Nov. 6, 1928.

1,691,019

C. B. SHEPHERD

RAIL ANCHOR

Filed Dec. 7, 1927

2 Sheets-Sheet 1

Fig. 1.

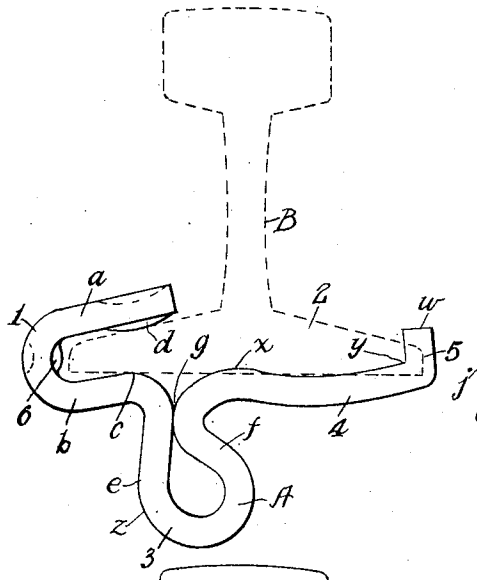


Fig. 2.

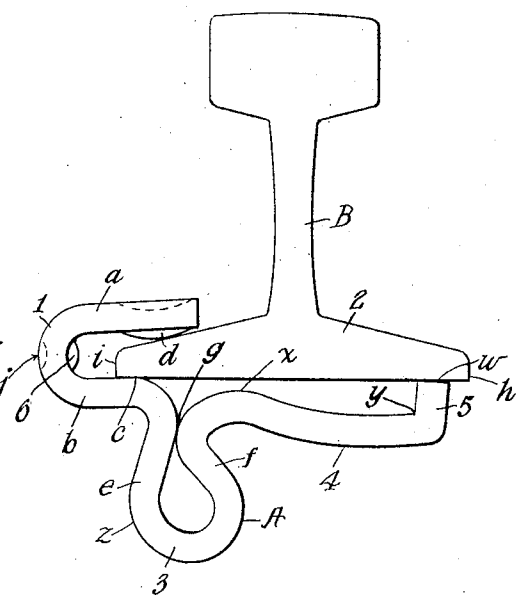


Fig. 3.

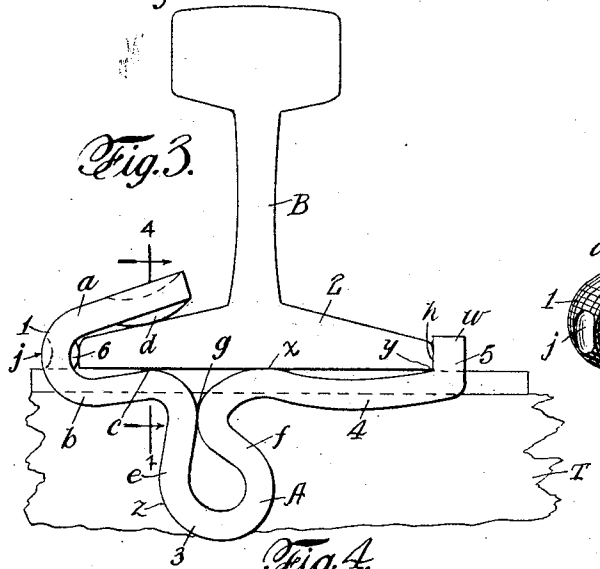


Fig. 5.

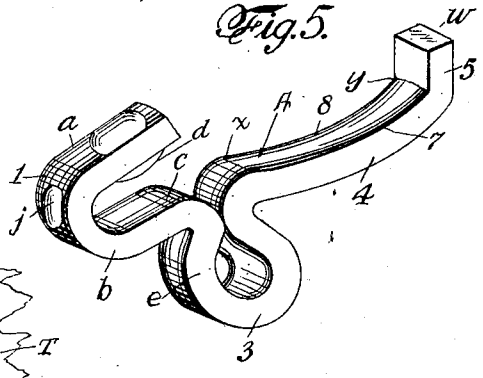
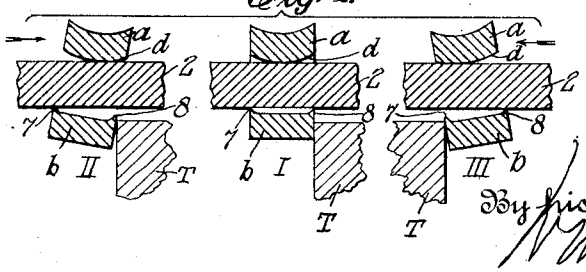


Fig. 4.



