Aug. 6, 1940. J. A. McGREW 2,210,334

RAILWAY TRACK CONSTRUCTION

Filed March 21, 1938 2 Sheets-Sheet 1

Fig. 1

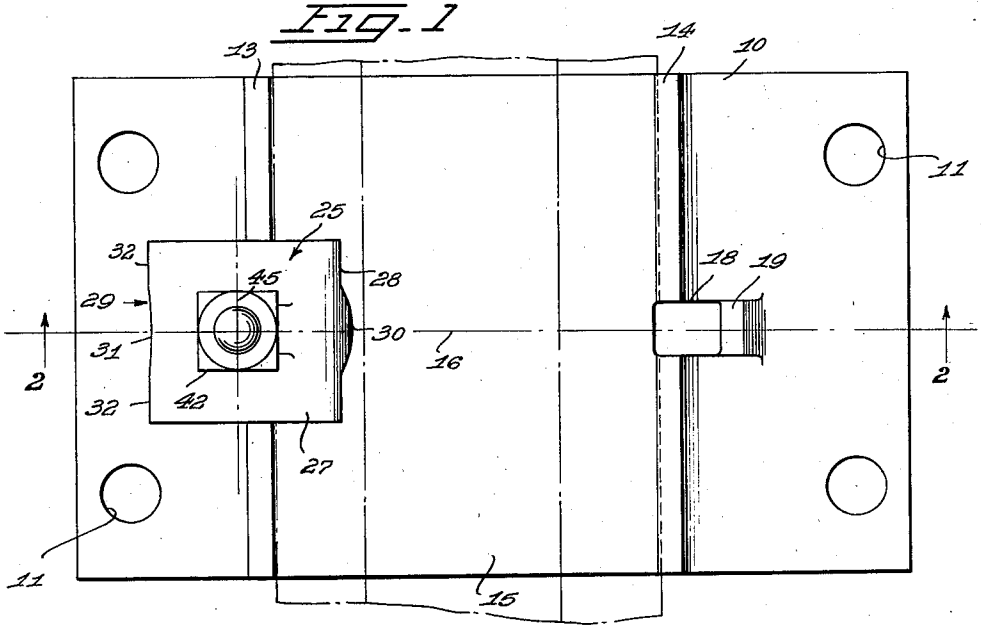


Fig. 2

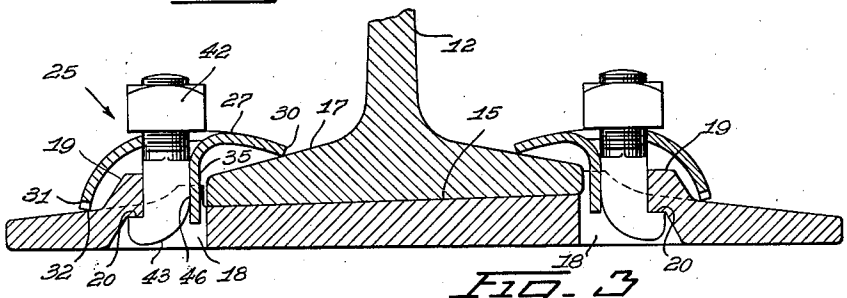
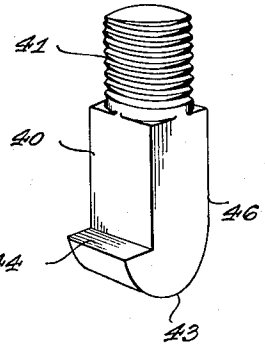
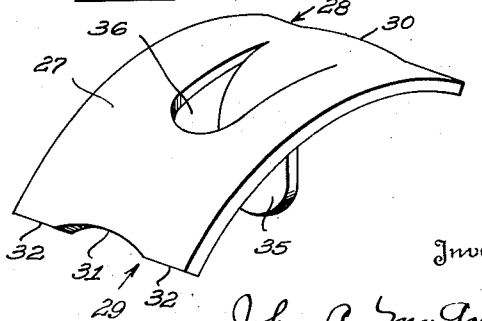


