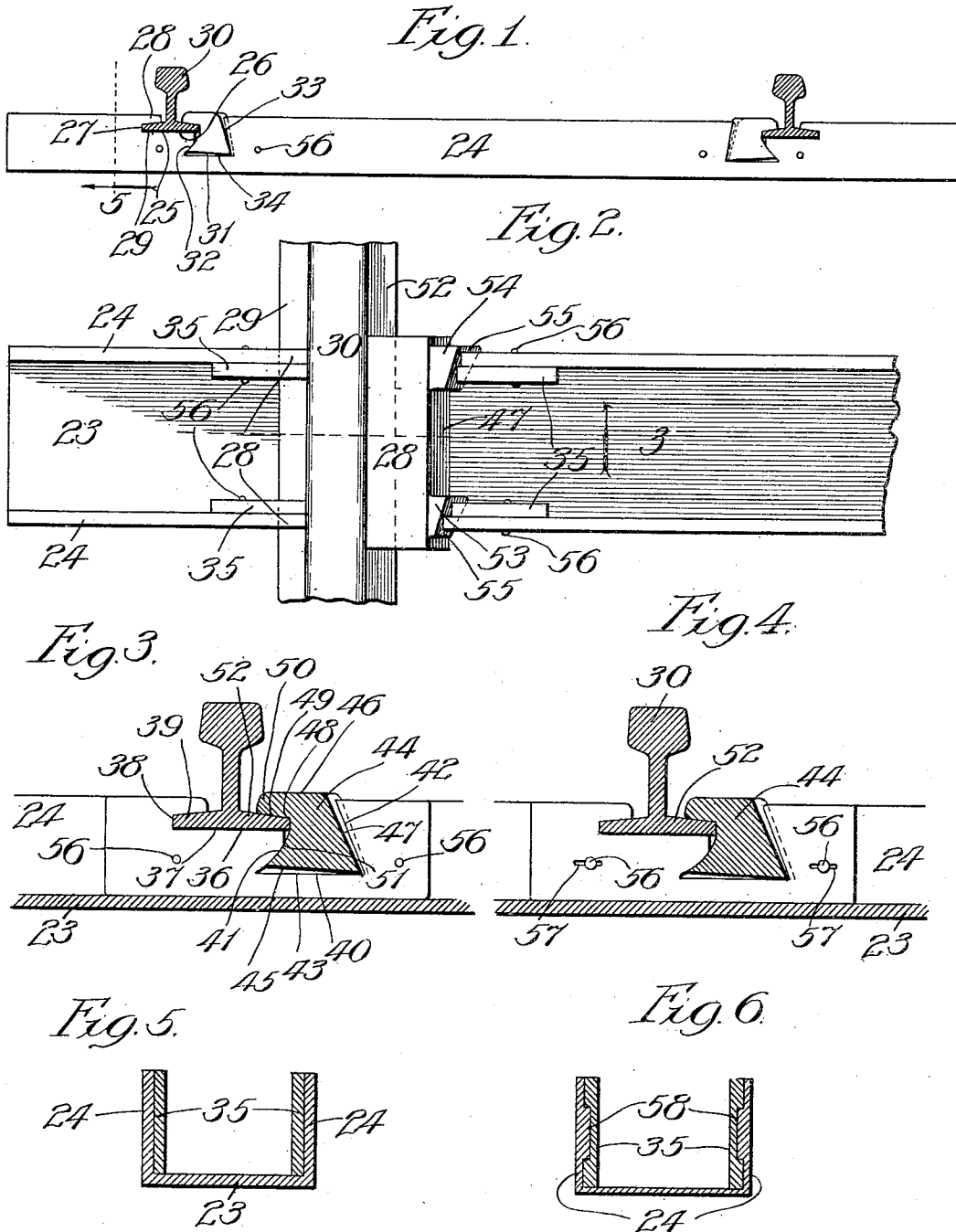


C. R. HOLDEN.
RAILWAY ROAD BED CONSTRUCTION.
APPLICATION FILED OCT. 12, 1908. RENEWED NOV. 10, 1909.

961,233.

