Feb. 12, 1924. 1,483,792

J. M. R. FAIRBAIRN

ANCHOR TIE PLATE

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Fig. 1.

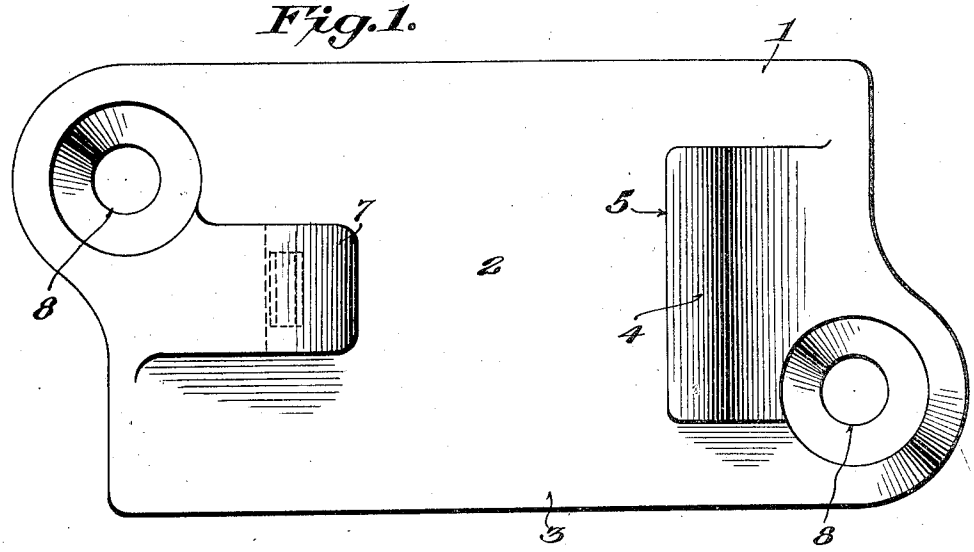
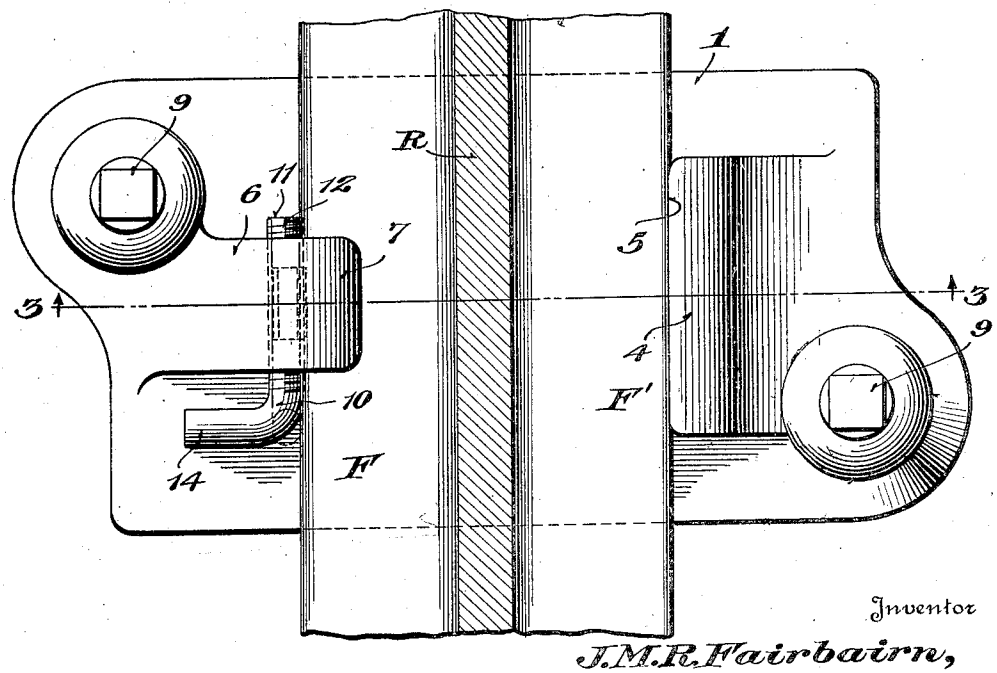


Fig. 2.



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ANCHOR TIE PLATE

Filed Sept. 22, 1922 4 Sheets-Sheet 2

Fig. 3.

