

July 12, 1960

F. S. SCHWINN

2,944,739

ANTI-CREEPER FOR RAILWAY RAILS

Filed Nov. 23, 1956

2 Sheets-Sheet 1

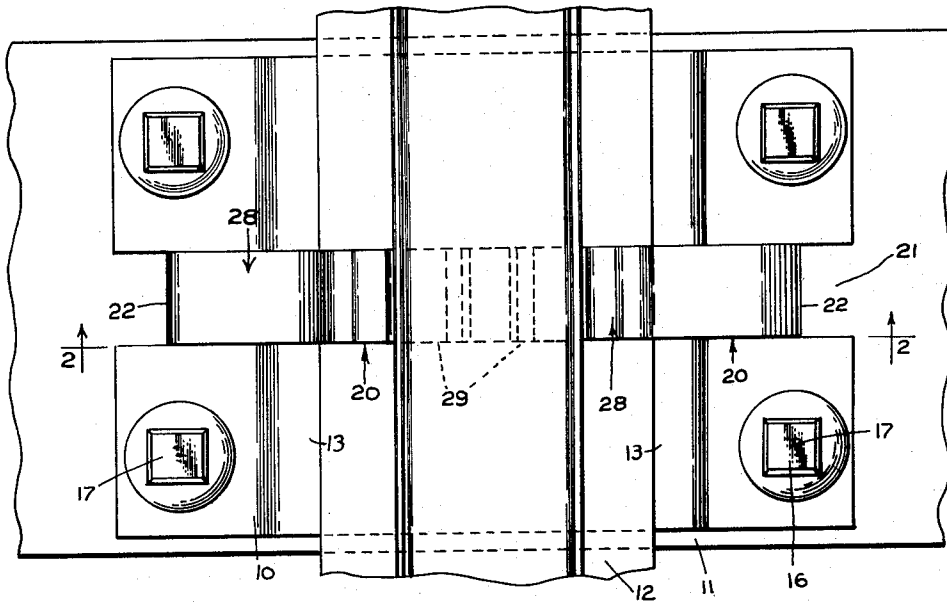


Fig 1

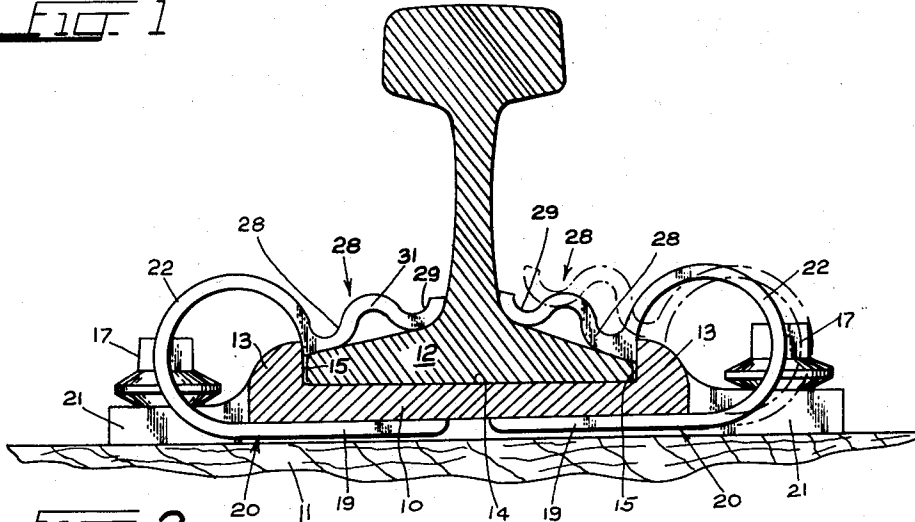
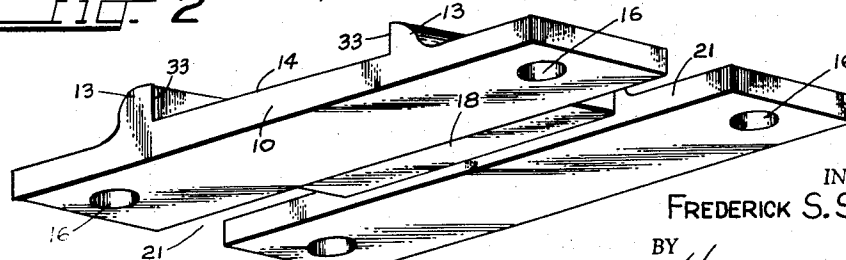


Fig. 2



III 3

INVENTOR.
FREDERICK S. SCHWINN

BY

BY *Harvey M. Gillespie*
Att'y.