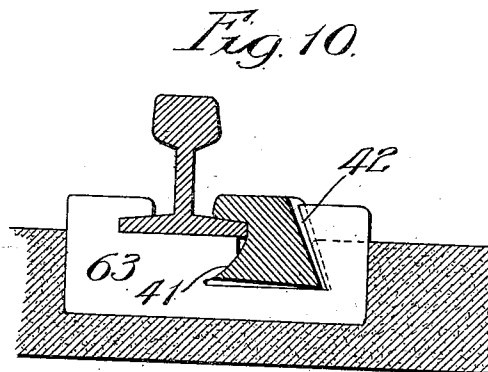
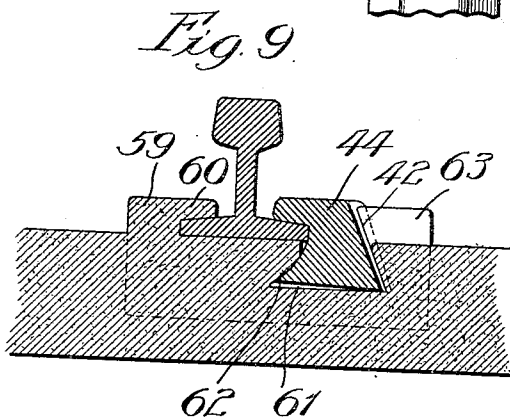
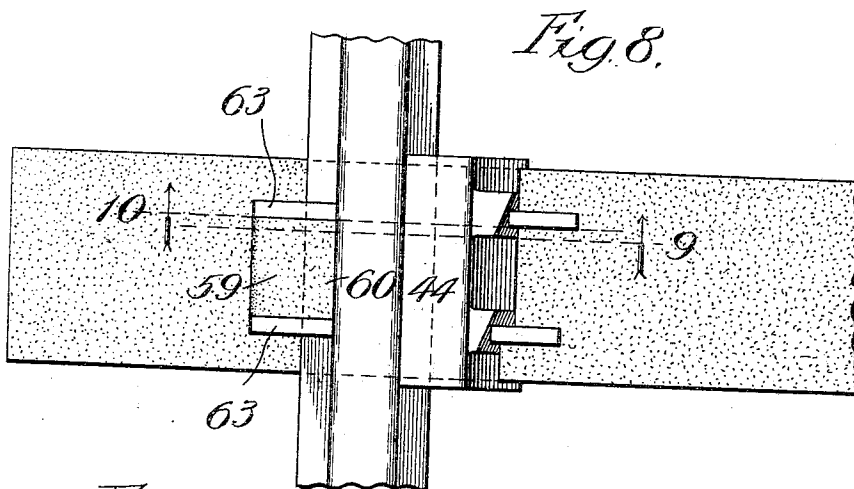
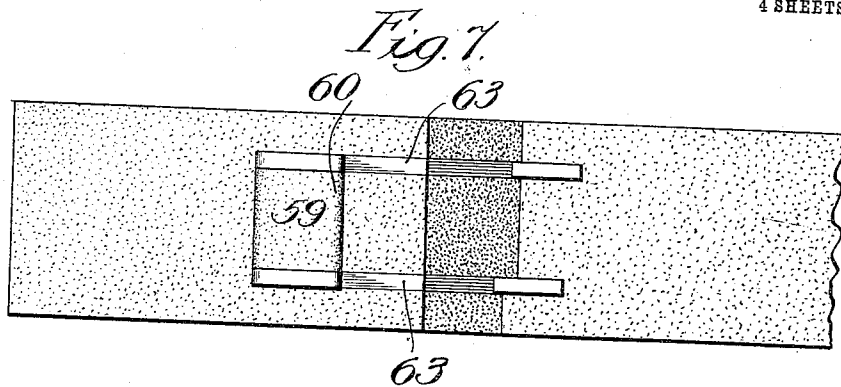
Patented June 14, 1910.

