

March 16, 1926.

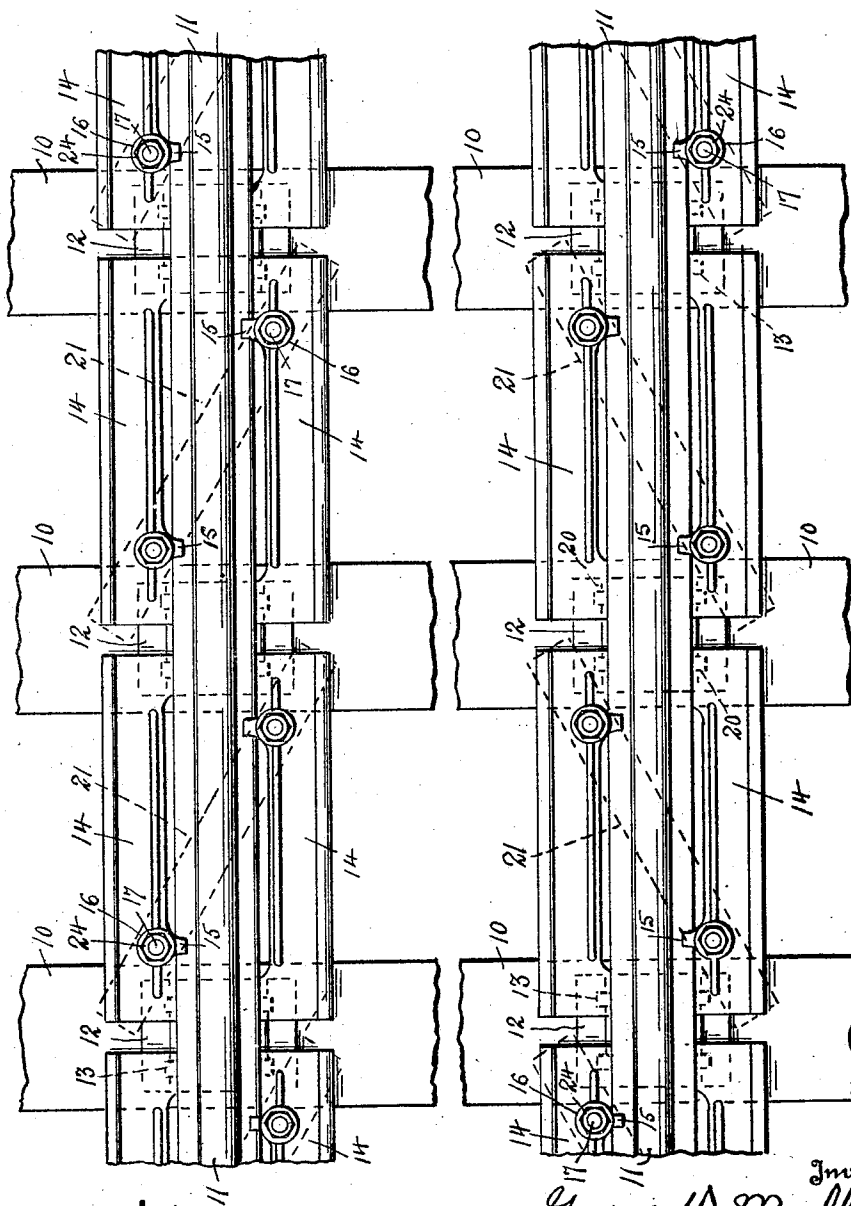
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G. W. MULLER

