W. H. CONRY.

RAILWAY TRACK CONSTRUCTION.

APPLICATION FILED JULY 13, 1910.

990,843.

Patented May 2, 1911.

3 SHEETS—SHEET 1.

Fig. 1.

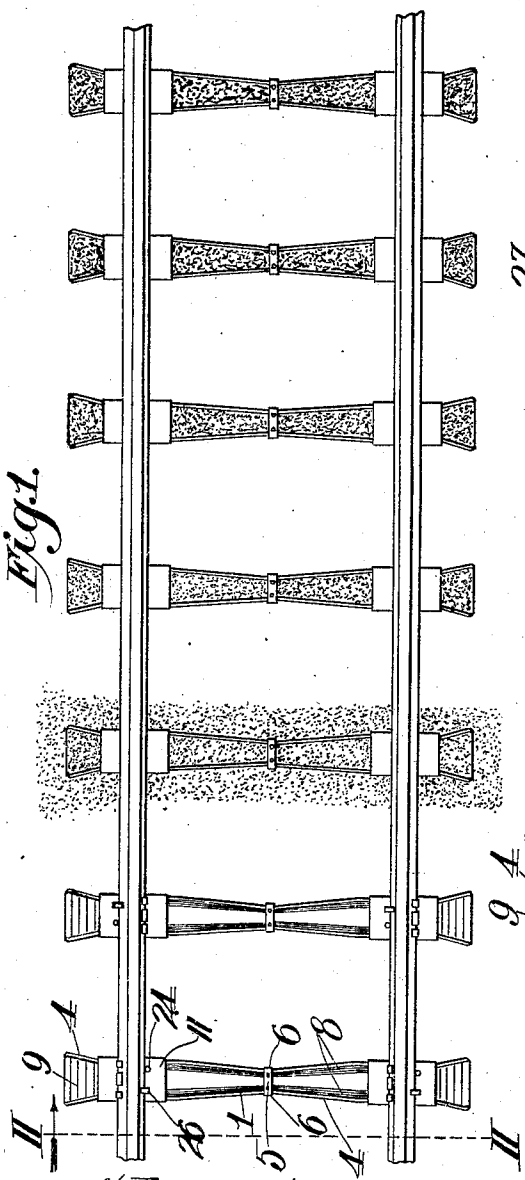


Fig. 12.

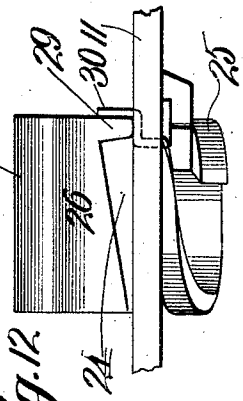
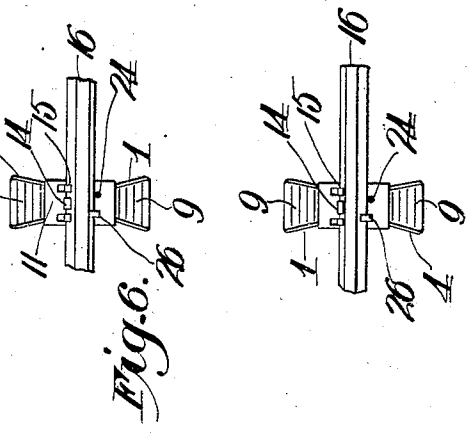


Fig. 6.



Witnesses

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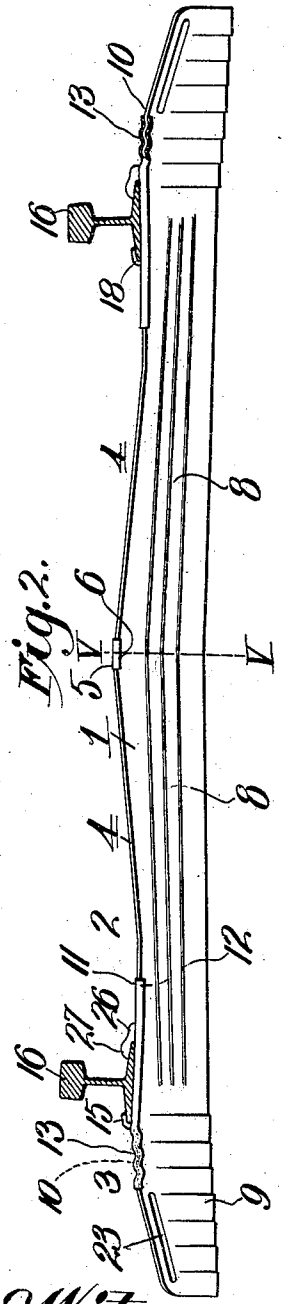

Fig. 2.

