June 4, 1940. R. P. CLARKSON 2,203,624

DOUBLE PRESSURE COMPENSATING RAIL FASTENING

Filed Feb. 21, 1936 4 Sheets-Sheet 1

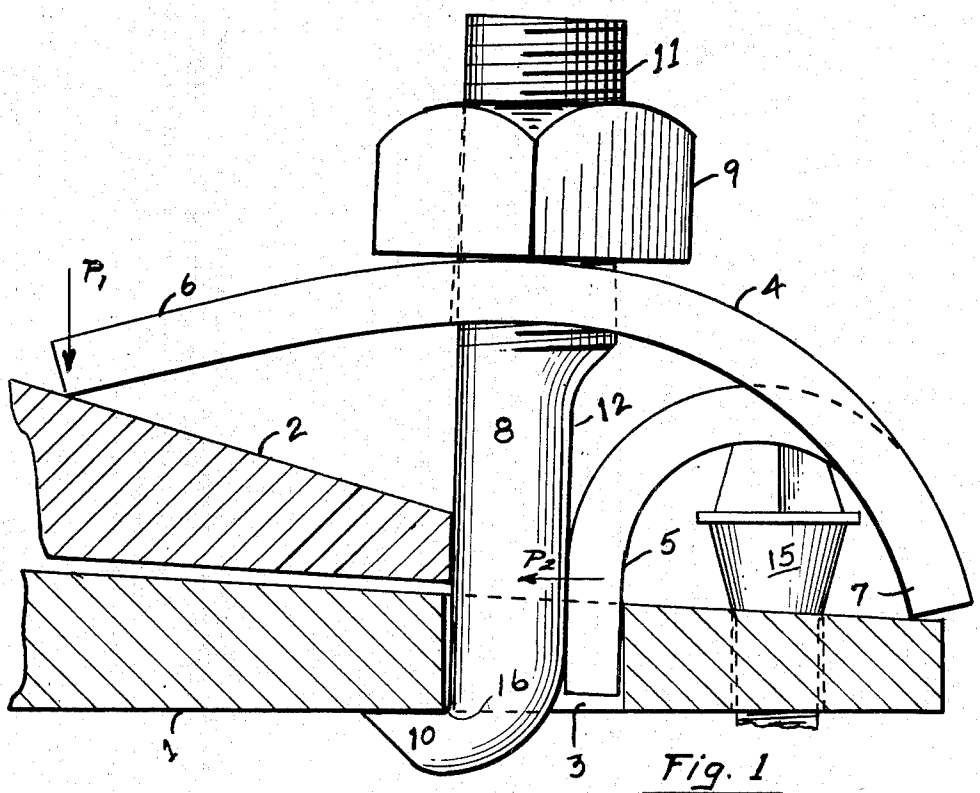


Fig. 1

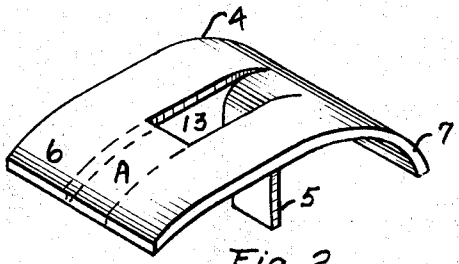


Fig. 2

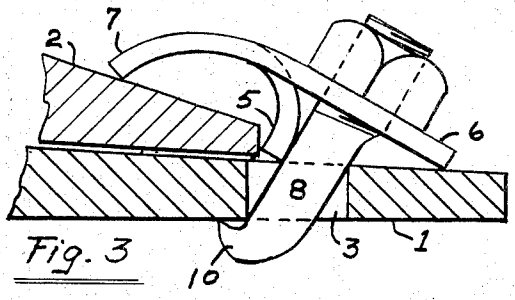


Fig. 3

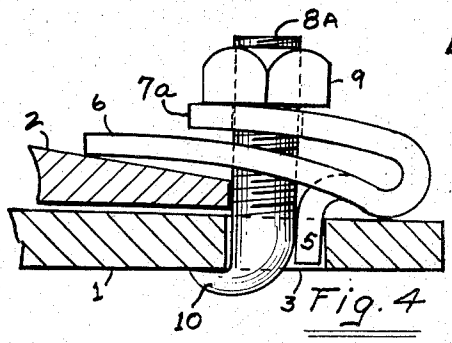


Fig. 4

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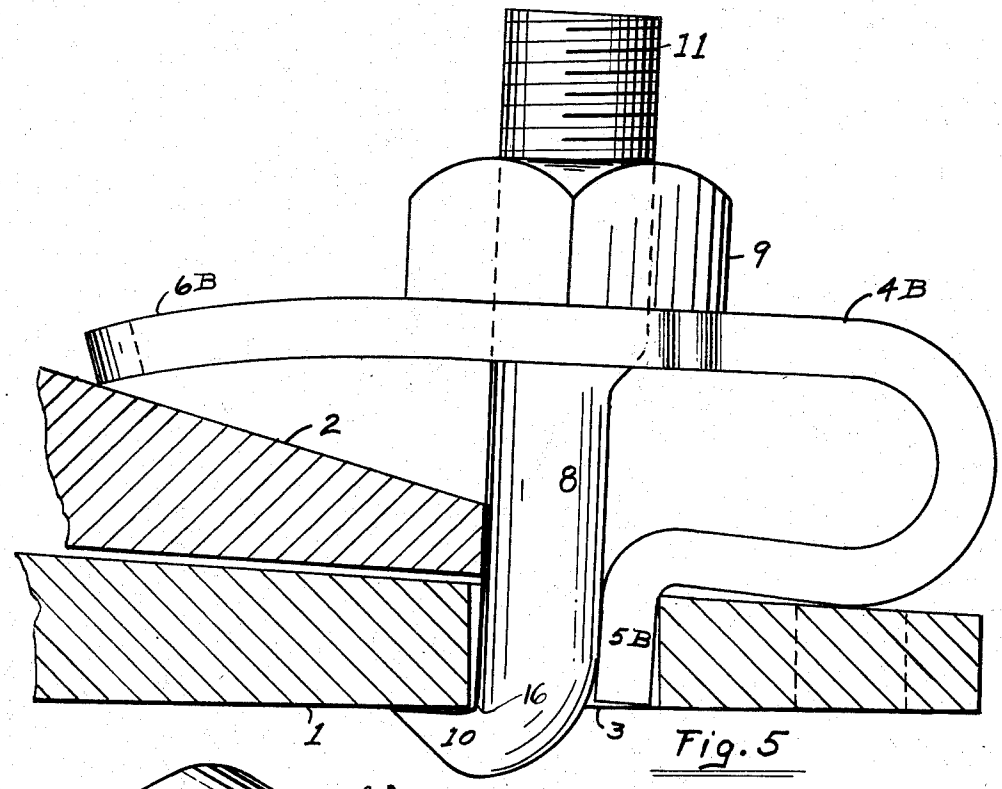


