

W. WHIGHAM.  
TIE PLATE FOR RAILWAY TRACK CONSTRUCTIONS.  
APPLICATION FILED DEC. 9, 1911.

1,059,799.

Patented Apr. 22, 1913.

3 SHEETS-SHEET 1.

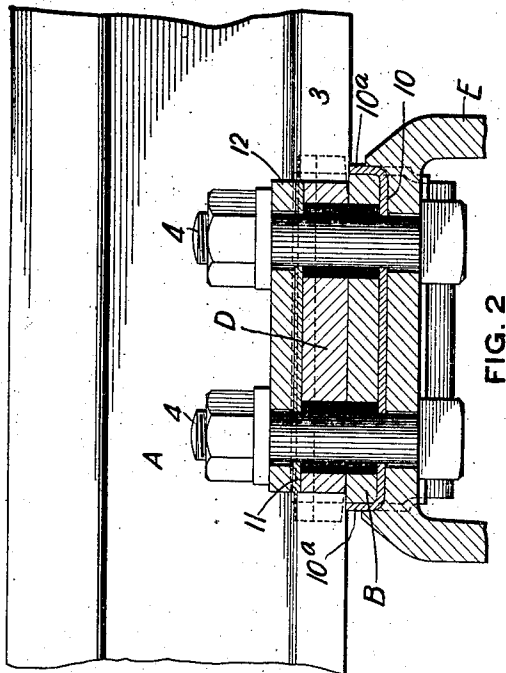


FIG. 2

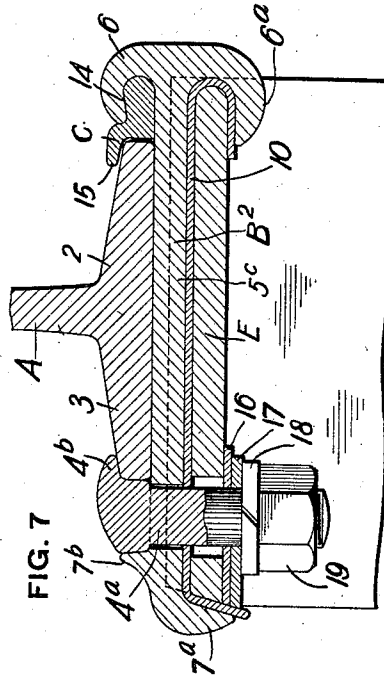


FIG. 7

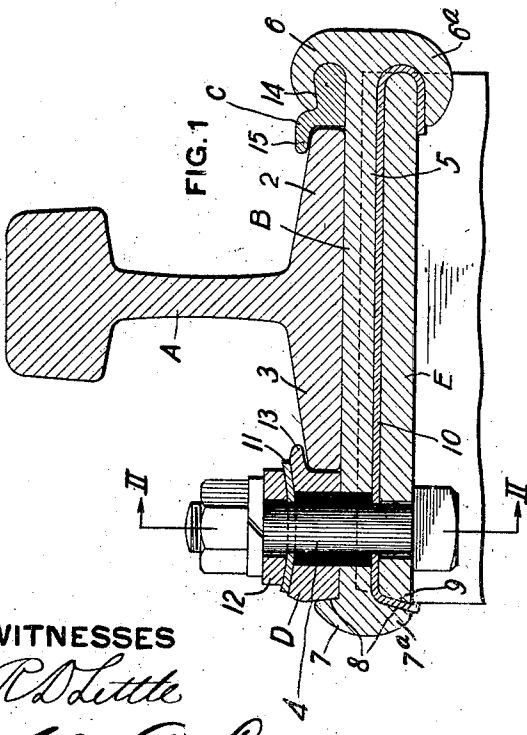


FIG. 1

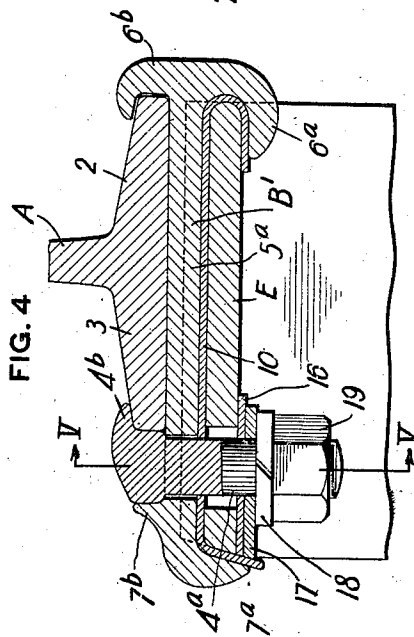


FIG. 4

WITNESSES

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3 SHEETS—SHEET 2.

