

D. CRAWFORD, JR.

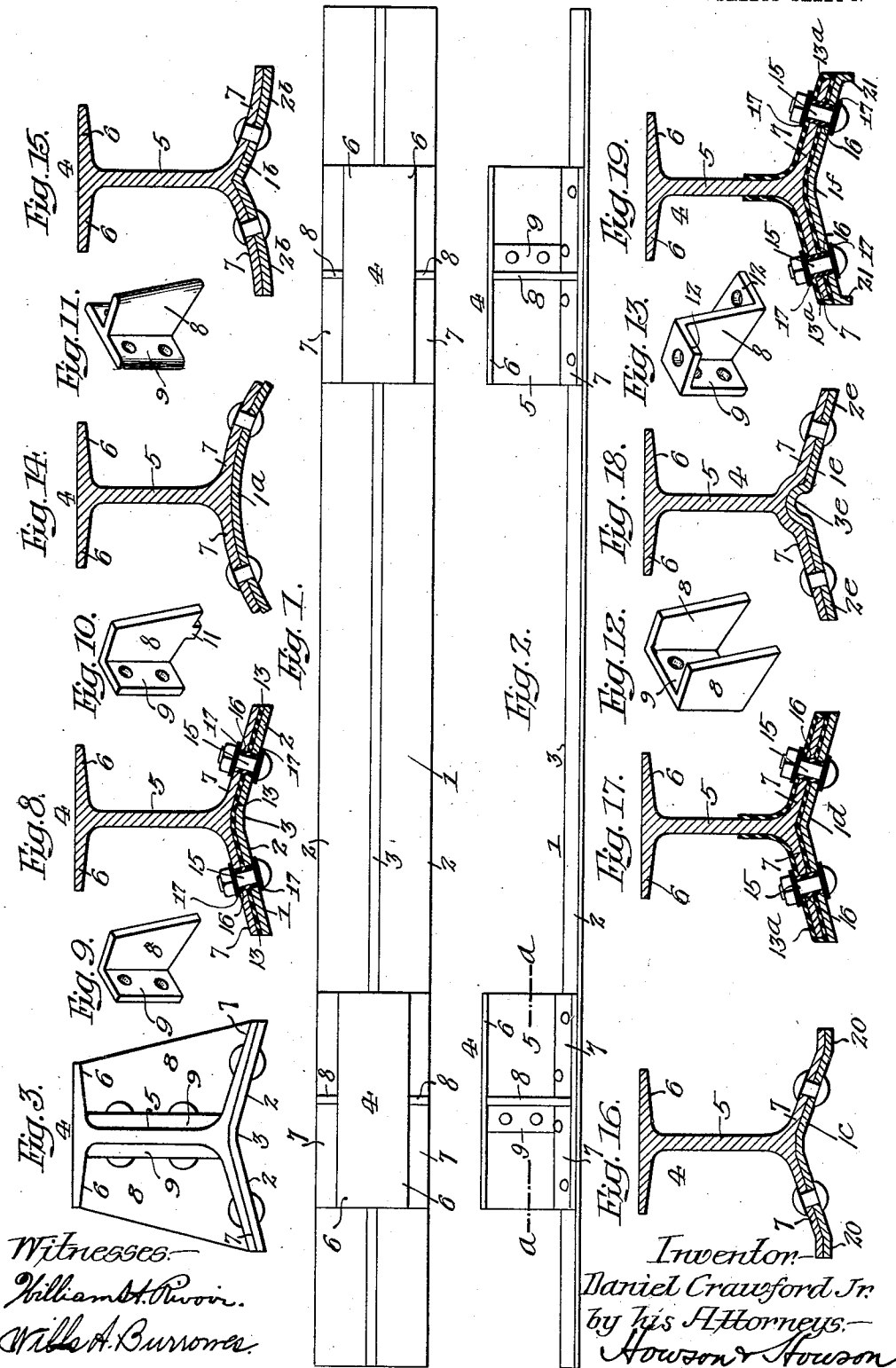
METALLIC TIE.

