

June 10, 1952

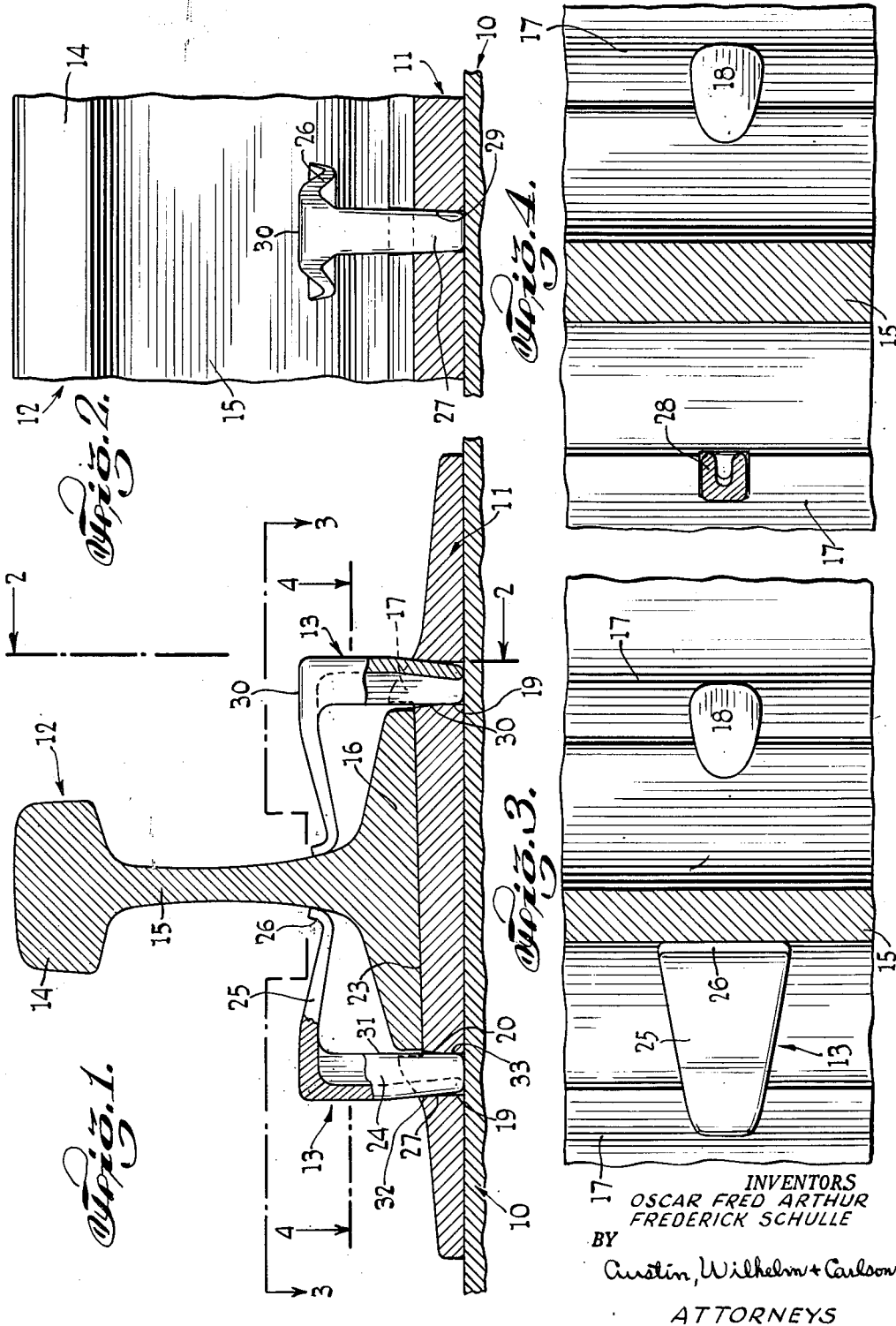
O. F. ARTHUR ET AL

2,600,089

RAIL ANCHOR

Filed Oct. 29, 1946

2 SHEETS—SHEET 1



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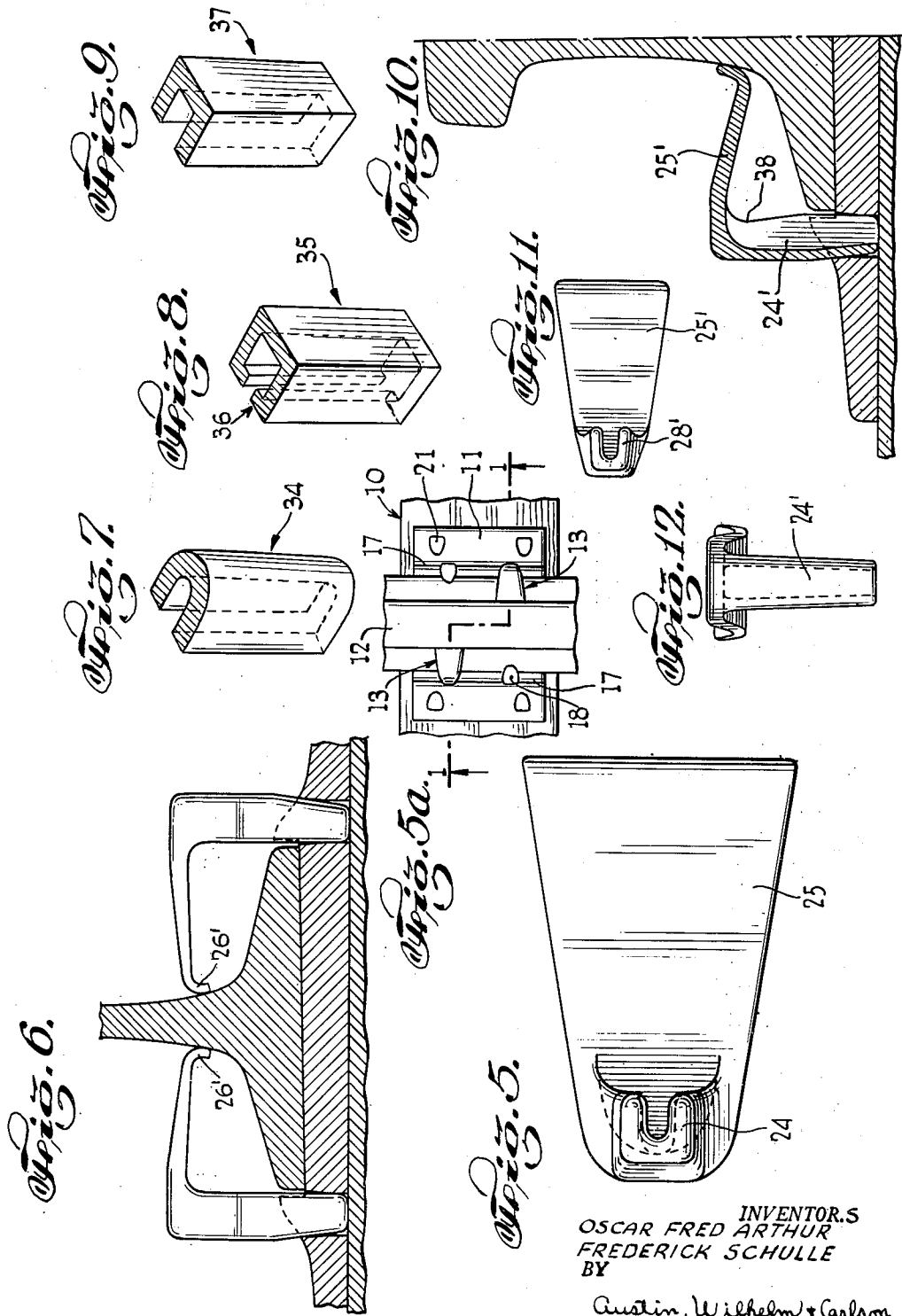
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2 SHEETS—SHEET 2



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2,600,089

RAIL ANCHOR

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Application October 29, 1946, Serial No. 706,312

20 Claims. (Cl. 238-349)

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The invention relates to railway track equipment and, more particularly, to devices known as rail anchors, anti-creepers or clips for preventing creep of railway rails.

This application constitutes a continuation-in-part of applications, Serial No. 494,702, filed July 14, 1943, now abandoned, and Serial No. 608,274, filed August 1, 1945, now abandoned.

It is well known that temperature changes and traffic exert forces lengthwise of the rail, causing the rail to creep. Such traffic causes include, for example, vibrations from constant speed trains, acceleration and deceleration of trains, driver thrust of locomotives, curve friction and location of the rail on grades. This creepage, if not prevented, causes dislocation of the ties, breakage of rail joint bolts, signal interruption, rough track, necessitating generally increased track maintenance.