July 12, 1960

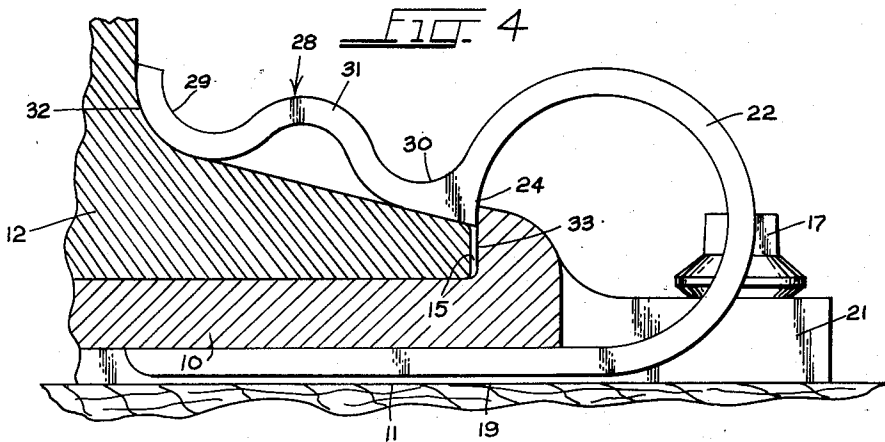
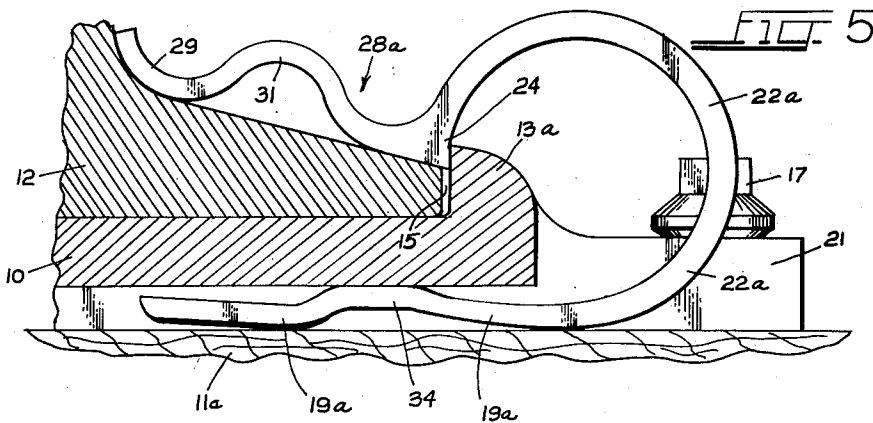
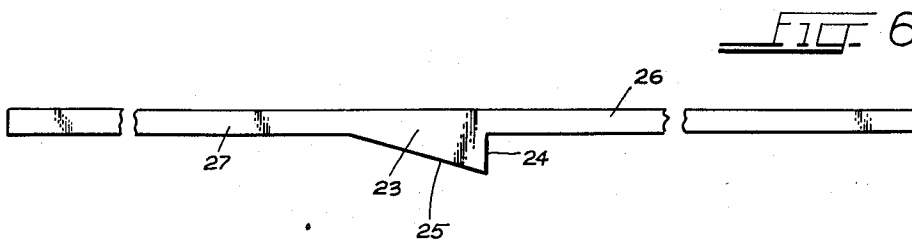
F. S. SCHWINN

2,944,739

ANTI-CREEPER FOR RAILWAY RAILS

Filed Nov. 23, 1956

2 Sheets-Sheet 2



INVENTOR.
FREDERICK S. SCHWINN
BY *Harvey M. Gillespie*
ATTY.

1

2,944,739

ANTI-CREEPER FOR RAILWAY RAILS

Frederick S. Schwinn, 4118 Tartan Lane, Houston 25, Tex.