Fig. 5

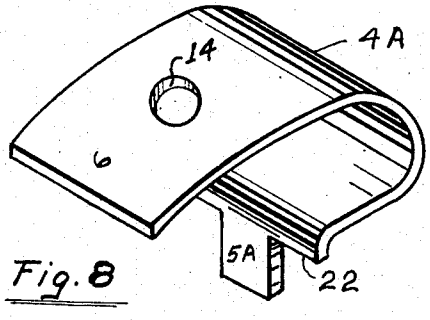


Fig. 8

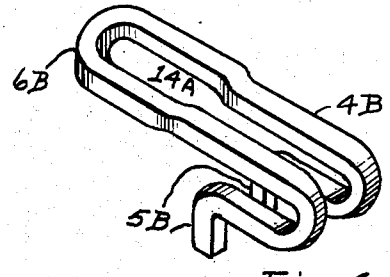


Fig. 6

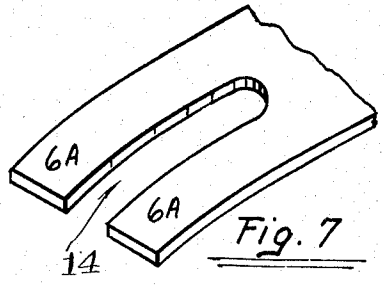


Fig. 7

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DOUBLE PRESSURE COMPENSATING RAIL FASTENING

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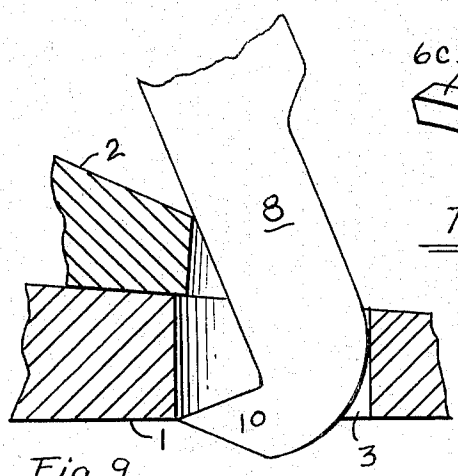