Many attempts have heretofore been made to produce an anti-creeper or rail anchor, which will meet all the various requirements of manufacture, performance and maintenance. Of the many prior constructions only a few have gone into extensive commercial use. Prior constructions have one or more of the following objections: they damage the rail; they interfere with proper vertical movement of the rail; they do not adequately anchor the rail; they are too expensive; they anchor the rail against creep only in one direction; they require special tie plates or other equipment; they are unreliable; they require excessive maintenance.

It is an object of the present invention to provide a rail anchor which eliminates these objections. In its preferred form such a device comprises a flat spring arm having an integral shank adapted to be driven into the ordinary tie plate spike hole, said spring arm resiliently engaging the web of the rail with sufficient pressure to prevent creepage, while at the same time having little or no interference with normal vertical movement of the rail with respect to the tie plate.

The invention also consists in certain new and original features of construction and combinations of parts hereinafter set forth and claimed.

Although the novel features which are believed to be characteristic of this invention will be particularly pointed out in the claims appended hereto, the invention itself, as to its objects and advantages, and the manner in which it may be carried out, may be better understood by referring to the following description taken in connection with the accompanying drawings forming a part hereof, in which

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Fig. 1 is a transverse vertical section, taken on the line 1-1 of Fig. 5a, illustrating clips according to the invention, applied to the opposite sides of a rail, said clips engaging in conventional tie plate holes;

Fig. 2 is a vertical section taken on the line 2-2 of Fig. 1;

Figs. 3 and 4 are horizontal sections taken respectively on the lines 3-3 and 4-4 of Fig. 1;

Fig. 5 is a bottom view of one of the clips; Fig. 5a illustrates one manner of using the clips with one type of tie plate;

Fig. 6 is a view corresponding to Fig. 1 but illustrating a modified form of clip in which the arm flanges turn downward;

Figs. 7, 8 and 9 illustrate modified forms of tapered clip shank;

Fig. 10 is a partial vertical section through a rail and tie plate assembly, illustrating a modified form of clip;

Fig. 11 is a bottom view of such modified clip; and

Fig. 12 is an elevation of such modified clip looking from the back of the shank toward the lip.

In the following description and in the claims, various details will be identified by specific names for convenience, but they are intended to be as generic in their application as the art will permit.

Like reference characters denote like parts in the several figures of the drawings.

In the drawings accompanying and forming part of this specification, certain specific disclosure of the invention is made for purposes of explanation, but it will be understood that the details may be modified in various respects without departure from the broad aspect of the invention.

Referring now to the drawings and more particularly to Figs. 1-6, the construction in general includes a conventional wooden tie 10, conventional tie plate 11, conventional rail 12 and two clips or anchors 13 engaging opposite sides of the rail web. The rail 12 includes head 14, web 15, base flange 16. The tie plate 11 includes longitudinally extending ribs 17 (see Fig. 5a) through which line spike holes pass, in some of which are located line spikes 18. Additional holes for hold-down spikes 21 are also provided. The rail 12 seats between the shoulders 17 upon a surface 23 having a slight cant or angle in accordance with common practice. As shown in Fig. 5a, clips 13 are located in longitudinally spaced line spike holes, the other line spike holes having the spikes 18.

The spike holes in conventional tie plates are

usually somewhat larger at the top than at the bottom, as illustrated in Fig. 1. This difference in size is caused by the punching operation. During manufacture the tie plate holes are punched from the bottom, the punching operation tearing the metal at the top a little more than at the bottom of the hole. The taper usually does not extend the entire depth of the hole but the hole is usually of more or less uniform size from the bottom of the tie plate (as indicated by 19) to a point midway the thickness of the plate from which point the taper starts and continues to the top of the plate (as indicated by 20). The holes for the line spikes 18, passing through the tie plate shoulders 17 and therefore being somewhat longer, naturally have more flare than the holes for hold-down spike 21.

The anchors 13 on either side of the rail are preferably identical in construction and dimension and are held in the line spike holes. Each anchor 13 comprises a shank 24 with a comparatively wide and thin arm 25 somewhat in the nature of a heavy leaf spring and ending in an upwardly extending contact lip or flange 26.

As shown in Figs. 4 and 5, the shank 24 is U-shaped in cross section. The back surface (remote from the rail) of the shank is shown tapered as indicated at 27 with respect to the shank axis while the front face of the shank is straight as indicated at 31 with respect to the shank axis. The side faces are also tapered with respect to the shank axis as indicated at 29 (Fig. 2) but the side tapers are less than the back taper. The angle of back taper 27 is preferably greater than that of the tie plate holes.