Fig. 3

Fig. 4





Inventor

John A. McGrew

By Watson, Cole, Morse & Grindle

Attorneys

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RAILWAY TRACK CONSTRUCTION

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Fig. 5

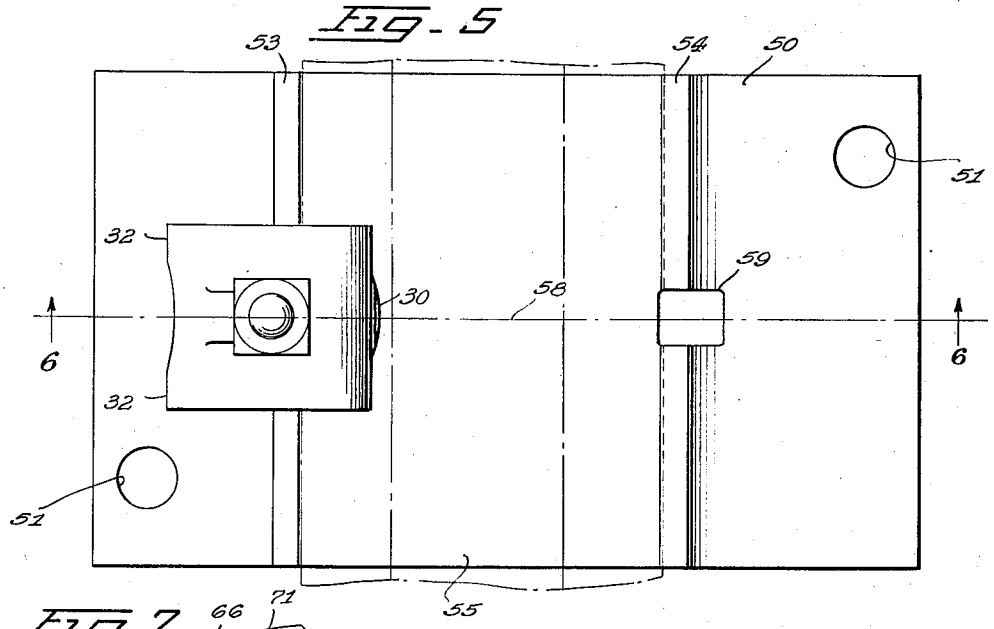


Fig. 7

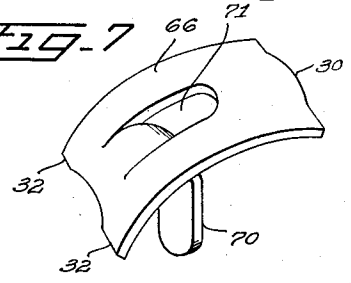
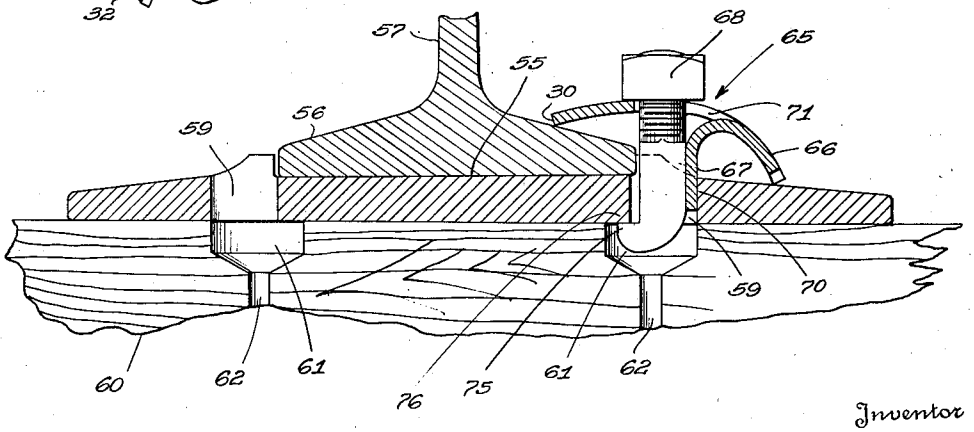


Fig. 6



Inventor

John A. McGrew

Watson, Cole, Morse & Grindle

By

Attorneys

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RAILWAY TRACK CONSTRUCTION

John A. McGrew, Albany, N. Y.

