J. R. STEELE, JR.

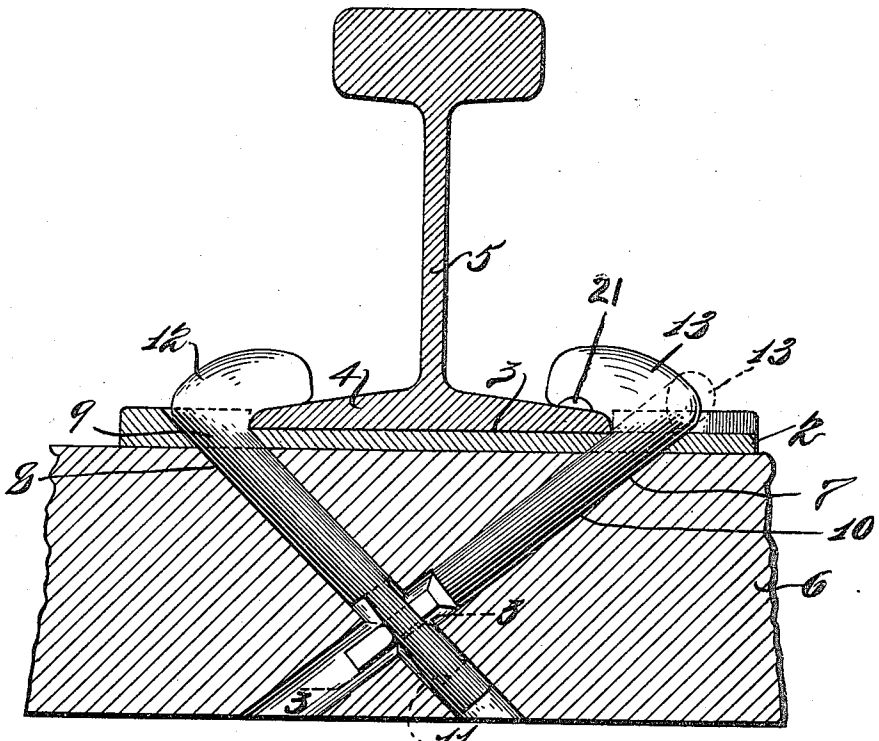
RAIL FASTENING.

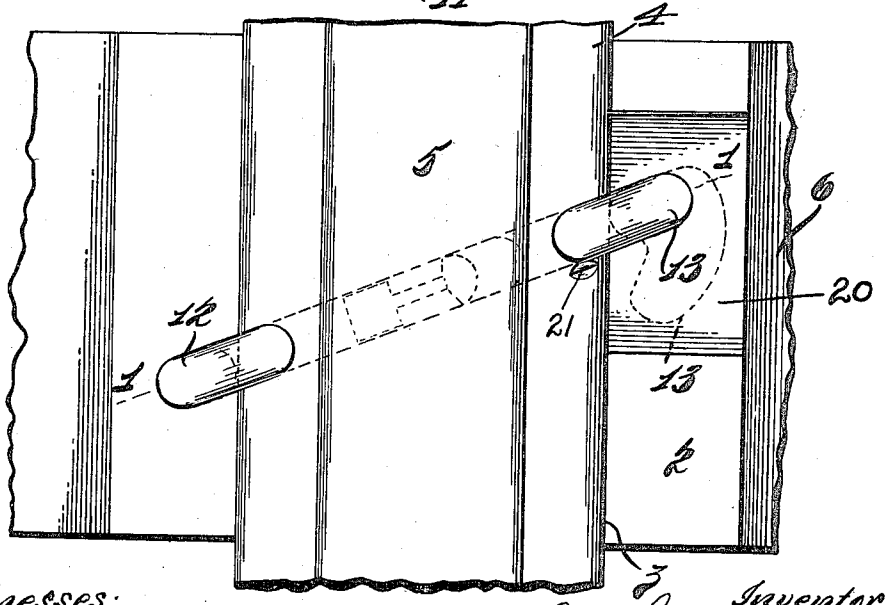
APPLICATION FILED DEC. 4, 1912. RENEWED SEPT. 9, 1916.

1,224,426. Patented May 1, 1917.

2 SHEETS—SHEET 1.

Fig. 1.





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Fig. 2.

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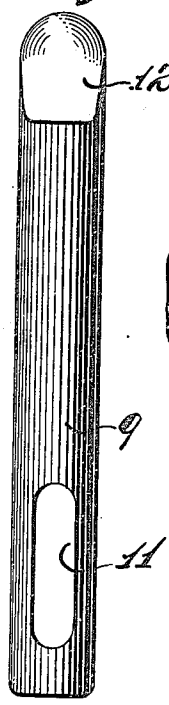
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2 SHEETS—SHEET 2.