RAIL AND TIE HOLDING MEANS

Filed Oct. 27, 1925

3 Sheets-Sheet 1



TIE

Inventor  
George W. Muller  
By William D. Deane  
his Attorney

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G. W. MULLER

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3 Sheets-Sheet 2

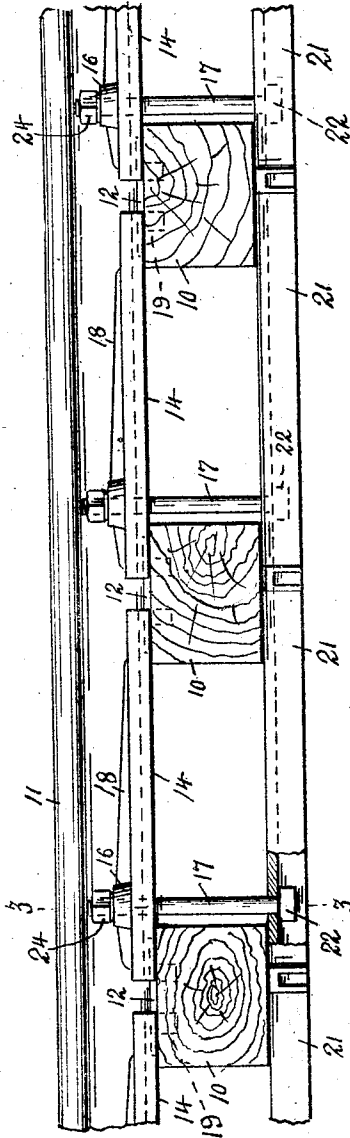


Fig. 2.

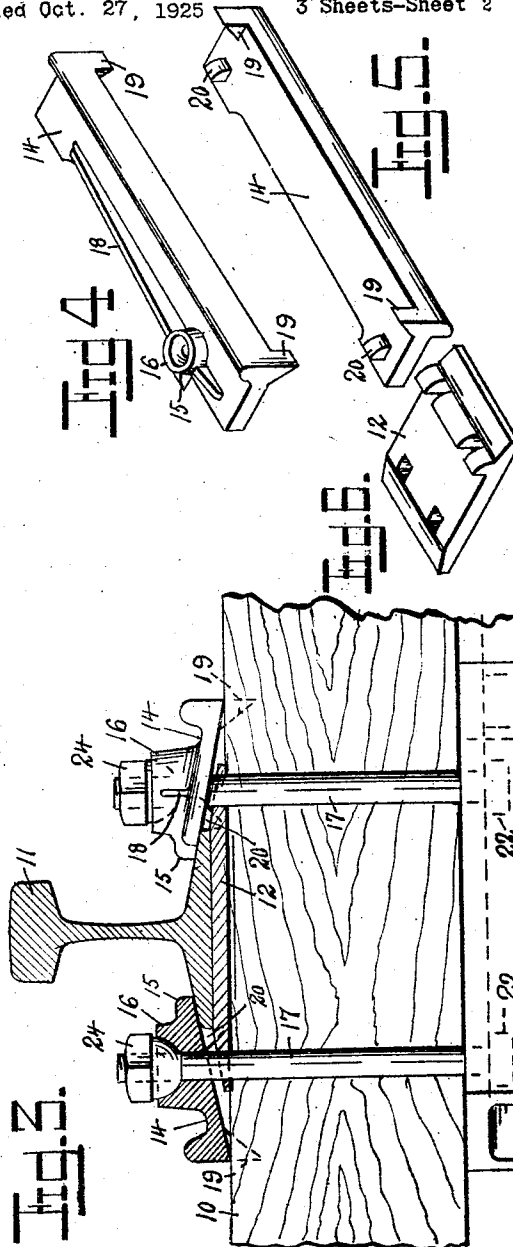


Fig. 3.

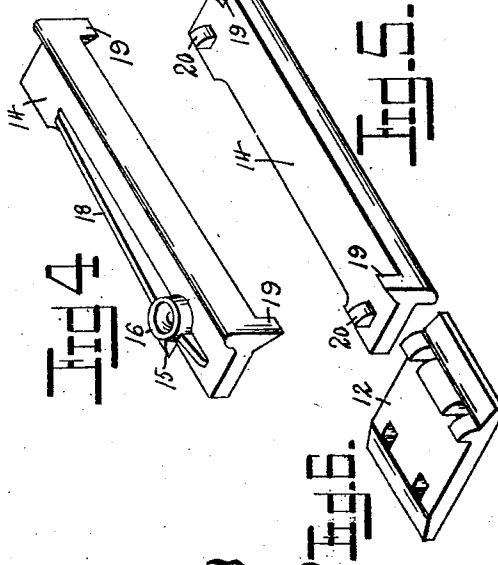


Fig. 4.