Application March 21, 1938, Serial No. 197,272

3 Claims. (Cl. 238—349)

This invention relates to railway track constructions and more particularly to the means employed for supporting rails upon and securing them to the cross ties.

The general object of the invention is to provide novel and improved resilient rail supporting and securing devices of the same generic type as those disclosed in my copending application Serial No. 157,623, filed August 5, 1937, issued as Patent No. 2,168,676; and further exemplified by the subject matter of my earlier Patent No. 1,887,457.

Rail securing devices of this class, which embody resilient rail engaging clips, have been found to be very efficient in actual use, serving to quite adequately hold the rail in proper position without creeping and without tilting or damaging the ties. The effectiveness of this general type of fastening and the unusually low rate of breakage are due not only to the resiliency of the clip, but also to various features of construction and installation which permit the wave action of the rail under rolling wheel loads to freely occur without setting up excessive torsional stresses in the clip. One of these advantageous features relates to the provision of a substantially three point bearing contact between the clip and the rail base and tie plate, all as clearly set forth in my copending application Serial No. 157,623.

The present invention has for its purpose to provide a modified fastener of the general type described which is a very practical embodiment and is characterized by exceedingly simple construction, low cost of manufacture and installation, and greatest effectiveness in use.

To this end, the invention, in its preferred embodiment, contemplates the provision of a tie plate of novel construction and particularly designed for cooperation with a novel form of rail clip securing bolt, by the provision of an undercut ledge adjacent one side of the bolt opening, and for the proper distribution of the metal of the tie plate to sustain the stresses set up by the bolt when applied. The bolt itself is especially adapted for ready application and removal and is also designed to apply the necessary clamping force to the rail clip in the most effective manner.

The rail retaining clips provided by the present invention are of improved construction and may be easily and economically manufactured in quantity. They also embody novel contact or bearing portions which are well adapted for retaining the rail against longitudinal movement with relation to the tie plate, but permitting the necessary wave motion to occur.

Other objects and features of novelty will be apparent from the following specification when read in connection with the accompanying drawings in which certain embodiments of my invention are illustrated by way of example.

In the drawings:

Figure 1 is a plan view of a tie plate and a rail fastener embodying the principles of the invention; the superposed rail being indicated in chain lines;

Figure 2 is a vertical, transverse sectional view taken on line 2—2 of Figure 1;

Figure 3 is a perspective view of the rail securing clip employed in this embodiment of the invention;

Figure 4 is a view in perspective of the clip securing bolt;

Figure 5 is a plan view similar to Figure 1 but illustrating a modified form of the invention;

Figure 6 is a vertical, transverse sectional view taken on line 6—6 of Figure 5; and

Figure 7 is a perspective view of one of the clips used in this form of the invention.

In the embodiment illustrated in Figures 1 to 4 inclusive, the tie plate is indicated at 10 and is provided with the usual openings 11 for the accommodation of fastening elements for securing the tie plate to the cross tie. In the case of wooden cross ties these elements may be the usual lag screws or spikes. Extending across the tie plate 10 in the direction of the rail 12 and spaced apart a distance approximately equal to the width of the rail base are the ribs 13 and 14, the rail seat 15 between these ribs or shoulders being preferably arched or cambered in a direction longitudinally of the rail so that the rail may rock or roll slightly thereon when it is subjected to vertical flexing due to the passage thereover of heavy wheel loads. The peak of the cambered surface is preferably midway of the seating surface 15 as indicated at 16 and the rail attaching devices are positioned in the transverse vertical plane which includes this peak or uppermost element 16 of the cambered surface. Aligned with this transverse vertical plane are the substantially rectangular openings 18 which are formed in the tie plates and pass vertically through the ribs 13 and 14. The metal of the tie plate adjacent the outer margins of these openings 18 is offset upwardly as indicated at 19 and forms a downwardly directed shoulder 20, the purpose of which will be presently described.