APPLICATION FILED FEB. 3, 1912.

1,057,805.

Patented Apr. 1, 1913.

2 SHEETS—SHEET 1.



Witnesses:
William St. Pierre.
Will A. Burnham.

Inventor:
Daniel Crawford Jr.
by his Attorneys:
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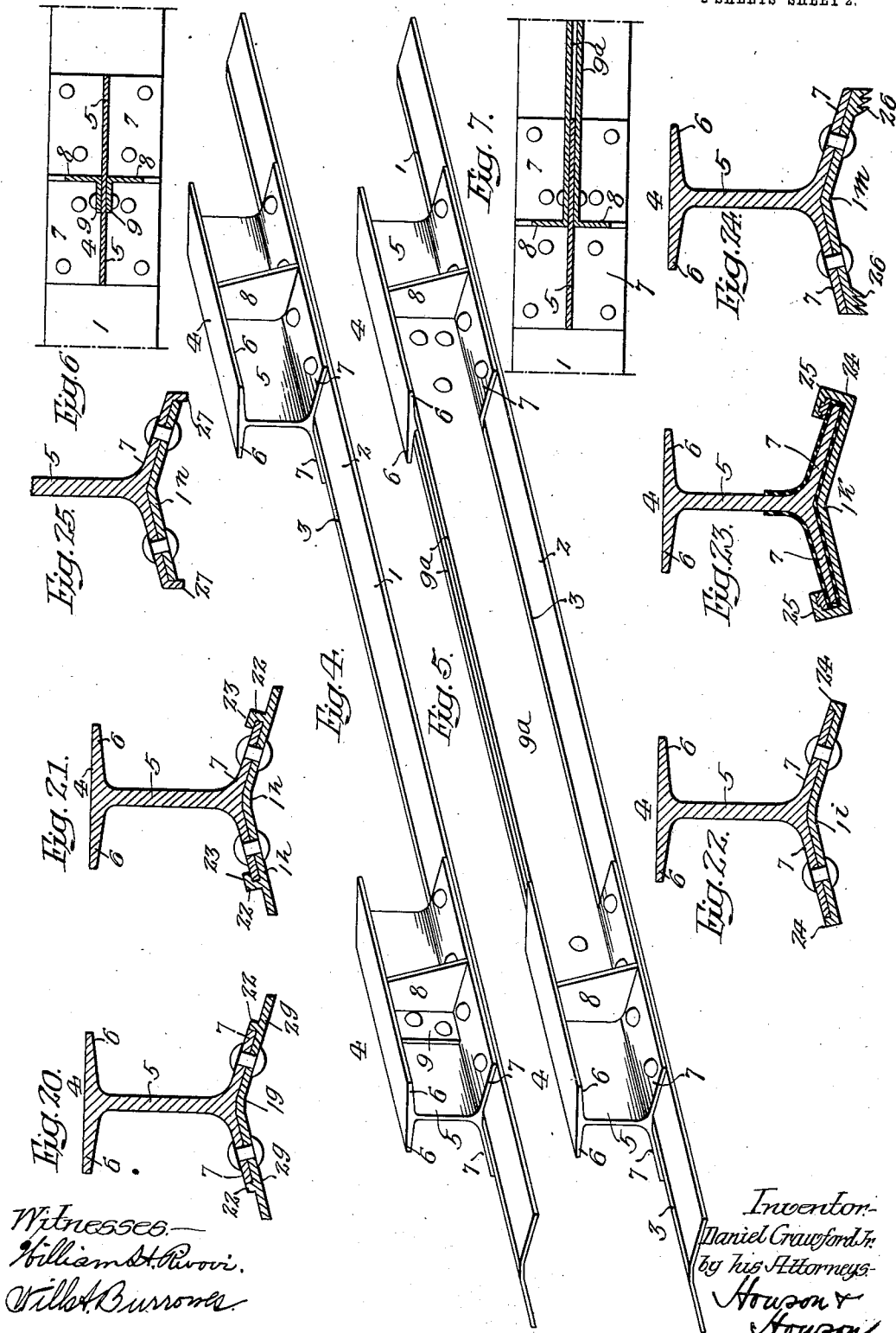
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UNITED STATES PATENT OFFICE.