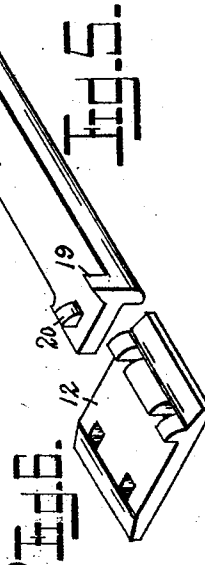


Fig. 5.

Inventor  
George W. Muller;  
William D. Dine,  
his Attorney

March 16, 1926.

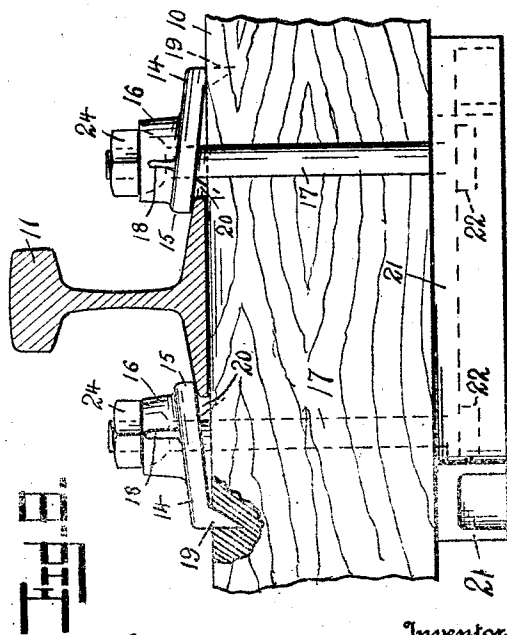
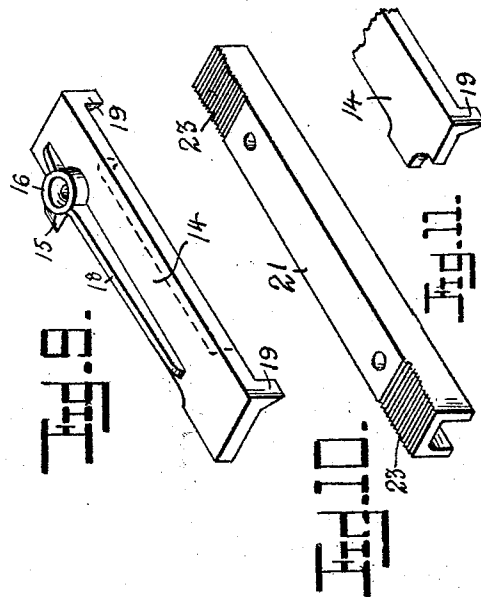
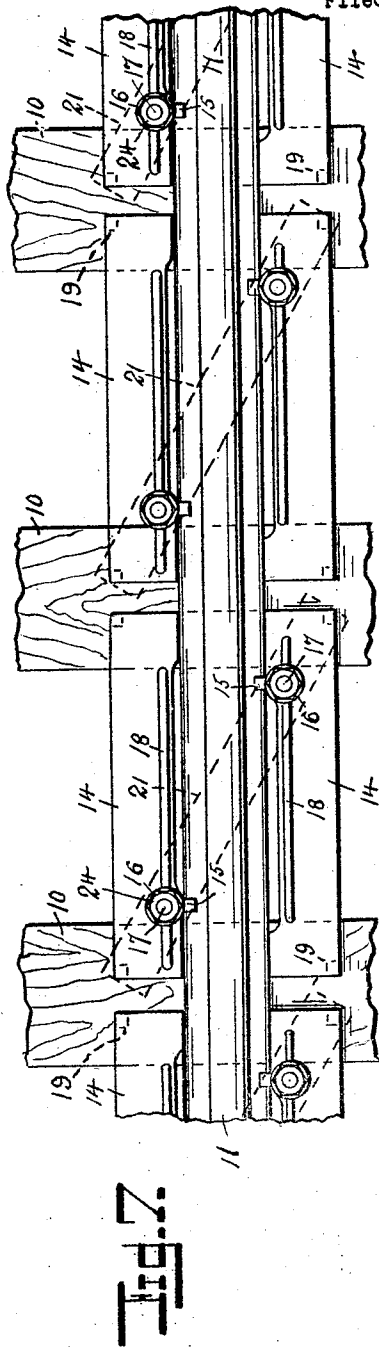
G. W. MULLER

