

B. WOLHAUPTER.
COMPOSITE RAIL TIE AND FASTENING.
APPLICATION FILED DEC. 23, 1907.

937,133.

Patented Oct. 19, 1909.
4 SHEETS—SHEET 1.

Fig. 1.

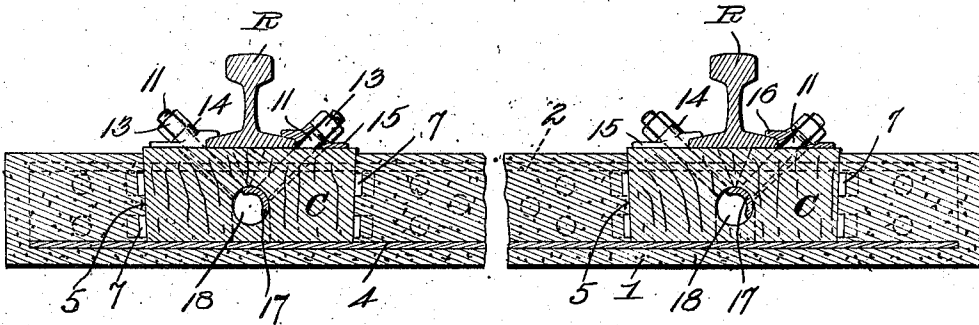
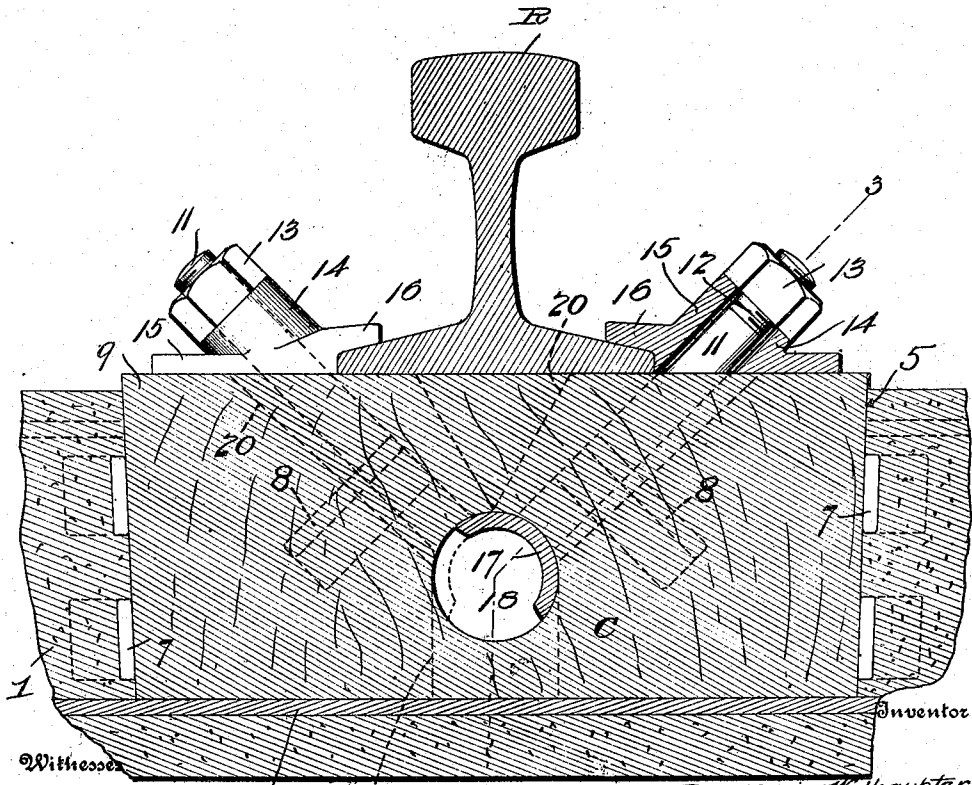


Fig. 2.