FIG. 3

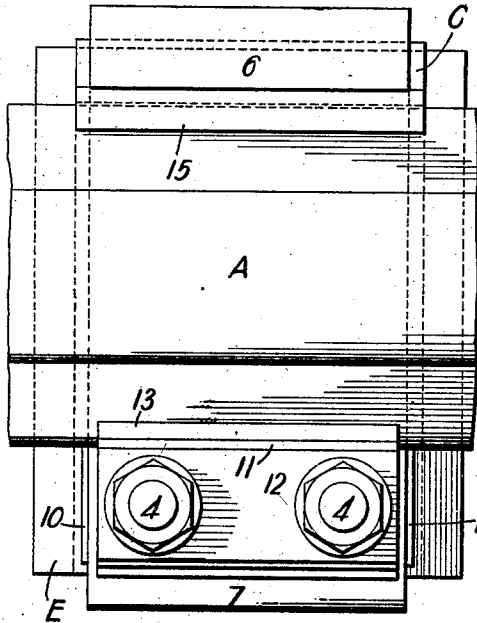


FIG. 6

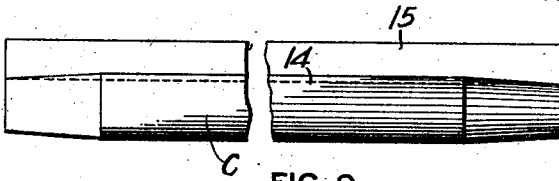
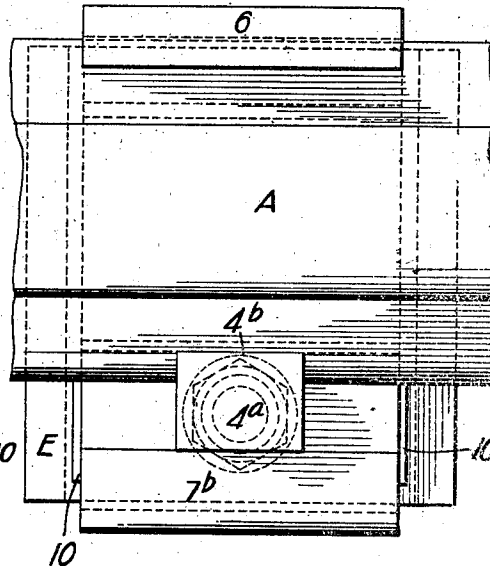


FIG. 9

FIG. 8

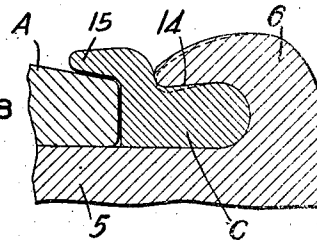
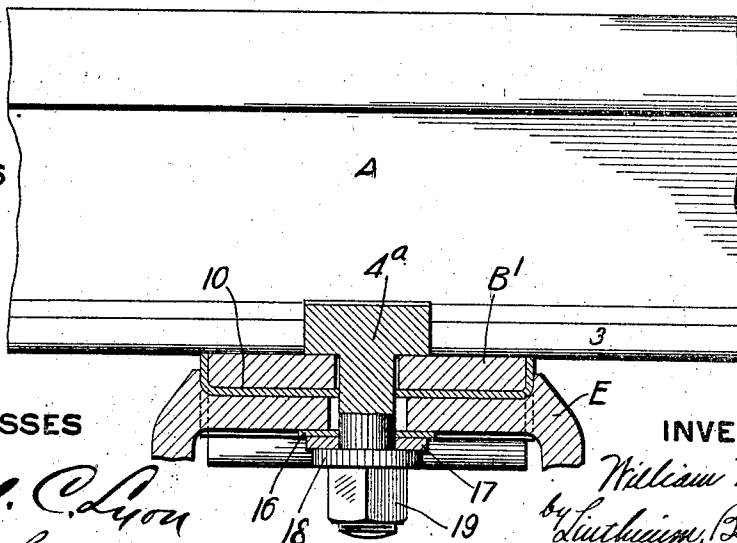


FIG. 5



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3 SHEETS-SHEET 3.