The fastening elements are indicated generally by the reference numeral 25 and since they are of identical construction, only one of them will be described in detail. The fastening elements include the resilient clip 27 which is shown very clearly in the perspective view in Figure 3. Substantially rectangular blanks for forming the clips may be cut from elongated strips, the line of severing of these strips being as indicated by the forward and rear sides 28 and 29 respectively of the clip where it will be seen that an arcuate projection 30 is formed upon the forward edge 28 of the clip and a similarly shaped arcuate indentation 31 is provided at the rear edge 29 of the clip. The remaining straight portions 32 at each side of the rear edge of the clip provide spaced corners or edges for contact with the tie plate. Centrally of the clip 27 a tongue 35 is punched out of the metal and is directed downwardly as clearly indicated in Figures 2 and 3 of the drawings. The final configuration and curvature of the clip 27 is shown in Figure 2 wherein the rear portion of the clip is directed downwardly, the forward portion forwardly over the rail base but still maintaining a slight curvature, and the tongue 35 being directed vertically downwardly into one of the openings 18 in the tie plate. The lower relatively sharp edge of the arcuate forward portion 30 of the clip presses firmly upon the top surface of the rail base 17 and the edges of the two spaced rear end portions 32 provide contact with the outer portion of the tie plate at longitudinally spaced points.

The bolt 40 has a substantially rectangular body portion and a threaded shank 41 to which is applied the nut 42. The head 43 of the bolt is curved as clearly shown in Figures 2 and 4 and is provided with the laterally offset hooked portion 44 which is adapted to underlie the shoulder 20 of the tie plate and bear firmly thereagainst when applied. The bolt passes through the central opening 36 of the clip 27 which is formed by the punching of the tongue 35. The nut 42 applied to the bolt bears upon the upper surface of the central portion of the clip 27 with substantially line contact along the line 45. The tongue 35 bears against the forward face 46 of the bolt and serves to retain it in applied position. A similar arrangement, of course, is provided on the opposite side of the rail.

From the foregoing description it will be clearly understood that by means of the present invention there has been provided a resilient rail securing clip which has substantially three point contact with the tie plate and rail, two longitudinally spaced points of contact being between the clip and the tie plate and a single point of contact between the clip and the rail base. Also the head of the bolt makes a substantially line contact with the top surface of the clip, and the configuration of the bolt, together with the laterally disposed bearing of the head of the bolt against the shoulder 20 of the tie plate, aids in the application of the fastening assembly to attain the most effective clamping of the rail base by the forward edge 30 of the clip.

In the embodiment of the invention illustrated in Figures 5 to 7 inclusive of the drawings, the tie plate employed is indicated by the numeral 50 and is provided with the screw or spike openings 51 and the spaced ribs 53 and 54 which define between them the rail seating surface 55 upon which the base flange 56 of the rail 57 is disposed. The seat 55 is preferably cambered as described in connection with the other embodiment of the invention, the two half surfaces thereof sloping longitudinally from the central transverse peak 58. Openings 59 are provided in the tie plate upon opposite sides thereof so as to intersect the ribs or shoulders 53 and 54 upon the transverse center line of the tie plate. A wooden cross tie is indicated at 60 and is provided with the countersunk openings 61 in the upper surface thereof with which the vertical drain passageway 62 communicates. The openings 61 are disposed immediately below the holes 59 in the tie plate and serve to accommodate portions of the fastening devices which will now be described.