The leaf spring arm 25 flares from the shank toward its free end, providing a web-engaging flange 26 of considerable extent lengthwise of the rail to provide an efficient triangle or truss action as discussed more in detail hereinafter. The web contact flange should preferably be straight (lengthwise of the rail) or, if not straight, it should present a concavity with respect to the rail web so that it will engage the web at spaced points. It should not present a convexity to the rail web or have any other shape causing any tendency to rock on the rail web.

The arm 25 extends substantially horizontally above the rail base and its direction may vary from a "positive" angle above horizontal to a "negative" angle below horizontal so long as the pressures generated by the clips act in the manner discussed more in detail hereinafter. This angle is determined by the line connecting the point of contact with the rail web and the section of highest flexure during vertical rail movement. The negative angle is generally preferred, i. e., where the point of web contact is lower than the section having highest flexure.

The clips are installed merely by inserting the shank 24 in the tie plate hole with the contact lip 26 adjacent the rail web and pounding on the flat anvil top 30 with a two-pound maul. The dimensions of the clips are such that, as the shank is driven into the hole, pressure will be built up between the upturned flange 26 and the rail web. The tapered configuration of the tie plate hole and of the shank 24 facilitates starting the shank in the hole and causes the shank to tilt toward the rail as it is driven into the hole, stressing the metal in the flange 26, arm 25 and shank 24 sufficiently to build up the desired pressure against the rail, the metal of the clips flexing to the necessary degree. The downward flare of the rail web 15 where the clip engages provides

additional camming or wedging action on the arm 25, further increasing the pressure built up against the rail web as the clip is driven home.

Preferably the shank should not be driven below the bottom surface of the tie plate even with a minimum tolerance shank applied to a maximum tolerance hole. The clips should be capable of being withdrawn by an ordinary track tool.

The main holding force of the clip in the tie plate hole withstanding any upward pull is caused by the friction developed at the contact areas between the front and back surfaces of the shank and the corresponding faces of the hole. Any upward force at the lip or contact flange 26 of the leaf or arm 25 increases the holding power of the clip in the spike hole. The clip, in a sense, tends to rotate in a vertical plane passing through the shank about the contact area 32, where the back of the shank engages the top of the hole. The moment arm from the contact area 32 to the lip 26 is much greater than that from the contact area 32 to the contact area, indicated by 33, where the front of the shank engages the bottom of the hole. This gives a high mechanical advantage, generating high pressure against the front and back of the hole to resist any upward pull at the rail, and necessitates vertical flexing of the arm or leaf 25.

It is preferred that the two opposed clips be used in longitudinally spaced line spike holes, as illustrated in Fig. 5a, although they may be placed in directly opposite line spike holes if desired.

It will be understood that vertical movement of the rail with respect to the tie plate is a condition in track and it is generally undesirable to attempt to hold the rail down onto the tie plate. Maximum vertical movement of the rail with respect to the tie plate is not usually considered to exceed $\frac{1}{8}$ to $\frac{3}{8}$ of an inch, depending upon the type and conditions of the track.

Creeping is resisted in the present construction by truss action of the straight surface (longitudinally of the rail) of the anchor arm flange 26 frictionally engaging the rail web—plus tight fit of the rectangular shank in the rectangular tie plate hole. This frictional force is effective to prevent rail creepage even with vertical rail movement but does not substantially interfere with such vertical rail movement.

This pressure of the clip against the rail web is not dependent upon rail creepage as is the case with certain cam types of anchor. In the present clip the engagement between the clip and the rail web is wholly frictional and sufficient pressure is generated between the clip and the rail by the driving of the clip into the tie plate hole to prevent creepage. However, in some cases slight rail creepage may occur, causing one end of the longitudinally straight lip surface to exert more pressure at the rail web. This shifting action is incidental and is caused by inaccuracies and is not deliberate as in the case with the true cam type anchor.

This small shifting of the rail anchor is of advantage in that it permits slight lengthening or shortening of a single standard length rail due to temperature forces and, if the rail joints are not frozen, these changes in length will not be cumulative.

The upturned contact flange or lip 26 does not bite into the rail web or rub against it in

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any way during use. There is no vertical slippage of the anchor against the rail web as the rail exercises its up-and-down movement under traffic. Any rubbing against the rail in use causes wear which is undesirable.