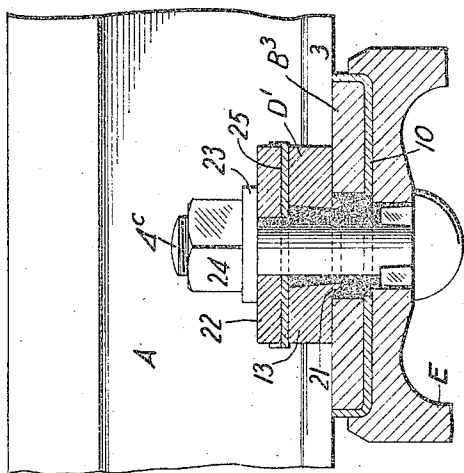


FIG. 11

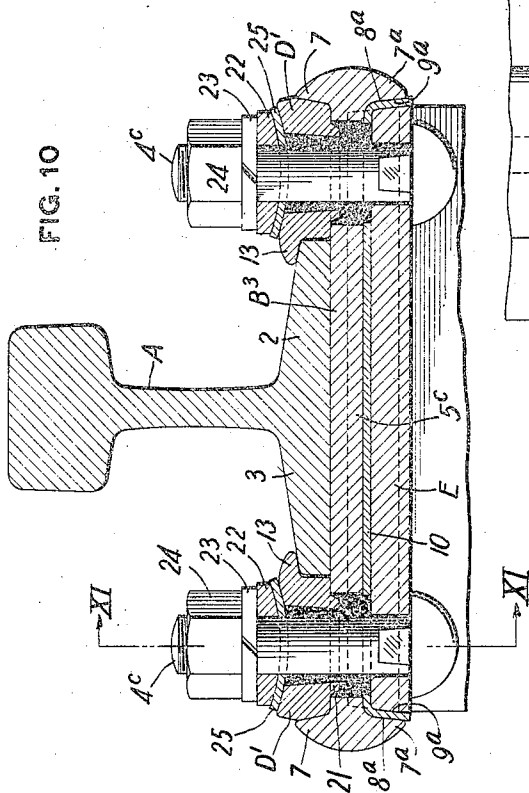


FIG. 10

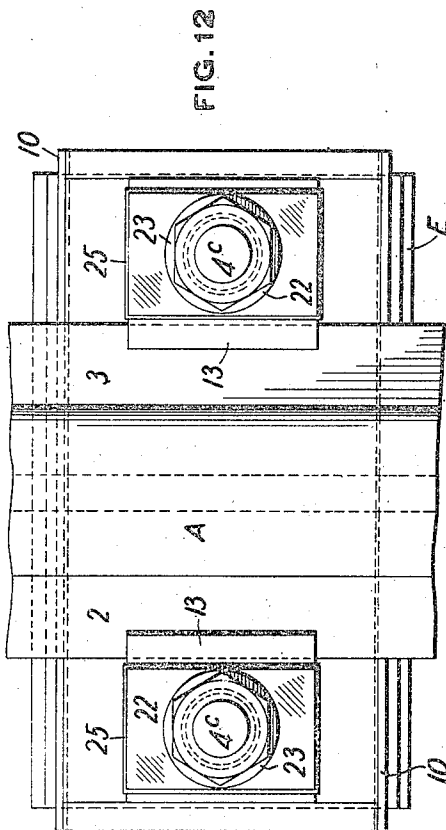


FIG. 12

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# UNITED STATES PATENT OFFICE.

WILLIAM WHIGHAM, OF PITTSBURGH, PENNSYLVANIA.