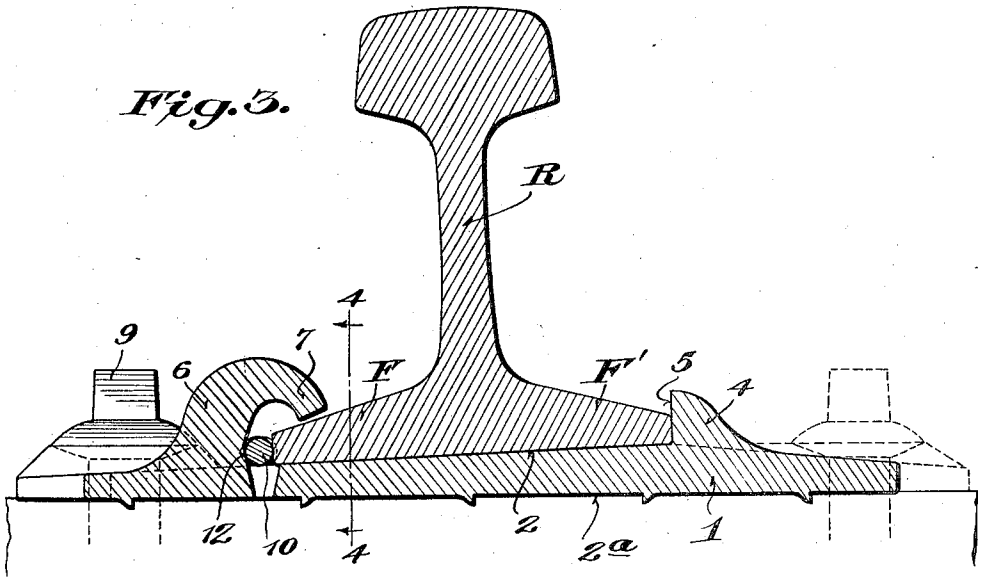


Fig. 4.

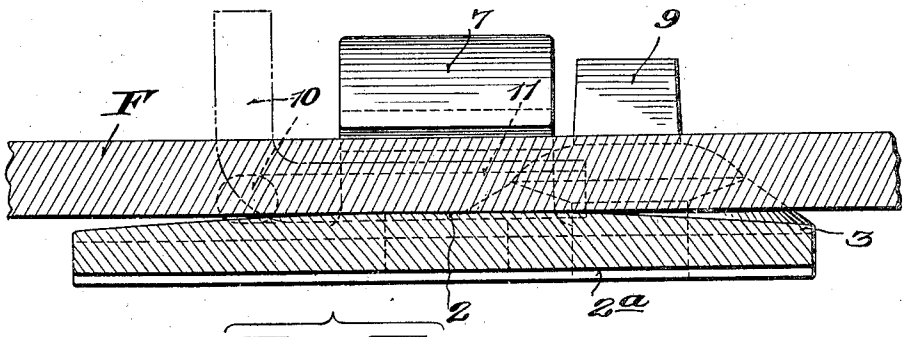
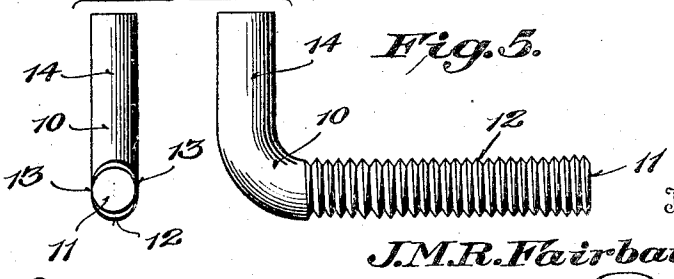


Fig. 5.



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ANCHOR TIE PLATE

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Fig. 6.