The contact flange or lip 26 may be turned upwardly as in Fig. 1 or downwardly as indicated by 26' in Fig. 6. It is preferred that the lip turn upwardly as in Fig. 1 for manufacturing purposes. The construction shown in Fig. 6 follows closely that shown in Figs. 1 to 5 except for the aforesaid downturned contact flange and the somewhat less slope to the arm body necessary for the contact flange 26' to engage the proper part of the rail web.

As above stated, the arm 25 may slope downwardly toward the rail, upwardly toward the rail, or horizontally toward the rail, so long as the pressure exerted by the clips on the rail is in the proper direction.

It is undesirable for the clip or anchor to hold the rail up off its seat 23 even though the weight of the train will always push the rail downwardly. It is therefore preferred that any vertical component in the pressure exerted by the clips against the rail be directed downwardly and not upwardly. It is desired, of course, that the preponderance of pressure exerted by the clip on the rail be exerted horizontally so as not to interfere with vertical movement of the rail with respect to the tie plate. It is this pressure against the rail web which provides the frictional force between clip and rail to resist creeping of the rail.

It is desired that the pressure exerted by the clips against the rail web be substantially normal (i. e. perpendicular) to that portion of the web surface contacted by the clip. Due to the fact that the webs of most rails flare slightly outwardly toward their lower ends before they merge into the lower fillets, such normal contact pressure will have a preponderantly great horizontal component and some, but relatively small, downward vertical component. Of course the pressure exerted by the clips against the rail web may also be at some small vertical angle with respect to normal, either above normal or below normal, so long as the angle does not exceed the critical angle of friction above which the contact flange will tend to slip on the web surface, and so long as there is no upward vertical force generated sufficiently high to hold the rail off its seat.

It is preferred that the clip contact the lower half of the rail web, and not too close to the lower fillet, as contact on the lower fillet surfaces may result in the downward vertical component of pressure being great enough to interfere with free vertical rail movement.

It will be noted that the clips are small and light and in practice may weigh somewhat less than a pound apiece. Considered with their efficiency and their ability to prevent creep in both directions, this is an important advantage, particularly when rail anchors are usually sold on a tonnage basis.

It is intended that these clips exert sufficient frictional force on the rail to cause the tie to move in its ballast before the rail moves with respect to the tie plate.

According to some authorities, a tie will withstand a force, exerted lengthwise of the rail, in the neighborhood of 600 pounds per rail without moving laterally of its length, provided the road-bed is well tamped and has a firm ballast. This

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force will be considerably less for poorly tamped track and for gravel, cinders or sand ballast and will be tremendously increased in frozen ballast. It is desired that each clip develop a frictional force (lengthwise of the rail) as high as 750 pounds (1500 pounds per pair) to withstand creepage, which means that the direct horizontal force applied by the clips against the web must be several times this frictional force, depending upon the coefficient of friction between clip and rail. To prevent too much horizontal movement of the ties in soft road bed a correspondingly larger number of clips must be used.

The clips are preferably designed to allow for a variation of $\frac{1}{8}$ of an inch under and $\frac{1}{8}$ of an inch over in the location of the spike holes and the same tolerance in the dimensions of the spike holes, and a manufacturing tolerance for the length of each clip (from top of shank to lip) of $\frac{1}{8}$ of an inch over and under. It is desired that the above forces should be exerted under normal vertical rail movement without over-straining the metal of the clip and causing it to take a permanent set.

The turned-up or turned-down contact flange provides greater area of contact against the rail web; it also provides more metal to withstand the large contact pressures generated by driving the clip into position and to allow for manufacturing tolerances.

The clips may be made of any standard spring steel having the necessary characteristics for withstanding the high stresses and strains. If desired, the clip may be coated either by electroplating with a suitable metal, such as zinc or cadmium, or it may be coated by some such protecting coating such as asphaltum or tar, in order to prevent atmospheric corrosion and possible failure due to corrosion fatigue. Material such as asphaltum or tar should be applied immediately after installation in the track.

It will be understood that the clips may be used with different types of tie plates and with different rail sections. The clips may also be used with metal ties, openings being provided therein for the clip shanks, in which case it is not necessary to use tie plates. The tie plates may be any of the usual standard tie plates adopted by the railroads, with or without longitudinal ribs or shoulders. In the event shoulders similar to 17 are used, the line spike holes may have their straight inner surfaces 19 spaced slightly inwardly toward the rail with respect to the shoulder as illustrated in Fig. 1; or their inner surfaces 18 may be in line with such shoulder, or spaced slightly outwardly away from the rail, with respect to such shoulder, as will be understood by those skilled in the art.