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Fig. 6.

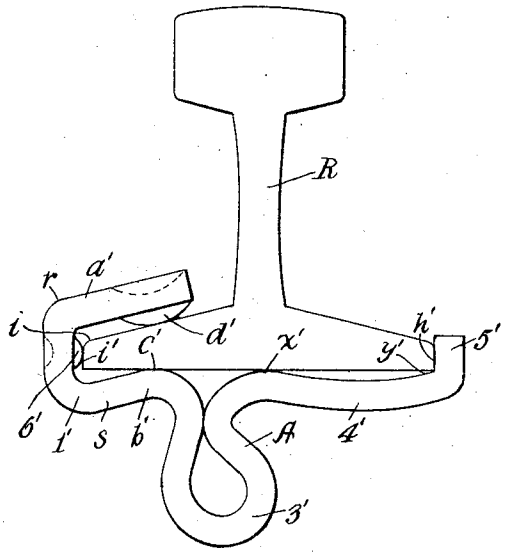
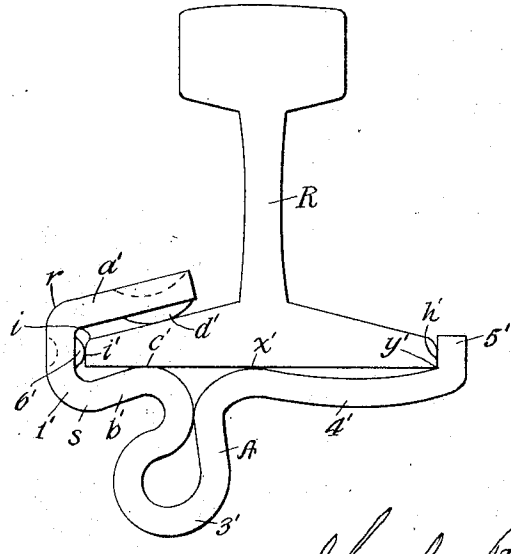


Fig. 7.



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Patented Nov. 6, 1928. 1,691,019

UNITED STATES PATENT OFFICE.

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RAIL ANCHOR.

Application filed December 7, 1927. Serial No. 238,342.

The present invention relates to anchors for rails or tracks of railways to prevent forward or longitudinal creeping of the rail on the cross-ties in the direction of moving trains thereover.

A number of devices of this character have been proposed of varying constructions and designs. While many are constructed to have sufficient holding force to resist the tendency of the rail to creep, they have objectionable features, some being too high in price due to their design and construction, others damaging the cross-ties to too great an extent, while others being satisfactory in these respects are too difficult to apply, remove and reapply, and require special tools for their application and removal.

Chiefly among the prior anchor devices, there are two distinct types, namely the "wedge type" and the "spring tension type." These latter devices generally have a loop or jaw which fits around the edge of the base flange of the rail, and in applying the same they are usually driven in place by a hammer or a suitable tool and spread beyond its elastic limits, causing it, under normal operating conditions, to lose its effectiveness.

The spring type of anchor relies upon a spring tension and friction to prevent creeping of the rails. It has been found that this alone is inadequate. To sufficiently increase this friction would require such tremendous spring force that the design of the anchor would render it hard to handle and too difficult to apply and remove, and therefore impractical.

The object of the present invention is the production of an inexpensive anchor of the spring tension type which will overcome all of the disadvantages above enumerated and which can be applied or installed on the rail with spike mauls or sledge hammers without resorting to special tools.

It is also an object of the invention to provide an anchor of the above stated character so constructed as to utilize the forces set up by moving trains passing over the rail to shift or rock the anchor into positive locking position to resist any forward creeping or slipping of the rail on the cross-tie.

Another object of the invention is the provision of a rail anchor of the above stated character which can be applied or removed from the rail without harmful spreading or stretching of the parts thereof beyond their elastic limits, which heretofore have resulted in a permanent elongation of the anchor causing it to become loose and to improperly hold on the rail.

A further object of the invention is the provision of a spring tension anchor having a depending tie-engaging loop which will not spread or become stretched due to relative vertical movement of the tie and rail.