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RAIL AND TIE HOLDING MEANS

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3 Sheets-Sheet 3



Inventor  
George W. Muller.  
By William D. Deane  
his Attorney

# UNITED STATES PATENT OFFICE.

GEORGE W. MULLER, OF WASHINGTON, DISTRICT OF COLUMBIA.

## RAIL AND TIE HOLDING MEANS.

Application filed October 27, 1925. Serial No. 65,147.

*To all whom it may concern:*

Be it known that I, GEORGE W. MULLER, citizen of the United States, residing at Washington, District of Columbia, have invented certain new and useful Improvements in Rail and Tie Holding Means, of which the following is a specification.

This invention relates to railway trackage, and has for one of its objects to provide simply constructed attachments whereby the tendency of the rails and ties to creep or "flow" longitudinally under the impact of the rolling stock is effectually resisted, and the rails and ties maintained in position.

The construction of the ordinary railway track including the cross ties, rails and ballast is such that they have a tendency to creep or flow longitudinally of the rails under the severe impact of the rolling stock, especially the heavy locomotives now required to meet traffic demands, and this movement is serious, and materially increases the expense of maintenance and repairs, and is moreover very deleterious to the rails and ties.

To counteract this tendency of the rails and ties to creep or "flow", to use a term commonly employed in railway parlance, is the principal object of the present invention, which may be applied without structural change to the rails, ties, and tie plates, when the latter are used.

In the drawings employed to illustrate the construction and application of the invention, a conventional section of a railway track is shown with the improvement applied, and in the drawings thus employed—

Figure 1 is a plan view of a section of a railway track with the improved rail and tie holding devices applied where tie plates are employed.

Figure 2 is a side elevation of the parts shown in Figure 1.

Figure 3 is a transverse section, enlarged on the line 3—3 of Figure 2.

Figure 4 is a detached perspective view, from above, of one form of the clamp member.

Figure 5 is a detached perspective view, from below, of the form of clamp plate shown in Figure 4.

Figure 6 is a perspective view of a tie plate of conventional form.

Figure 7 is a plan view illustrating the manner of employing the improved device where the plates are not used.

Figure 8 is a cross section, enlarged of the rail end shown in Fig. 7, the two clamping plates at the end of the rail being omitted. In this Fig. 8 is also shown the engagement of one of the spurs and a tie to hold the plate in place.

Figure 9 is a detached perspective view of another form of the clamp member.

Figure 10 is a detached perspective view of one of the combined braces and stay bars.

Figure 11 is a detail perspective view of a modified form of the clamp plate.

The improved device may be employed in coactive relation to the usual tie and rail structures in which tie plates are employed between the rails and ties, or to tie and rail structures in which no tie plates are used, and for the purpose of illustration the device is shown arranged in connection with both forms.

The usual railway trackage includes ties 10, rails 11 and tie plates 12 bearing on the ties and on which the rails rest, and secured in place by the usual spikes indicated at 13, the tie plates having apertures to receive the spikes, as represented in Figure 6.

This constitutes the usual or ordinary railway construction, and under normal conditions does not present sufficient resistance to prevent the rails or the rails and ties from creeping or flowing under the impact of the rolling stock.