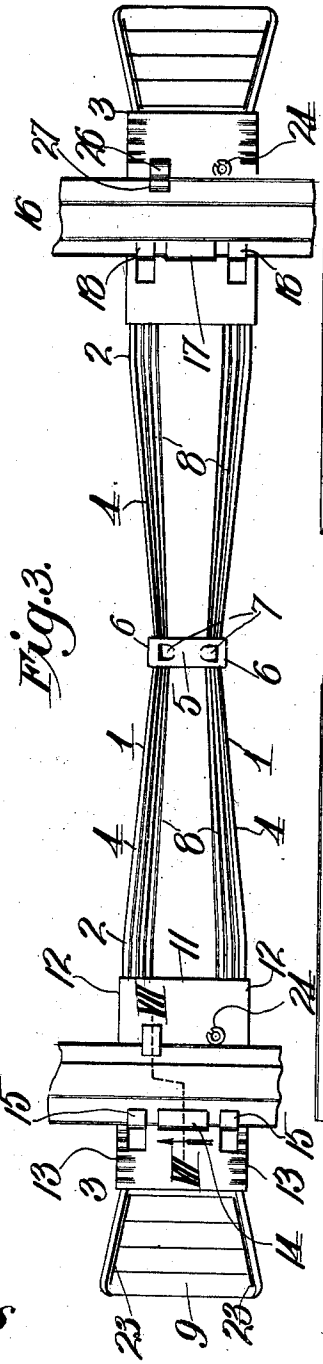

Fig. 3.

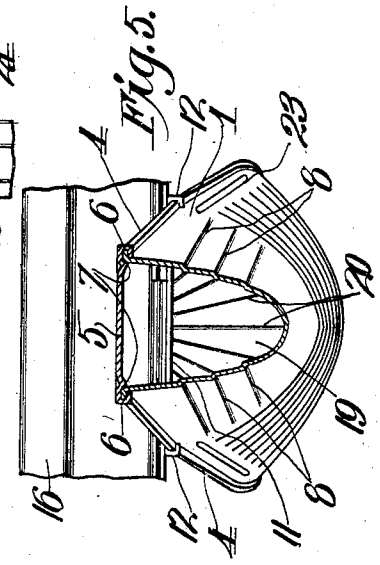

Fig. 5.

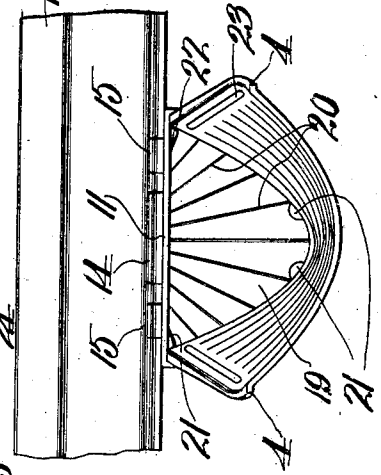

Fig. 4.

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3 SHEETS—SHEET 3.

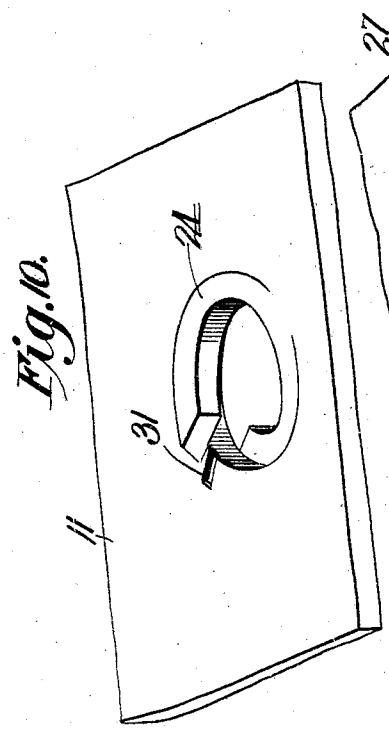

Fig. 10.