DANIEL CRAWFORD, JR., OF PHILADELPHIA, PENNSYLVANIA.

METALLIC TIE.

1,057,805.

Specification of Letters Patent.

Patented Apr. 1, 1913.

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To all whom it may concern:

Be it known that I, DANIEL CRAWFORD, Jr., a citizen of the United States, residing in Philadelphia, Pennsylvania, have invented certain Improvements in Metallic Ties, of which the following is a specification.

My invention, relating to railroad or railway track construction, consists of certain improvements in metallic ties for supporting the rails of the permanent way; the object of my invention being to provide an efficient and substantial support for the rails, simple in construction and easy of manufacture and relatively inexpensive.

A further object of my invention is to combine suitable non-conducting material with the other parts of the tie whereby the rails may be properly insulated from each other.

My invention comprises a tie made up of chairs or supporting elements for the rails anchored to and spaced apart by base members which may underlie said chairs and extend across the roadbed beneath the ballast thereof.

Any suitable form of fastening devices applicable to metallic ties may be employed to secure the rails to the structure forming the subject of my invention.

These and other features of my invention are more fully described hereinafter, reference being had to the accompanying drawings, in which:

Figure 1, is a plan view of one form of metallic railroad tie embodying my invention; Fig. 2, is a side elevation of the same; Fig. 3, is an end elevation of the structure shown in Fig. 1; Fig. 4, is a perspective view of the tie shown in Figs. 1, 2 and 3; Fig. 5, is a similar perspective view of a modified construction; Fig. 6, is a sectional view of the chair on the line *a-a*, Fig. 2; Fig. 7, is a similar sectional view of the structure shown in Fig. 5; Fig. 8, is a view similar to Fig. 3, showing one form of means for insulating the chair from the base or supporting member; Figs. 9, 10, 11, 12 and 13, are perspective views illustrating various forms of reinforcing or supplementary supporting elements for the rail-chairs, and Figs. 14 to 25, both inclusive, are views illustrating various forms of base plates and chairs within the scope of my invention.

In the drawings, 1 represents a base plate or anchorage member, which may be dis-

posed below and held in place by the ballast of the roadbed. This plate 1, in all of the forms hereinafter described, is substantially arch-shaped in cross section. In the form shown in Figs. 1, 2, 3 and 4, it comprises outwardly and downwardly inclined webs 2 on both sides of its central portion, which is truncated as indicated at 3. Other forms of base plates or anchorage members may be employed, however, having various cross sectional contours, as illustrated in Figs. 13, 14, *et seq.* Mounted upon this base member 1, adjacent the opposite ends of the same and in proper position with respect to the rails of the permanent way of whatever gage they may be set, are rail-chairs 4, preferably formed of I-beam section, in which one pair of the flanges may be of a greater width than the other pair. In the present instance the lower flanges are the widest and of substantially the same width as the base plate or anchorage member 1. In addition, these lower flanges are bent or shaped to conform to the contour of said base plate or anchorage member. They may be riveted or otherwise secured to said base plate or anchorage member; it being essential that their connection thereto be as rigid and strong as it is possible to make the same in order that no displacement or separation may occur in practice. The rails are mounted upon these I-beam chairs and may be secured thereto in any suitable manner; for instance, by means of fastening devices of the type shown in Patents Nos. 828,793; 828,794, and 828,795; the upper flanges of the chairs being properly shaped or organized to receive such fastening members.