Witnesses

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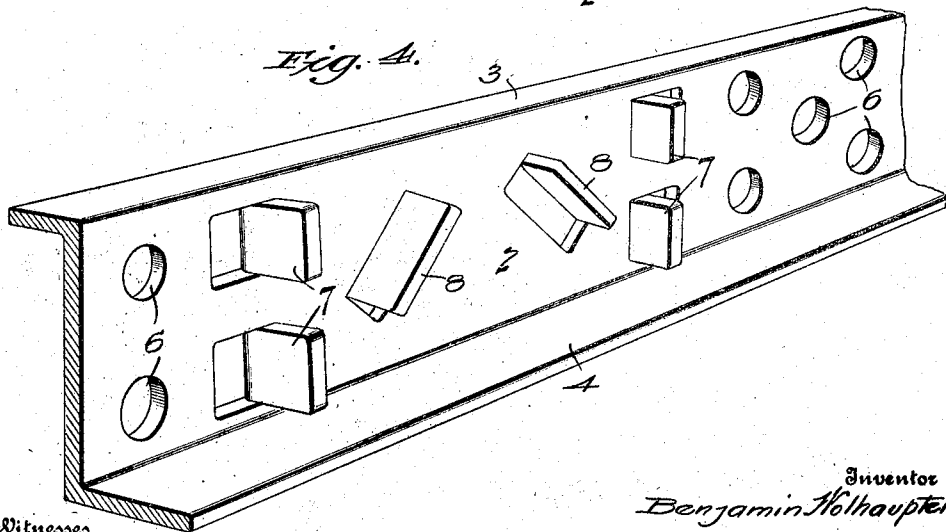
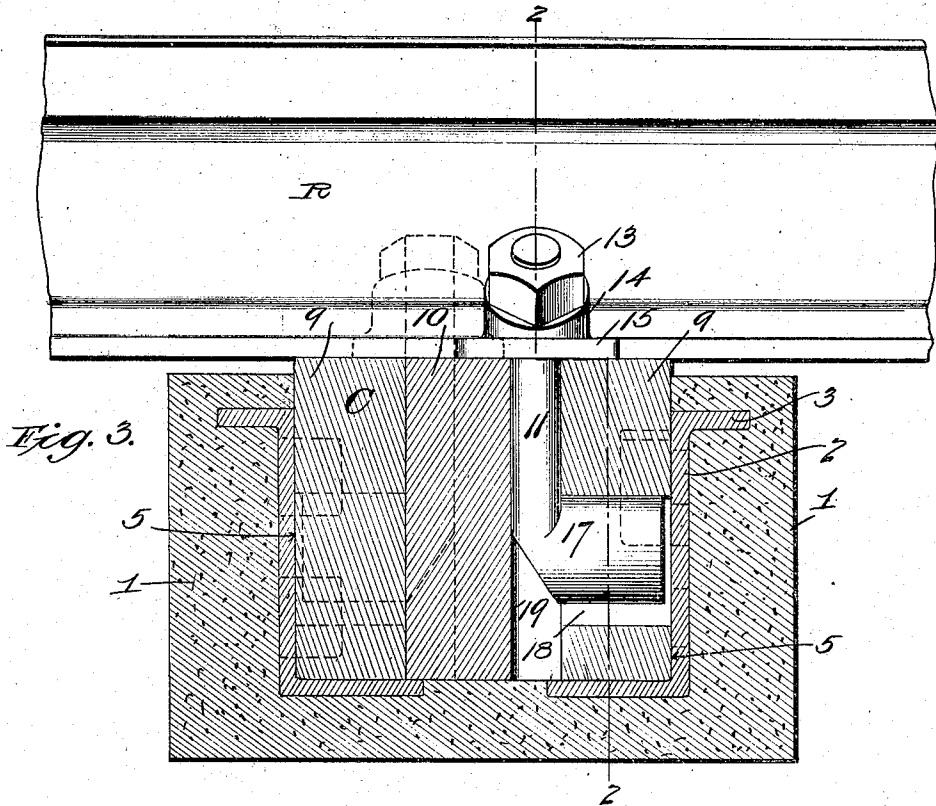
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4 SHEETS—SHEET 3.