Fig. 3.



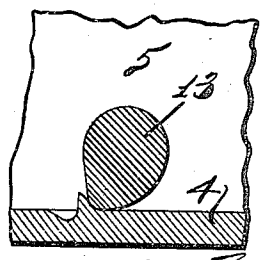


Fig. 7.

Fig. 4.

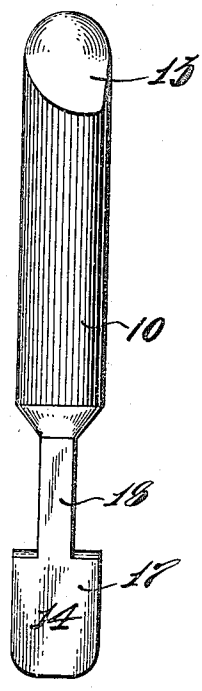


Fig. 5.

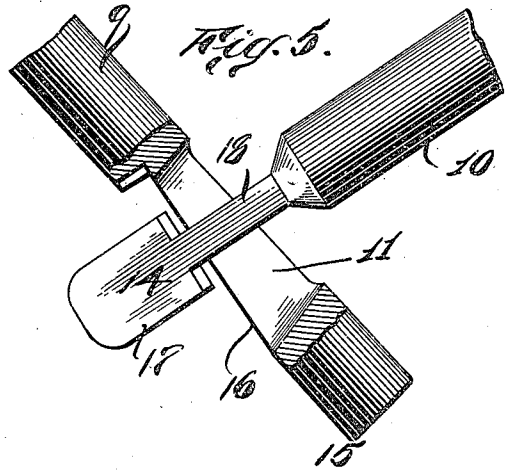
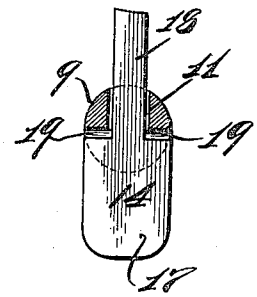


Fig. 6.



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UNITED STATES PATENT OFFICE.

JAMES ROBERT STEELE, JR., OF OWEGO, NEW YORK, ASSIGNOR TO STEELE RAIL ANCHOR COMPANY, INC., OF OWEGO, NEW YORK, A CORPORATION OF NEW YORK.

RAIL-FASTENING.

1,224,426. Specification of Letters Patent. Patented May 1, 1917.

Application filed December 4, 1912, Serial No. 734,838. Renewed September 9, 1916. Serial No. 119,280.

To all whom it may concern:

Be it known that I, JAMES ROBERT STEELE, Jr., a citizen of the United States, residing at Owego, in Tioga county, State of New York, have invented certain new and useful Improvements in Rail-Fastenings, of which the following is a clear, full, and exact description.

The object of my invention is to provide a rail-fastening means characterized by features of construction and relation which are specially effective to prevent both spreading and creeping of the rails and to resist and utilize the various stresses which act at the same or different times within the track. These features are illustrated herein in connection with one embodiment of the invention, but it is to be understood that other specific embodiments containing part or all of the elements disclosed may be produced within the scope of the invention.