Filed Nov. 23, 1956, Ser. No. 624,124

2 Claims. (Cl. 238—217)

This invention relates to railway rail anticreepers of the general class which includes a tie plate and spring clip assembly adapted to clamp the base portion of the rail, the plate being secured to an underlying cross-tie or other fixed part of the roadbed so as to hold the clamped rail from creeping longitudinally.

A principal object of the invention is to provide, in anti-creeper structures of the above general class, a novel form of spring clip element and an improved cooperative relationship of the spring clip and the associated tie plate of the assembly, whereby a more tenacious grip is exerted on the rail to resist longitudinal creeping thereof and whereby the rail is securely clamped to the tie plate in an improved manner to prevent movement of the rail laterally of the tie plate.

A more specific object is to provide certain improved constructions of the tie plate and spring clip assembly disclosed in my prior United States Patent No. 2,107,131, whereby the spring clip, when in its applied position, will exert a vertical clamping action to hold the rail to the tie plate and which will also exert pressure laterally of the rail to maintain it in a fixed position on the tie plate.

In an assembly structure of the above general class, particularly the structure shown in my said prior patent, the tie plate element is formed with spaced apart shoulders which define a seat for the base portion of the rail. The width of such seat must be slightly greater than the maximum width of oversized rail bases, such as are formed after the forming surfaces of the rolls used to produce the rails have become worn. Because of the clearance of requirements and manufacturing tolerances, in the production of railway rails and shouldered tie plates of the above character, there may be a clearance of $\frac{1}{16}$ " to $\frac{3}{32}$ ", between each shoulder of the tie plate and the adjacent edge of the base portion of a railway rail when the latter is seated in a central position on the plate. If the rail is arranged in close engagement with one shoulder of the tie plate, the clearance between the rail base and the other shoulder is proportionately increased. Under such conditions the rail has capacity for maximum movement of approximately $\frac{1}{8}$ " to $\frac{3}{16}$ " laterally of the tie plate. Inasmuch as the spring clip elements of the assemblies heretofore known are designed to embrace portions of the rail base and tie plate and frictionally grip them by means of vertical pressure only and are interlocked with the tie plate or otherwise held in fixed relation thereon, any lateral movement of the rail base in a direction away from such clip partially withdraws the inclined surface of the rail base from beneath the clamping jaw of the clip and thereby relieves the tension and consequently the gripping action of such clip on the rail base flange.

According to the present invention, the spring clips are formed to overcome the above objections. Each clip is formed from a strip of metal of uniform width by bending it intermediate its ends to form a relatively large loop, the end portions of the metal strip constituting

2

upper and lower jaws which embrace portions of the rail and the tie plate and clamp them together. The lower jaw fits into a recess formed on the bottom surface of the tie plate and the upper jaw is made slightly longer than the distance between the vertical central web of the rail and the inner face of an adjacent shoulder on the plate. The central portion of the upper jaw is bowed upwardly relative to the rail so that when the upper jaw is forced to its applied position, said upwardly bowed portion is distorted sufficiently to exert lateral pressure against the web of the rail and against the inner face of said tie plate shoulder. If only one spring clip is used for each tie plate the plate in such case is arranged with one of its shoulders in abutting engagement with the adjacent edge of the rail base and the clip is applied at the other side of the rail. The pressure exerted lengthwise of the upper jaw of the clip forces the base portion of the rail firmly against the first mentioned tie plate shoulder. However, when two spring clips are used, as shown in the drawings, the pressures exerted by the upper jaws of said clips serve to hold the rail centered on the rail seat portion of the tie plate. The resilient pressure exerted lengthwise of the jaws of the clips exert lateral pressures between the central web of the rail and the tie plate shoulders at opposite sides of the rail. This force, in addition to preventing lateral movement of the rail relative to the plate also functions to prevent lengthwise creeping movements of the rail.

The invention is illustrated in certain preferred embodiments in the accompanying drawings wherein:

Fig. 1 is a plan view of a tie plate and rail retaining clip assembly constructed in accordance with the present invention;

Fig. 2 is a vertical section taken on line 2—2 of Fig. 1, looking in the direction indicated by the arrows;

Fig. 3 is a view in perspective of the tie plate element of the assembly;

Fig. 4 is a fragmentary view similar to one side of Fig. 2, but illustrating the several parts of the assembly on a larger scale so as to better illustrate the clearance between the rail base flange and an abutting shoulder of the tie plate and also better illustrate the preferred contour of the upper jaw of the rail retaining clip and the manner in which it engages the base portion of the rail and the inner surface of an abutment shoulder on the tie plate;

Fig. 5 is a fragmentary view similar to Fig. 4, but illustrating a slight modification of the lower jaw of the clip designed to increase the vertical gripping pressure exerted on the top of the rail base and on the bottom of the tie plate; and

Fig. 6 is a fragmentary view in elevation of a side face of the metal stock from which the above rail retaining clips are formed.

