April 3, 1951 A. R. SCHULZE 2,547,839

RAIL FASTENING DEVICE

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FIG. 1.

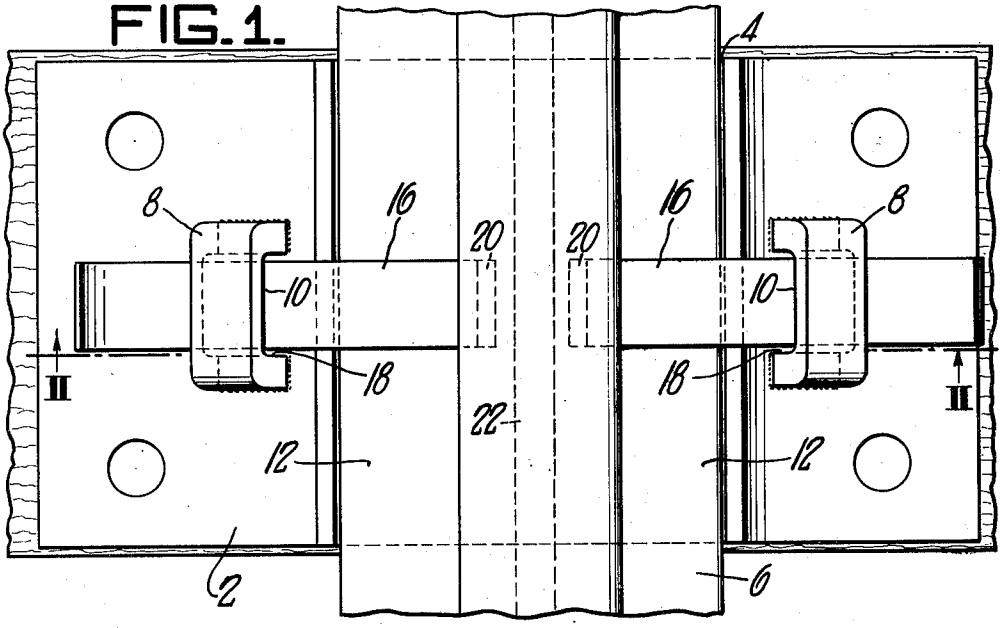


FIG. 2.

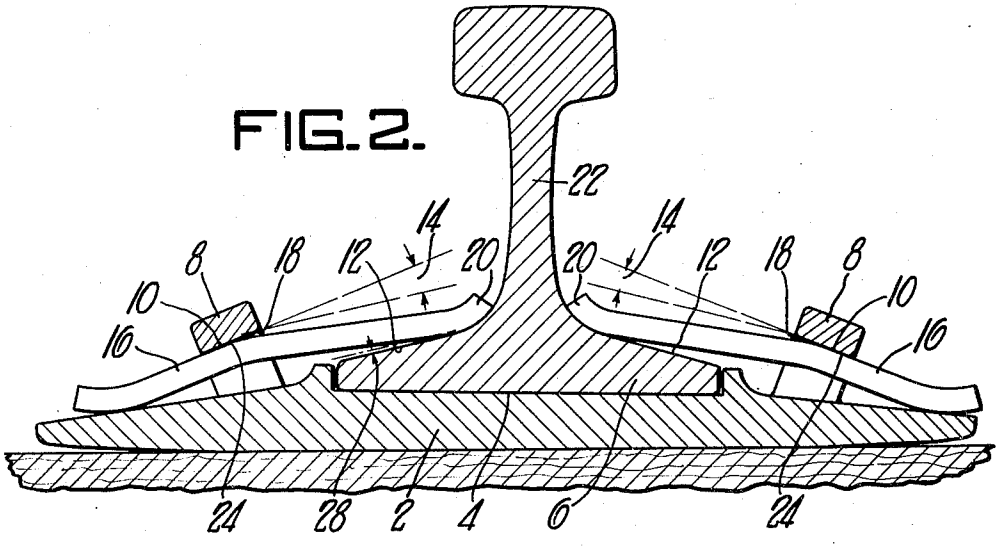
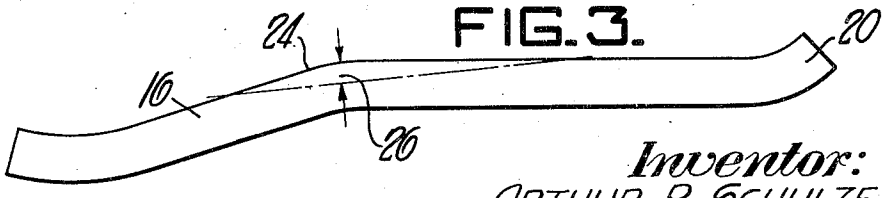


FIG. 3.