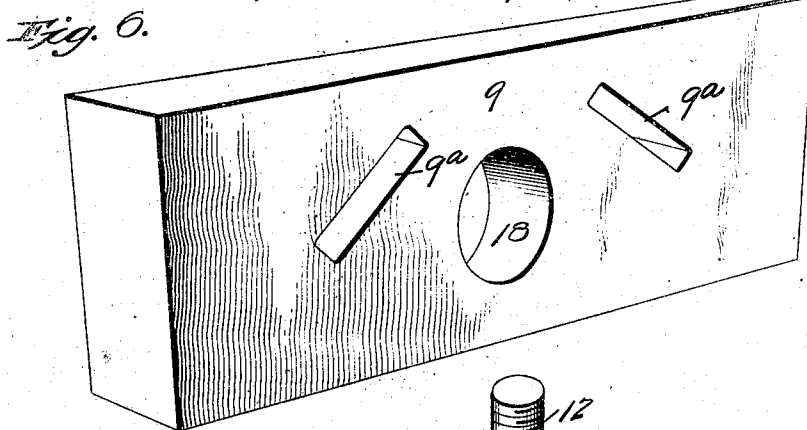
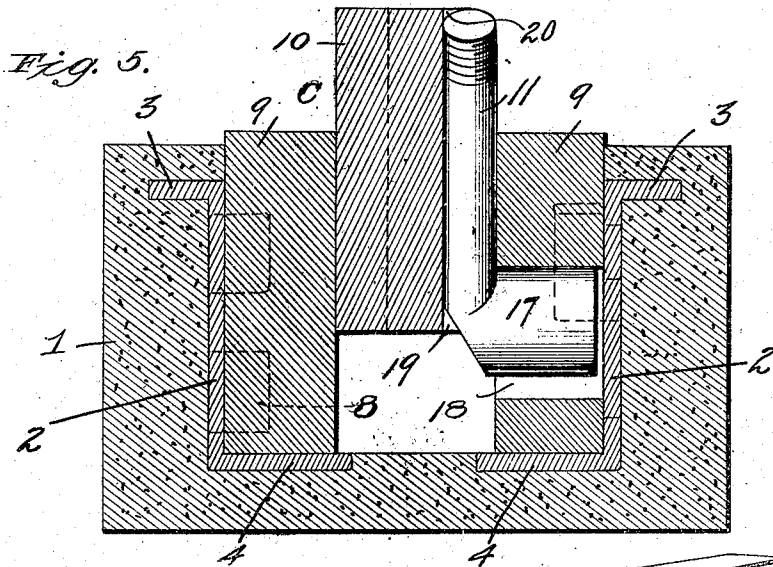


Fig. 7.