The complete rail fastening, as preferably constituted, comprises a tie plate and integral-head, cylindrical-shank fasteners inserted in diagonal bored holes in the tie, the fasteners and tie plate together forming a semi-rigid load-sustaining and stress-resisting unit, wherein the tie plate receives the load from the rail and in turn transmits it to the diagonal shanks of the fasteners, upon which the tie plate rests. When the load is on the rail the tie plate seizes the upper portions of the shanks in its holes, so that all relative movement between the same, either vertically or horizontally, is prevented, for which purpose the cylindrical shanks and the holes in the tie plate are formed for close engagement with each other, the holes being preferably punched diagonally to correspond with the holes bored in the tie. In this way the tie plate is compelled to bear upon the fasteners and the integral heads of the latter cannot spread apart or loosen their grip on the rail flanges. As long as the vertical load bears on the shanks of the fasteners, it so far outweighs any other forces acting at the same time that the resultant upon the fasteners is directed steeply downward, and consequently upward movement thereof is impossible. Because of the support afforded the tie plate by the diagonal fasteners, its tendency to settle into the tie under the weight of passing trains is greatly decreased, and the life of the tie is correspondingly prolonged. Furthermore, the rail, tie plate and tie, being all lashed firmly and permanently together, there is no opportunity for the plate to work up and down, so as to injure the wood and permit it to be attacked by admitted moisture. It may be noted, however, that, while for this and other reasons, including the holding of the rail against longitudinal movement or creeping, it is extremely desirable that the heads of the fasteners clamp the rail tightly to the tie plate and tie, yet I do not in all instances limit myself to this, since many of the advantages of the tie plate resting on the fasteners and of other features of the invention, can be realized even though a certain amount of relative vertical play be permitted to the rail, as is preferred by some. While the settling of the tie plate into the tie is substantially overcome by supporting it on the fasteners, such downward movement of the plate as does occur carries the fasteners with it, their necks being gripped immovably in the tie plate holes. As the result of such action the shanks may bend slightly below the tie plate, but this is, if anything, an advantage, since such bending constitutes an additional check against any possibility of the fasteners rising. Still another effect of the tie plate resting on the fasteners is that the moment of the load on the rail tending to break the plate is decreased because the points of support of the plate on the fasteners are inward of the ends of the plate, for which reason it is possible to use a thinner plate than would otherwise be safe to employ. The tie plate and the fasteners at both sides of the rail act as a substantially rigid structure, engaging a large amount of wood in the tie and conjointly resisting and neutralizing all stresses to which a rail fastening may be subjected.

The integral heads of the fasteners extend laterally from the plain cylindrical shanks, so that the rails can be released for removal by merely turning the fasteners so that their heads are parallel with the rail or pointing outward. This lateral disposition of the heads and the ability of the fasteners to turn has the further advantage that the fastenings are not likely to be torn out or broken in event of the heads being clutched by dangling parts on passing trains, such arrangement merely turning the heads sufficiently to permit the engaging parts to escape.

The firmness of the structure is increased by causing the fasteners to engage with each other within the tie, the tie holes being bored intersecting for this purpose. One form of intersecting construction of the fasteners is shown herein, but other forms may be used, or interlocking may be dispensed with entirely.

In order to increase the amount of wood engaged and to remove any possibility of any resultant of forces, in the absence of the load, acting upward sufficiently in line with any of the fasteners to raise the same, the shanks are disposed at a double diagonal, that is to say, they are transversely diagonal with respect to the rail and also diagonal lengthwise thereof. It results from this arrangement that one of the fasteners, at least, is contrary to traffic, that is to say, inclined upward and backward relative to the direction of movement of trains on the track, so that any tendency of the rail to creep creates a further tightening of the head of the fastener upon the rail flange. A further advantage of the double diagonal disposition of the fasteners as herein illustrated results from the fact that their upper portions are offset lengthwise of the rail, so that the tie plate cannot rock upon its points of support on the fasteners to the detriment of the tie.

In the accompanying drawings illustrating the invention:

Figure 1 is a cross-sectional view of my invention, the section being taken on a line 1—1 in Fig. 2, the fasteners being shown in elevation.

Fig. 2 is a plan view thereof.

Fig. 3 is an enlarged elevation of one of the fasteners.

Fig. 4 is a similar view of the other.

Fig. 5 is an enlarged fragmentary elevation, partly in section, illustrating the fasteners prior to locking.

Fig. 6 is an enlarged fragmentary view, showing the fasteners locked; and

Fig. 7 is a sectional diagrammatic view illustrating a manner of preventing loosening of the fasteners.

As herein illustrated, my improved rail fastener includes a plate or base 2 provided with a channel 3 adapted to receive the flange 4 of a rail 5. I prefer that the channel 3 be just wide enough to receive the flange 4, so that there will not be any side lash on the part of the rail. As can be seen, the plate 2 rests upon a tie 6 and takes the weight placed upon the rail.

To secure the rail and plate to the tie I provide fasteners 9 and 10, each of which passes through the plate 2 and into the tie 6. The fasteners are made from lengths of rod and have laterally projecting integral heads 12 and 13 to engage the flanges 4 of the rail and cylindrical shanks which are inserted without play in bored openings 7 and 8 into the tie.

The said openings are bored diagonally in the tie and the heads of the fasteners are formed in such relation to the shanks that when the latter are inserted in the openings the heads bear properly upon the surfaces of the flanges 4. In the present embodiment of the invention the diagonal openings are so bored as to intersect beneath the rail, in order that the fasteners may engage with each other. As will be observed in Figs. 1 and 2, the openings in the tie, and consequently the shanks of the fasteners when forced therein, are disposed at a double diagonal, being inclined both transversely and longitudinally with respect to the rail.