The fastening devices in this embodiment of the invention are indicated generally by the reference numeral 65 and comprise the rail and tie plate engaging clip 66, bolt 67, and the nut 68. The clip 66 is of the same general exterior or marginal contour as the clip 27 described in the prior embodiment, being provided with the forward arcuate contacting edge 30, the spaced rearward edges of contact 32 which bear upon the tie plate just as in the case of the clip 27. A tongue 70 is punched downwardly from the body of the clip 66 leaving an opening 71 centrally thereof. The tongue 70, however, depends from the rearward portion of the clip rather than the forward portion as in the case of the clip 27. The clip 66 is applied as shown in Figure 6 of the drawings, the bolt 67 passing through the opening 71 and the tongue 70 bearing against the body portion of the bolt and entering the opening 59 in the tie plate. The head of the bolt 67 is provided with a hooked portion 75 which underlies the bottom surface of the tie plate as at 76 and bears thereagainst as the nut 68 is screwed down. The nut 68 bearing upon the curved upper surface of the clip 66 has substantial line contact therewith and the three-point contact of the clip with the rail base and the tie plate is also maintained in this embodiment.

The best method of installing and applying the fasteners will be readily apparent from an inspection of the sectional views of Figures 2 and 6. With the rail properly resting in the seat 15 or 55, the heads of the clamping bolts are inserted through the openings 18 or 59, which are of ample width to accommodate the bolt heads in the absence of the tongues of the clips.

In the case of the embodiment illustrated in Figure 2, the offset head of the bolt faces outwardly and is moved laterally beneath the undercut shoulder 20 formed on the tie plate, when it is introduced into the opening 18. The clip 27 is then applied to the shank of the bolt which is adapted to pass through the opening 36. At the same time the tongue 35 enters the opening 18 in the tie plate at the inner side of the squared portion of the bolt, and not only serves to secure the clip against displacement but prevents shifting of the bolt. Finally the nut 42 is applied and screwed home against the clip 27, causing the clip to bear upon the rail base and tie plate with the proper resilient pressure.

In the case of the latter embodiment, the bolt 67 is inserted through the opening 59 with the offset head directed inwardly toward the rail. The head extends into the recess 61 of the tie and is finally moved laterally until the hooked portion 75 underlies the bottom portion of the tie plate at 76. The clip 66 is then placed over the shank of the bolt and the tongue 70 enters the tie plate opening 59 outwardly of the bolt, and locates the clip and prevents the backing off of

the hook-like bolt head just as in the case of the first embodiment.

It will thus be understood that by means of the present invention there have been provided novel and improved rail fastening devices which, while securing the rail to the tie plate against longitudinal movement or creeping, provide for sufficient flexure in the rail during the time that it is subjected to the rolling wheel loads applied thereto, so that there results a minimum of breakage of the fastening elements and a longer life for the ties themselves since the latter are not subjected to the wear or tilting stresses which prevail when rigid rail fastening connections are employed.

It will be also understood that various changes and alterations may be made in the embodiments illustrated and described herein without departing from the scope of the invention as defined by the following claims.

Having thus described the invention, what is claimed as new and desired to be secured by Letters Patent is:

1. A railroad track construction comprising, in combination, a rail, a tie plate underlying the rail and projecting laterally therefrom, a curved, plate-like spring clip having one end portion bearing upon said tie plate at two points spaced longitudinally of the rail, each of said bearings being along a short line of contact also extending longitudinally of the rail, and the opposite end portion of said clip having an arcuate edge bearing against the rail base, a securing bolt passing through aligned openings in the clip and tie plate, and a nut applied to said bolt above the clip whereby the clip may be firmly clamped against the rail base and tie plate.

2. For use in a rail fastening device of the class described, a substantially rectangular plate-like clip of spring metal having an arcuate indentation centrally of one end and a similarly shaped arcuate protuberance at the opposite end, the remaining portions of said ends being straight and conforming to the rectangular configuration, and means provided substantially centrally of the clip whereby it may be secured in position for use.

3. For use in a rail fastening device of the class described, an arched substantially rectangular plate-like clip of spring metal having an arcuate indentation centrally of one end and a similarly shaped arcuate protuberance at the opposite end, the remaining portions of said ends being straight and conforming to the rectangular configuration, and a tongue punched from a central portion of the clip and bent downwardly from the plane thereof for aiding in positioning and securing the clip, displacement of said tongue providing an opening in the clip for the passage of securing means therethrough.

JOHN A. McGREW.