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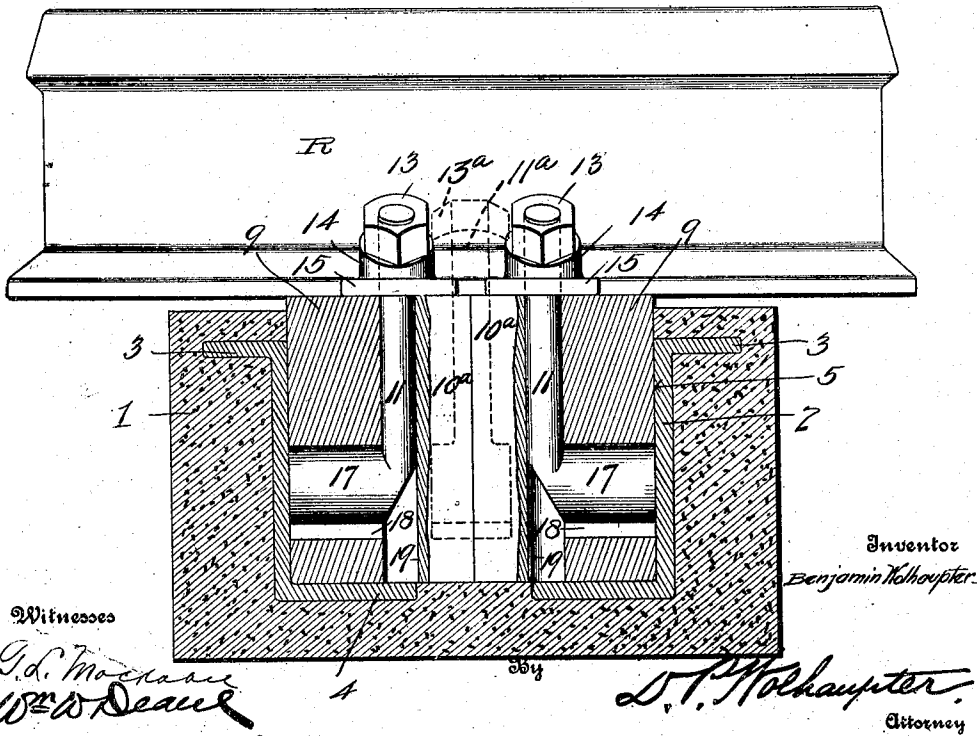
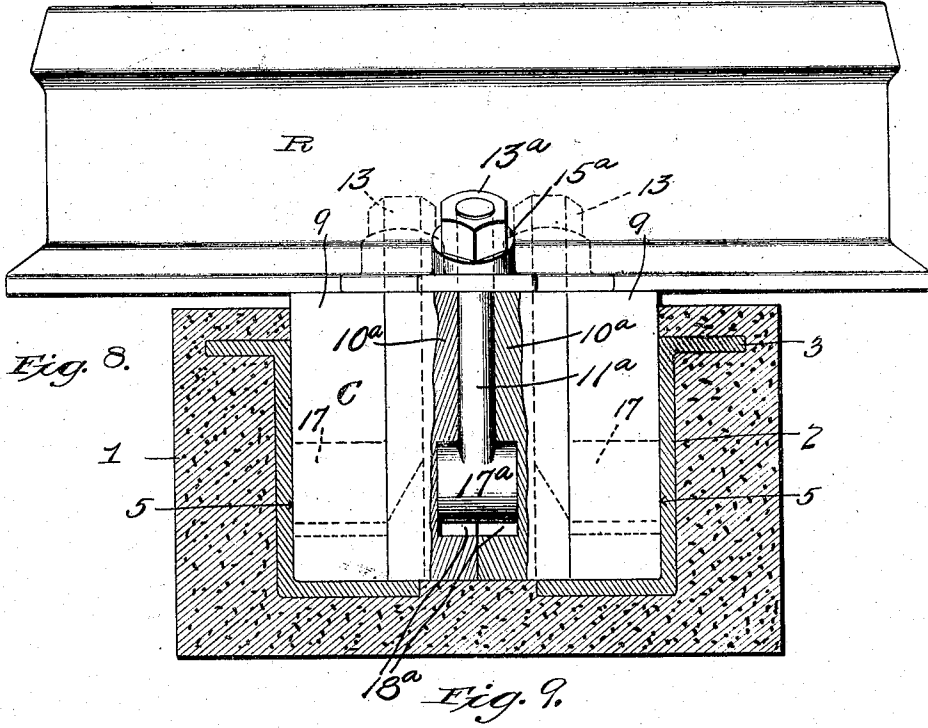
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4 SHEETS—SHEET 4.



Witnesses

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COMPOSITE RAIL TIE AND FASTENING.

937,133.

Specification of Letters Patent.

Patented Oct. 19, 1909.

Application filed December 23, 1907. Serial No. 407,775.