4 SHEETS—SHEET 1.



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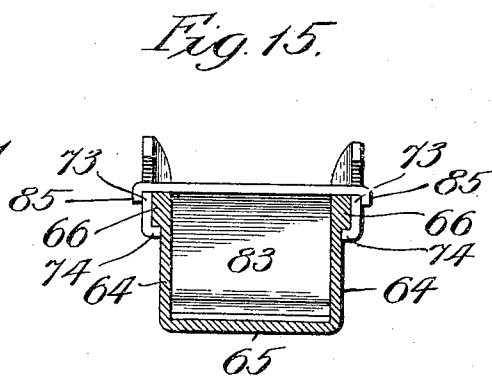
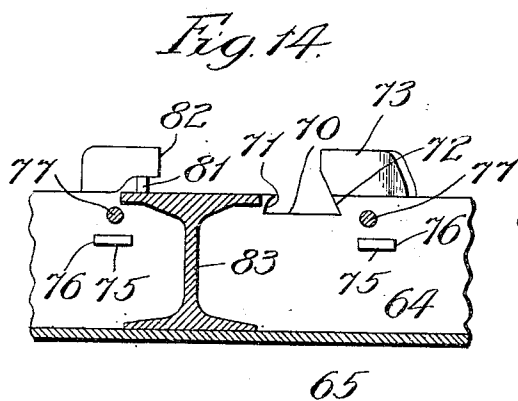
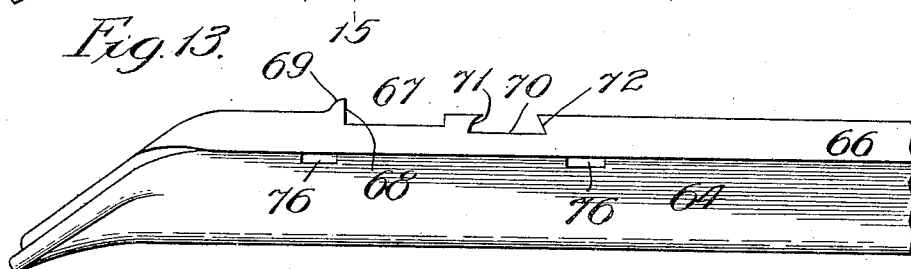
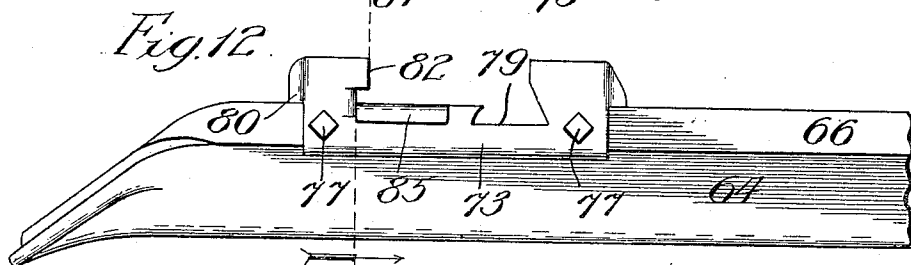
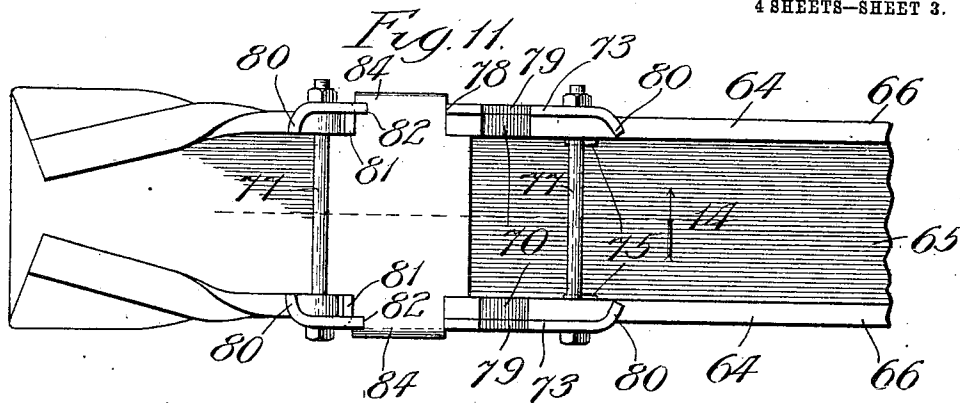
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4 SHEETS—SHEET 3.