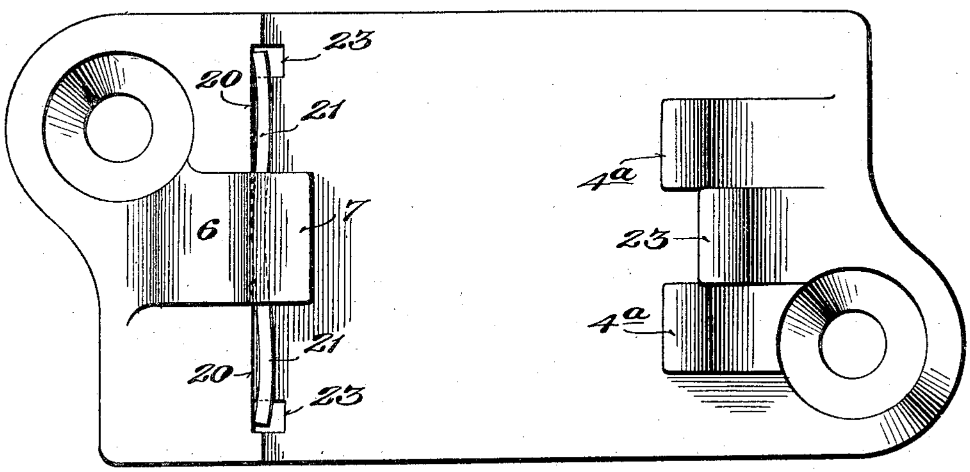
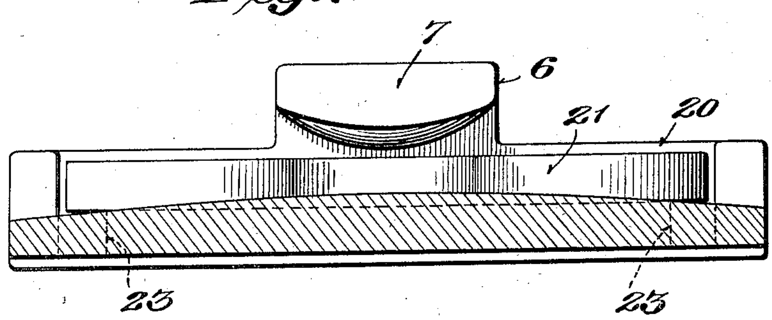


Fig. 7.



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1,483,792

ANCHOR TIE PLATE

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Fig. 8.

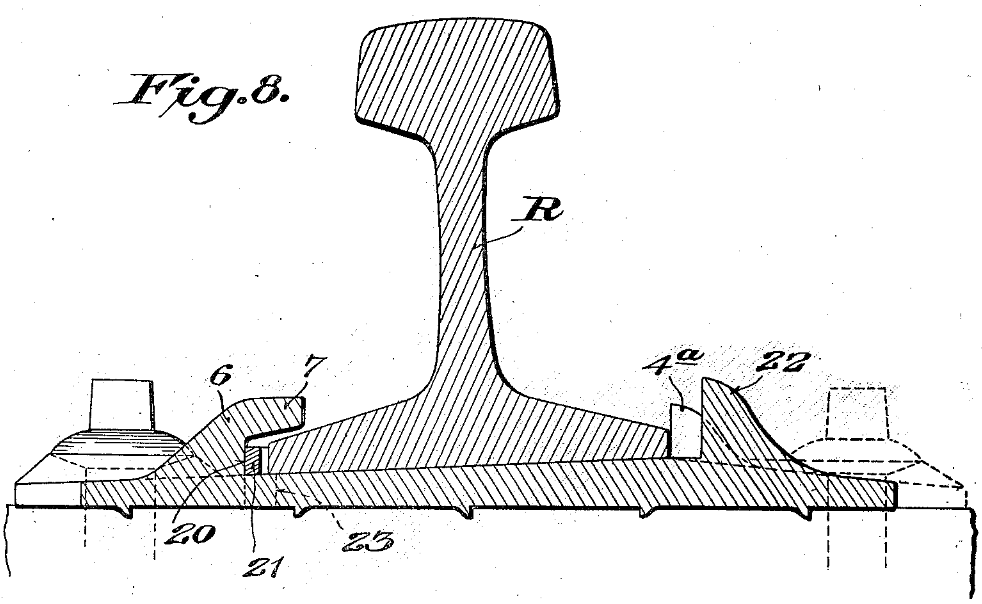
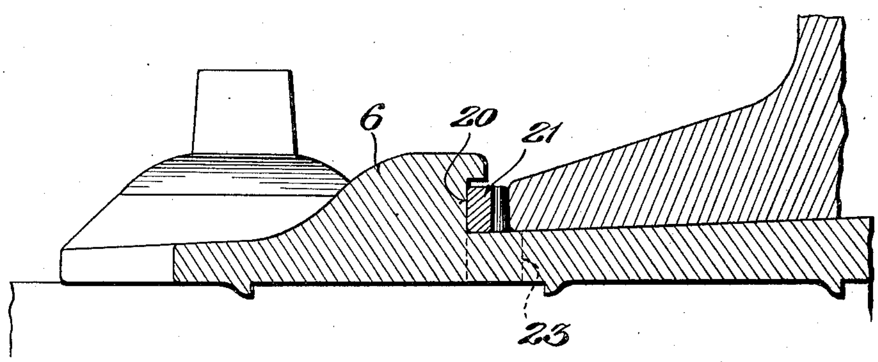


Fig. 9.