The improvement which is the subject matter of the present application includes two essential elements, a clamp plate bearing over at least two of the ties and against the opposite edges of the rail flanges, and a combined brace and holding member bearing beneath the ties, and preferably directed obliquely to the longitudinal axis of the rails, and coupling means such as clamp bolts uniting the clamp plates and brace elements.

The clamp plates are indicated as a whole at 14 and each includes a lateral lug 15 near one end and extending over the tie flanges of the rails 11, the lugs preferably, extending from enlargements or bosses 16 rising from the upper faces of the plates, and apertured to receive clamp bolts 17 as shown. The plates are reinforced and

stiffened by longitudinally directed integral ribs 18.

The plates 14 are preferably cut away intermediate the ends, to decrease the weight thereof.

At its outer corners each plate is formed with tie penetrating spurs 19, and likewise formed with spurs 20 at the inner edges and preferably spaced from the ends.

When the plates 14 are employed upon trackage which include the tie plates 12, as shown in Figures 1, 2 and 3, one or all of the spikes 13 of each tie plate is withdrawn and the spurs 20 inserted in the aperture in the plate from which the spike has been removed, as illustrated in Figure 3, and when the device is employed upon trackage where the tie plates are not used, the spurs 20 will be driven into the ties the same as the spurs 19, as illustrated in Figure 8. If deemed expedient, the spikes can remain in place in the tie plates; the clamp plates being cut away at their corners to accommodate the spike heads, as shown in Figure 11.

The combined brace and holding members are each represented as a whole at 21, and each preferably formed of a section of a channel bar and perforated to receive the clamp bolts 17.

The members 21 are arranged reversely oblique to the longitudinal axis of both of the rails 11, or with the bars beneath the ties and rails directed inwardly and forwardly, or toward the line of travel of the rolling stock, as illustrated in Figure 1, and effectually brace the rails and ties and prevent them from creeping or flowing under the impact of the rolling stock, as hereinbefore stated. Hence, the whole structure is firmly braced which results in a perfect tight fitting of all the elements involved, thereby preventing undulating movement of the rolling stock.

The lower ends of the bolts 17 are formed with square heads 22 to engage in the channels of the bars 21, and operative to prevent the bolts from rotating.

The upper faces of the bars 21 at the ends are serrated or otherwise roughened as shown at 23, to provide a gripping element between the bars and ties, to assist in holding them in positive engagement with the ties when the nuts 24 of the bolts are strained.

The ties when held by usual clamping devices slip sideways of the track and when a train is running at a high rate of speed and hits a low place in the track or curve, it throws the tracks out of line and causes the ties to slip and the rail to break at the joint, and causes wrecks. The ties creep and crawl forward with the motion of the train. The rails flow or crawl forward under the motion of the trains and causes

the breaking or bulging out of the rails, thus resulting in many wrecks and great expense to the railroad. It will therefore be understood that the safeguarding of life is a desideratum of my invention.

The clamp plates are made so that they fit on the plain wood tie surface, or fit over the various standard type tie plates now used by railroads. The plates have two prongs, or "dogs," on the outer edge to drive down into the tie, to keep the plate in line with the track and from slipping back from the rail. The points of said prongs are similar to a spike end, the outside face of the prongs being straight up and down to give a shoulder or bearing to prevent the plate from moving back, and to hold the tie and keep it in place from slipping. The inside of said prongs, slopes to the bottom or under the side of the plate.

On the inside edge of said plate the spur is designed to fit down in the spike hole of the tie plate, or if steel tie plates are not used, the spur can be driven down into the wood tie. Near one end of the plate is a projecting stud or tongue which laps down over the lower edge of the rail, after the fashion of a spike head, so that when the bolts are drawn and the pressure put on the top of the plate, it pulls the rail down to the tie. The aperture for a clamp bolt is set back from the edge of the tie, so that various widths of ties can be used and to give clearance, and avoid boring holes through the ties, which weaken the same, and allows water to enter, thereby deteriorating the ties.

The spurs 20 on the lower surface of plates 19 fit directly against the edge of the lower flange of the rail to hold the same in line.

