while ramming and packing the concrete, suitable retaining means and great care are required. In the present invention a different method is employed which consists in forming a skeleton cage or frame of the several rods 13, 14 and 21 passing through holes in the two pillow-blocks 12 spaced the proper distance apart, and the flat strips 16, 16^a seated in the recesses 17 in said pillow-blocks. This cage can be quickly assembled and when completed is ready to be placed in a mold of suitable shape. The pillow-blocks and flat strip 16^a being flush with the sides of the cross tie, bear against the inner walls of the mold and hold the cage in position. Furthermore endwise movement of the cage is prevented because the ends of the several rods or bars are in contact with the ends of the mold. The only requirement necessary to complete the cross tie after placing the cage in the mold is to pack the same full of concrete and let it remain until solid enough to be removed.

Among the advantages possessed by this novel cross tie may be mentioned the absence of thin layers of concrete under or around the pillow-blocks to weaken the tie by their liability to crack or break; a reduction of noise and wear on rolling stock because the rails are carried on wood alone, being similar to wooden ties in this respect, and for the same reason the pounding of the car wheels is not carried to the concrete, and therefore will not cause the latter to break or crack.

When these cross-ties are used on bridges and trestles a plate similar to the rail plate 20 will be placed below the tie.

A railroad constructed with cross-ties made as hereinabove described, presents a practically safe road bed, and one destined to a long life with a minimum of attention. From the fact that the road bed will be held up in grade, the rolling stock will travel thereover with greater ease than on roads as at present constructed.

Having thus described the invention what I claim as new is:—

1. A concrete cross tie thicker and wider at its middle than at its ends and having embedded therein a rail-supporting pillow block near each end.

2. A concrete cross-tie thicker and wider at its middle than at its ends, its vertical sides gradually tapering from said middle of the tie to each end.

3. A concrete cross tie thicker and wider at its middle than at its ends, its vertical sides gradually tapering from said middle of the tie to each end which ends have flat top and bottom faces.

4. A concrete cross-tie in which the ver-

tical sides gradually taper from the middle of the tie to each end, said tie having flat top and bottom faced ends, and an intermediate part gradually increasing in thickness toward its center.

5. A concrete cross tie in which the vertical sides gradually taper from the middle of the tie to each end, said tie having its ends flat on the upper and lower faces, the lower face bulging downwardly between said flat portions.

6. A concrete cross tie in which the vertical sides gradually taper from the middle of the tie to each end, said tie having its ends flat on the upper and lower faces, said faces bulging outwardly between the flattened ends, the greater bulge being on the lower face.

7. A railway cross tie comprising concrete center and end sections, and interposed wooden sections of equal height and width as said concrete sections, said wooden sections having facial projections embedded in the concrete of the tie.

8. A railway cross-tie comprising concrete center and end sections, interposed wooden sections of equal height and width as said concrete sections, said wooden sections having side projections embedded in the concrete of the tie, and metal reinforcing members extending from end to end of said tie and passing through all of said sections.

9. A railway cross-tie comprising concrete center and end sections, interposed wooden sections of equal height and width as said concrete sections, said wooden sections having side projections embedded in the concrete of the tie, metal reinforcing members extending from end to end of said tie and passing through all of said sections, and other reinforcing members also running from end to end of said tie but exterior to said wooden sections.

10. A railway cross-tie comprising concrete center and end sections, interposed wooden sections of equal height and width as said concrete sections, metal reinforcing members extending from end to end of said tie and passing through all of said sections, and other reinforcing members also running from end to end of said tie seated in recesses in the exterior of said wooden sections, certain of said latter reinforcing members being flush with the surface of the sections while the remaining members pass through the concrete sections.

11. A railway cross-tie comprising concrete center and end sections, interposed wooden rail-supporting blocks of equal height and width as said concrete sections, and a plurality of reinforcing members extending from end to end of said cross-tie and passing through all of said sections and blocks parallel to each side of said tie.