## TIE-PLATE FOR RAILWAY-TRACK CONSTRUCTIONS.

1,059,799.

Specification of Letters Patent.

Patented Apr. 22, 1913.

Application filed December 9, 1911. Serial No. 664,781.

*To all whom it may concern:*

Be it known that I, WILLIAM WHIGHAM, a citizen of the United States, residing at Pittsburgh, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Tie-Plate for Railway-Track Constructions, of which the following is a specification.

My invention relates to the construction of tie plates employed in building railway tracks, the fastenings used thereon in securing the rails in place on the ties of such railway tracks and to the means employed in insulating the track rails.

One object of my invention is to provide a tie plate of improved construction having novel means whereby the track rails are insulated from the ties and from each other, and by which the rails are rigidly secured on the tie plates against vertical and transverse movement, while permitting free lengthwise movement of the rails on the tie plate and ties.

Another object of this invention is to provide a tie plate having fastening means of improved construction whereby the tie plates and rails are secured and held in place on the ties and by the use of which the insulating medium is easily and quickly applied for use and is maintained in place to insulate the tie plates and track rails from the ties to which the rails are applied in forming the railway track.

Still further objects of the invention will be apparent as the invention is more fully described hereinafter.

Referring to the accompanying drawings forming part of this specification, Figure 1 is a sectional elevation showing one form of tie plate constructed and arranged and applied for use in accordance with this invention. Fig. 2 is a longitudinal section of the same, the section being taken on the line II—II of Fig. 1. Fig. 3 is a plan of the tie plate construction illustrated in Figs. 1 and 2. Fig. 4 is a sectional elevation similar to that shown in Fig. 1, showing a modification in the tie plate and the fastening means employed therewith by means of which the tie plate and track rails are secured in place on the rail ties. Fig. 5 is a longitudinal section taken on the line V—V of Fig. 4. Fig. 6 is a plan of the construction shown by Figs. 4 and 5. Fig. 7 is a sectional elevation similar to those shown in Figs. 1 and 4 showing a

further modification in the fastening means whereby the tie plates and track rails are secured in place on the rail ties. Fig. 8 is an enlarged detail showing in transverse section the construction and arrangement of the keeper forming part of the fastening means employed in the construction shown in Figs. 1 and 7. Fig. 9 is a longitudinal elevation on an enlarged scale of the keeper shown in Figs. 1, 7 and 8. Fig. 10 is a sectional elevation showing a further modification in the construction of the tie plate and fastenings by which the tie plate and track rails are secured to the ties. Fig. 11 is a transverse section of the same, the section being taken on the line XI—XI of Fig. 10. Fig. 12 is a plan of the construction shown in Figs. 10 and 11.

In the drawings, referring to the construction shown in Figs. 1, 2 and 3, the track rails A are secured in place on the tie plates B by means of keepers C engaging with one flange 2 of the track rails, and rail clips D which engage the opposite flange 3 of the rails A. Securing bolts 4 are employed in fastening the rail clips D in place on the tie plates B and ties E. The tie plates B have a flat web portion 5 with oppositely projecting flanges 6, 6<sup>a</sup>, 7, 7<sup>a</sup>, along the marginal edges thereof. The flanges 6, 6<sup>a</sup> along one edge are curved inwardly into hooked form, and the oppositely projecting flanges 7, 7<sup>a</sup> on the opposite marginal edge of the web 5 have downwardly and inwardly inclined inner faces 8. The downwardly extending hook flange 6<sup>a</sup> on the tie plate B is arranged to engage with the top surface of the metal tie E to which it is applied and the metal tie E has a beveled edge portion 9 adjacent to the beveled or inclined face 8 on the downwardly extending flange 7<sup>a</sup> located on the opposite edge portion of the tie plate. A sheet of vulcanite, wood fiber, or other suitable insulating material 10, which is preferably molded to the desired shape preparatory to being put into use, is placed in position between the top surface of the tie E and the under surface of the tie plate B, so as to insulate the tie plate from the tie. One marginal edge of the insulating material is curved or bent to conform to the shape of the undercut recess formed by the hook flange 6<sup>a</sup> on the tie plate B, and the opposite marginal edge of the insulating material is bent so as to extend at substantially the