The top of the hole in the plate is made to receive a half ball socket joint so as to take up the lateral motion as well as the vertical motion of the rails, therefore retaining the pressure constantly uniform against the bottom of the nut and bolt.

It has been extremely difficult for railroad engineers and track builders to hold the rails down to the ties. The rails, when first laid, and the spikes driven into the tie to hold the rails down, begin to work loose in a short time. The spikes work out and leave the rail loose on the tie plates and the tie. Hence, day by day, such condition grows worse. More space for the parts to work loose is left, between the bottom of the rail and tie plate and tie.

Space between the rail and the tie causes the rail to work up and down and beat on the tie and tie plate caused by the running and weight of the trains which therefore results continually in cutting deeper into the tie until same wears out. Not only on top of the tie does this condition occur, but

the bottom of the tie also suffers to a great extent by a similar beating down on the rock ballast.

Then again the rail being loose on the ties gives the rail an opportunity to twist thereby causing the same to wear out quicker, resulting therefore in irregular running of the tread of the wheel, which brings about uneven riding of the rolling stock over said twisted rails, aside from the tremendous wear that takes place.

The expense necessary to constantly drive the spikes back in the ties to hold the rails, and the replacement thereof, amounts to a considerable item, but all of said expenditure of both money and labor is avoided by the use of my invention.

By employing the improved clamping means a material saving in the expense of maintenance including the cost of ties, spikes, and labor, and the life of the ties and rails is materially increased.

The improved clamping means by eradicating the tendency of the rails to break, buckle or bend at the joints causes the rails to retain their true and uniform alinement, consequently the trains can be run with materially increased smoothness and with decreased friction and incidentally decrease of fuel required in the motive mechanism.

By using the upper plates and channel bar beneath the bottom of tie a truss is formed and when in place holds the ties up against the bottom of the rails perfectly rigid and tight and prevents the tie and rails from getting loose and the beating back together and cutting and wearing out the ties and rails.

By the adoption of my invention the employment of spikes can be entirely eliminated by the railroads. This is equally true of the tie plates.

The plates can be made with an upwardly directed rib as shown in Figures 3 and 4, to engage the wheel in the event of its jumping the track and prevent it from engaging the ties on the ballast. Or, if deemed advisable, with a view of saving weight and cost of steel, said rib or bead can be omitted from the plates as illustrated by Figures 7 and 8.

It will be further observed that the clamping plates 14 and bars 21, including the bolt holding means therefor, lend great weight to the track, all of which is highly essential to the present day methods of railway construction.

What is claimed and desired to be secured by Letters Patent is:—

1. Rail clamping plates located on opposite sides of the rail and extending from one tie to another and provided with means whereby the ties are individually engaged and the clamping plates held thereon against displacement, a brace member bear-

ing beneath the ties engaged by the said clamping plates and arranged obliquely with respect to the rail, and means located at the sides of the ties and engaging the said brace member and clamping plates whereby the rail, the clamping plates and the said brace member are secured to the tie.

2. Rail clamping plates located on opposite sides of the rail and extending from one tie to another and provided with means whereby the ties are individually engaged and the clamping plates held thereon against displacement, a brace member bearing beneath the ties engaged by the said clamping plates and arranged obliquely with respect to the rail, and means located at the sides of the ties and engaging the said brace member and one end portion of each of said clamping plates whereby the rail, clamping plates and brace member are secured to the ties.

3. Rail clamping plates extending from one tie to another and arranged opposite each other on opposite sides of the rail, the said clamping plates being provided with portions constructed to penetrate the ties to hold said plates in position against displacement, a brace member bearing beneath the ties engaged by the said clamping plates and arranged obliquely with respect to the rail, and means located at the sides of the ties and engaging the clamping plates and the said brace member whereby the rail, clamping plates and brace member are secured to the tie.

4. Rail clamping plates extending from one tie to another and arranged opposite each other on opposite sides of the rail, the said clamping plates being provided with portions constructed to penetrate the ties to hold said plates in position against displacement, a brace member extending beneath the ties engaged by the said clamping plates and arranged obliquely with respect to the rail, and means located at the sides of the ties and engaging the ends of the brace member and opposite end portions of different clamping plates whereby the rail, clamping plates and said brace member are secured to the tie.