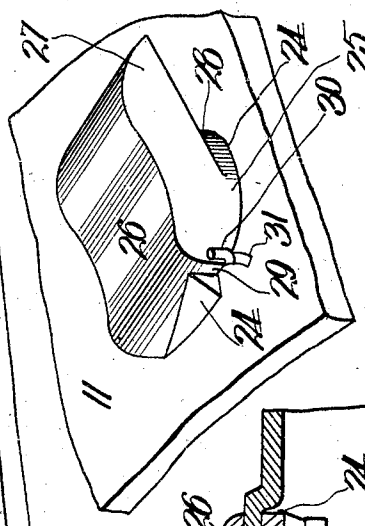

Fig. 11.

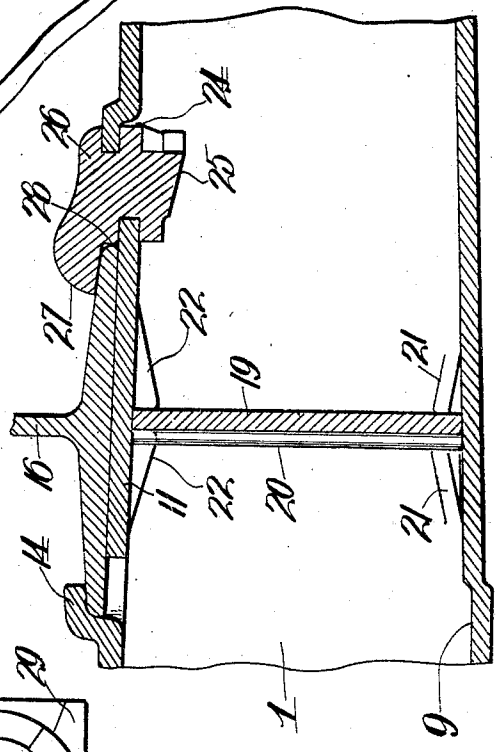

Fig. 7.

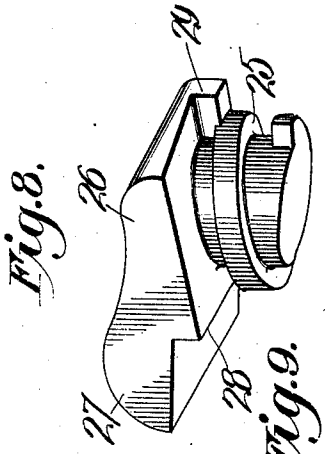

Fig. 8.

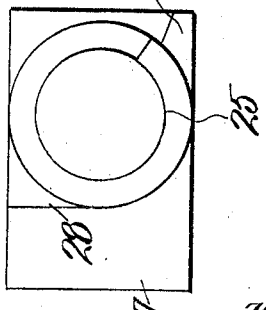

Fig. 9.

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UNITED STATES PATENT OFFICE.

WILLIAM H. CONRY, OF TOPEKA, KANSAS, ASSIGNOR TO WILLIAM H. HOLMES, OF KANSAS CITY, MISSOURI.

RAILWAY-TRACK CONSTRUCTION.

990,843. Specification of Letters Patent. **Patented May 2, 1911.**

Application filed July 13, 1910. Serial No. 572,397.

To all whom it may concern:

Be it known that I, WILLIAM H. CONRY, a citizen of the United States, residing at Topeka, in the county of Shawnee and State of Kansas, have invented certain new and useful Improvements in Railway-Track Construction, of which the following is a specification.

This invention relates to railway track construction and has for its object the production of a sheet metal tie affording wide rail-support and ballast supported surfaces under the rails; the maximum ballast-supported surface consistent with strength outward of the rails; and the minimum ballast-supported surface consistent with strength between the rails.