Witnesses:

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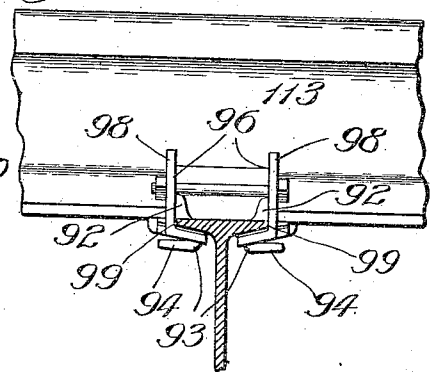
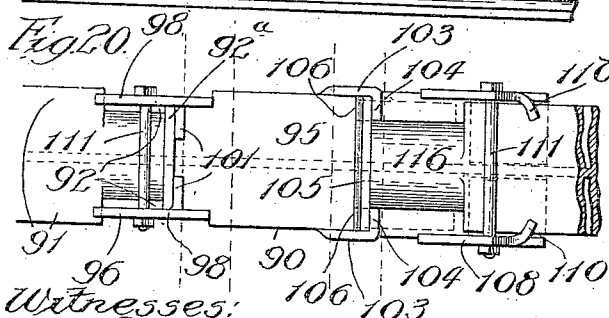
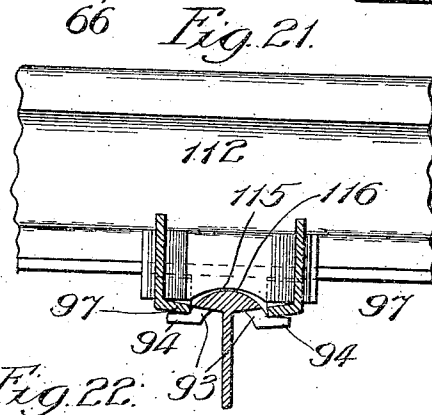
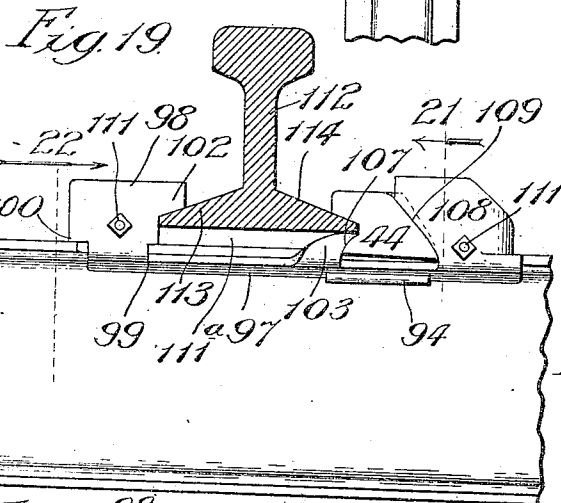
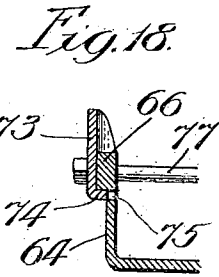
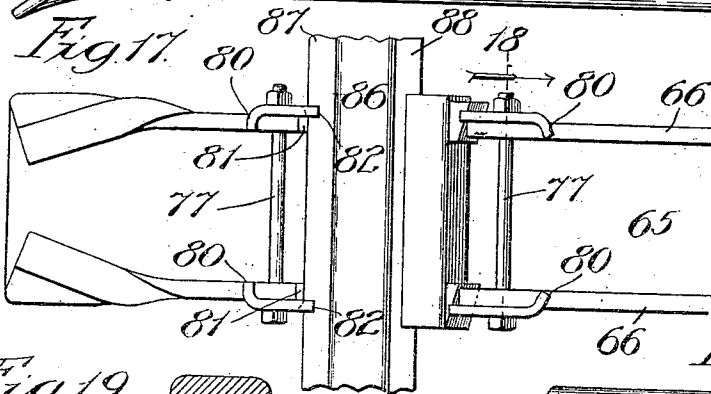
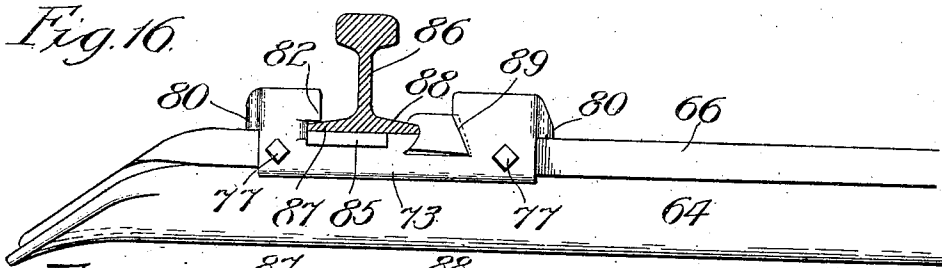
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961,233.