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UNITED STATES PATENT OFFICE.

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ANCHOR TIE PLATE.

Application filed September 22, 1922. Serial No. 589,826.

To all whom it may concern:

Be it known that I, JOHN M. R. FAIRBAIRN, a subject of the King of England, residing at Montreal, in the Province of Quebec, Canada, have invented certain new and useful Improvements in Anchor Tie Plates, of which the following is a specification.

This invention relates to a novel rail-holding tie plate possessing special utility in facilitating the accurate laying and seating of rails on ties without the use, if desired, of the usual rail-holding spikes or equivalent fasteners.

Primarily, therefore, the present invention contemplates a novel combination of features in a tie plate responding to the requirements of track as to correct positioning and seating of the rail, as well as facilitating the convenient laying and holding of the rail without being spiked down independently of the tie plate spikes as is now the practice.

Furthermore, it is now considered by skilled engineers good practice to hold the rail canted or inclined in track, and to give it a seat on a rail-plate seat crowning in the direction of the length of the rail, thus better enabling the rail to properly absorb and distribute the loading strains.

To that end the present invention provides a practical tie plate combining those features together with the novel means for holding a rail to gauge, as well as preventing displacement from its seat, and accomplishing these desirable results without the use of rail-holding spikes.

As is well known to those familiar with track conditions, there is a decided tendency of rails in either straight or curved sections of track to "roll out" or become tilted outwardly due to the combination of forces acting upon the head of the rail, thus causing undesirable disalinement and spreading of the rails. That is to say, owing to the wheel load acting vertically and the wheel flange thrust acting horizontally on the head of the rail, there is a tendency for the head of the rail to cant outwardly from the gauge side. Under the most favorable conditions of track, rolling stock, and speed, there would be very little wheel flange thrust against the rail. And, if curves could be elevated to meet the requirements of each train, if car trucks pivoted freely, and the track could be maintained to a perfect line and surface, the lateral thrust or strain on the rails would be negligible. However, since these ideal conditions are not entirely practicable, the lateral wheel flange thrust becomes a factor that must be taken care of, thus making it desirable to cant or tip the rails inwardly so as to bring the rail base in a plane approximately at right angles to the resultant of the combined vertical and lateral forces acting on the rail.

These conditions are recognized in the making of the present invention, which therefore is intended to respond as far as practicable to the ideal conditions recited, at the same time making it possible to establish a new practice of accurately fitting tie plates to the ties in a shop or other place with shop facilities, and afterwards placing the ties in the road bed, properly alining the tie plates and hooking-in the rail on the tie plates without the use of spikes or equivalent fastenings for engaging the rail.

A further object of the invention is to provide a novel construction of tie plate which lends itself readily to the application of a rail check or anti-creeping means, which may or may not be employed if desired.

It will be seen therefore that the present invention provides a construction which facilitates the emplacement of a rail in track, as well as providing means for holding the same onto its seat without the necessity of spiking to the flanges thereof, and at the same time having the advantages incident to the use of a tie plate presenting an inclined and crowned rail seat, so distributing the lateral thrust and the wheel loads as to firmly maintain the position of the rail and allow the latter to adjust itself easily under the load. At the same time the improved construction permits the ties to be bedded in their usual horizontal position.

In its more specific aspect therefore the present invention contemplates a novel rail-holding tie plate combining novel structural features, including a seat designed to better permit the wave motion of the rail to carry along, while also providing means for resisting lateral sliding and rocking movement of the rail, and yet admitting of perfect

freedom to lift the rail out of track when desired by workmen, due to there being no means for holding the same down on the outer side. Also to provide spike locations relatively remote from the rail so that there is no wear or pulling directly on the spikes by the rail action.

With the above and other objects in view which will more readily appear to those familiar with this art as the nature of the invention is better understood, the same consists in the novel construction, combination and arrangement of parts hereinafter more fully described, illustrated and claimed.

Though the invention is necessarily susceptible of embodiment in modified forms of construction without departing from the spirit or principle of the invention, nevertheless, for the purposes of example, a preferred and practical embodiment of the invention is shown in the accompanying drawings in which—

Figure 1 is a plan view of one form of rail-holding tie plate containing the present invention.

Figure 2 is a view showing a rail positioned on the tie plate.