With this general object in view, the invention consists in certain novel and peculiar features of construction and organization as hereinafter described and claimed; and in order that it may be fully understood, reference is to be had to the accompanying drawings, in which—

Figure 1, is a plan view of a section of a railway track construction embodying my invention and showing the securing devices of adjacent ties engaging opposite sides of the rails. Fig. 2, is an enlarged section on line II—II of Fig. 1. Fig. 3, is a top plan view of the construction shown in Fig. 2. Fig. 4, is an end view of the construction shown in Fig. 2, on a still larger scale. Fig. 5, is a section on the same scale as Fig. 4, on the line V—V of Fig. 2. Fig. 6, is a plan view showing the rails engaged by a modified form of tie. Fig. 7, is an enlarged section on the line VII—VII of Fig. 3. Fig. 8, is a perspective view of one of the removable fastening devices. Fig. 9, is an inverted plan view of the same. Fig. 10, is a perspective view showing the threaded opening in the chair plate of the tie for engagement by the fastening device shown by Fig. 8. Fig. 11, is a perspective view showing the rail plate engaged by the fastening device. Fig. 12, is a view showing the inner edge of the rail plate, the corresponding edge of the fastening device when in engagement with the plate and a wire locking the device against rotatable movement in the rail plate.

In the said drawings where like reference characters indicate corresponding parts in all the figures, the tie, as shown is pressed out of sheet metal, the side walls 1 being formed on curves whose radii constantly change, by preference, in such a manner as to resist the tendency either to bulge or collapse. For this reason a plate of smaller size may be used than where the curvature of the side walls is constant, that is to say of equal radius.

The tie is narrowest and of greatest depth at its center. Narrowing the center without changing the width of the metal heightens the tie at the center, the point of frequent great strain, and places more metal as nearly as is practicable, in a vertical position to the strain, to strengthen the bond between the rails and consequently prevent the spreading of the rails which sometimes results from the bending of ties, and by the relative sharpening of their central portions the ties are more readily embedded in the roadway and therefore less liable to become center bound and bend at points intermediate the rails.

From the center the tie diminishes in height to a point approximately half-way between the center and ends as shown in Fig. 2, and from the center the upper edges also extend divergingly outward as shown clearly in Fig. 3, this diverging relation of the upper edges of the side walls and the proportionate reduction in height from the center outward of the tie resulting in the widening of the bearing of the tie upon the ballast as well as increasing the width of the points of support for the rails, so that where the weight of the rails and of trains passing over them, is greatest, the tie is strongest, and the ballast-supported surface is large.

From the points numbered 2 to the points numbered 3, the width of the tie is preferably uniform, the points 2 being inward of the rails and the points 3 outward of the same, and the tie gradually diminishes in height and increases in width from points 3 to the extremities of the tie. The strength of these end portions is ample to support the relative proportion of the load which is imposed upon them and their chief function is to provide oppositely-disposed wedges, which when embedded in the ballast, will successfully guard against endwise movement of the tie, it being noted that the central portion or body of the tie will coöperate in this function with the said end por-

tion because at opposite sides of the center the tie is of gradually increasing width until the parts of uniform width are reached.

The upper edges of the side walls are preferably formed with outturned flanges 4, which extend from the center to the extremities of the tie and by preference from points 2 to the center and from points 3 to the extremities of the tie, said flanges diminishing in width, as by this construction more metal is available for increasing the height of the central portion and the width of the end portions.

At its center the tie is braced by a cross strap 5 which bridges the tie and terminates in hooks 6, which fit around and under the flanges 4 and thus tend to guard against outward collapse or bulging of the walls, and to brace said walls against inward movement the strap is formed with depending lugs 7 which bear against the inner sides of the walls as shown most clearly in Fig. 5.

To strengthen the tie and therefore guard against the spreading of the rails, it is longitudinally corrugated at 8 from the center to points approximately midway between points 2 and 3 and the end portions of the tie are transversely corrugated as at 9, to strengthen them against collapse under weight imposed upon them, and the upper edges of the walls adjacent to the said end portions are crimped at 10 for a purpose which is hereinafter explained.

11 are bridge or tie plates fitting down upon the upper edge of the wall of the tie between points 2 and 3, and provided with downturned inwardly-opening hooks 12, engaging the flanges 4, the outer portions of said plates being crimped at 13 to engage and interlock with the crimped portions 10 of the walls and thus guard against movement of the plates lengthwise of the tie.