same angle as the inclined races 8 and 9 of the tie E and adjacent flange 7<sup>a</sup> on the tie plate. Registering openings are provided in the top surface of the tie E, the tie plate B and the rail clip D employed therewith, through which the bolts 4 extend in securing the rail and tie plate to the tie, and a washer 11 formed of insulating material is inserted between the top surface of the rail clip D and the metal washer 12 on the bolts 4, so as to insulate the bolt 4 from the tie plate and rail clip. The diameter of the openings in the tie plate and rail clip is somewhat greater than the diameter of the bolts 4 extending therethrough, and the so-formed annular space is filled with pitch or similar insulating material. The rail clip D has a lip 13 along one longitudinal side edge which overlaps the side edge of the rail flange 3, with which it engages, so as to prevent vertical or sidewise movement of the rails. The upwardly and inwardly extending hook flange 6 on the opposite side of the tie plate forms a recessed groove for the keeper C, this keeper having a depression or groove 14 extending lengthwise in its upper surface. The hook flange 6 is formed so that its toe is curved downwardly to tightly engage the surface of the depression or groove 14 in the top of the keeper C when this keeper is inserted in place. An overhanging lip 15 is provided on the keeper C which engages with the rail flange 2 in the same manner as the lip 13 on the rail clip D in maintaining the track rails in place. The ends of the keeper C are tapered, and in forming the tie plates the hook flanges 6 engaged by the keepers C are bent downwardly so that the distance between the toe of the hook flange and the top surface of the tie plate is slightly less than the thickness through the keeper at points engaged by the toe of the hook flange. This construction is clearly shown in Fig. 8. When the keepers C are driven in place the hook flange 6 will be sprung upwardly where it contacts with the grooved upper surface of the keeper, and the end portions of the flange 6 on account of the resiliency of the metal of the tie plate will spring downwardly opposite the tapering end portions of the keeper. This downward springing of the hooked flange serves to prevent endwise movement of the keeper when inserted in place. It will be seen by reference to Fig. 2 that the marginal edges 10<sup>a</sup> of the ends of the insulation 10 are turned upwardly into contact with the ends of the tie plate web 2 and by reference to Fig. 3 it will be noted that the insulation 10 is substantially covered and protected from the weather by the metal of the track rails, bolt washers and keepers.

In the construction shown in Figs. 4, 5 and 6, the tie plate B<sup>1</sup> is provided with a

downwardly extending flange 7<sup>a</sup> and hook flange 6<sup>a</sup>, on opposite side edges of the lower surface of the web members 5<sup>a</sup> on the tie plate B<sup>1</sup> in the same manner as the flanges 7<sup>a</sup>, 6<sup>a</sup> in Figs. 1, 2 and 3. The flanges on the opposite side of the tie plate are modified to an extent, the hook flange 6<sup>b</sup> being arranged so as to engage directly with the flange 2 of the track rail A, and the keeper of Figs. 1, 2 and 3 being dispensed with in this construction. Instead of employing a rail clip as in Figs. 1, 2 and 3, a hook bolt 4<sup>a</sup> is used having a lip portion 4<sup>b</sup> which engages directly with the rail flange 3 in securing the rail in place. The head of the hook bolt 4<sup>a</sup> abuts against one side of the upwardly extending flange 7<sup>b</sup> on one side edge of the tie plate B<sup>1</sup>. The tie plate B<sup>1</sup> and the tie E have registering openings as in the previously described construction and a sheet of insulating material 10 similar to that before described is inserted between the adjacent faces on the tie plate and tie. The hook bolt 4<sup>a</sup> for securing the rail is insulated from the tie, instead of, as in the construction of Figs. 1, 2 and 3, insulating the securing bolt 4 from the tie plate B and rail A. A washer 16 formed of fiber or other insulating material in contact with the under surface of the tie E is in turn engaged by a metal washer 17 which contacts with the spring locking washer 18 shown, when the nut 19 is turned on the bolt 4<sup>a</sup> to fasten the parts together. In the construction of Figs. 4, 5 and 6, it will be necessary to back off the nut 19 from the bolt 4<sup>a</sup> to such extent as will permit sidewise movement of the rail A (from right to left as shown in Fig. 4) in removing and replacing the rails.