Figure 3 is a vertical cross-sectional view taken on the line 3—3 of Figure 2.

Figure 4 is a detail vertical sectional view taken on the line 4—4 of Figure 3.

Figure 5 is a detail view of a type of anti-creeping means that may be employed if desired.

Figure 6 is a plan view showing another form of the improved tie plate that may be used with a compression spring check.

Figure 7 is a cross-section of the modified plate.

Figure 8 is a sectional view of the plate with a rail shown seated thereon.

Figure 9 is a detail view showing a modification of the plate, providing a recessed shoulder for holding the check spring in place.

Similar reference characters designate corresponding parts throughout the several figures of the drawings.

In carrying the present invention into effect it is proposed to provide a rail-holding tie plate 1 of suitable dimensions and having a rail seat 2, and a horizontal tie-engaging base 2^a, of a suitable character. A characteristic feature of the tie plate is that the rail seat 2 is inclined at a predetermined ratio, such as 1 to 20 or other ratio figured accurately to obtain a proper canting of the rail, so as to bring the rail base into a plane approximately parallel to the coning of the wheel. Furthermore, the inclined rail seat is preferably crowned transversely of the plate, as shown, the crowning being in the direction of the length of the rail, as indicated in Figures 4 and 7, thereby reducing the frictional area of the rail base with its seat and providing easement from the rail at the edges of the plate so that better freedom is given to the rail in its wave motion.

At the outer side of the rail seat 2 the tie plate body 1 is provided with an outer abutment shoulder 4, having an upright inner wall 5, while at the opposite side of the rail seat the tie plate is formed with an upwardly projecting inner abutment member 6. In the suggested embodiment of the plate shown in Figures 1–4, this inner abutment member may be formed with an inturned hook or holding flange 7 which overhangs the position of the inner flange of the rail, but this hook or flange may be omitted, under certain conditions, as hereinafter referred to. The corners of the plate body 1 or other portions of the plate relatively remote from the seat 2, and outside of the locations of the outer and inner abutment members 4 and 6, may be provided with the openings 8 for receiving the screw spikes 9 or their equivalent.

The novel construction of the tie plate 1 above described permits of the sliding of the rail R laterally onto the seat 2 from the outside of the plate so that the inside flange F of the rail becomes disposed beneath the overhanging portion 7 of the abutment 6, while the outer base flange F′ solidly engages with the upright shoulder 5 of the abutment 4. When the rail is thus placed in position, it will be apparent that it is effectually and properly held, because it cannot slide laterally outward due to the abutment 5, and its inner flange cannot lift on account of the overhanging element 7. However, when it is desired to remove the rail for repairs or other reasons, workmen can readily lift the outer flange above the upright face of the abutment 4, and then withdraw the rail from its position beneath the hook.

The design of the improved tie-plate lends itself readily to the use therewith of a suitable rail-check or anti-creeping means. Several different kinds of such checks can be employed, such for example, as those shown respectively in the groups of Figures 1 to 4 and 7 to 9 of the drawings. The example of check illustrated in Figures 1 to 4, consists of a key wedge or equivalent member 10 preferably interposed between the edge of one rail flange and the base part of the inner abutment member 6, thus holding the rail firmly against the outer shoulder of the plate, and providing an effective anti-creeping check or rail anchor.

As shown in Figure 5, this check may consist of the key member 10 having a shank portion 11 provided with threads 12, the said threads being mutilated, as indicated at 13, to provide in effect flat sides for the shank and reducing its width, producing a camming shank member of ob-

long or somewhat elliptical cross section. Due to the narrowing or reduction in the width of the thread portion of the shank, as indicated, the key may be readily inserted with its smaller diameter or narrow portion between the edge of the flange F of the rail and the inside face of the abutment 7 with the head or handle 14 of the key in an upright position, as shown in dotted lines in Figure 4. The said head or handle 14 may then be struck a blow by a track maul or other similar tool to displace it from its upright position to a horizontal position, as also shown by the dotted lines in Figure 4 and by the full lines in Figure 2. When the key is thus forcibly struck and rotated on the axis of its shank, the widest part or major diameter of the shank will be brought into play to force the threads or serrations thereof into biting engagement with the edge of the rail flange and also with the hook. Thus, the rail is effectively held against longitudinal creeping and at the same time is forced into firm engagement with the upright face 5 of the shoulder 4 when the anti-creeping means is employed in connection with the tie plate. When it is desired to remove the rail, the anti-creeper may be readily withdrawn by prying up the head or handle 14 by means of any suitable and available tool which will release the engagement of the hook and the rail and permit of the same being readily removed.