One of the plates 11 is provided at its crimped or outer end with an upwardly projecting, inwardly disposed lug 14, stamped out of the body of the plate, and stamped out of the body of the plate outward of lug 14 and at opposite ends of the same, is a pair of lugs 15 which are bent upwardly and inwardly to coöperate with lug 14 in holding one of the rails 16 firmly upon the underlying bridge or tie plate. The companion bridge or tie plate is provided with a lug 17 corresponding to lug 14, and lugs 18 corresponding to lugs 15, the only difference residing in the fact that the lugs of said companion plate are produced at the inner end of the same so as to engage the inner flange of the adjacent rail instead of the outer flange as is true of lugs 14 and 15, it being noticed in this connection that the construction and arrangement of the tie and plates 11 is such that the rails are pitched slightly inward to better withstand the side thrusts imposed upon them by a moving train. At points under the rails and beneath the plates 11 are vertically disposed supporting plates 19, corresponding in contour to the interior sectional form of the tie, and to strengthen and stiffen said supporting plates, they are corrugated at 20, or otherwise, and to hold said plates in position the tie is formed with upwardly-projecting lugs 21 to receive between them the lower ends of plates 19, plates 11 being also provided with downwardly-pressed projections 22 which fit against the opposite sides of the plates 19 and also against the inner sides of the walls of the tie to assist in holding the same against inward movement, and outward of said supporting plates the end portions or extremities of the ties are stiffened by corrugations 23, adjacent to and parallel with the upper edges of said portions. Each bridge or tie plate 11 is also formed with one or more circular threaded openings 24, and to engage each threaded opening 24, I provide a bolt fastening consisting of a screw 25 and a head 26 formed with a lug 27 to overlie one of the flanges of the adjacent rail, the head being provided with a shoulder 28, it being noticed by reference to Fig. 9, that shoulder 28 merges at one end into the threaded stem so that the bolt may be screwed home until said shoulder bears squarely against the edge of the flange. The head of the bolt is also provided with a depending flange 29, for abutment against the extremity of the thread of opening 24 which is above the surface of plate 11, as shown in Figs. 10, 11 and 12. To guard against accidental unscrewing movement of the bolt, a short piece of wire 30 is fitted down through the opening 24 between the terminals of the screw thread, the upper end of the wire being bent outwardly and downwardly into a groove 31 in the upper side of the plate and there held as the bolt is screwed home, in which operation the flange 29 passes over the upper portion of the wire and clamps the same tightly in the said groove, the threaded portion of the bolt bending the wire against the underside of the threaded portion of the plate, after which the upper end of the wire is bent upwardly against the outer side of flange 29, and the lower end downwardly against the lower end of the thread 24, and then upwardly so as to occupy substantially the position shown in Fig. 12, and thus guard against unscrewing movements of the fastening, it being understood that the fastenings are secured in position after the rails are placed upon the plates 11 and slipped laterally under the lugs stamped out of the same as hereinbefore explained.

By reference to Fig. 1, it will be seen that upon adjacent ties the plates are reversed, that is to say, upon adjacent ties the plates 11 are so arranged that their lugs face in

reversed directions. By this arrangement it will be apparent that the rails are rigidly secured in position should the bolts 26 be omitted or become inoperative from any cause.

In practice the ties are preferably filled with ballast, concrete or any other filling and are also embedded in ballast to about the level of the top of the tie. Preferably the bottom of the tie is of slightly arched form as shown in Fig. 2, to increase the strength and effect the drainage of water therefrom, it being understood that the supporting plates 19 will not form a water-tight joint with the ties and thus prevent proper drainage.

In Fig. 6, which illustrates a modification of the tie construction, it will be seen that I provide a short tie underlying each rail, this tie comprising a central portion corresponding to the construction of the preferred type of tie between the numbers 2 and 3 and terminating at each end in a flaring end portion corresponding in construction to the extremities of the preferred type of tie, and this short tie is provided centrally with a bridge or tie plate 11, equipped with permanent lugs for engagement with the rail upon it and with removable fastening means of the same type as those shown in the preferred construction, for engagement with the opposite base flanges of the rail.

In practice, it is contemplated for economical reasons, to build railway track embodying both the preferred and modified forms of ties a pair of the short ties being arranged between each pair of the preferred type of ties, though it will be understood that on curves or wherever it is deemed advisable, the short or modified type of ties may be omitted and the preferred type substituted therefor.

From the above description it will be apparent that I have produced a railway track construction possessing the features of advantage enumerated, and which, obviously is susceptible of changes in the form, proportion, detail construction and arrangement of the parts without departing from the spirit and scope of the appended claims.