Patented June 14, 1910.

4 SHEETS—SHEET 4.



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UNITED STATES PATENT OFFICE.

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RAILWAY-ROAD-BED CONSTRUCTION.

961,233.

Specification of Letters Patent. Patented June 14, 1910.

Application filed October 12, 1908, Serial No. 457,277. Renewed November 10, 1909. Serial No. 527,307.

To all whom it may concern:

Be it known that I, CHARLES R. HOLDEN, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Railway-Road-Bed Construction, of which the following is a specification.

My invention relates particularly to rail-ties and the means for securing the rails to them; and my object is to provide a construction which will be of comparatively light weight, involving the use of comparatively light ties, and by which spreading of the rails upon the ties will be avoided.

Referring to the accompanying drawings, Figure 1 is a view in side elevation of a U-shaped metal tie and rails, shown in section, secured on the tie, with means for securing the rails to the tie, the whole constituting a railway road-bed construction embodying my invention. Fig. 2 is an enlarged plan view of one end of the tie illustrated in Fig. 1. Fig. 3 is a section taken at the line 3 on Fig. 2 and viewed in the direction of the arrow, showing one of a number of ways of assembling the plates employed in connection with the tie proper. Fig. 4 is a view similar to that of Fig. 3 showing another way of assembling the plates with the tie. Fig. 5 is a section taken through the tie illustrated in Fig. 1 and viewed in the direction of the arrow. Fig. 6 is a view, similar to that of Fig. 5, of a tie provided with reinforcing ribs on its vertical flanges. Fig. 7 is a plan view of a concrete tie embodying my invention. Fig. 8 is a view like that of Fig. 7 showing a rail secured thereon. Fig. 9 is a section taken at the line 9 on Fig. 8 and viewed in the direction of the arrow. Fig. 10 is a section taken at the line 10 on Fig. 8 and viewed in the direction of the arrow. Fig. 11 is a plan view of one end of a U-shaped tie illustrating another form of construction in which my invention may be embodied. Fig. 12 is a view in elevation of the construction represented in Fig. 11. Fig. 13 is a view in side elevation of the end of the tie illustrated in Figs. 11 and 12 with the side-plates removed. Fig. 14 is a section taken at the line 14 on Fig. 11 and viewed in the direction of the arrow. Fig. 15 is a section taken at the line 15 on Fig. 12 and viewed in the direction of the arrow. Fig. 16 is a view in elevation of the end of the tie illustrated in

Fig. 11, showing a rail secured in place thereon. Fig. 17 is a plan view of the construction illustrated in Fig. 16. Fig. 18 is a section taken at the line 18 on Fig. 17 and viewed in the direction of the arrow. Fig. 19 is a view in side elevation of an I-beam tie with fastening means for a rail shown in cross-section, the whole being constructed in accordance with my invention. Fig. 20 is a plan view of the construction represented in Fig. 19. Fig. 21 is a section taken at the line 21 on Fig. 19 and viewed in the direction of the arrow, and Fig. 22, a section taken at the line 22 on Fig. 19 and viewed in the direction of the arrow.