To all whom it may concern:

Be it known that I, BENJAMIN WOLHAUPTER, a citizen of the United States, residing at New York city, in the county of New York and State of New York, have invented certain new and useful Improvements in Composite Rail Ties and Fastenings, of which the following is a specification.

This invention relates to the subject of railway track ties and track fastenings, and more particularly to an improvement in track fastenings possessing special utility in connection with cross ties of the metal, cement, or composition type.

To this end the invention has in view the provision of certain practical and novel improvements in the construction of composite rail ties to secure an effective cushion support for the rails embodying all of the desirable characteristics of the ordinary wooden tie.

A further object of the invention is to provide a novel and effective construction of track fastening associated with the bearing supports for the rails embodying a wide range of adjustment to accommodate the fastening to rail bases of different widths, and also to adapt the fastenings for tracks requiring adjustments and variations of gage.

Another and practical object of the invention is to provide a track fastening device for metallic ties which shall insulate electrically one rail from the other.

With these and many other objects in view, which will readily appear to those familiar with the art, the invention consists in the novel construction, combination and arrangement of parts hereinafter more fully described, illustrated, and claimed.

The essential features of the invention, involved in carrying out the objects above indicated are necessarily susceptible to a wide range of structural modification without departing from the scope of the invention, but a preferred embodiment thereof is shown in the accompanying drawings, in which:

Figure 1 is a broken longitudinal sectional view of a composite tie equipped with the improved rail fastenings contemplated by the present invention. Fig. 2 is an enlarged sectional view of one portion of the tie showing one of the rail bearing cushions and one set of rail fastenings carried thereby, the line of section of this figure being indicated by line 2—2 on Fig. 3. Fig. 3 is a transverse sectional view taken on the line of one of the

fastening bolts, and indicated by the section line 3—3 of Fig. 2 of the drawings. Fig. 4 is a detail in perspective view of a section of one of the incased reinforcing frame bars. Fig. 5 is a cross sectional view on the same line of section as Fig. 3, illustrating the manner of assembling the several sections of the bearing cushion in connection with the pivotal mounting of the individual fastening bolts. Fig. 6 is a detail in perspective of one of the side block sections of each rail bearing cushion. Fig. 7 is a detail in perspective of one of the individual pivotal fastening bolts. Fig. 8 is a view similar to Fig. 3, but illustrating a modification wherein additional fastenings are provided for the outer flange of the rail, the view showing in section the inner blocks which hold the intermediate fastening. Fig. 9 is a view similar to Fig. 8, but from the reverse side of the rail, the view showing in section the outer blocks which hold the outside fasteners for the rail.

Like references designate corresponding parts in the several figures of the drawings.

The general construction and characteristics of the composite tie disclosed in this application are the same as those of the tie forming the subject matter of a companion application filed of even date herewith, and bearing Serial No. 407,774. This tie is provided with a concrete tie body 1 of the conventional form and dimensions and formed of any of the well known cement or cement compositions used in concrete structures of this character. In connection with the concrete body portion 1, the composite tie includes in its general organization a pair of oppositely arranged reinforcing frame bars 2 entirely incased in the concrete body, and each of which is preferably of that design of flanged bar known as the Z bar and consisting of a main web portion provided with the upper and lower flanges 3 and 4, which are arranged respectively at the top and bottom edges of the bar web. The top flanges 3 of the said bars 2 are preferably turned outwardly from the web portions thereof, while the bottom flanges 4 are turned inwardly toward each other to constitute supporting bases for the rail bearing cushions which are seated between the bars in retaining pockets 5 provided in the tie body for the reception thereof. The said bearing cushions are designated in their entirety by the reference letter C, and will be hereinafter more fully referred to.

The opposite frame bars 2 are arranged vertically in the enveloping concrete body so as to dispose their horizontal top flanges 3 within the top portion of the body, and their bottom flanges 4 within the bottom portion of the body, thereby providing a relatively deep retaining pocket 5 for each of the cushions C. This permits the employment of a cushion C of a height nearly equaling the vertical height of the tie body itself and extending from its point of support on the bottom flanges 4 of the frame bars to a point above the top surface of the concrete body, whereby the rail is held clear thereof and at the same time is provided with a deep cushion, which cushion is preferably made of wood so as to preserve all of the advantages of the ordinary wooden cross tie.