5. A rail, tie plates disposed upon the ties under the rail, rail clamping plates located on opposite sides of the rail and extending from one tie to another and provided with means whereby the ties are individually engaged and the clamping plates are held thereon against displacement, a brace member bearing beneath the ties engaged by the said clamping plates and arranged obliquely with respect to the rail, and means located at the sides of the ties and engaging the said clamping plates and brace member whereby the rail, the clamping plates and the said brace member are secured to the tie.

6. In railway trackage including ties, spaced rails and tie plates between the rails and ties, clamping plates bearing above contiguous ties and upon the tie plates thereon, said clamping plates having spurs to enter the ties and the perforations of the tie plates, a brace member bearing beneath the ties and directed obliquely to the longitudinal axis of the rails, and means for uniting the clamping plates and braces.

7. In railway trackage including ties, spaced rails and tie plates between the rails and ties, clamping plates bearing above contiguous ties and upon the tie plates thereon, said clamping plates extending over portions of the rails from opposite sides thereof and having spurs to enter the ties and the perforations of the tie plates, a brace member bearing beneath the ties and directed obliquely to the longitudinal axis of the rails, and means for uniting the clamping plates and braces.

8. In railway trackage including ties and spaced rails bearing thereon, clamping plates bearing upon said ties at opposite sides of each rail and extending over the adjacent portion of the rails, said clamping plates formed with apertured bosses rising from the upper faces thereof and rail holding means also forming part of said bosses.

9. In railway trackage including ties and spaced rails bearing thereon, clamping plates bearing upon said ties at opposite sides of each rail and extending over the adjacent portion of the rails, said clamping plates formed with apertured bosses, rail holding means and a reinforcing rib extending longitudinally on both sides of said bosses, and brace members bearing beneath the ties arranged obliquely with respect to the rail, and means operative to connect the clamping plates and brace member.

10. In railway trackage including ties and spaced rails bearing thereon, clamping plates bearing upon said ties at opposite sides of each rail and extending over the adjacent portion of the rails, said clamping plates formed with apertured bosses, rail holding means and tie penetrating means provided at the outer corners of said plates.

11. In railway trackage including ties and spaced rails bearing thereon, clamping plates bearing upon said ties at opposite

sides of each rail and extending over the adjacent portion of the rails, said clamping plates formed with apertured bosses, rail holding means and tie penetrating means provided at the outer corners and also at the inner edges of said plates.

12. In railway trackage including ties and spaced rails bearing thereon, clamping plates bearing upon said ties at opposite sides of each rail and extending over the adjacent portion of the rails, said clamping plates formed with apertured bosses, rail holding means and tie penetrating means provided at the outer corners and also at the inner edges of said plates, a brace member bearing beneath the ties engaged by the said clamping plates and arranged obliquely with respect to the rail, and means located at the sides of the ties and engaging the said brace member and clamping plates whereby the rail, the clamping plates and the said brace member are secured to the tie.

13. Rail clamping plates located on opposite sides of the rail and extending from one tie to another and provided with means whereby the ties are individually engaged and the clamping plates held thereon against displacement, a brace member of channel-bar formation bearing beneath the ties engaged by the said clamping plates and arranged obliquely with respect to the rail, and means located at the sides of the ties and engaging the said brace member and clamping plates whereby the rail, the clamping plates and the said brace member are secured to the tie.

14. Rail clamping plates located on opposite sides of the rail and extending from one tie to another and provided with means whereby the ties are individually engaged and the clamping plates held thereon against displacement, a brace member of channel-bar formation with its upper face serrated bearing beneath the ties engaged by the said clamping plates and arranged obliquely with respect to the rail, and means located at the sides of the ties and engaging the said brace member and clamping plates whereby the rail, the clamping plates and the said brace member are secured to the tie.

In testimony whereof I affix my signature.

GEORGE W. MULLER.