Fig. 9

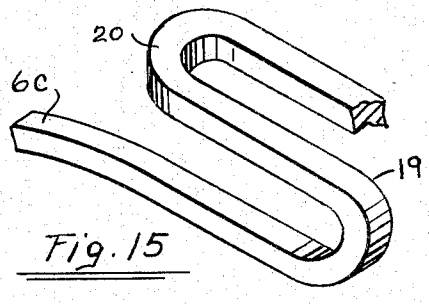


Fig. 15

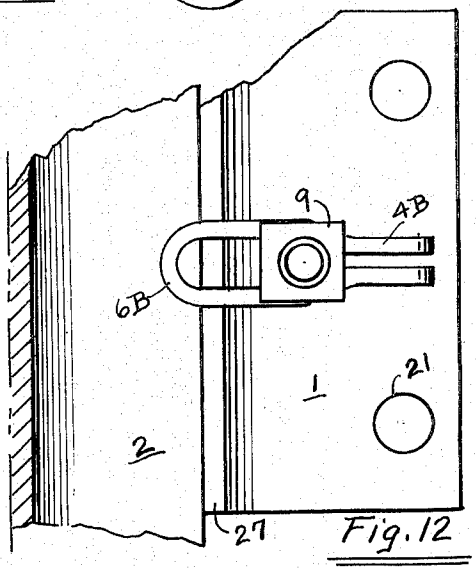


Fig. 12

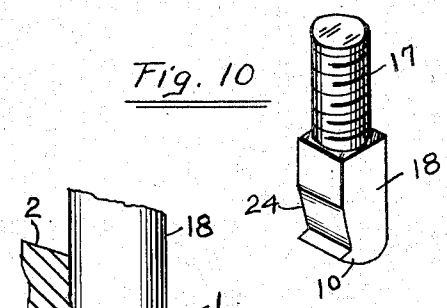


Fig. 10

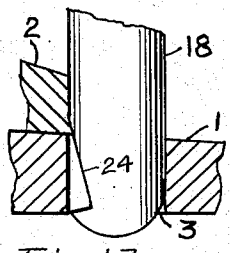


Fig. 13

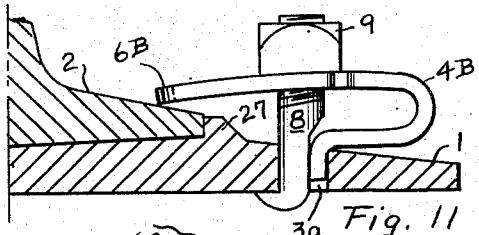


Fig. 11

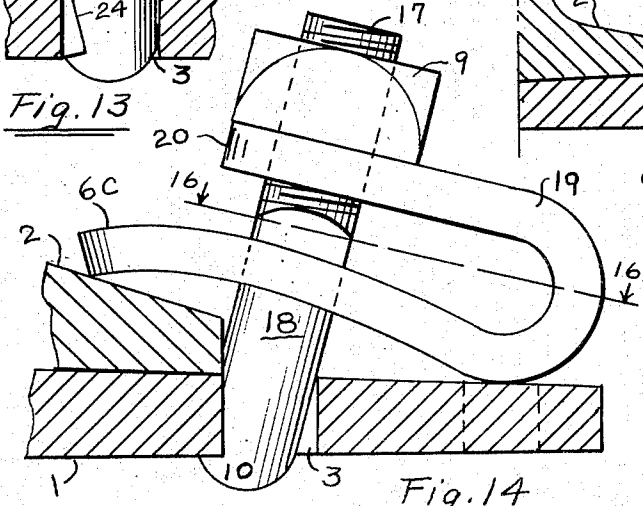


Fig. 14

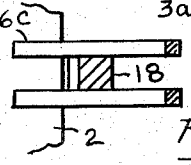


Fig. 16

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DOUBLE PRESSURE COMPENSATING RAIL FASTENING

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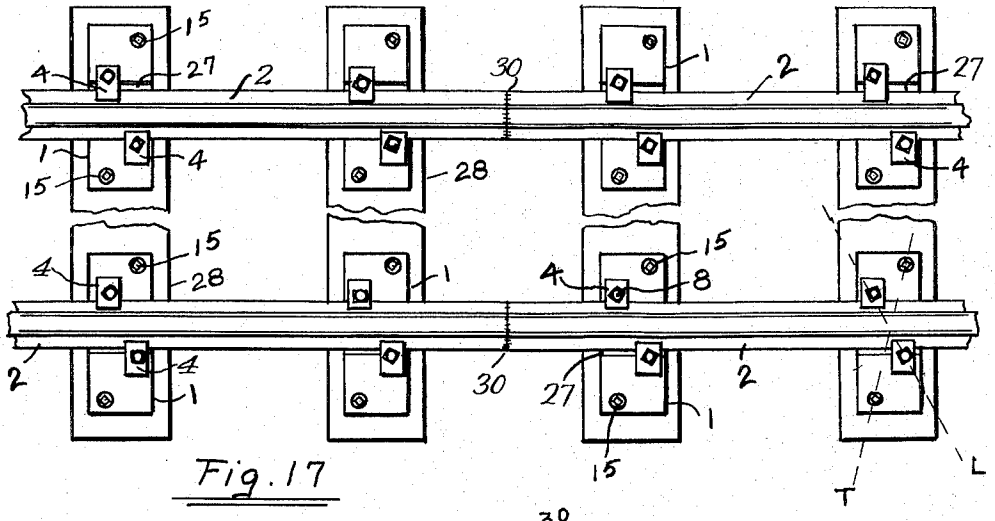


Fig. 17

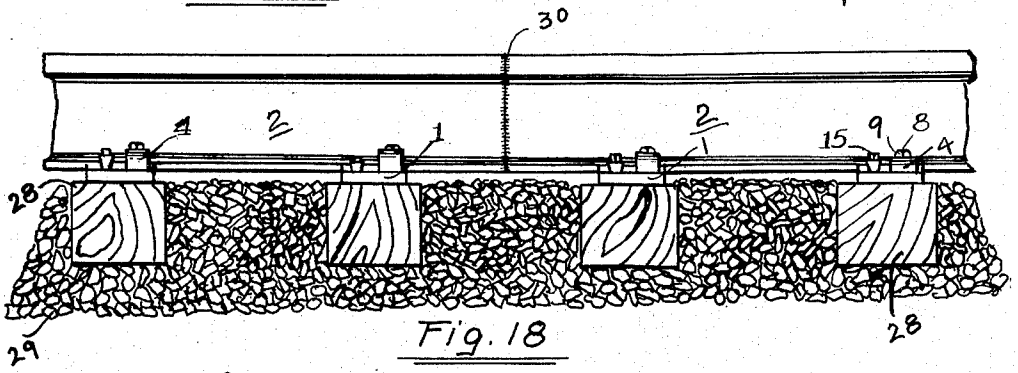


Fig. 18

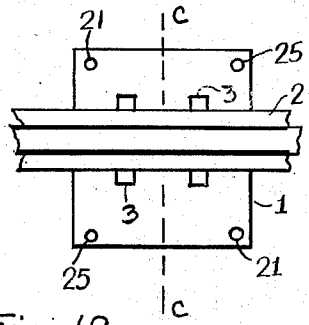


Fig. 19

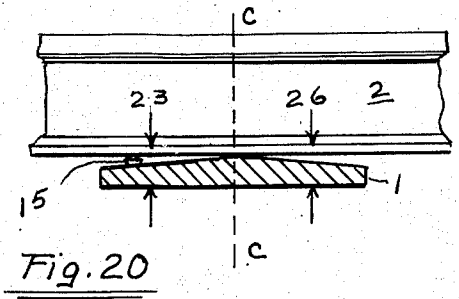


Fig. 20

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UNITED STATES PATENT OFFICE

2,203,624

DOUBLE PRESSURE COMPENSATING RAIL FASTENING

Ralph P. Clarkson, New Rochelle, N. Y.