To provide for the firm bonding or keying of the frame bars in the concrete body, the said bars have preferably provided therein a plurality of suitably arranged bonding holes 6 into and throughout which fills concrete or cement material. Also, if found desirable, any suitable expedients may be resorted to for transversely bracing or connecting the opposite frame bars as suggested in the companion application aforesaid, but these or other details may be omitted without affecting the essential features of the present application, which relate particularly to the construction and mounting of the individual bearing cushions C, and the construction and mounting of the individual rail fastenings associated therewith.

In connection with the mounting of the individual bearing cushions C, it is preferable to provide each frame bar 2 with a plurality of oppositely arranged abutment projections 7 deflected inwardly from the web of the bar at substantially right angles thereto, and arranged in pairs respectively at the ends of each of the cushion retaining pockets 5, so as to provide metallic end rests or abutments for the ends of the cushions seated in said pockets. With reference to these paired abutment projections 7, the same are preferably in the form of wings punched out directly from the body of the bar, and these wings, as well as the concrete faces at the ends of the pockets 5, are also preferably disposed at an inclination to a perpendicular plane so as to provide pockets of a tapering form corresponding to the preferable wedge shaped form of the cushions C as an entirety, as may be plainly seen from Figs. 1 and 2 of the drawings.

In addition to the inwardly projecting wings 7 constituting the abutment projections referred to, each frame bar 2 is provided, within the transverse plane of each retaining pocket 5, with reversely and oppositely disposed punched-out wings 8 forming what may be termed holding lugs 3 for the side block sections 9 of the cushions. These side

block sections 9 are provided in their outer sides next to the frame bars with reversely and oppositely disposed inclined keeper mortises 9^a corresponding in inclination, location, and shape to the holding lugs 8, and receiving said lugs to provide a firmly interlocked connection between the said side block sections and the frame bars of the tie.

Each rail bearing cushion C comprises a sectional wooden body preferably consisting of a plurality of matching and closely registering wooden blocks which may be characterized as the side block sections 9 referred to, and the central key block section 10 adapted to fit between and to key into place said side sections when the several parts of the cushion are assembled, as plainly indicated in Fig. 5 of the drawings.

A distinctive feature of the present invention resides in the mounting of the individual fastenings for each rail upon each of the sectional cushions, and referring particularly thereto it will be seen that each set of fastenings associated with each rail bearing cushion, comprises a pair of diagonally opposite individual fastening bolts 11, one for each side of the rail R on the cushion. Each fastening bolt 11 essentially consists of a main bolt stem provided at one end with a threaded tip 12 receiving thereon the binding nut 13 and adapted to extend through the inclined bolt collar 14 of a flanged rail clamp 15. The rail clamp 15 rests flat on top of the rail bearing cushion and the flange or lip 16 thereof is adapted to clamp over the edge of the base flange of the rail, as best shown in Fig. 2 of the drawings. The binding nut 13 on the tip of the bolt stem binds on the outer end or top of the bolt collar 14, and the opposite or lower end of the stem of each bolt 11 is provided with a laterally projecting semicylindrical journal segment 17 which has a pivotal or journal mounting in a circular bearing opening 18 provided in the side block section 9, with which the bolt cooperates. As stated, for each cushion, there is a pair of the bolts 11, and said bolts being arranged in diagonally opposite relation, each bolt has the pivotal bearing described in one of the side block sections 9, and, to permit of the assembling of the parts and the proper play for the swinging adjustment of the bolts, the central key block section 10 is provided in opposite sides thereof with the clearance slots 19, which have upper inclined flared portions 20 constituting play-accommodating spaces for the pivotal swing bolts 11.