Referring first to the embodiment of the invention shown in Figs. 1, 2, 3, 4 and 6: 10 designates a tie plate supported on the top surface of a cross tie 11. The base portion 12 of a railroad rail is positioned on the tie plate between a pair of abutment shoulders 13—13, defining a rail seat 14. The width of the rail base and the distance between the abutment shoulders 13—13 of the plate are normally such that a clearance 15 is maintained between the opposite edges of the rail base and the adjacent shoulders 13 of the plate when the rail base portion is seated centrally on said seat 14. The amount of the clearance 15 may vary slightly, but it is always present to a degree, since it results from the limit tolerances permitted in the manufacture of the railway rails and the double shouldered tie plate of the type herein shown. The spacing between the abutment shoulders 13—13 is substantially greater than the width of the rail base 12 so as to accommodate rail bases of oversized widths,

such as result when the forming surfaces of the rolls used in forming the rails become worn. This sizing must also take into account the wearing of the rolls used in forming the spaced abutment shoulders of the tie plate and consequently slight reduction in the width of the rail seat 14. Ordinarily, the clearance 15 at opposite edges of the rail base is approximately $\frac{1}{16}$ inch.

The tie plate 10 as shown herein may be, and preferably is, the same in construction as the tie plate shown in my prior Patent 2,107,131. It is provided with a plurality of openings 16 for the reception of screw spikes 17 adapted to clamp the tie plate firmly to the top surface of the cross tie 11. It will be obvious, however, that square openings 16 may be formed in the tie plate if it is desired to employ ordinary cut spikes instead of the screw type of fastening means. The shoulders 13—13 of the tie plate are preferably in the form of ribs which extend entirely across the plate and are of greater height than the edge thickness of the rail base. The bottom surface of the plate is formed with a recess or channel 18 for receiving the lower jaws 19—19 of a pair of rail retaining clip members 20. Preferably, the channel 18 is substantially the same width as the said jaws 19—19 of the clip 20 so that the vertical walls of the channel will serve as abutments for opposite edges of the clip members 20—20 for the purpose, which will be hereinafter explained. At the opposite ends of the channel portion 18 the plate is formed with slots 21—21 which extend through the plate from the shoulders 13—13 to the outer edges of the plate.

The rail retaining clip members 20 are formed, in each case, from a metal blank of the configuration shown in Fig. 6. The blank may be sheared to the desired width from a high carbon spring metal plate formed with a thickened portion 23 providing each blank with a vertical shoulder 24 and an inclined face 25. The end 26 of the blank is bent into a relatively large loop portion 22, as shown in Fig. 4, the loop terminating at one end in a horizontal portion which defines the lower jaw portion 19 of the clip. The end 27 of the blank is utilized to form the clip with an upper jaw 28 composed of a single arm. It is formed with terminal bends 29 and 30 and with an intermediate upwardly bowed portion 31. The terminal bend 29 bears against a fillet 32 at the junction of the rail base 12 and the central vertical web of the rail. The vertical surface 24 of the blank provides a locking shoulder which snaps over and engages the inner face 33 of an adjacent shoulder 13 of the tie plate when the clip is forced into its applied position. In this position the inclined surface 25 of the blank provides a flat bearing surface which exerts pressure against the top surface of the rail base adjacent a shoulder 13. Preferably, the upper jaw 28 of the clip has a length somewhat greater than the distance between the fillet 32 of the rail and the inner face 33 of the abutment shoulder 13 on the plate at that side of a rail so that when the clip is forced to its applied position, the curved configuration of the upper jaw is distorted, that is to say the intermediate bowed portion 31 is compressed lengthwise of the jaw. This compression of the bowed portion 31 exerts pressure laterally against the fillet 32 of the rail base and against the vertical surface 33 of the adjacent abutment shoulder 13 of the tie plate.