With these and other objects in view, the invention resides in the details of construction, combination and arrangement of parts hereinafter more fully described and pointed out in the appended claims.

In the drawings which illustrate one embodiment of the invention:

Figure 1 is a side elevation of the anchor of the present invention, the rail being dotted in position in order that that the normal position of the parts of the anchor can be readily observed;

Figure 2 is a side elevation of the anchor showing the same in one of its positions during application to a rail;

Figure 3 shows the anchor applied to the rail and the position it assumes with respect to the cross-tie;

Figure 4 is a series of sectional views taken substantially on the line 4—4 of Figure 3, view I illustrating the position of the anochor on the base flange of the rail before the same has been subjected to a tilting or rocking action; while view II illustrates the position the anchor assumes upon longitudinal shifting movement of the rail in the direction of the arrow, and view III is a view similar to view II, but illustrating the position of the anchor in respect to the rail when tilted by a longitudinal movement of the rail in the direction of the arrow adjacent thereto;

Figure 5 is a perspective view of the anchor in accordance with the present invention;

Figure 6 is a side elevation of the anchor applied to a rail, which anchor has its gripping jaw of modified construction;

Figure 7 is a similar view to that shown in Figure 6, but illustrates the depending loop thereof offset in an opposite direction.

Referring in detail to the drawings, the anchor A of the present invention comprises an elongated strip or bar of resilient metal, preferably cold, rolled alloy steel. One end of the bar is bent upon itself to form an open loop 1 having the gripping jaws *a* and *b* of

such shape and dimensions as to receive therebetween the edge portion 2 of the base flange of a railway track or rail B. The inner faces of the jaws *a* and *b* will grip the adjacent surfaces of the base flange 2 near their outer ends, namely, at points *c* and *d*, when the anchor is in position as shown in Figure 3. The intermediate portion of the anchor A is formed into a depending loop 3, which loop has its leg portions *e* and *f* brought in close contacting position at their outer ends, as at *g*. The closed or lower end of the loop 3 is offset laterally to a plane passing through the meeting surfaces *g* of the legs *e* and *f*, which plane is substantially at right angles with the under surface of the rail base B when the anchor is applied. One leg of the loop 3 is provided by bending the bar immediately beyond the point *c* of the jaw *b* to a position which will be substantially perpendicular to the base flange 2, while the other leg is formed to lie at an oblique angle with respect to the base flange.

The other end portion 4 of the anchor extends in a direction opposite to the portion *b* of the loop 1 and in substantially the same plane therewith. The outer end of the arm 4 is bent upwardly at substantially right angles thereto to provide a gripping finger 5 which will contact with the other side edge of the rail base flange 2. The arm 4 is designed to contact with the under surface of the base flange 2 at the points *x* and *y*. From Figure 1 it will be observed that with respect to the rail and in its normally unapplied position, the point *y* of arm 4 of the anchor is in a plane above the point *x*, and the point *x* is in a plane above the point *c*.

In applying the anchor to a rail, the loop 1 thereof is placed around one edge of the base flange 2 in the manner shown in Figure 2, the inner portion of the loop opening between the jaws *a* and *b* being wider than at the points of entrance *c* and *d*, thus allowing a sufficient clearance to permit the anchor to fulcrum about the point *d* when pressure is applied to force the same in position so that the gripping finger 5 will snap over the other edge of the base flange 2. This applying pressure may be supplied by a blow from a spike maul or a sledge hammer, first, on the closed end of the loop 1. as at *j*, and then, if necessary, at substantially the point *z* on the loop 3. These blows are directly transmitted through the contacting portions *g* of the loop 3 to the arm 4, causing tensile strain in the loop 1 which will force the jaws *a* and *b* open a certain distance to grip the surfaces of the base flange 2.

During this application of the anchor, the loop 3 is not subjected to any substantial strain or stress, but transmits in the manner just described the applying force in a direction longitudinally of the anchor to shift the same transversely of the rail base into position. By reason of the contacting surfaces *g* of the loop 3, the blow from the applying tool is directly and positively transmitted, avoiding the resiliency of the loop 3.

Because the point *y* on the arm 4 is in a higher plane than the point *x*, and the point *x* in a higher plane than the point *c*, as above pointed out, it is obvious that in applying this anchor to the rail the arm 4 is forced downwardly and subjected to compression stresses which, when the anchor is on the rail, react to tightly bind the anchor at the points *x* and *y* and the finger 5 against the adjacent surface *h* of the base flange 2. Once the anchor is in place on the rail, the strains set up in the loop 1, loop 3 and arm 4, during its application, are equally distributed throughout the anchor construction.