Having thus described the invention what I claim as new and desire to secure by Letters Patent, is:

1. In a railway track construction, a sheet metal tie of inverted arch form in cross section, which diminishes in width and increases in height toward its center from points outwardly thereof, and which is provided with stiffening longitudinal corrugations which extend downwardly and outwardly from the center of the tie.

2. In a railway track construction, a metal tie made from a single sheet, of inverted arch form in cross section, which diminishes in width toward its center from points outwardly thereof, is of substantially uniform width for a certain distance outward of each of said points, and is of gradually increasing width and decreasing height outwardly of the said portions of substantially uniform width.

3. In a railway track construction, a sheet metal tie of inverted arch form in cross section, which diminishes in width toward its center from points outwardly thereof, and which is of substantially uniform width for certain distances outward of said points and of gradually increasing width outwardly of the portions of substantially uniform width; said last-named portions being provided with transverse stiffening corrugations.

4. In a railway track construction, a sheet metal tie of inverted arch form in cross section, which diminishes in width toward its center from points outwardly thereof, and which is of substantially uniform width for certain distances outward of said points and of gradually increasing width and diminishing height outwardly of the portions of substantially uniform width; said last named portions having transverse stiffening corrugations and stiffening corrugations near and substantially parallel with their upper edges.

5. In a railway track construction, a sheet metal tie of inverted arch form in cross section which diminishes in width and increases in height toward its center from points outwardly thereof, and which outward of said points is of substantially uniform width and of gradually increasing height for suitable distances, and from the last-named points is of outwardly increasing width and diminishing height.

6. In a railway track construction, a sheet metal tie of inverted arch form in cross section, which diminishes in width and increases in height toward its center from points outwardly thereof, and which outward of said points is of substantially uniform width and of gradually increasing height for suitable distances and from the last-named points is of outwardly increasing width and diminishing height; said tie being provided with longitudinal corrugations extending about midway the center of one portion of substantially uniform width to a point about midway of the corresponding portion and transverse corrugations beyond the opposite ends of such longitudinal corrugations.

7. In a railway track construction, a sheet metal tie of inverted arch form in cross section, which diminishes in width to its center from points outwardly thereof; in combination with a tie plate bridging the tie at its narrowest point and interlocked therewith to brace the same from spreading.

8. In a railway track construction, a sheet metal tie of inverted arch form in cross sec-

tion, which diminishes in width to its center from points outwardly thereof, in combination with a tie plate bridging the tie at its center and provided with down-turned ends engaging the outer sides of the tie to prevent the same from spreading and provided with depending projections engaging the inner faces of the sides of the tie to prevent collapse of the latter.

9. In a railway track construction, a sheet metal tie of inverted arch form in cross section, which diminishes in width toward its center from points outwardly thereof, and which is of substantially uniform width for certain distances outward of said points and of gradually increasing width outwardly of the portions of substantially uniform width; in combination with tie plates bridging said portions of substantially uniform width and interlocked with the tie to brace the same.

10. In a railway track construction, a sheet metal tie of inverted arch form in cross section, which diminishes in width toward its center from points outwardly thereof, and which is of substantially uniform width for certain distances outward of said points and of gradually increasing width outwardly of the portions of suostantially uniform width; in combination with tie plates bridging said portions of substantially uniform width and interlocked with the tie to brace the same, and plates fitting edgewise in and interlocked with the tie below said tie plates and forming a support for the latter between the walls of the tie.

11. In a railway track construction, a sheet metal tie of inverted arch form in cross section, which diminishes in width toward its center from points outwardly thereof, and which is of substantially uniform width for certain distances outward of said points and of gradually increasing width outwardly of the portions of substantially uniform width; in combinations with a tie plate bridging the portions of the tie of substantially uniform width and terminating at their side margins in hooks interlocked with and bearing against the outer sides of the walls of the tie and provided with depending projections engaging the inner sides of the said walls.

12. In a railway track construction, a sheet metal tie of inverted arch form in cross section, which diminishes in width toward its center from points outwardly thereof, and of substantially uniform width for certain distances outward of said points and of gradually increasing width outwardly of the portions of substantially uniform width; in combination with tie plates bridging the portions of substantially uniform width of the tie and resting upon the upper edges of the walls thereof and interlocked therewith against lateral and endwise movement.