Application February 21, 1936, Serial No. 64,999

16 Claims. (Cl. 238—349)

This invention relates to double pressure compensating rail fastenings or the like and to track construction designed for quietness, smoothness, and speed, the maintenance of the road bed, which makes for safety, and economy of installation and upkeep, all of which may be contributed to and include rail and tieplate fastenings and their application.

Preferably such track construction includes welded continuous rail but it may be of rail with bolted joints or otherwise, or any construction in which it is desired to limit or prevent longitudinal creeping, side buckling, or transverse movement of the rail, longitudinal expansion and contraction of the rail, rolling of the ties, disturbance of the ballast, all or any of these, and where it is desired to permit or facilitate wave motion caused by passing traffic, and to keep the construction tight and without rattle in spite of wide variations in dimensions and tolerances of track material.

In instances of present existing track which at present commonly uses rail spikes and rail anchors or the like, the present tieplates must, for economy, be used without requiring any alteration that would necessitate their removal when changing over to new construction. It is therefore desirable that such fastenings as are supplied and such changes in construction as are advised may be adapted for substitution in place of existing rail spikes and anchor means and perform the function of these devices, as well as such added functions as are thought to be desirable and set forth herein.

It is a general object of this invention to fulfill the requirements above mentioned, and particularly to provide novel and improved track construction of the resilient clip type with anchored tieplates, preferably cambered or crowned, or otherwise such as will provide line contact with the rail during wave motion, such that, preferably, the rail is substantially floated in place to provide quiet and smooth riding, with effective bars to material rail movement either longitudinally or laterally, with resilient vertical restraining means which minimizes the disturbance of the road bed, and which is safer and more satisfactory for high speed traffic than is the present type of loose rail construction.

It is a further object of the present invention to provide an improved rail fastener simple and rugged in design, easy to manufacture and to apply, which is low in cost and efficient in operation, and which may utilize the present rail and support structure and preferably may be applied by the utilization of the present standard spike hole when the rail spike is removed, or a similar opening.

Another object of this invention is to provide a rail fastener which maintains yielding pressure on the rail both vertically and transversely and also blocks definitely any material lateral movement of the rail.

Still another object of this invention is to provide a rail fastener of general application to track construction and the like, comprising a bolt provided with a lip on one side of the head which engages the underside of the tieplate or its equivalent, and a resilient clip which maintains yielding pressure on the rail and holds the bolt firmly without danger of looseness or rattle and in which neither the bolt nor the clip can turn.

It is another object of this invention to provide means for "floating" the rail in that its initial lateral movement, however slight, is restricted by resilient members, permitting wide tolerances in manufacturing dimensions of rail, rail support, and fastenings, without resulting looseness or rattle.

Still another object of this invention is to provide compensating and balanced restraint with respect to the wave motion of the rail caused by passing traffic in its effect, in that the clips are so placed with respect to the line support of the rail that compensation is made for loss in pressure of one clip by gain in pressure of the other, resulting in substantially constant frictional holding of the rail.

A further object of this invention is to so fasten the rail to the tieplate and the tieplate to a tie embedded in ballast, as to minimize disturbance of the ballast so far as possible, with economy of construction and resulting economy of maintenance. It will be realized that the safety of any track construction depends ultimately upon its maintenance and anything that cuts down necessary maintenance improves safety. Safety, smooth riding, and economy are outstanding goals of the present invention.

It is apparent that fastenings of the character herein described when positioned centrally of the tieplate, especially on those of the cambered or crowned type, may embody the principle of balanced three point rail suspension as set forth in my copending application Serial No. 29,052, filed June 29, 1935, issued as Patent No. 2,144,608, to which reference is made in this and other particulars which are there claimed. Attention is also directed to my divisional application Serial No. 333,417, filed May 4, 1940.

Moreover, it will be understood that the presence or absence of double shoulders, or single shoulders, on the tieplates used, is comparatively immaterial to the present invention as the distance between shoulders is normally greater than the width of the rail base and the spike hole normally extends within the rail seat on the inside of a shoulder. The rail may overlie either or both such spike holes before striking the shoulder. Thus, for small lateral movements, the shoulder is not effective.

It will be further understood that in track construction of the character herein described, it is most effective to anchor the tieplate to the tie, preferably by screw spikes or the like. While many present tieplates have anchor spikes or provisions for them, such present tieplates as are without anchor spike openings may be readily drilled in place and the tie pre-bored for screw spikes or lags, without removal of the plate.

It may be further set forth that according to this invention where tieplate shoulders are continuous, where greater flexibility of the track fastenings is desired, or where for other reasons it may be found expedient, the holding bolt and the tongue of the clip or, if the type of clip permits, the holding bolt only, may be located in a hole through the tieplate laterally removed from the rail, although I prefer to utilize, where possible, the standard rail spike hole adjacent the rail base.

And lastly, it may be observed that there are thousands of variations in tieplates, that a multitude of varying weights and sizes of rail are in service, and even for the same weight of rail there are hundreds of differing plates, that the two sides of the same plate may vary 3/8 of an inch or more in thickness, and between one combined plate and rail and another there may be a variation of an inch or more in thickness at the rail edge. In many instances tolerances and wear may increase the effect of these variations. It is essential, therefore, to practical construction that wide variations may be made in adjustment and that means be provided for the various slight and unexpected deviations and tolerances even on a single stretch of track.