In the assembling of the parts of the individual cushions and the mounting of the fastening bolts, it will be seen from Fig. 5 of the drawings that for each cushion the side block sections 9 are first dropped into the retaining pocket and moved laterally into engagement with the holding lugs 8 provided therefor, after which the bolts are inserted in

place with their journals 17 arranged in the bearings 18 therefor, and the grooved, central key block section 10 is then placed between the opposite bolts and the opposite side block sections 9 and forced down to the final position shown in Fig. 3 of the drawings. This securely and rigidly locks the side block sections in place and also secures the fastening bolts in working position so that the same may be freely adjusted to provide for binding the rail clamps 15 upon rail bases of varying sizes, as well as to adapt the fastenings to tracks of different gage.

A feature of practical importance in connection with the mounting of the individual fastening bolts resides in the feature of arranging the bearings or bearing openings for the pivotal swinging bolts substantially in the plane of the vertical center of the rails seated on the cushions, so that the tightening of the nut on either bolt will provide two movements, one a vertical movement forcing the rail to the tie, and the other a lateral movement of the rail on the tie producing adjustment of the gage of the track.

While the tapering form of the retaining pockets of the cushions, and the wedge shape of the cushions themselves provide for a tight wedging fit of the cushions in said pockets, an added feature of security is provided for by the reversely and oppositely disposed inclined lugs 8 which necessarily subserve the function of wedges to tend to force the cushions in a downward direction toward either of the bottom corners of their pockets when endwise thrust is imposed on the cushions in either direction produced for instance by the movement of the wheel flange against the rail.

It will also be observed that by reason of the employment of the wooden bearing cushions C, and the fact that the rail fastenings are carried by said cushions, this structure provides a track fastening device for metallic ties which electrically insulates one rail from the other.

In carrying out the invention it may be desirable under some conditions, to provide for a stronger fastening at the outer edge of the rail on curves where extra strain or stress comes upon the rail. This may be accomplished by various expedients, such for instance as making the outer fastening for the rail much heavier than the inner fastening, but a practical and effectual construction for performing the function referred to is suggested in Figs. 8 and 9 of the drawings which illustrate a modification involving a special arrangement of the fastenings. This modification involves the suggestion of utilizing a plurality of individual bolt fastenings for the outer edge or flange of the rail in order to more securely hold the rail at the outside on curves where extra strain

or stress is imposed thereon. In the construction shown in Figs. 8 and 9 of the drawings, all of the essentials of the construction already described are preserved, it only being necessary to employ a third fastening bolt 11^a and to interpose between the outer side block sections 9 a pair of intermediate block sections 10^a flatly abutting with each other and also respectively abutting against the side block sections 9. The intermediate block sections 10^a in the modification, take the place of the single central block section 10 previously referred to; and are likewise provided in their outer sides with the clearance grooves or slots for the bolts 11 journaled in the side blocks 9, but in addition to this detail, the intermediate block sections 10^a are formed in their facing sides with complementary parts of a bearing opening 18^a in which is journaled the T or equivalent journal head 17^a provided at the lower end of the stem of the extra or third fastening bolt 11^a. The outer end of this bolt 11^a accommodates thereon the binding nut 13^a working on the flanged rail clamp 15^a which rests on top of the intermediate block sections 10^a and is designed to engage the inner flange of the rail. The outer flange of the rail is engaged by the rail clamps 15 through which extend a pair of bolts 11 journaled in the side blocks 9, said bolts 11 being swung to the same side of the vertical center of the rail so as to provide duplicate spaced fastenings for the outside of the rail, all of which will be well understood by those familiar with the art.