The vertical spacing between the lower and upper jaws 19 and 28 of the clip is less than the combined thickness of the tie plate and the rail base embraced. Consequently, the jaws are spaced apart in their applied position. The clip is driven or otherwise forced transversely of the rail over a shoulder 13 of the tie plate, the final applying force being sufficient to compress the intermediately bowed portion 31 sufficiently to permit the shoulder 24 to be snapped by the tension in the loop 22, over the shoulder 13 and into strong gripping engagement with the inclined top surface of the rail base, while the lower

jaw is pressed into tight clamping engagement with the bottom surface of the tie plate.

In the applied position of the clip the thickened portion thereof at the junction of the upper jaw 28 and the loop 22 is sufficient to withstand the normally high stresses at this area of the clip, such stresses being due to upward flexing of the terminal end 29 of the upper jaw relative to the thickened portion at the bend 28. The width of the clip corresponds to the width of the channel 18 and the end slots 21.

In some instances only one spring may be used to clamp the rail base to the plate. In such case the pressure exerted lengthwise of the upper jaw 28 serves to press the rail base firmly against the abutment shoulder 13 at the opposite side of the rail and to resist lateral displacement of the rail toward the spring clip. However, it is preferred to use two spring clips for each tie plate wherever possible. In such case the pressure exerted lengthwise of the upper jaw 28 serves to hold the rail base portion centered on the seat 14 and provides forces for resisting the lengthwise creeping movement of a rail in addition to the vertical gripping force exerted by the clip on the top surface of the rail base and the bottom surface of the tie plate.

In the modified embodiment shown in Fig. 5, the lower jaw 19a of the clip is formed with an upwardly bowed portion 34 which is partially flattened when it is driven into wedging engagement between the tie plate 10a and the top surface of the cross tie 11a. The compression of the upwardly bowed portion 34 effects a slight elongation of the circular bend 22a and thereby increases the downward thrust of the upper jaw 28a against the top surface of a rail base at a location adjacent the shoulder 13a. In other respects the clip 20a, being made from the blank shown in Fig. 6, has the same construction as shown in Fig. 4, and functions in the same manner except for the additional vertical pressure exerted on the rail base as a result of the flattening of the bowed portion 34 and the resultant greater thrust exerted by the upper jaw 28a against the rail base.

I claim:

1. A railway rail anti-creeper assembly comprising, in combination, a tie plate formed with spaced apart shoulders defining a seat for a conventional railway rail having opposed fillets at the junction of the base portion with the central web thereof, and means for securing the rail to the plate comprising a spring clip having single upper and lower jaws for embracing and vertically clamping together overlying portions of the rail base and the tie plate; the arm of the upper jaw being formed at one end with a curved portion for bearing against one of said fillets and provided at the other end with a vertically disposed loop and with a thickened portion serving to stiffen said upper jaw at its junction with the loop and having snap lock engagement with an inner face of one of said shoulders of the tie plate, and the portion of the upper jaw intermediate said curved end portion and said thickened portion being formed with a series of reverse bends normally compressed lengthwise of the jaw, when the jaw is forced to its applied position; the lower jaw of the clip being formed with an upwardly bowed portion at a location beneath the tie plate adapted to be partially flattened by forcing the lower jaw between a bottom portion of the plate and the top surface of a cross tie on which the tie plate is supported, whereby the deflection of the bowed portion of the lower jaw elongates the vertical loop and thereby increases the thrust of the upper jaw against the top surface of the rail base.

2. An anti-creeper assembly as defined in claim 1 wherein the said seat for the rail is greater than the width of the rail base and a second clip of like construction is applied at the other side of the rail to clamp the rail base to the tie plate and to exert transverse pressure on the rail, whereby the combined pressures exerted by both clips maintain the rail base centered on the plate

and resist lateral movement of the rail relative to the plate.

References Cited in the file of this patent

UNITED STATES PATENTS

1,888,557	Kurkowski	Nov. 22, 1932
1,942,464	Willard	Jan. 9, 1934

5

2,107,131
2,228,461
2,446,495
2,450,559
2,546,046
2,600,089

Schwinn	Feb. 1, 1938
Kelly	Jan. 14, 1941
Smithers	Aug. 3, 1948
Parsons	Oct. 5, 1948
Scholes	Mar. 20, 1951
Arthur et al.	June 10, 1952