Referring now to Figs. 7, 8 and 9, these figures illustrate modified ways of making the lower tapered portions of the shank 24. In Fig. 7, the shank 34 is U-shaped in cross-section and the legs of the U-formation have sharpened corners to fit more closely into the corresponding corners of the tie plate holes, while the crotch of the U-formation is more gently rounded.

In Fig. 8, all four corners of the U-formation 35 are relatively sharp while the ends of the legs have inturned toes 36. In Fig. 9, all corners of the U-formation 37 are sharp while the thickness of the metal is somewhat greater than in Fig. 8.

In all three cases, Figs. 7, 8 and 9, the legs of the U-formation may face toward the rail and be straight while the back faces and the side

faces of the shanks may be tapered, as with the shank of Fig. 1.

In all forms of shank shown herein, the front surface of the shank may be tapered and the back face straight, if desired. The important relationship is the angle between the shank back and front surfaces. This angle facilitates starting of the clip in a tie plate hole and serves to tilt the shank toward the rail as the clip is driven into the hole as discussed above.

Referring now to Figs. 10, 11 and 12, the clip here follows that shown in Figs. 1 to 5 with the following differences. The upper part of the shank 24' is reduced in transverse section at the front face as indicated by 38 to provide greater length and flexibility to the arm or leaf 25'. This reduction forms an oblique surface on the upper part of the front face, the lower part of which is parallel to the shank axis where it engages in the spike hole. In addition, the U-shaped legs 28' flare (in cross section) somewhat from the crotch thereof, as shown especially in Fig. 11.

The construction, operation and manner of driving this modified clip, shown in Figs. 10 to 12, is otherwise substantially as described above in connection with the main form shown in Figs. 1 to 5.

While certain novel features of the invention have been disclosed herein, and are pointed out in the annexed claims, it will be understood that various omissions, substitutions and changes may be made by those skilled in the art without departing from the spirit of the invention.

What is claimed is:

1. A rail anchor comprising a shank and an integral rail-contact blade, said shank being adapted to fit in a line spike hole of a tie plate or the like, said blade extending substantially horizontally and having a contact surface which is straight lengthwise of the rail, said surface being adapted to contact the lower part of a rail web above the lower fillet thereof, whereby to firmly wedge said straight contact surface frictionally against the rail web when the anchor is driven home, said blade having vertical flexibility.

2. A rail anchor comprising a shank and an integral rail-contact blade, said shank having a generally rectangular outline in cross section and adapted to fit in a line spike hole of a tie plate or the like, said blade extending substantially horizontally and having a vertically directed flange with a contact surface which is straight lengthwise of the rail, said surface being adapted to contact the lower part of a rail web above the lower fillet thereof, the front surface of the said shank being straight and the back surface thereof being tapered with respect to the axis of the shank, whereby to firmly wedge said contact surface frictionally against the rail web when the anchor is driven home, said blade having vertical flexibility.

3. In an anti-creep track structure, a tie plate having shoulders forming a rail seat therebetween, a T-rail having head, web and base flange, the latter resting on said seat, said tie plate having rectangular spike holes passing through said shoulders, rail anchors, one on each side of the rail, each rail anchor having a spring arm and an integral shank, said shank being disposed within a spike hole, said arm having a contact surface engaging the lower part of the rail web at spaced points, said arm extending substantially horizontally from said shank to said web, whereby to exert high static pressure substantially normal to the web surface, the

greater part of said pressure being directed horizontally and a relatively small part of said pressure being directed downwardly, said shank having a substantially rectangular outline in cross section, the front and back surfaces of said shank being tapered with respect to each other, said arm being spaced from said base and exerting a truss action on said web, whereby to prevent substantial creepage of the rail in both directions, while permitting relatively free vertical movement thereof on said tie plate.

4. In combination with a rail and a tie plate or the like supporting said rail, a rail anchor comprising a shank and an integral rail-contact blade extending from the front thereof, said shank having a generally rectangular outline in cross section and adapted to fit in a line spike hole of said tie plate or the like, said blade extending substantially horizontally and having a contact surface adapted to engage the rail web between upper and lower fillets thereof at spaced points lengthwise of the rail, the back surface of the shank being on an angle with respect to the front surface of the shank, whereby to firmly wedge said contact surface frictionally against the rail web when the anchor is driven home.