Referring to a desirable and practical embodiment of the invention shown in Figures 6 to 9 of the drawings, the inner abutment member 6 may be recessed as at 20 to receive therein a rail check in the form of a modern compression spring 21. This spring preferably is a leaf compression spring, waved throughout its length and disposed against the inner abutment 6 in a direction parallel to the inner rail flange which is intended to be placed under pressure against said spring. In this application of the invention the inturned holding hook or flange 7 of the inner abutment shoulder 6 may be omitted, as shown in Figure 9, as the powerful spring force exerted by said spring when under tension will ordinarily be sufficient to firmly hold the rail against the outer abutment shoulders 4^a on the plate. In this embodiment, it may be desirable, as shown, to have a pair of spaced outer abutment shoulders 4^a, against which the outer rail flange is held, with an intermediate fulcrum lug 23 between, but set back from the said spaced abutments. This fulcrum lug permits a claw bar or other tool to be conveniently used in forcing the rail over the abutments 4^a against the holding or check spring, as well as facilitating the prying out of the rail from its seated position. Holes 23 adjacent the ends of the spring 21 afford similar means to facilitate the seating or unseating of the spring.

From the foregoing it will be apparent that the present invention aims to provide a novel rail-holding tie plate for securing the rails in position without the aid of spikes engaging directly with the rail, thus permitting the adoption, if desired, of the new practice of fitting the tie plates to the ties at a shop or other place of assembly with shop conveniences; after which it will only be necessary to position the ties in the road bed, with the tie plates properly alined, and then drop the rail into position by sliding the inner flange thereof beneath the hook 6 and permitting the outer flange to drop behind the abutment shoulder 5. The invention also permits of the effectual use of a simple and practical type of anti-creeping means, as explained.

Without further description it is thought that the features and advantages of the improvement will be readily apparent to those skilled in the art, and it will of course be understood that changes in the form, proportion and minor details of construction may be resorted to without departing from the spirit of the invention or scope of the appended claims.

I claim:

1. A tie plate provided with a horizontal tie engaging bottom surface and a top inwardly and downwardly inclining rail seat, said rail seat being crowned in the longitudinal direction of the rail, a straight abutment shoulder at the outer side of the rail seat, and a rail-holding member located at the lower and inner side of the said rail seat.

2. A tie plate provided with a horizontal tie engaging bottom surface and a top inwardly and downwardly inclining rail seat, said rail seat being crowned in the longitudinal direction of the rail, a straight abutment shoulder at the outer side of said seat and an inturned rail-holding member located at the inner side of said seat and overhanging the inner flange position.

3. A tie plate provided with a horizontal tie engaging bottom surface and a top inwardly and downwardly inclining rail seat, said rail seat being crowned in the longitudinal direction of the rail, an abutment shoulder provided at one side of the rail seat and a relatively narrow rail-holding hook at the inner side of the rail seat, and said tie plate being provided with spike holes disposed beyond and outside of the rail seat and the locations of said shoulders and said hook.

4. A tie plate provided with a horizontal tie engaging surface and a top inwardly and downwardly inclining rail seat, said seat being crowned in the longitudinal di-

rection of the rail, an outer straight abutment shoulder, an inner relatively narrow rail holding hook, and anti-creeping means cooperating with the rail-holding hook and one rail flange.

5. The combination of a tie plate having an inclining and crowned rail seat, an abutment shoulder provided at one side of the seat, an abutment member located at the opposite side of the said seat, and an anti-creeping means interposed between one of said abutments and one rail flange.

6. A tie plate having an inclining and crowned rail seat, an abutment at the outer side of the rail seat, an abutment at the inner side of the rail seat, and anti-creeping means seated against one of the abutments and comprising a compressible spring.

7. A combination of a tie plate having an inclining and crowned rail seat, an abutment member provided at the outer side of the seat, an abutment member provided at the inner side of the seat, and a rail-holding spring seated against one of the abutment members and adapted to engage under tension one rail flange.

8. The combination of a tie plate having an inclining and crowned rail seat, a recessed shoulder arranged at one side of the seat, an abutment shoulder arranged at the opposite side of the seat, and a bent compressible leaf spring seated in the recessed shoulder and adapted to engage under tension an edge of one rail flange.

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

JOHN M. R. FAIRBAIRN.

Witnesses:
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F. M. DUCKETT.