12. A railway cross-tie comprising a con-

crete center and concrete end sections, interposed wooden sections between said concrete sections of equal height and width therewith and provided on opposite sides thereof with projections fitting into depressions in the adjacent concrete sections, a plurality of reinforcing members with intumed ends extending from end to end of said cross-tie and passing through all of said sections parallel each side of said tie, and a straight member also extending from end to end of the tie provided with threaded ends for tension nuts.

13. A railway cross-tie comprising a concrete center and concrete end sections, interposed wooden sections between said concrete sections of equal height and width therewith and provided with projections on opposite sides thereof fitting into depressions in the adjacent concrete sections, a plurality of reinforcing members extending from end to end of said tie and passing through said sections parallel to each side of the tie, a straight member also extending from end to end of said tie provided with threaded ends for tension nuts, a number of short reinforcing members running through and extending from the sides of each of said wooden sections, and a rail plate entirely covering each wooden section and projecting over the adjacent concrete sections and formed with flanges turned downwardly to lie against said wooden section.

14. A railway cross-tie comprising a concrete center and concrete end sections, interposed wooden sections between said concrete sections of equal height and width therewith, a plurality of reinforcing members extending from end to end of said cross-tie and passing through said sections parallel to each side of the tie, a series of crooks or loops formed in each of said members, a parallel to each side of the tie, a series of crooks formed in each of said members, a central longitudinal reinforcing member having threaded ends, flat straight reinforcing members, bent at their ends, on the top and bottom of the tie running through the concrete sections but exterior to the wooden sections, similar members on the sides of the cross-tie and flush with the same, and a concrete cap on each end of said tie to cover the exposed ends of the reinforcing members.

15. A railway cross-tie comprising a unitary skeleton cage made of a plurality of reinforcing members and two spaced wooden pillow blocks, and concrete center and end sections molded only around the reinforcing members of said cage.

16. A railway tie comprising a unitary skeleton cage made of a plurality of longitudinal reinforcing members shaped to the

form of said cross-tie and two spaced wooden pillow blocks, and concrete center and end sections molded only around the reinforcing members of said cage.

17. A railway tie comprising a unitary skeleton cage made of a plurality of longitudinal reinforcing members shaped to the form of the tie and extending from end to end thereof and two spaced wooden pillow-blocks, concrete center and end sections molded only around the reinforcing members of said cage, and a concrete cap on each end of the tie.

18. A railway cross-tie wider and thicker at its center than at its ends toward which it tapers, which ends have flat top and bottom faces, said tie comprising a unitary skeleton cage made of a plurality of longitudinal reinforcing members shaped to the form of the tie and extending from end to end of the same and two spaced wooden pillow blocks, and concrete center and end sections molded only around the reinforcing members of said cage.

19. As an article of manufacture for use in molding concrete cross-ties, a cage formed of reinforcing members extending the entire length of the tie, and rail-supporting cushion blocks constituting the means for firmly securing said members in position.

20. As an article of manufacture for use in molding concrete cross-ties, a cage formed of reinforcing members extending the entire length of the tie and of the general shape thereof, and rail-supporting pillow blocks constituting the means for firmly securing said members in position, said means also holding the cage in fixed position in a mold.

21. As an article of manufacture for use in molding concrete cross-ties, a cage formed of reinforcing members extending the entire length of the tie and of the general shape thereof, and spaced wooden pillow-blocks through which said members pass and by which they are firmly held in position.

22. As an article of manufacture for use in molding concrete cross-ties, a cage formed of reinforcing members extending the entire length of the tie and of the general shape thereof, spaced wooden pillow-blocks through which said members pass and by which they are firmly held in position, and other reinforcing members of the length of the tie secured on the exterior of said pillow-blocks.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

LAWRENCE C. MOONEY.

Witnesses:

WM. T. SEIHELS,

ROBT. G. ARRINGTON.