The holes in the tie plate 3, through which the fasteners are passed, are also punched diagonally in the same directions in which the openings are bored in the tie and are fitted closely by the shanks for the reasons hereinbefore set forth. They are also offset from each other lengthwise of the rail, the points of support of the tie plate on the fasteners being, therefore, out of transverse alinement.

In the particular form of engagement between the fasteners within the tie herein illustrated, one of the fasteners, 9, is provided near its lower end with a slot 11 to receive the lower portion of the fastener 10. The lower portion 17 of the latter fastener is flattened, comprising a relatively wide keeper 14 at the extremity of a reduced portion 18 which connects the keeper with the cylindrical body. The relation of the parts is such that when the fastener 10 is turned, so that its head 13 is approximately parallel with the base, as represented by dotted lines in Figs. 1 and 2, the keeper 14 may pass through the slot 11, but when the head 13 is turned into operative position over the rail flange, the width of the keeper 14 is disposed at right angles to the length of the slot and consequently the fasteners cannot be withdrawn. The reduced portion 18 of the fastener 10, it will be understood, should be of such dimensions with reference to the slot 11 as to permit it to turn therein. The upper surface of the rail flange 4 slopes upward from its outer edge, and consequently as the head 13 is turned from the dotted line to the full line position (Figs. 1 and 2), it rides uphill on the flange, with a resulting tendency to draw its shank upward. This effect is also secured by a cam formation of the head, indicated in Figs. 4 and 7. The parts are so proportioned that as the result of this action the keeper 14 bears forcibly against a flat under surface 16 on the fastener 9 at the back of the slot 11, and the head 13, therefore, exerts a powerful grip on the rail flange. In order to facilitate the turning of the fastener 10, the shoulders 19

on the upper end of the keeper 14 may be rounded, as indicated, and after the fasteners are locked, backward turning of the element 10 may be prevented by striking up a bur 21 on the flange of the rail. The keeper 14 bearing against the surface 16 thus serves as an anchorage, causing the head 13 as the result of its camming action when turned to bear with an anti-creeping grip on the rail flange. It also holds the fastener 9 against withdrawal, and in order to increase the security with which this fastener is held, the surface 16 is formed at an inclination as shown. This inclination is not such as to cause the fastener 9 to be drawn downward by a wedging action, but it does prevent the said fastener moving upward. The tie plate may be provided adjacent one end with a recess 20 in its upper surface to accommodate the head 13 in a relatively low-lying position when turned horizontally, so as to render its camming action more effective when turned to ride upon the surface of the rail flange as described.

In setting the fastener the tie is bored with the diagonal intersecting openings 7 and 8, the tie plate is placed in position on the tie with its diagonal punched openings in alinement with the bores in the tie, and the rail is seated in the channel of the plate. The fastener 9 is now inserted through its tie plate hole into the opening 8 and forced home with its head 12 bearing upon the corresponding rail flange. The fastener 10 is next inserted in the opening 7 with its head 13 in the approximately horizontal position and its keeper 14 consequently presented so as to pass through the slot 11. Upon turning the fastener 10 so that its head takes over the rail flange the parts are locked against displacement and the head 13 binds upon the rail flange so as to oppose creeping. With the parts thus assembled the tie plate rests upon the shanks of the diagonal fasteners, so that the vertically acting load is utilized as described. Side thrust and other stresses are resisted by the tie plate and fasteners acting as a substantially rigid unit, and the double diagonal disposition of the fasteners possesses the advantages indicated in the introductory part of the specification. Various other advantages of the novel principles of construction and relation herein disclosed will be recognized by those skilled in the art. It may be noted that it is desirable to bore the holes 7 and 8 completely through the tie, as shown in Fig. 1, since in this way they are self draining.

I claim as my invention:

1. The combination with a rail and an underlying tie having formed holes therein extending diagonally beneath the rail, of fasteners having integral laterally extending heads engaging the flanges of the rail and plain cylindrical shanks inserted in said holes, and a tie plate having openings receiving and closely engaging said shanks, the tie plate resting on the fasteners.

2. In a rail fastening, the combination of a tie plate and fasteners having integral heads engaging the rail flanges and plain shanks passing through and closely fitting the openings of the tie plate and entered diagonally into the tie, the tie plate resting on the fasteners.

3. In a rail fastening, the combination of a tie plate and fasteners having integral laterally extending heads engaging the rail flanges and plain shanks circular in cross-section passing through the tie plate and extending diagonally beneath the rail, the tie plate having openings to fit the fasteners.