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FIG. 4.

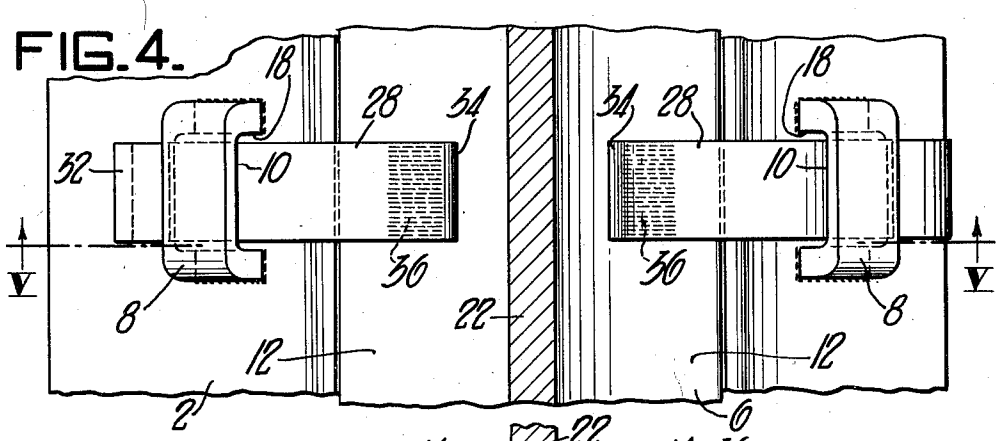


FIG. 5.

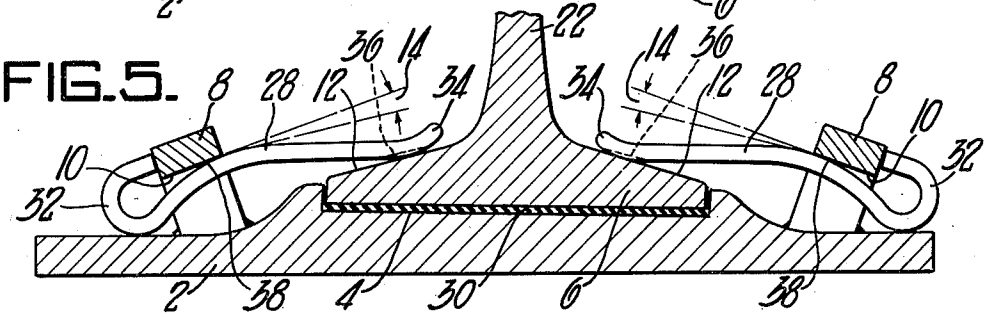


FIG. 6.