With the foregoing and other objects in view, as will be apparent to those skilled in the art as the description proceeds, my invention resides in the combination and arrangement of parts and in the details and methods of construction described in this specification and particularly pointed out in the appended claims, it being understood that changes may be made in the particular embodiment of the invention within the scope of what is claimed, without departing from the spirit of the invention. I intend no limitation other than those of the claims when fairly interpreted in the light of the full disclosure and the present state of the art.

Referring now to the accompanying drawings illustrative of my preferred method of track construction embodying my invention and various forms of rail fasteners embodying my invention, including a form at present preferred:

Fig. 1 illustrates a preferred form of rail fastening applied, a fragment of the rail and tieplate being shown in section;

Fig. 2 is a perspective view illustrative of the rail clip member of the assemblage of Fig. 1;

Figs. 3 and 4 illustrate modified applications of forms of the rail clip of Fig. 2;

Fig. 5 illustrates the application of a further modified form of rail clip or fastening;

Fig. 6 is a sketch illustrative of the rail clip member of the assemblage of Fig. 5;

Figs. 7 and 8 illustrate modifications of the rail clip of Fig. 6;

Fig. 9 is a fragmentary detail illustrative of the application of the bolt of Figs. 1 and 5;

Fig. 10 is a sketch illustrative of the bolt of Fig. 14;

Figs. 11 and 12 are elevational and plan views respectively illustrative of a modification of the application of the assemblage of Fig. 5;

Fig. 13 is a fragmentary detail illustrative of the application of the bolt of Figs. 10 and 14;

Fig. 14 is an elevational view illustrative of a modified bolt and clip assemblage;

Fig. 15 is a fragmentary sketch illustrative of the clip of Fig. 14;

Fig. 16 is a plan fragment on the line 16—16 of Fig. 14;

Figs. 17 and 18 illustrate in plan and elevation respectively, an application of my invention to continuous or welded rail;

Figs. 19 and 20 illustrate, in part diagrammatically, in plan and elevation, certain relationships illustrative of my invention.

Similar reference characters relate to similar parts throughout the drawings.

Throughout the views, a rail 2 of which a fragment of the base is shown, is yieldingly held to a tieplate 1 by one or more resilient clips such as, for example, a clip 4 (Fig. 1) and the tieplate 1 is held firmly to a tie, as 28 (Figs. 17 and 18), preferably by two or more screw spikes 15 or other tieplate anchor means.

In all the present embodiments of my invention, a rail fastening clip is anchored to a tieplate 1 by a bolt 8 (Fig. 1) or 18 (Fig. 14) which is provided on the head end with a lip 10 acting as a detent at the head of the bolt and effective on one side only, either projecting beyond the shank (Fig. 1) or to the side of the shank continued (Fig. 14). In all cases the detent lip portion 10 engages the under side of the tieplate 1, preferably at the lower inner edge of the spike hole 3 or its counterpart 3A (Fig. 11) and the shank of the bolt upwardly extends through a tieplate opening 3 and is threaded at its upper end, as 11 (Fig. 1) or 17 (Fig. 14). The bolt may be provided with a standard shank, as 8A (Fig. 4), either square or round, without reduced section. As the size of existing spike holes seldom exceeds 3/4 inch square, I prefer for existing track construction, to provide a stronger thread by a larger threaded end 11 (Fig. 1) than the shank of the bolt, and I prefer to flatten the latter, as at 12, and, if the shank is round (Fig. 5) to flatten the bolt also at the lip angle 16 to prevent turning of the bolt or clip relative to each other or to the tieplate, and to provide better and firmer bearing.

Turning now to a bolt 8 (Figs. 1–9, 11 and 12), the reduced or small shank provides a clearance in the tieplate opening 3 which permits bolt 8 to be inserted in spite of an overhanging lip 10. In fact, a lip 10 may and preferably does project a distance greater than the clearance provided in the opening so that insertion and withdrawal of bolt 8 (Fig. 9) is made by tipping bolt 8 towards the rail 2, as shown, and hooking the lip 10 under the tieplate 1. As the tendency of the clip pressure and the action of rail 2 in rising off the tieplate 1 is to tip the bolt 8 away from the rail, this added overhang makes an ef-

fective means to prevent the bolt being withdrawn by any action of the rail. Moreover, the bolt 8 is normally slightly canted away from the rail 2, as set forth below.

In order to hold a bolt 8 in the opening 3 from looseness or turning, each form of clip 4, or the like, is provided with an integral portion or tongue downwardly extending into the tieplate opening 3, such as 5, 5A or 5B. This tongue portion should be aligned with the bolt passage 13 (Fig. 2), 14A (Fig. 6), 14 (Fig. 8) and the like, to permit that the tongue 5 lie against the bolt 8, preferably against a flat surface, as 12 (Fig. 1). For this purpose, the tongue portion 5 must project below the rest of the clip 4 that it may enter the tieplate opening 3.

Preferably the tongue, as 5, or similar downwardly extending portion, when positioned slopes in towards the rail 2 an amount depending upon the thickness of the material of the clip 4, or is of such configuration as to permit it to slope in and press against the bolt 8 when the clip, of whatever thickness it may be, is compressed sufficiently by the nut 9 threaded on the anchor bolt 8 to tense the clip downward against the rail base. When the rail 2 rises slightly the resulting lateral pressure towards the rail exerted by the tongue 5 may be slightly increased (Figs. 1, 4, 5) as clearly shown.

This lateral pressure action of the clip tongue portion is preferably accomplished by making the clip fulcrum initially on the upper outer edge of the tieplate opening 3, although it is preferred that in final working position the free end of the clip, as 7 (Fig. 1), bears on the tieplate 1 so that the holding strain of the clip as the rail rises is not thrown on the relatively weak tongue portion 5 in this particular form of clip 4.