13. In a railway track construction, a sheet metal tie of inverted arch form in cross section, which diminishes in width toward its center from points outwardly thereof, and which is of substantially uniform width for certain distances outward of said points and of gradually increasing width outwardly of the portions of substantially uniform width; in combination with tie plates bridging said portions of substantially uniform width and interlocked with the tie to brace the same and provided with a plurality of hook-shaped lugs to receive base flanges of the rails which rest upon the tie plates.

14. In a railway track construction, a sheet metal tie of inverted arch form in cross section and which diminishes in width toward its center from points outwardly thereof, and which is of substantially uniform width for certain distances outward of said points and of gradually increasing width outward of the portions of substantially uniform width; in combination with tie plates bridging said portions of substantially uniform width and interlocked with the tie to brace the same and provided with a plurality of hook-shaped lugs to receive base flanges of the rails which rest upon the tie plates, and with threaded openings, and headed bolts screwed into said openings to cause their heads to overlap the other base flanges of said rails.

15. In a railway track construction, a sheet metal tie of inverted arch form in cross section and which diminishes in width toward its center from points outwardly thereof and which is of substantially uniform width for certain distances outward of said points and of gradually increasing width outward of the portions of substantially uniform width; in combination with tie plates bridging said portions of substantially uniform width and interlocked with the tie to brace the same and provided with a plurality of hook-shaped lugs to receive the base flanges of the rails which rest upon the tie plates and with threaded openings, headed bolts to be screwed into said openings to cause their heads to overlap the opposite base flanges of said rails, and means for interlocking the bolts and plates together to prevent unscrewing movement of the former.

16. A railway tie formed from a single piece of sheet metal, of inverted arch form in cross section and embodying portions at opposite sides of its center which are of substantially uniform width and slope downward and inward at their upper edges and end portions which diminish in height and increase in width outwardly from said portions of substantially uniform width.

17. A railway tie formed of sheet metal pressed to inverted arch form in cross section and embodying portions at opposite sides of its center, which at their upper edges slope downwardly and inwardly at slight angles, and tie plates bridging the tie and resting upon and interlocked with the

portions which incline downwardly and inwardly at their upper edges and partaking of such inclination.

18. A railway tie formed of sheet metal pressed to inverted arch form in cross section and provided at the upper edges of its walls with outturned flanges and embodying portions at opposite sides of its center which at their upper edges slope downwardly and inwardly at slight angles, and tie plates bridging the tie and resting upon and interlocked with the portions which incline downwardly and inwardly at their upper edges and partaking of such inclination.

19. A railway tie formed of sheet metal pressed to inverted arch form in cross section and provided at the upper edges of its walls with outturned flanges and embodying portions at opposite sides of its center which at their upper edges slope downwardly and inwardly at a slight angle, and tie plates bridging the tie and resting upon and interlocked with the portions which incline downwardly and inwardly at their upper edges and partaking of such inclination, in combination with plates fitting edgewise within the tie and interlocked with the same and forming a support for said tie plates between the points where the same rest upon the tie.

20. A tie made from a single piece of sheet metal pressed to substantially inverted arch form in cross section and of greatest height and narrowest width at its center and diminishing in height and increasing in width gradually from said center and provided with end portions which diminish outwardly in height and increase outwardly in width at sharper angles respectively than the diminish in height and increase in width respectively, from its center outwardly.

21. In a railway track construction, the combination of a pair of cross ties and tie supporting plates secured thereon, the tie plates of one cross tie having hook-shaped lugs facing in the same direction and the tie plates of the other cross tie having hook-shaped lugs facing in the reverse direction, rails resting on said plates with their base flanges underlying said hook-shaped lugs; and a removable bolt secured to each of said plates and provided with a head bearing against the edge of the base flange at the opposite side thereof from the lugs of the corresponding plate, and with a lug projecting from said head and fitting down upon the said base flange of the rail.

22. A metal tie supporting plate for ties having hook-shaped lugs pressed from its body and facing in the same direction and having a circular threaded opening one end of the thread of which projects above and the other below the plane of the plate.

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

WILLIAM H. CONRY.

Witnesses:
H. C. RODGERS,
G. Y. THORPE.