From the foregoing it is thought that the construction, operation and many advantages of the herein described invention will be apparent without further description, and it will also be understood that various changes in the form, proportion, and minor details of construction may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

I claim:

1. In a track fastening, the tie body having a bearing cushion for each rail, and a fastener having a shiftable mounting in said cushion and carried by the latter.
2. In a track fastening, the tie body having a bearing cushion for each rail, and a fastener having a shiftable and detachable mounting in said cushion and carried by the latter.
3. In a track fastening, the tie body having a bearing cushion for each rail, and a pair of oppositely arranged fasteners having a shiftable mounting in said cushion and carried by the latter.
4. In a track fastening, the tie body having a bearing cushion for each rail, and a pair of oppositely arranged fasteners having a shiftable and detachable mounting in said cushion and carried by the latter.

5. In a track fastening, the tie body having a bearing cushion for the rail, and a fastener having a pivotal mounting in the cushion.
- 5 6. In a track fastening, the tie body having a bearing cushion for the rail, and a fastener having a pivotal and detachable mounting in the cushion.
7. In a track fastening, the tie body having a bearing cushion for the rail, and oppositely arranged fasteners having a pivotal mounting in the cushion.
- 10 8. In a track fastening, the tie body having a bearing cushion for the rail, and oppositely arranged fasteners having a pivotal and detachable mounting in the cushion.
- 15 9. In a track fastening, the tie body, a separate bearing support for the rail, and diagonally opposite fasteners pivotally mounted in said support and having their pivot centers substantially in the plane of the vertical center of the rail.
- 20 10. In a track fastening, the tie body, a separate bearing support for the rail, and fastening bolts pivoted to said support.
- 25 11. In a track fastening, the tie body, a separate bearing support for the rail, and fastening bolts pivoted to, and detachable from, said support.
- 30 12. In a track fastening, the tie body, a separate bearing support for the rail, rail clamps, and fastening bolts engaging said clamps and having a pivotal mounting at their inner ends in said support.
- 35 13. In a track fastening, the tie body having a bearing support for the rail provided with bearing openings, and rail fastening bolts having journals pivoted in said bearing openings.
- 40 14. In a track fastening, the tie body having a bearing support for the rail provided with bearing openings and with clearance grooves, and adjustable rail fastening bolts arranged in said clearance grooves and having journals pivotally engaging said bearing openings.
- 45 15. In a track fastening, the tie body, a sectional rail bearing cushion, and rail fastenings pivotally held in place by the sections of said cushion.
- 50 16. In a track fastening, the tie body having retaining pockets, a sectional rail bearing cushion seated in each pocket, and rail fastenings pivotally held in place by the sections of said cushion.
- 55 17. In a track fastening, the tie body having retaining pockets, a sectional rail bearing cushion seated in each pocket, and adjustable swinging fastening bolts pivotally held in place by the sections of said cushion. 60
18. In a track fastening, the tie body having retaining pockets, a sectional rail bearing cushion arranged in each pocket, rail clamps for each rail, and a pair of oppositely disposed adjustable swinging fastening bolts, each of which engages a rail clamp and is pivotally held in place between sections of the cushion. 65
19. In a track fastening, the tie body having retaining pockets, a sectional cushion seated in each pocket and consisting of side block sections provided with bearing openings and a central key block section, and a swinging rail fastening bolt held between each side block section and the key block section and provided with a lateral journal mounted in the bearing opening of said side block section. 70
20. In a track fastening, the tie body having cushion retaining pockets and incased reinforcing bars each provided with inclined holding lugs projecting into each pocket, a sectional bearing cushion seated in each pocket and consisting of side block sections having keeper mortises receiving said lugs and a central key block section, and a rail fastening bolt held between each side block section and the key block section and provided with a laterally extending journal portion pivotally engaging the bearing opening of the side block section. 75
21. In a track fastening, the tie body having a separate electrical insulating cushion for the rail, and a fastener having a pivotal mounting in the cushion. 80
22. In a track fastening, the tie body having an electrical insulating cushion for the rail, and a fastener having a pivotal mounting in the cushion. 85
23. In a track fastening, the tie body having an electrical insulating cushion for the rail, and a fastener having a pivotal and detachable mounting in the cushion. 90
- In testimony whereof I hereunto affix my signature in the presence of two witnesses. 95

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