It may be pointed out that the lateral or transverse pressure P2 exerted by a tongue member 5 on the bolt 8 towards a rail 2 tends to push the bottom of the bolt 8 in and if the rail overlaps the tieplate opening (Fig. 5) tends to induce a slight leaning or cant of the bolt away from the rail 2 at the top, the bolt bearing against the edge of the rail.

The present preferred form of clip 4 is that of Fig. 2 in which the downwardly projecting leg 5 may be punched downwardly out of a solid bowed plate, leaving by its depression from the body of the clip, a bolt passage 13 aligned with the tongue 5. If desired, a portion A of the metal between the dotted lines (Fig. 2) may also be removed, leaving separated fingers for the rail bearing portion of the clip similar to the end fragment shown in Fig. 7, with a bolt passage between the fingers. I prefer at present, however, to leave the rail bearing portion or finger 6 solid, as shown.

Such a clip may be reversable (Fig. 3) with a portion 6 bearing on the tieplate 1 and the free end 7 bearing on the rail 2, as the bolt 8 sloping away from the rail 2, bears against the upper outer edge of the tieplate opening 3. Such construction is not at present deemed preferable unless the available tieplate is of such limited dimensions that the end 7 (Fig. 1) would not contact it under the normal arrangement of Fig. 1.

A further change in the application of a clip 4 may be made to provide greater resiliency or leverage of the rail bearing arm 6 by doubling the free end 7 back over the body of the clip as at 7a (Fig. 4) and providing therethrough a bolt passage in line with that through the body of the clip below. In this instance the loop or bend may rest on the tieplate in a manner similar to that of the clip 19 (Fig. 14) and the clip is compressed by a nut 9, and while the effective down pressure P1 may be substantially that of the clip of Fig. 1, it is apparent that the lever arm acting when the rail 2 rises is substantially longer in the instance of the clip of Fig. 4 and the clip of Fig. 14 than in that of Fig. 1.

A modified or alternate preferred form of clip 4B, illustrated in Figs. 5 and 6, may be of wire, preferably square steel wire or rod, and lends itself to a different type of manufacturing production and of material. It is preferably formed of an elongated member bent double, as at 6B, and providing at that point a rail bearing loop, the parallel elements being spaced apart to provide a bolt passage 14A and each element having a U-shaped bend as it is bent under. The end portion 5B of each element is preferably bent downwardly to provide an anchoring pressure member or tongue which becomes seated in the tieplate opening 3 and bears against the bolt 8, as described with respect to the clip 4.

It is this wire clip 4B which is shown, by way of example, also in Figs. 11 and 12 anchored by a bolt 8 in a tieplate opening 3a spaced away from the rail 2, the rail bearing member 6B extending in this instance over the continuous shoulder 27 of tieplate 1. It is apparent that other clips may be similarly positioned, if desired.

Likewise a similar U-shaped clip 4A, with unequal legs, may be formed of solid plate and a bolt passage 14 provided (Fig. 8) the shorter or lower leg having a downwardly bent portion the end of which 5A is of reduced width to form a tongue to enter the tieplate opening 3 or 3a, preferably providing shoulders 22 below the bend to act as a fulcrum for the clip, the bolt passage 14 being aligned with the tongue 5A. This embodiment of my invention may be further modified (Fig. 7) to provide separate rail bearing fingers 6A with a bolt passage 14 between them, by the removal of an additional portion of the metal of the clip as will be understood.

A recognized limitation of the embodiment of my invention in clips of the character described when applied to a present tieplate is the limitation in size of the spike hole 3 which, in turn, limits the thickness of metal readily employed in clips of the type where a portion of the clip is positioned with the bolt 8 in the spike hole. With new construction or new punching such limitations may be removed, if desired.

To provide an embodiment of my invention without such limits in dimensions and without upsetting or forging the metal to different thicknesses, a bolt 18 may be provided (Fig. 10) with a shank of rectangular section substantially that of the opening 3, at least in thickness, one side being indented to provide a lip or detent 10 and the opposite end of the shank threaded as at 17. When driven or inserted (Fig. 13) into a spike opening 3 the bolt 18 must be held vertically until the lip portion 10 is below the tieplate 1 whereupon the bolt 18 may be struck away from the rail 2 (Fig. 14) causing the lip 10 to penetrate or crush the tie and hook under the tieplate 1, the bolt thus canted away from the rail and bearing back against the upper outer edge of the spike opening, a portion of the indented flat surface 24 of the bolt bearing against the bottom edge of the rail base.

By a mere change in dimensions various clips of the character described may be applied with this bolt, as is apparent by inspection, but I prefer to provide for use with this bolt a wire clip 19 formed of an elongated member or wire, preferably rectangular in section (Fig. 15) bent double to provide a retaining loop 20, the resulting parallel sided elements spaced apart to provide a passage for the bolt 18, each of the parallel elements having a U bend, with a rail bearing leg 6C. As clearly indicated (Fig. 16) the parallel sides of the clip elements contact the square sides of the shank of a bolt 18 and tend to prevent the clip from turning. In the sketch of Fig. 15, one of the parallel elements of the clip is broken away, the broken leg being identical with the leg 6C shown, and preferably parallel thereto.

Turning now to the application of my invention particularly to a cambered tie plate 1 (Figs. 19 and 20) in which the line of contact c—c of rail and tieplate is indicated, I prefer that the tieplate be rigidly held to the tie 28 (Figs. 17 and 18) by screw spikes or the like applied at opposite corners of the tieplate, as in openings 25, 25, for example (Fig. 19), the tieplate anchoring means thus being on opposite sides of the rail and on opposite sides of the line of contact c—c, with the resulting line of pressure between them at an angle to the longitudinal or rolling axis of the tie 28. I prefer that the rail fastenings when applied to present construction, be located on opposite sides of the rail and on opposite sides of the line of contact, as in openings marked 3, 3 (Fig. 19), for example, and preferably at equal distances from said line of contact so that the rail may rock freely under wave motion of passing traffic with compensating effect in the pressures of the rail fastenings, as indicated by the sets of arrows 23 and 26 (Fig. 20).