In order to prevent the loop 1 of the anchor from being driven too far on the base flange 2, which is usually wedge shaped in cross-section, and thus stretching the loop beyond its elastic limits, an inwardly projecting stop 6 is provided at the inner face of the closed end of the loop which will abut only with the vertical edge of the base flange when the anchor has been forced into position on the rail. This stop 6 may be of any character or construction which does not overlie, underlie, grip around, or vertically bear against the edge of the base flange, thus avoiding the possibility of breaking or chipping the base flange if the anchor is struck in the event of derailment.

In the present invention the frictional contact between the anchor and the rail caused by the tensional strains on the several parts of the anchor in its applied position are not depended upon to prevent a longitudinal creeping or slipping of the rail under a traction force of a moving train. The present anchor is constructed to utilize any tendency of the rail to shift longitudinally, to rock or tilt the anchor transversely, and cause the same to bite into the base of the rail with a penetrating or shearing force. To this end the point of contact *d* on the jaw *a* of the loop 1 is provided with a convex surface extending substantially transversely across the jaw *a*, as can be seen from Figure 4. This convex surface may be provided by stamping the end of the jaw *a* or in any other suitable manner.

The inner surface of the bar or stock forming the anchor A is provided at its longitudinal edges, at least at the points *c*, *x* and *y*, with outstanding biting edges 7 and 8. These biting edges may be provided by any suitable manner, either by cupping or dishing the bar or by forging the bar with upstanding ribs. Thus, longitudinal creeping of the rail causes the anchor to rock or tilt with the point *d* as a fulcrum to force one of the edges 7 or 8, according to the movement of direction of the rail, to bite into the under surface of the base flange 2, and thereby firm-

ly lock the rail against said shifting movement, it, of course, being understood that the depending loop 3 engages the side surface of the cross-tie T immediately behind which the anchor is disposed. Manifestly, the construction of the anchor permits it to be used for either right or left hand positions.

Under certain conditions a vertical, or what is commonly called a "pump" movement is produced between the rail and the cross-tie to which it is secured when moving loads pass over the rail. If the anchor has become embedded in the side face of the tie, or bound in the ballast, or if the bottom end of the loop 3 pounds against the ballast, the loop usually spreads loosening the anchor. But by offsetting the loop, in the manner shown in the drawings, the same forces which would spread the loop cause it to bend or pivot with the point c or x as a fulcrum bearing against the base flange 2, according to the side upon which the loop is offset (see Figures 1 and 3) without injury to the anchor, but with a tendency to tighten its grip about the base flange rather than loosen it. In previous devices of which this applicant has knowledge, this pumping action or vertical movement has caused the loops of the spring tension anchors to spread apart and lose their effectiveness in maintaining the anchor tightly on the rail.

To remove the anchor from the rail it is only necessary that the same be struck with a blow on the end of the finger 5, at the point w, which disengages the finger 5 and the force of the blow is directly transmitted through the arm 4 and the contacting surfaces g to the jaw b of the loop 1, loosening the grip of the jaws a and b, and shifting the anchor with a downward and rearward movement to the position shown substantially in Figure 2, which loosens the grip of the jaws a and b on the base flange 2, without stretching the loops 1 and 3 or otherwise injuring the anchor.

It is pointed out that the converging legs of the loop 3 contact only at the point g which is below the plane of the body portion of the anchor which comprises the arm 4 and the jaw b. Thus a blow on the loop 3 at z is fully transmitted to the arm 4 without being absorbed by the resiliency of the loop 3 and forces the anchor in a forward and upward direction.

In removing the anchor a blow at w is fully transmitted from the arm 4 to the loop 1 without loss of any of the force from the blow by reason of the contacting surface at the point g, this removing being in a downward and rearward direction.

While in Figures 1 to 5 of the drawings the loop 1 is shown as being partially elliptical in form, it is preferred to form the loop 1 as shown in Figure 6, with its closed end being somewhat flattened or straight and extending at an angle between the jaws a' and b'. This form of loop insures a less degree of clearance between the edge of the base flange and the inner face of the loop, and the tensional strains exerted on the loop, when the same is spread or forced on the base flange, are distributed at the two points of curvature r and s which tends to press the stop 6′ against the vertical face of the edge of the base flange. The stop 6 as well as the stop 6′ are in the form of rounded projections which will impinge against the surface i to the edge of the base flange. The stops 6 and 6′ are preferably formed by dimpling the outer face. It will thus be seen that the rounded surface d on the jaws a and a' of the anchor, together with the stops 6 and 6′, present surfaces which offer a minimum of resistance to the tilting or rocking action of the anchor.