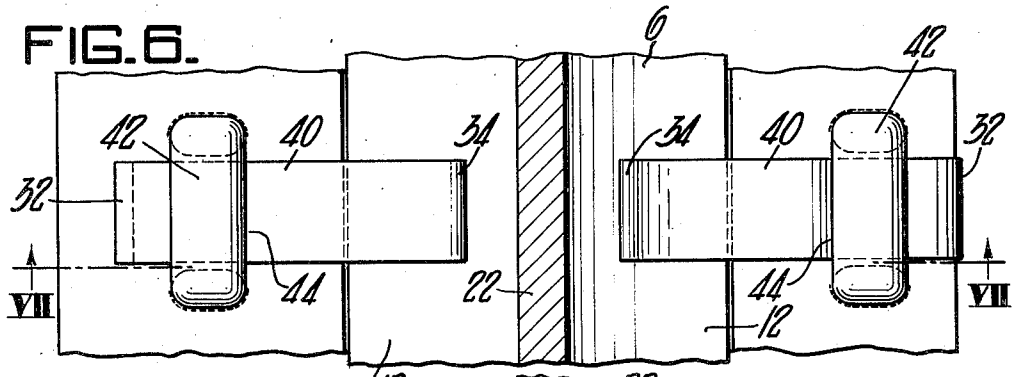
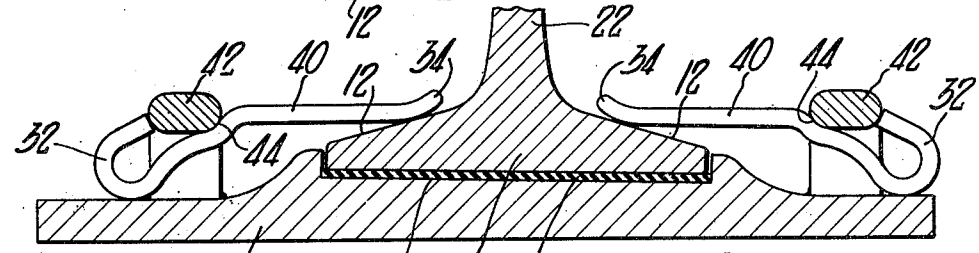


FIG. 7.



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RAIL FASTENING DEVICE

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Application June 5, 1947, Serial No. 752,775

3 Claims. (Cl. 238—349)

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This invention relates to a rail fastening device and more particularly to such a device for fastening a rail to a tie plate. The railroad tracks are subjected to extreme vibrations, noticeable deflections and a resulting wave motion due to the rapid change from no load to full load as the train travels over the track. It is desirable that the fastening means remain in position in spite of this vibration, but when simple conventional devices, such as bolts or cap screws are used in fastening the rail to the tie plates, the extreme and rapid vibration of the track structure under traffic causes wear on the small contact surfaces with resultant rapid loosening of the assembled parts. Special devices have been resorted to with considerable success, but ordinarily they are relatively expensive and many of them are so constructed that the strength and bearing area of the tie plates are reduced.

It is an object of my invention to provide a rail fastening device which is inexpensive and rugged in construction.

Another object is to provide such a device which utilizes a standard tie plate without reducing its strength.

Still another object is to provide such a device which remains in place under extreme vibration of the track.

These and other objects will be more apparent after referring to the following specification and attached drawings, in which:

Figure 1 is a top plan view of the preferred embodiment of my invention;

Figure 2 is a sectional view taken on the line II—II of Figure 1;

Figure 3 is a view of the spring clip of Figures 1 and 2;

Figure 4 is a plan view of a second embodiment of my invention;

Figure 5 is a sectional view taken on the line V—V of Figure 4;

Figure 6 is a top plan view of a third embodiment of my invention; and

Figure 7 is a sectional view taken on the line VII—VII of Figure 6.

Referring more particularly to the drawings, the reference numeral 2 indicates a standard tie plate which is mounted on a tie in the usual manner and which is provided with the usual rail seating portion 4 for receiving the flange 6 of the rail. An inverted U-shaped member 8 is welded to the base plate 2 on each side of the rail between the seat portion 4 and the edge of the plate. The position of the member 8 is such

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that its top inner surface 10 is arranged at a slightly steeper angle than the top surface 12 of the rail base. The difference between the two angles may be termed a differential angle which is indicated as 14 in the drawings. This differential angle 14 is preferably greater than the frictional angle between the spring clip 16 and the member 8 and may be approximately between 4°–0′ and 8°–45′. The spring clip 16 is elongated and passes through an opening 18 in the member 8 with one end bearing on the tie plate 2 and the other end bearing on the rail surface 12. The inner end of the clip 16 is bent upwardly at 20 so that it may be driven into position until it abuts the rail web 22 which limits its inward movement. The upper part of the clip 16 is essentially convex as shown.

In installing the clip 16 it is driven into position with its surface 24 which contacts surface 10 being compressed a distance 26 as shown in Figure 3. The shape of the clip 16 before installing is shown in solid lines in Figure 3 and the amount of compression is shown in broken lines. The inward movement of the clip 16 is limited by contact of the end 20 with web 22 and backing out of the clip 16 is prevented by reason of the differential angle 14. This arrangement permits a limited movement 28 of the rail with respect to the base plate 2 and holds the spring clip 16 in position regardless of the movement due to vibrations. While the spring clip 16 is shown as a solid member it will be understood that it could also be made of a plurality of leaves fastened together.