Any closing together of the arrows at 23 by the tilting or wave action of the rail, representing a decrease of pressure exerted by the clip located on that side of the line of contact is substantially compensated for by opening of the arrows 26 representing an increase in pressure exerted by the clip opposing the motion on the other side of the line of contact, thus providing a substantially equal pressure at all times downward on the fulcrum and consequently substantially constant frictional forces between the rail and its supporting structure, tending to prevent longitudinal creeping or expansion-contraction movement of the rail thus held. It is apparent that this action is possible only with yielding rail fastenings engaging the rail and tieplate and clamping them together with the tieplate held to the tie.

Where ties 28 are embedded in ballast 29 (Fig. 18) it is apparent that wave motion in the rail 2 may tend to roll the ties about their longitudinal axis, kick out the ballast at their lower edges and ends and ruin the roadbed. With flat tieplates and the usual track construction this tendency is greater than on cambered plates, a loose rail on the latter having substantially no such tendency except from impact or the like. The provision of a compensated structure, as herein described, with yielding clips spaced substantially equally from the center line (Fig. 20) provides a down pressure of the rail on cambered plates substantially at the center line c—c and, if the rocking of the rail is downwards at the arrows 23, provides an upward pull of the tieplate through the spring clip at the arrows 26, and vice versa, the tendency of this pull being to bend or fold the tieplate upwards, the clip in fact yielding, if it is a yielding clip, to permit the wave motion. By positioning the fastening means of the tieplate such as the screw spikes 15 away from the center line c—c at an angle to the rolling or longitudinal axis of the tie 28, leaving two corner portions of the tieplate free, the tendency to bend the tieplate 1 is communicated to the tie 28 on a line of pressure between the down pressure line of the plate and the effective one of the tieplate fastenings 15 at such angle, with a minimizing of the rolling tendency and a utilization of all yielding resiliency or springiness between the various members of the structure to take up the movement of the rail, which is of the order of $\frac{1}{16}$ or $\frac{1}{8}$ of an inch on a good track.

Preferably the rail fastening 4 (Fig. 17) is positioned to tend to pull up the free corner of the tieplate, as in Fig. 17, which necessitates the diagonal line of the rail fasteners L crossing the diagonal line T of the tieplate fasteners.

With a plurality of rail lengths welded together at the ends, as at 30, each rail length has its ends firmly held longitudinally by the friction of and the clamping down of the adjacent rails and the motion or wave of the rail is consequently decreased to the yielding of the structure and any stretch of the rail and is thus distributed over a greater number of tieplates than where the rail is loose. Similarly when individual rails in place of being free, as usual, are clamped down at each tieplate by yielding clips the same effect is obtained, if the friction and clamping action is maintained, manifested by decreased pumping and rolling of ties under the application of my invention, whether the tieplate is or is not cambered. The flat tieplate throws the downward pressure application to the edge of the plate in place of the center line during wave motion and gives during the motion a line contact between rail and tieplate and tends to fold the tieplate up along a diagonal to the tieplate fastening, thus in this case also communicating the force to the tie at an angle to its longitudinal or rolling axis and minimizing the roll of the tie.

What I claim is:

1. An assemblage of the character described comprising a rail, a tie embedded in ballast, a tieplate providing line contact with the rail transversely thereof during wave motion of said rail, resilient means to clamp said rail to said tieplate comprising a rail fastener positioned on one side of said rail and another rail fastener positioned diagonally therefrom on the opposite side of the rail, each of said fasteners engaging said rail and said tieplate, means tending to provide a line of pressure between said tieplate and said tie at an angle to the rolling axis of said tie during the wave motion of said rail comprising an anchoring member engaging said tieplate and said tie on one side of the rail, another anchoring member engaging said tieplate and said tie diagonally from said first member and on the opposite side of the rail, two corner portions of said tieplate adjacent the resilient means being free.

2. An assemblage of the character described comprising a rail, a tie embedded in ballast, a tieplate providing line contact with the rail transversely thereof, means on each side of the rail to secure said tieplate to said tie, resilient rail fasteners locked to said tieplate and clamping said rail thereto and engaging said rail base on opposite sides of and substantially equally distant from said line of contact and on opposite sides of the rail adapted and arranged to pro-

vide substantially unvarying downward pressure on said rail.

3. An assemblage of the character described comprising a rail, a tie, a tieplate providing line contact with the rail transversely thereof and provided with openings therethrough on each side of the rail and oppositely spaced from said line of contact, upstanding threaded bolts in said openings provided with detent lip portions engaging the under side of said tieplate, resilient rail clips engaging said rail base and tensed by nuts threaded on said bolts, and members to anchor said tieplate to said tie positioned on opposite sides of said rail, two corner portions of said tieplate adjacent the resilient clips being free.

4. An assemblage of the character described comprising a rail, a tieplate provided with the usual spike opening therethrough adjacent said rail, a bowed plate of resilient material to secure said rail to said tieplate provided with a bolt passage, a bolt to anchor said resilient member provided with a detent lip projection on one side only engaging the under face of said tieplate adjacent the lower edge of said spike opening and a reduced shank positioned in said spike opening and provided with an enlarged threaded portion thereabove extending upward through said bolt passage, a nut adapted to take on said threaded portion and flex said resilient member, and means to prevent said resilient member from turning relative to said bolt when said nut is turned and to maintain said lip in engagement, including a flat surface provided on the reduced shank of said bolt at the back opposite to said lip projection, and means projecting from said resilient member engaging said flat surface.