In the construction shown in Figs. 1, 2 and 3, the bolts 4 securing the rail clip D and the tie plate B to the tie E need not necessarily be removed, the keeper C when removed releasing the rail A and the hook flange 6 being located with respect to the marginal edge of the adjacent rail flange 2 so as to permit removal of the rail. In the construction shown in Fig. 7 the hook bolt 4<sup>a</sup> by which the rail A and tie plate B<sup>2</sup> are fastened to the tie E is the same as in Figs. 4, 5 and 6, and the flanges on the bolt side of the tie plate web 5<sup>c</sup> are also the same as that shown in Fig. 4. The oppositely projecting hook flanges 6, 6<sup>a</sup> on the opposite side of the tie plate web are constructed and arranged in the same manner as shown in Figs. 1, 2 and 3, and a keeper C is employed in this hook flange construction which is formed as before described in connection with Figs. 1, 2 and 3, 7 and 8.

In the construction shown by Figs. 10, 11 and 12 the tie plate B<sup>3</sup> is disposed with respect to the rail A and tie E in the same manner as in the preceding figures. The tie plate has a web member 5<sup>c</sup> with oppositely

disposed flanges 7, 7<sup>a</sup> on each of its opposite side edges, the tie plate of these figures preferably being symmetrical about the transverse center of the web. A sheet of insulating material 10 is placed between the lower surface of the tie plate web 5<sup>c</sup> and the top surface of the tie E and the opposite end portions of the insulation 10 are turned downwardly so as to be engaged by the adjoining faces 8<sup>a</sup>, 9<sup>a</sup> of the tie and the downwardly extending flanges 7<sup>a</sup> on the tie plate.

The opposite side edges of the insulating material 10 are turned upward so as to extend between and engage with the adjacent side edges of the tie plate web and the upwardly extending flanges on the tie, which project above the upper surface thereof. A rail clip D<sup>1</sup> having a flange engaging lip 13 is employed to engage with each rail flange 2 and 3. The top surface of these rail clips D<sup>1</sup> is curved as is best seen in Fig. 10 and the outer beveled edge engages with the flanges 7 projecting upwardly from the upper surface of the tie plate web 5<sup>c</sup>. The tie plates, tie and rail clips, and when employed, the insulating material have openings or holes therein which are in register when assembled, the bolts 4<sup>c</sup> extending therethrough in securing the several parts in place upon the tie. The holes through the tie plate are somewhat larger in diameter than the bolts and annular projections 21 on the rail clips D<sup>1</sup> extend downwardly into the holes, these projections serving to overcome any tendency of the rail clips to creep and the bolts 4<sup>c</sup> to rock or tilt on the rail ties when in use. The holes in the ties and the portions of the bolts therein are elongated or oblong so as to prevent turning of the bolts in the holes. A metal washer 22 having a curved under face and the spring locking washer 23 and nuts 24 are employed on the bolts, to hold the rail clips and tie plate on the tie in rail securing position and a fiber washer 25 is placed between the curved faces on the rail clips and the washers 22 so that the bolt is perfectly insulated from the tie plate and rail clip. To exclude moisture and more effectively insulate the parts, the annular space between the bolts and surrounding walls of the holes in the tie plate and rail clips are filled with pitch or similar insulating material.

The rail tie construction with which the tie plate and rail fastening described and claimed herein is particularly adapted for use, is fully shown and described in my co-pending application Serial No. 664,780, filed Dec. 9, 1911, for railway track constructions, although the insulated tie plate and rail fastening covering, the subject matter of this invention can be applied for use to various known metal tie constructions.