From the above it will be apparent that a very desirable and effective anchor has been provided for railway rails or tracks, which not only overcomes the objectionable features and drawbacks now being experienced in similar devices, but which also possesses a very simple construction capable of being readily applied, removed and reapplied to the rails without special tools and without fear of distorting or overstretching which renders the anchor ineffective for its purposes.

What is claimed is:

1. A traction anchor comprising a body member having an open loop thereon to receive the base flange of a traction rail, the inner surfaces of the legs of the loop being formed to contact with opposing faces of the flange at points near their free ends and at points substantially removed from the edge of the flange, other rail gripping means on the body member spaced from said loop to engage the opposite edge of the base flange, when said loop has been moved in position, and an inwardly projecting stop in said loop extending in the same horizontal plane with the edge of said base flange to abut thereagainst without extending around said edge.

2. A traction anchor comprising a body member having an open loop formed thereon to receive an edge portion of the rail base flange, the inner surfaces of the loop being formed to be substantially spaced from the edge of the base flange so as to be free of contact therewith except at a point removed from said edge, an upstanding lip on the body member spaced from said loop to engage the opposite edge of said rail flange when said loop has been moved into position, and a stop projecting inwardly of said loop to abut the vertical face only of said edge of the base flange when said edge engaging means has been moved into position.

3. A traction rail anchor comprising a body member having one end formed into an open loop, the entrance of said loop being restricted, said restricting portions providing the only surfaces of the loop which contact with

opposite faces of a base flange of a traction rail, a lip formed on the other end of said body member and adapted to be moved into engagement with an edge of the base flange, when said open loop is positioned on the other edge portion of said base flange.

4. A traction rail anchor comprising a body member having one end formed into an open loop, the entrance of said loop being restricted, said restricting portions providing the only surfaces of the loop which contact with top and bottom faces of the base flange of a traction rail, a lip formed on the other end of said body member and adapted to be moved into engagement with an edge of the base flange when said open loop is positioned on the other edge of said base flange, and an inwardly projecting button-like member on the closed end of the loop to abut the vertical face of the base flange edge for limiting the sliding movement of said anchor upon said flange.

5. A traction rail anchor comprising an elongated body member formed at one end into an open loop and its other end formed into an upstanding lip, the intermediate portion of said member being formed into a depending loop having the outer ends of its leg portions contacting.

6. A traction rail anchor comprising an elongated body member formed at one end into an open loop and its other end formed into an upstanding lip, the intermediate portion of said member being formed into a depending loop having the outer ends of its leg portions contacting, one leg of said intermediate portion extending substantially in a general right angular direction with respect to said body, and the other leg extending obliquely thereto.

7. A traction rail anchor comprising an elongated body member formed at one end into an open loop and its other end formed into an upstanding lip, the intermediate portion of said member being formed in a depending loop having the outer ends of its leg portions contacting, said depending loop being offset from a plane substantially at right angles to the general direction of said body member.

8. A traction rail anchor comprising an elongated body member formed at one end with a horizontally extending open loop and at its other end with a lip substantially in the plane of said loop, the intermediate portion of said member being formed into a depending loop having its elongated portions brought into contact, the inner face of said body member between said depending loop and said lip being raised at points adjacent said loop and said lip.

9. A traction rail anchor having a body member adapted to underlie the base flange of the rail, means for attaching said anchor to the rail and permitting said anchor to rock in a direction longitudinally of the rail under a pressure less than that required to slip the anchor longitudinally of the rail against the frictional tension of the anchor on the rail, and parallel means on said body member, one of said means adapted to be forced against the rail with a biting action when said anchor is rocked.

10. A traction rail anchor having a body member adapted to underlie the base flange of a rail, a loop at one end of the member to engage about one edge of the base flange, means at the other end of the anchor to engage the opposite edge of said base flange, means on one arm of said loop to permit said anchor to tilt with respect to said rail, and means on said member to bite into the rail with a penetrating force when said anchor is tilted.