Figures 4 and 5 disclose a second embodiment of my invention which is quite similar to that shown in Figures 1, 2 and 3. In this embodiment, the various parts of the device are the same as shown in Figures 1, 2 and 3 and have like reference numerals with the exception of spring clip 28 which differs somewhat from spring clip 16. Also, a rubber shim 30 is indicated under the base 6 of the rail, but this shim may or may not be used in each of the embodiments as desired. The spring clip 28 differs from spring clip 16 by having a hook portion 32 provided at its outer end with the end thereof abutting against the inverted U-shaped member 8 to prevent inward movement thereof. The other end 34 is bent upwardly with its under surface serrated at 36 to prevent it from sliding on the surface 12. The main portion of the clip 28 is of the same general shape as that of 16 except that it is generally arcuate instead of having an angular bend therein. The upper end of surface

10 is contacted by surface 38 of the clip 28 when the clip is driven into position.

Figures 6 and 7 show a third embodiment of my invention which differs from the first two embodiments in the shape of the spring clip 40 and the arrangement of the inverted U-shaped member 42 which is welded to the base plate 2 in a vertical position. The spring clip 40 generally resembles that of spring clip 28 being provided with the hook portion 32 for limiting inward movement thereof, but differs from spring clip 28 by having a shoulder 44 on the top surface thereof which abuts the inner surface of the member 42 to prevent outward movement of the clip 40. The clip 40 is assembled in the same general manner as the clips 16 and 28, but the outward movement is prevented by shoulder 34 instead of by means of the differential angle 14.

While three embodiments of my invention have been shown and described, it will be apparent that other adaptations and modifications may be made without departing from the scope of the following claims.

I claim:

1. A rail fastening device comprising a tie plate having a seat portion for the base of the rail, an inverted substantially U-shaped member secured to said tie plate at a point intermediate the seat portion and the edge of the plate, said U-shaped member being arranged at an angle to the vertical with the underside thereof being arranged at a steeper angle than the top surface of the flange of the rail, the angle of the underside of the U-shaped member being inclined in the same general direction as the top surface of the flange of the rail adjacent thereto, an elongated longitudinally bowed spring clip extending through said inverted U-shaped member and bearing against the underside thereof, the upper surface of said clip being longitudinally convex, the distance between the underside of the U-shaped member and the tie plate being greater than the thickness of the clip, one end of said clip bearing against the top of the rail flange and the other end bearing against the top of the tie plate, the portion of said spring clip bearing against the underside of said inverted U-shaped member being under compression and being arranged at an angle at least as great as the angle of the underside of the U-shaped member, the

said convex portion of the spring clip being in contact with the U-shaped member in a manner to urge said clip toward the rail under vibration.

2. A rail fastening device comprising a tie plate having a seat portion for the base of the rail, a member secured to said tie plate at a point intermediate the seat portion and the edge of the plate, said member having an opening therethrough with the upper surface of the opening being spaced from the top of said tie plate, said upper surface being arranged at a steeper angle than the top surface of the flange of the rail, the angle of said upper surface being inclined in the same general direction as the top surface of the flange of the rail adjacent thereto, an elongated longitudinally bowed spring clip extending through said opening and bearing against said top surface, the upper surface of said clip being longitudinally convex, one end of said clip bearing against the top of the rail flange and the other end bearing against the top of the tie plate, said opening being of greater height than the thickness of that portion of said clip passing through said opening, the portion of said spring clip bearing against the said upper surface being under compression and being arranged at an angle at least as great as the angle of the said upper surface, the said convex portion of the spring clip being in contact with the said upper surface in a manner to urge said clip toward the rail under vibration.

3. A rail fastening device according to claim 2 in which the end of the clip adjacent the rail is turned upwardly and a hook portion is provided at the outer end of the clip, said hook portion extending upwardly from the tie plate with the end thereof being adapted to abut against said member to limit inward movement of said clip.

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