5. In combination with a rail and a tie plate or the like supporting said rail, a rail anchor comprising a shank and a rail-contact blade, said shank adapted to fit in a hole of said tie plate or the like, said blade extending substantially horizontally and having a vertically directed flange with a contact surface which is straight lengthwise of the rail, said surface being adapted to contact the rail web between upper and lower fillets thereof, whereby to firmly wedge said contact surface frictionally against the rail web when the anchor is positioned, said anchor having vertical flexibility.

6. In an anti-creep track structure, a rail seat, a rail having head, web and base flange, the latter resting on said seat, means laterally positioning said rail including a rail anchor, said rail anchor including a post supported by said seat alongside the rail, an arm extending downwardly from said post to the rail to provide rail contact portions spaced lengthwise of the rail, said rail contact portions engaging the lower part of the rail web below the upper part of the rail web and above the lower fillet thereof, whereby to firmly wedge said contact portions frictionally against the rail web, said anchor having vertical flexibility to permit vertical movement of said rail on said seat.

7. A rail anchor comprising an integrally connected angularly related shank and arm, said arm being sufficiently thin to provide vertical flexibility in a direction axially of the shank and having a sufficiently long rail engaging portion to abut the rail web at spaced points lengthwise of the rail, said shank and arm being so dimensioned that the shank may be started into a tie plate hole with the rail in position on the tie plate and with said rail engaging portion adjacent the rail web, said shank, when driven into the tie plate hole, forcing said arm into wedging engagement with the lower part of the web, said anchor having the aforementioned vertical flexibility to enable the rail to partake of normal wave movement with respect to the tie plate.

8. In combination with a rail and a tie plate or the like for supporting said rail, a rail anchor comprising essentially an arm and a shank, said arm engaging the rail web at spaced points lengthwise of the rail, said shank engaging in a hole in said tie plate or the like, said spaced

points and the engagement with said tie plate hole forming in effect a triangular truss, said anchor being so dimensioned that, when the shank is forced into the tie plate hole, the arm is wedged against the rail web.

9. A rail anchor comprising a shank with an integral, relatively long and thin, flat, flexible rail contact blade whose length projects from the top of the shank at the front in cantilever fashion at an angle slightly less than a right angle with the shank axis and in the direction of the bottom of the shank, said shank being U-shape in cross section with the legs of the U-shank facing toward the free end of said blade and with the crotch of the U-shape tapered axially of the shank, said shank having a flat top providing an anvil surface, the width of said blade extending transversely of the shank axis and gradually increasing from the shank toward said free end, said blade having a flange at said free end turned in a direction parallel to the shank axis and forming a straight rail web contact surface whose length extends in the direction of blade width, the front surface of the shank being relieved just under the blade to increase the effective length of the blade.

10. A rail anchor comprising a shank with an integral, relatively long and thin, flat, flexible rail contact blade whose length projects from the top of the shank at the front in cantilever fashion at an angle slightly less than a right angle with the shank axis and slopes toward the bottom of the shank, the front and back surfaces of the shank forming an acute angle to provide a taper to the shank, the width of said blade extending transversely of the shank axis and increasing from the shank toward the free end of the blade, said blade having a flange at said free end forming a straight rail web contact surface whose length extends in the direction of blade width.

11. The combination with a rail support having an opening therein, of a shank seated in the opening, a flattened arm integral with and extending from the upper end of the shank and proportioned and positioned to engage one side of the web of a supported rail, said arm, when forcibly moved downwardly, constituting means for binding the shank upon the wall of said opening and for binding the end of the arm upon the web of the rail, said arm being proportioned to flex upwardly and downwardly under pressure exerted by the engaged web of the rail.

12. The combination with a rail support having openings therein spaced to receive the base flanges of a rail therebetween, of shanks insertible downwardly within the respective openings, flattened arms extending from the respective shanks toward each other, said arms being proportioned to frictionally engage opposed faces of the web of an interposed rail, the proportions of each arm being such that when its shank is forcibly driven into its respective support opening, said arm will bind the shank upon opposed walls of the opening in which it is seated and will effect a tight frictional fit against the adjacent side of the web, the thickness of the arm being such as to permit limited up and down flexing of the arm relative to the shank when subjected to up and down movement respectively of the rail engaged by the arms, the rail engaging ends of the arms being straight lengthwise of the rail and cooperating to grip the web and hold it against longitudinal movement when subjected to longitudinal thrust.