The rail chairs 4 comprise I-beam sections, each having a central, vertical web 5, upper flanges 6, and lower flanges 7. The upper flanges are disposed substantially in a single horizontal plane, while the lower flanges are bent or shaped to conform to the base plate or connecting and spacing anchorage member 1. If desired, a pair of channel members, each having a web and an upper and lower flange, respectively, may be secured together by suitable means to form a rail chair; otherwise shaped and organized for connection to a base plate or anchorage member 1, and to properly support the rails.

In Fig. 3, I have shown an end elevation of the form of tie shown in Figs. 1, 2 and 4; the base connecting and spacing member 1 having inclined side portions and a sub-

stantially flat central part; the whole presenting a substantially arch-shaped contour, upon which the rail-chair 4 is mounted.

To afford an additional support for the rails and insure against any tendency of the flanges of the rail-chairs to bend or break down under traffic, I provide the chairs with angularly disposed vertical supporting elements, which lie between the upper and lower flanges thereof. These elements comprise plates or webs 8, having flanges 9, which may be secured by means of rivets, bolts or other suitable fastening devices to the webs 5 of the chairs, or by means of flanges 12 to the flanges of the chairs, or fastened to both web and flanges of the latter. These sections may be cut from ordinary angle iron, as shown in Figs. 9 and 10, or from a T-section, as shown in Fig. 11, or from channel-sections, as shown in Fig. 12. They may also be provided with projections 11 adapted to enter apertures or depressions in the lower flanges of the rail-chairs, and they may also be provided with integral wings 12 disposed at top and bottom of the same, in addition to the flange 8, which may be riveted or otherwise secured to the upper and lower flanges of the rail-chairs, as shown in Fig. 13. If desired, the flanged portions 9 of said supporting members, which are riveted to the webs of the chairs, may be continuous, as shown at 9^a in Fig. 5, and form additional securing and spacing means between said chairs.

In Fig. 8, I have shown one arrangement of means for insulating the rail-chairs from the base plate or anchorage member 1. As shown in this view, such result may be accomplished by interposing a plate 13 of insulating material; hard rubber or the like, between the lower flanges 7 of the chair and said base plate or anchorage member 1. Bolts 15 may be provided to secure these parts together, with insulating bushings 16 and washers 17 assembled therewith to prevent current leakage.

In Fig. 14, I have shown a base plate or anchorage member 1^a for the rail-chairs, wholly arch-shaped in cross-sectional contour.

Fig. 15, shows a base plate or anchorage member 1^b, with the webs 2^b on either side of a line passing longitudinally through the center of such base plate or anchorage member curved in the arc of a circle.

Fig. 16 shows an arched connecting base plate or anchorage member 1^c with horizontally disposed longitudinal edge portions, indicated at 20; the lower flanges of the rail-chairs having their edges correspondingly flattened.

In Fig. 17, the cross-sectional contour of the base plate or anchorage member 1^d is angular; being substantially V-shaped.

In Fig. 18, the base plate or anchorage

member 1^e comprises diagonally disposed side webs 2^e with a central arch-shaped portion 3^e, joining such webs.

In Fig. 19, the base plate or anchorage member 1^f is substantially arch-shaped, with depending side flanges 21. In this structure I have also shown another form of insulation; the plate 13^a embracing both lower flanges 7 of the rail-chair and a portion of the web 5, and being secured in place in substantially the same manner as indicated in Fig. 8.

In Fig. 20, the contour of the base-plate or anchorage member 1^g is substantially the same as that illustrated in Fig. 3; with the addition of longitudinal ribs 22, extending upwardly from the webs 2^g for engagement with the edges of the lower flanges 7 of the rail-chairs; such ribs being disposed inwardly with respect to the side edges of the base plate or anchorage member.

In Fig. 21, the contour of the base plate or anchorage member 1^h is substantially the same as that shown in Fig. 20, with the exception that the longitudinal ribs 22 are provided with return portions 23 overlying the flanges 7 of the rail-chairs.