11. A traction rail anchor comprising a body member adapted to underlie the base flange of a rail and having a loop at one end to engage around the edge portion of said base flange, the inner surface of the upper leg of said loop being rounded, ribs formed at the longitudinal edges of said member adapted to bite into the base of said rail flange, and means at the other end of said body member to grip the rail and cooperate with said loop for maintaining the same on the rail.

12. A traction rail anchor comprising a strip of elongated material formed at one end into an open loop having the inner face of the free leg of said loop rounded, a laterally upstanding lip on the other end of said body, the intermediate portion of said body being formed into a depending loop, the ends of said intermediate loop having their opposing faces brought into contacting relation, biting edges on the inner face of said body member to engage the under face of the rail flange.

13. A traction rail anchor comprising a strip of elongated material formed at one end into an open loop having the inner face of the free leg of said loop rounded, a laterally upstanding lip on the other end of said body, the intermediate portion of said body being formed into a depending loop, one leg of said depending loop extending obliquely to the general longitudinal plane of the body member, the ends of said intermediate loop having their opposing faces brought into contacting relation, parallel biting edges on the inner face of said body member and on opposed sides thereof to engage the under face of the rail flange.

14. The combination with a traction rail and a cross-tie supporting the same, an anchor to underlie said rail adjacent said tie, means for attaching the anchor to the rail, and permitting the anchor to tilt transversely with respect to the rail, a tie engaging member on the anchor to tilt the anchor when the

rail is moved transversely with respect to the tie, and means on the anchor to bite the rail with a force opposed to and at an angle to the direction of movement of the rail when said anchor is tilted, said biting means comprising a longitudinal rib.

15. The combination with a traction rail and a cross-tie supporting the same, an anchor to underlie said rail adjacent said tie, means for attaching the anchor to the rail, and permitting the anchor to tilt transversely with respect to the rail, a tie engaging member on the anchor to tilt the anchor when the rail is moved transversely with respect to the tie, and means on the anchor to obstruct said movement of said rail with a force opposed to said movement when said anchor is tilted, irrespective of the direction of the tilt of the anchor.

16. A traction anchor comprising a body member having an open loop at one end to receive an edge portion of a rail base flange, said loop comprising opposed leg portions extending in the same general direction and a substantially straight closed end connecting said legs, a projection on the inner face of said closed end portion of the loop having a rounded surface adapted to contact with the vertical face of the base flange of a rail, and other means on said body member for cooperating with the base flange of the rail to maintain the anchor in position.

17. A traction rail anchor comprising a body member having one end formed into an open loop having opposed legs connected at one end by a substantially straight portion, the open end of the loop forming a restricted entrance, a lip formed on the other end of the body member and adapted to be moved into engagement with an edge of the base flange when said open loop is positioned on the other edge portion of said flange, an inward projection on the inner face of said substantially straight end portion of said loop to abut the vertical face of the base flange edge for limiting the applying movement of said anchor on the rail.

18. A traction rail anchor comprising an elongated body member formed at one end into an open loop and its other end formed into an upstanding lip, the intermediate portion of said member being formed into a depending loop having the outer ends of its leg portions contacting at a point below the plane of said body member.

19. A traction rail anchor comprising an elongated body member formed at one end into an open loop and its other end formed into an upstanding lip, the intermediate portion of said member being formed into a depending loop having the outer ends of its leg portions contacting only at the point below the plane of said body member.

20. A traction rail anchor comprising an elongated body member formed at one end into an open loop and its other end formed into an upstanding lip, the intermediate portion of said member being formed into a depending loop having the outer ends of its leg portions contacting only at a point below the plane of the body member, one leg of said intermediate portion extending substantially in a general right angular direction with respect to said body member, and the other leg extending obliquely thereto.

21. A traction rail anchor comprising an elongated body member formed at one end into an open loop and its other end formed into an upstanding lip, the intermediate portion of said member being formed into a depending loop having the outer ends of its leg portions contacting at a point below the plane of said body member, said loop being offset to a plane passing through the point of contact of said legs.

22. A traction rail anchor comprising an elongated body member formed at one end into an open loop and its other end formed into an upstanding lip, the intermediate portion of said member being formed into a depending loop having the outer ends of its leg portions contacting only at a point below the plane of said body member, the inner face of said body member being raised at points adjacent said loop and said lip.

In testimony whereof, I have affixed my signature to this specification.

CHARLES B. SHEPHERD.