The advantages of my invention will be apparent to those skilled in the art. By the

novel construction employed the tie plates and rails are firmly secured in place on the rail ties. The tie plates and track rails are efficiently insulated from the ties, and the tie plates and insulating material is readily applied in the field when the track is being constructed and can be easily and quickly renewed or replaced when necessary or desirable. The peculiar fastening means employed in securing the rails in place permit of longitudinal movement of the rails, while preventing sidewise or vertical movement thereof on the tie plates and ties. The keepers forming part of the rail securing means, when used, enable the rails being readily removed and replaced in the track without necessarily disturbing the tie plate and insulation with respect to the ties.

Modifications in the construction and arrangement of the parts may be made without departing from my invention as defined in the appended claims. The keepers may be employed or not as is desired, the number of securing bolts used in fastening the parts together may be changed, and other variations may be made.

I claim:—

1. In a railway track construction, a tie plate comprising a web having integral oppositely extending flanges on opposite marginal edges thereof, the flanges on one face of said web engaging the side edges of the tie to prevent relative sidewise movement thereof, insulating means between the tie plate and tie and means for fastening the tie plate and insulation on the tie, said means being arranged to secure and hold the track rail in place on the tie plate.

2. In a railway track construction, a tie plate comprising a web having integral parallel oppositely extending flanges on opposite marginal edges thereof, the flanges on one face of said web engaging the side edges of the tie to prevent relative sidewise movement thereof, the flanges on one marginal edge being bent to form hooks, the hook flanges embracing the track rail and tie in securing the rail and tie plate on the tie and means for securing the tie plate flanges in engagement with the tie.

3. In a railway track construction, a tie plate comprising a web having integral oppositely extending flanges on opposite marginal edges thereof, the flanges on one face of said web engaging the side edges of the tie to prevent relative sidewise movement thereof, the flanges on one marginal edge being bent to form hooks, the hook flanges embracing the track rail and tie in securing the rail and tie plate on the tie and means for securing the tie plate flanges in engagement with the tie, said means being constructed and arranged to secure and hold the track rails in place on the tie plate.

4. In a railway track construction, a tie

plate comprising a web having integral parallel oppositely extending flanges on opposite marginal edges thereof, the flanges on one face of said web engaging the side edges of the tie to prevent relative sidewise movement thereof, the downwardly extending flange on one marginal edge being bent into hook form, the hook flange embracing the side edge of the tie in securing the tie plate to the tie and means for securing the hook flange in engagement with the tie.

5. In a railway track construction, a tie plate comprising a web having integral oppositely extending flanges on opposite marginal edges thereof, the flanges on one face of said web engaging the side edges of the tie to prevent relative sidewise movement thereof, the downwardly extending flange on one marginal edge being bent into hook form, the hook flange embracing the side edge of the tie in securing the tie plate to the tie and means for securing the tie plate flanges in engagement with the tie, said means being constructed and arranged to secure and hold the track rails in place on the tie plate.

6. In a railway track construction, a tie plate comprising a web having integral oppositely extending flanges on opposite marginal edges thereof, said flanges co-acting to prevent relative sidewise movement of the track rail and tie plate on the tie and means for securing the tie plate on the tie with the downwardly projecting flanges thereof in operative engagement with the tie, said securing means also fastening the track rails in position on the tie plate.

7. In a railway track construction, a tie plate comprising a web having integral parallel oppositely extending flanges on opposite marginal edges thereof, the flanges on the tie plate co-acting with the tie and the rail prevent relative sidewise movement of the track rail and tie plate on the tie, the flanges on one marginal edge being bent to form hooks, the downwardly extending hook flange embracing the rail tie and means for securing the tie plate on the tie and holding the flanges thereon in operative engagement therewith.

8. In a railway track construction, a tie plate comprising a web having integral parallel oppositely extending flanges on opposite marginal edges thereof, the flanges on one face of said web engaging the side edges of the tie to prevent relative sidewise movement thereof, the flanges on one marginal edge being bent to form hooks, the downwardly extending hook flange embracing the top flange of the tie, the upwardly extending hook flange forming a recess, a keeper removably secured in said recess engaging with one rail flange in holding the rail on the tie plate and means for securing the tie plate on the tie with the downwardly extending flanges in engagement with the tie.

In testimony whereof, I have hereunto set my hand.

WILLIAM WHIGHAM.

Witnesses:

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S. FRANK STEDEFORD.