5. In combination with a tieplate provided with an opening therethrough, a rail, and a resilient rail engaging member, of flexing and securing means for said member comprising a bolt positioned in said opening provided with an upwardly extending reduced shank having thereabove a threaded portion and, at the lower end, a detent lip portion with a flattened lip angle on one side only engaging the under side of said tieplate below the rail, the intermediate reduced portion of said shank being flattened and of less thickness, measured at right angles to the rail, than the corresponding dimension of said tieplate opening, whereby a clearance space is provided for the removal of said bolt, and means integral with said resilient rail engaging member extending into and substantially filling said clearance space of such nature that shifting of said bolt with consequent release of said detent lip engagement is prevented.

6. A structure as defined in claim 5 in which said detent lip portion of said bolt projects therefrom a distance greater than the clearance of said shank in said tieplate opening, whereby said bolt must be cocked in said opening to release it.

7. In a railroad track construction the combination with a rail support provided with a spike hole and a rail free to move laterally thereon and overlap said spike holes, of a threaded bolt positioned in said spike hole against said rail base and provided with a lip portion engaging the under side of said rail support below the rail, and resilient means engaging the base of said rail tensed by said bolt and provided with a downwardly extending tongue extending into said spike hole adapted to press transversely against said bolt, whereby to exert both downward and lateral pressure on said rail base, and means to rigidly secure said rail support to a tie.

8. In a rail fastener, in combination, a tieplate provided with a through opening, a bowed clip of resilient material adapted to bear at one end upon the rail base and at the back end upon the tieplate and provided with a bolt passage, a bolt provided with a detent lip portion engaging the under side of said tieplate adjacent the lower edge of said opening and comprising an upwardly extending shank positioned in said tieplate opening and extending through said bolt passage, the portion of said shank above said resilient clip being threaded, a nut threaded on said threaded portion and adapted to tense said resilient clip, a tongue downwardly curving from the back of said clip into said tieplate opening and bearing against the shank of said bolt and the edge of said opening adapted when said clip is tensed to exert lateral pressure on said bolt to maintain tightness.

9. The combination with a rail and a rail support provided with a spike opening adjacent the edge of the rail base, of a resilient member provided with a rail engaging portion and a plate engaging end, a threaded bolt positioned in said spike opening against said rail base and engaging said rail support and passing through a bolt passage provided in said resilient member, an integral portion of said resilient member aligned with said bolt passage curving downwardly from said plate engaging end into said spike opening and yieldingly bearing against the shank of said bolt and against said rail support whereby when a nut is threaded on said bolt said resilient member may exert downward pressure on said rail base and transverse pressure on said bolt and thence on said rail base.

10. As an article of manufacture, a rail fastener member comprising a plate provided with a rail base engaging end and a tieplate engaging end constructed and arranged to rest on the top surface of the rail support when positioned, said plate being bowed in arch form from one said end to the other and an anchoring tongue struck downwardly from the metal of said plate and providing by its depression an opening at the top of said arch aligned with said tongue for the passage of a holding bolt, said tongue downwardly curving from the back of said plate and extending below the rest of the plate and below the top surface of the tieplate when positioned, constructed and arranged to enter a spike hole and bear against the edge of said hole and against the holding bolt.

11. As an article of manufacture, a rail clip of resilient material formed of an elongated member bent double and providing elements spaced apart to permit the passage of a bolt, each said element being bent under and the end portion thereof bent downwardly to provide an anchoring pressure member.

12. As an article of manufacture for clamping a rail to a tieplate, a rail clip of resilient material formed of a wire of substantially uniform cross-section bent double and thereby providing elements spaced apart in substantially parallel relationship, said elements being spaced apart a greater distance through a portion of their length to provide a bolt passage between them and each said element being slightly arched to avoid the tieplate shoulder when in use.

13. A rail securing device including a resilient clip, said clip comprising a single continuous bar

of substantially uniform cross section doubled upon itself at its midpoint so as to have a curved rail flange engaging portion, the remainder thereof forming resilient bridging portions and rail plate engaging portions disposed at an acute angle to each other, the parts of the bar forming the bridging portion being spaced apart to receive therebetween a securing bolt.

14. A rail securing device including a resilient clip, said clip comprising a single continuous bar of substantially uniform cross section doubled upon itself at its midpoint so as to have a curved rail flange engaging portion, the remainder thereof forming resilient bridging portions and rail plate engaging portions disposed at an acute angle to each other, the parts of the bar forming the bridging portion being spaced apart to receive therebetween a securing bolt and the ends of the bar being in close proximity.

15. A rail securing device including a resilient clip, said clip comprising a single continuous bar of substantially uniform cross section doubled upon itself at its midpoint so as to have a curved rail flange engaging portion, the remainder thereof forming resilient bridging portions and rail plate engaging portions disposed at an acute angle to each other, the parts of the bar forming the bridging portion being spaced apart to receive therebetween a securing bolt and the parts of the bar which together form the tieplate engaging portion being relatively inclined at an acute angle.

16. A rail securing device including a resilient clip, said clip comprising a single continuous bar of substantially uniform cross section doubled upon itself at its midpoint so as to have a curved rail flange engaging portion, the remainder thereof forming resilient bridging portions and rail plate engaging portions disposed at an acute angle to each other, the parts of the bar forming the bridging portion being spaced apart to receive therebetween a securing bolt, said bar having two flat sides which intersect to form a corner for engagement with the rail base.

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