Fig. 22 shows a base plate or anchorage member 1ⁱ of substantially the same sectional contour as that shown in Fig. 3, with upwardly turned flanges 24 at the edges thereof for engagement with the lower flanges 7 of the rail-chairs.

Fig. 23 shows a base plate or anchorage member 1^k having a sectional contour of substantially the same character as that shown in Fig. 22, with the flanges 24 turned over at 25 to engage the edges of the lower flanges 7 of the rail-chairs, in the same manner as indicated in Fig. 21.

In Fig. 24, I have shown a base member 1^m substantially arch-shaped in cross sectional contour and similar to that shown in Fig. 3, in which the under surface of the same at the edges thereof is provided with longitudinal depending portions 26, substantially wedge-shaped in cross section; such construction being particularly designed for rock bottom roadbeds.

In Fig. 25, I have shown a form of base member 1ⁿ of the same character as that shown in Fig. 3, but slightly narrower to permit the lower flanges of the rail-chairs to be bent over the same, as indicated at 27. If desired, the base member may be of the full width throughout the major portion of its length and simply cut away adjacent the rail-chairs for the positioning of the depending portions 27 of the lower flanges of such chairs.

In the employment of base plates or anchorage members of the different contours, such for instance as those illustrated in Figs. 14, 15, *et seq.*, inclusive, the base flanges of the rail-chairs employed there-

with will be correspondingly shaped, as illustrated, so as to closely hug the upper surface of said base members. The flanged supporting elements 8 carried by the rail-chairs and underlying the flanges of the same in line with the rails serve the additional function of anchoring said rail-chairs against longitudinal movement; the ballast of the permanent way contacting therewith and preventing longitudinal movement of said ties or lateral movement of the permanent way.

If it be desired to provide means for preventing lateral movement of the ties, base plates or anchorage members of a contour such as illustrated in Fig. 19, may be employed. In addition, if desired, the lower flanges of the chairs may be shaped to provide the depending edges 27 extending below the edges of the base plates or anchorage members and forming means to prevent lateral movement of the ties, as shown in Fig. 25. The arched contour of the base member provides for the ready tamping of the ballast to properly secure the tie in place.

While I prefer to rivet or bolt the rail-chairs to the base plates carrying the same, it may be desirable, especially when insulating material is interposed between the rail-chairs and the base plate, to provide wedging or clamping means for securing these parts together such, for instance, as indicated in Fig. 23.

I claim:

1. In a metallic tie, the combination of a rail-chair, and a base plate or anchorage member therefor serving as a spacing element and permanently secured thereto, said base plate or anchorage member being substantially arch-shaped in cross section and the contacting portion of the rail chair conforming to the contour thereof.

2. In a metallic tie, the combination of a rail-chair formed of an I-beam section, and a base plate or anchorage member therefor serving as a spacing element and permanently secured thereto, said base plate or anchorage member being substantially arch-shaped in cross section.

3. In a metallic tie, the combination of a pair of rail-chairs, and a base plate or anchorage member therefor serving as a spacing element and permanently secured thereto, said base plate or anchorage member being substantially arch-shaped in cross section and the contacting portion of the rail chair conforming to the contour thereof.

4. In a metallic tie, the combination of a pair of rail-chairs formed of I-beam sections, and a base plate or anchorage member therefor serving as a spacing element and permanently secured thereto, said base plate or anchorage member being substantially arch-shaped in cross section.

5. In a metallic tie, the combination of a pair of rail-chairs each having upper and lower flanges and a central connecting web, and a base plate or anchorage member therefor serving as a spacing element and permanently secured thereto, said base plate or anchorage member being substantially arch-shaped in cross section and the lower flanges of the chairs overlying said base plate and having the same contour.

6. In a metallic tie, the combination of a pair of rail-chairs having upper and lower flanges, a base plate or anchorage member therefor serving as a spacing element and permanently secured thereto, said base plate or anchorage member being substantially arch-shaped in cross section and the lower flanges of the chairs overlying said base plate and having the same contour, and supplemental supports interposed between the flanges of said rail-chairs.