13. A rail anchor comprising a shank and a rail contact arm, said shank being adapted to fit into the hole of a tie plate or the like, said arm extending laterally to provide rail-contact portions spaced lengthwise of the rail, said rail-contact portions being adapted to engage the rail web in spaced relation to upper and lower fillets thereof, whereby to firmly wedge said contact portions frictionally against the rail web when the anchor is positioned, said anchor having vertical flexibility to permit vertical movement of the rail.

14. A rail anchor comprising a shank with an integral rail-contact blade, said shank being adapted to fit into the hole of a tie plate or the like, said blade extending substantially horizontally from shank to rail to form a rail-contact surface which is straight lengthwise of the rail, said contact surface being adapted to engage the lower part of a rail web spaced from the upper part thereof and from the lower fillet thereof, whereby to firmly wedge said straight contact surface frictionally against the rail web when the anchor is driven home, said blade having vertical flexibility to permit vertical movement of the rail.

15. A rail anchor comprising a shank with an integral rail-contact blade, said shank having a generally rectangular outline in cross section and adapted to fit into a hole of a tie plate and to extend substantially flush with the lower surface thereof, said blade extending substantially horizontally and flaring from shank to rail to form a rail-contact surface which is straight lengthwise of the rail, said contact surface being adapted to engage the lower part of a rail web spaced below the upper part thereof and above the lower fillet thereof, whereby to firmly wedge said straight contact surface frictionally against the rail web when the anchor is driven home, said blade having vertical flexibility to permit vertical movement of the rail.

16. In an anti-creep track structure, a rail seat, a rail having a head, a web and a base flange, the latter resting on said seat, means laterally positioning said rail including a rail anchor, said rail anchor including a post held to said seat alongside the rail, an arm extending laterally from said post to provide rail contact portions spaced lengthwise of the rail, said arm being firmly wedged against the rail web with said rail contact portions frictionally engaging the rail web and spaced between upper and lower fillets thereof, said anchor having vertical flexibility to permit vertical movement of said rail on said seat, while preventing creep of said rail on said seat in both directions.

17. The combination with a rail having a head, web and base flanges and a support having spaced openings positioned to receive the base flanges of the rail therebetween, of shanks insertible into the openings, arms inclined relative to and extending from the shanks, said arms being proportioned to engage the web of said rail at spaced points longitudinally of the rail and at points spaced from the base flanges and from the head of the rail, each shank and its arm being positioned for frictional contact with the rail support and the web respectively and each arm being proportioned for limited up and down flexing through frictional contact with the web of the engaged rail.

18. The combination with a rail support having an opening therein, of a shank seated in the

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opening, a flattened arm extending from the upper end of the shank and proportioned and positioned to engage one side of the web of a supported rail at spaced points longitudinally of the rail, said arm being of such length that, when forcibly moved downwardly, it constitutes means for binding the shank upon the wall of said opening and for binding the end of the arm upon the web of the rail to prevent creepage.

19. The combination with a rail support having openings therein spaced to receive the base flanges of a rail therebetween, of shanks insertible downwardly within the respective openings, flattened arms integral with said shanks and extending from the respective shanks toward each other, said arms each being proportioned to frictionally engage the adjacent face of the web of an interposed rail at spaced points lengthwise of the rail, the proportions of each arm being such that when its shank is forcibly driven into its respective support opening, said arm will bind the shank upon opposed wall portions of the opening in which it is seated and will effect a tight frictional fit against the adjacent face of the web.

20. The combination with a rail support having openings therein spaced to receive the base flanges of a rail therebetween, of shanks insertible downwardly within the respective openings, flat-

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tened arms integral with their respective shanks and extending from the respective shanks toward each other, said arms each being proportioned to frictionally engage the adjacent face of the web of an interposed rail at spaced points lengthwise of the rail, the proportions of each arm being such that when its shank is forcibly driven into its respective support opening, said arm will bind the shank upon opposed wall portions of the opening in which it is seated and will effect a tight frictional fit against the adjacent face of the web, the thickness of the arm being such as to permit limited up and down flexing of the arm relative to the shank when subjected to up and down movement of the rail engaged by the arms.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,023,871	Payne et al.	Apr. 23, 1912
2,101,038	Armstrong	Dec. 7, 1937
2,152,853	Packer	Apr. 4, 1939