4. In a rail fastening, the combination of a tie plate and fasteners having integral laterally extending heads and plain shanks circular in cross-section passing through the tie plate into the tie in directions diagonal both transversely and longitudinally to the rail, the tie plate resting on the fasteners.

5. A rail fastening comprising a tie plate having openings and fasteners having integral laterally extending heads engaging the rail flanges and plain shanks circular in cross-section extending diagonally beneath the rail, the upper parts of the shanks fitting closely in the openings of the tie plate, which rests upon the diagonal fasteners.

6. The combination with a rail and an underlying tie having diagonal formed holes therein, of fasteners having integral heads to engage the rail flanges at opposite sides of the rail and plain shanks inserted in said diagonal holes, and a tie plate having openings occupied by the shanks, whereon the tie plate rests.

7. The combination with a rail and an underlying tie having diagonal intersecting formed holes therein, of fasteners having integral heads to engage the rail flanges at opposite sides of the rail and plain shanks inserted in said holes and provided with mutually engaging portions, and a tie plate resting on the said shanks.

8. The combination with a rail and an underlying tie having holes formed therein in directions doubly diagonal to the rail, of fasteners having plain shanks inserted in said doubly diagonal holes and integral heads arranged to engage the opposite flanges of the rail, and a tie plate resting on said shanks.

9. A rail fastening, comprising the combination of rail fasteners having integral laterally extending heads formed to engage the rail flanges and plain cylindrical shanks formed to be inserted diagonally in a wood tie, and a tie plate having openings whereby under load it seizes and is supported by the shanks of the fasteners.

10. Rail fastening means comprising a tie

plate having holes formed diagonally therethrough and offset longitudinally from each other at opposite sides of the rail, and fasteners having integral laterally extending heads to engage the rail flanges and plain circular shanks fitting closely in said holes in the tie plate, said shanks being diagonal in the tie both transversely and longitudinally with respect to the rail.

11. A pair of integral head rail fasteners having plain shanks intersecting within bored holes in the tie, one or both of said shanks extending diagonally downward beneath the rail and also diagonally to the length thereof, combined with a tie plate having longitudinally offset openings whereby it engages and rests upon the upper portions of the diagonal shanks.

12. In a rail fastener, the combination with a rail and tie, the latter provided with intersecting bored holes, of a pair of fasteners having cylindrical shanks inserted in said holes and integral heads bearing directly upon the rail flanges, the said shanks having integral mutually engaging lower portions, and means whereby setting of one of the integral fasteners into its final position locks the other.

13. A pair of rail fasteners having integral heads and cylindrical shanks designed to be inserted in intersecting bored holes in a tie, an integral lock between the fasteners, and means whereby the lock is tightened upon rotation of one of the fasteners by reaction of its integral head on the flange of the rail tending to draw the shank of this fastener upward.

14. A rail clamp comprising two interlocking integral members extending into the tie from opposite sides of the rail in a direction diagonal to the length, means carried by said members adapted to engage the rail, and a tie plate having openings for the passage of said members arranged diagonally on opposite sides of the rail.

15. In combination with a tie provided with angularly disposed intersecting openings, a rod carried by one of said openings, provided with a surface inclined with relation to the axis of the rod adjacent the lower end thereof, a rod carried by the other of said openings, means carried by the rod last named adapted to engage the inclined surface on the rod first named, and means carried by said rods adapted to engage the flange of a rail.

16. In combination with a tie provided with angularly disposed intersecting openings, a rod carried by one of said openings, provided with a surface inclined with relation to its axis, adjacent the lower end thereof, a rod carried by the other of said openings, means carried by the rod last named adapted to engage the said inclined surface on the rod first named, and means carried by said rods adapted to engage the flange of a rail, said means being integral with said rods.

17. In combination with a tie having intersecting openings, rail fasteners having shanks in said openings and integral heads to bear upon the flanges of the rail, one of said shanks having means to lock against the other shank when partially turned in its opening, and the head of said shank being adapted to ride with a camming action upon the rail flange when so turned.

18. In combination with a tie having intersecting openings, rail fasteners having shanks in said openings and integral heads to bear upon the flanges of the rail, one of said shanks having an abutment adapted to bear upward against the other shank when the first shank is partially turned in its opening whereby the head of this first shank is caused to grip upon the rail flange, the second shank presenting an inclined surface to the thrust of the abutment whereby it is held against upward movement.

Signed at New York city, in the county of New York and State of New York, this 3d day of December, 1912.

JAMES ROBERT STEELE, JR.

Witnesses:

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F. WARREN WRIGHT.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."