7. In a metallic tie, the combination of a pair of rail-chairs having upper and lower flanges, a base plate or anchorage member therefor serving as a spacing element and permanently secured thereto, and supplemental supports interposed between the flanges of said rail-chairs, said base plate or anchorage member being substantially arch-shaped in cross section, and the lower flanges of the rail-chair following the contour of said base plate.

8. The combination, in a metallic tie, of a base plate or anchorage member substantially arch-shaped in cross section, rail-chairs secured thereto, said chairs being formed of I-beam sections with their lower flanges in direct contact with and conforming to the shape or contour of the base plate, and means connecting said base plate and chairs together.

9. The combination, in a metallic tie, of a base plate or anchorage member substantially arch-shaped in cross section, rail-chairs secured thereto, said chairs being formed of I-beam sections with their lower flanges conforming to the shape or contour of the base plate, means connecting said base plate and chairs together, and supporting means interposed between the upper and lower flanges of the chairs and disposed to underlie rails supported thereby.

10. The combination, in a metallic tie, of a base plate or anchorage member substantially arch-shaped in cross section, rail-chairs connected to said base plate, means securing said chairs thereto, supplemental supports interposed between the flanges of the chairs and underlying the point at which a rail is supported, and means connecting the supplemental support of one chair with the supplemental support of the other.

11. The combination, in a metallic tie, of a base plate or anchorage member substan-

5 tially arch-shaped in cross section, rail-chairs connected to said base plate, means securing said chairs thereto, and means carried by said base plate and engaging the chairs for preventing lateral movement of said chairs with respect to said base plate.

10 12. The combination, in a metallic tie, of a base plate or anchorage member substantially arch-shaped in cross section, rail-chairs carried by said base plate, means securing said chairs thereto, and longitudinal positioning means carried by said base plate in engagement with said chairs.

15 13. The combination, in a metallic tie, of a base plate or anchorage member substantially arch-shaped in cross section, rail-chairs carried by said base plate consisting of I-beam sections each having a vertical web with upper and lower flanges, means securing said chairs to the base plate, and longitudinal positioning means carried by said base plate in engagement with the lower flanges of said chairs.

20 14. In a metallic tie, the combination of a plurality of rail-chairs, and a base plate or anchorage member therefor serving as a spacing element and permanently secured thereto, said base plate or anchorage member being substantially arch-shaped in cross section and the contacting portion of the rail chair conforming to the contour thereof.

25 15. In a metallic tie, the combination of a plurality of rail-chairs each formed of an I-beam section, and a base plate or anchorage member therefor serving as a spacing element and permanently secured thereto, said base plate or anchorage member being substantially arch-shaped in cross section.

16. In a metallic tie, the combination of a plurality of rail-chairs, a base plate or anchorage member therefor serving as a spacing element and permanently secured thereto, said base plate or anchorage member being substantially arch-shaped in cross section, and wedging or clamping means for securing said rail-chairs to the base plate.

17. In a metallic tie, the combination of a plurality of rail-chairs formed of I-beam sections, a base plate or anchorage member therefor serving as a spacing element and permanently secured thereto, said base plate or anchorage member being substantially arch-shaped in cross section, and wedging or clamping means for securing said rail-chairs to the base plate.

18. In a metallic tie, the combination of a plurality of rail-chairs each having upper and lower flanges and a central connecting web, a base plate or anchorage member therefor serving as a spacing element and permanently secured thereto, said base plate or anchorage member being substantially arch-shaped in cross section and the lower flanges of the chairs having the same contour as said member, and wedging or clamping means in engagement with the lower flanges of said rail-chairs for securing the same to the base plate.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

DANIEL CRAWFORD, JR.

Witnesses:

MURRAY C. BOYER,
JOS. H. KLEIN.