One of the forms of tie in connection with which I have chosen to illustrate my invention is of the stamped steel U-shaped variety illustrated in the first six figures, formed of a base 23 and two vertically extending flanges 24. Each of the flanges 24 has two recesses 25 formed in it, each recess presenting a horizontal bottom 26 with an undercut portion 27 affording a shoulder 28, which, preferably, is in the position illustrated in Fig. 1, to receive the outer flange 29 of a rail 30, which seats upon the bottom-portion 26 of the recesses 25, the rail illustrated being of the ordinary type, although the bull-rail, common to continental railroads, may be employed. The recesses 25 and shoulders 28 aline with each other at the opposite ends of the tie and extend transversely of the flanges 24, as illustrated in Fig. 2. In addition to the recesses 25 formed in the flanges 24 other recesses 31 are provided in each flange 24 extending below the level of the bottom portions 26 of the recesses 25, the recesses 31 having curved walls 32 adjoining the portions 26 of the recesses 25, an opposed tapering wall 33, and a horizontal wall 34, the tapering walls at the opposite ends of the tie tapering in opposite directions, as represented in Fig. 1, and these tapering walls at each end of the tie bearing stepped relation to each other, as illustrated in Fig. 2, for a purpose hereinafter disclosed. Fitting flatwise against the inner sides of the flanges 24 adjacent to each recessed portion thereof, are plates 35. Each of these plates is provided with a recess 36 presenting a horizontal bottom 37 with an undercut portion 38 affording a shoulder 39. Each plate also is provided with a recess 40 extending below the level of the bottom-portion 37 of the recess 36 and provided with a curved wall 41 ad-

joining the portion 37 of the recess 36, an opposed tapering wall 42 and a horizontal wall 43. The recess 36 and the undercut portions 39 of these plates correspond with the
 5 recesses 25 and undercut portions 28 of the flanges 24, and these serve to cooperate therewith in affording a rail-seat and a stop for the outer flange of the rail. The recesses 40
 10 of these plates correspond in shape and approximately in size with the recesses 34 with the walls of which they cooperate in forming bearing surfaces for the rail-fastening key hereinafter described.

The rails 30 are clamped in place against
 15 the rail-seats 26 and 37 and the shoulders 28 and 39 by means of keys 44, one for each end of the tie, adapted to be inserted transversely of the flanges 24 into the adjacent recesses 31 and 40 to be wedged against the inner
 20 flanges of the rails and the walls of the recesses 31 and 40. The key which I prefer to employ is that represented in the drawings, it being of general frusto-conical shape in cross-section having a flat bottom 45 and top
 25 46, a tapering surface 47 on one side and a grooved surface on the other affording a channel 48 having a slightly inclined upper wall 49 presenting a flange 50 and a curved lower wall 51, as illustrated, the walls 49 and
 30 51 preferably conforming in contour to the upper side of the inner flange 52 of the rail 30, and the curved walls 32 of the recesses 31, respectively.

The tapering side 47 of the key 44 is provided with a series of flanges 53, 54, of a
 35 number corresponding with the number of flanges on the tie, these key-flanges having surfaces 55 which taper in a horizontal direction at angles to the side of the key and
 40 in an upward direction, relative to the side 47 of the key, from their lower to their upper portions, it being preferred that the surfaces 55 extend at an angle to the lower side
 45 of the key slightly greater than the angle at which the walls 33 extend with relation to the bottom of the recesses 31, as illustrated in Fig. 3, for a purpose hereinafter disclosed. The extent of protrusion of the key-flanges
 50 53, 54, beyond the side 47 varies successively, the flange 54 extending to a greater distance from the side 47 than the flange 53, so that the key may be introduced into the recesses 31 and 40 in the flanges 24 and plates 35,
 55 and the key-flanges be caused to impinge against the walls 33 and 42 of the adjacent recesses in the flanges and plates, as hereinafter described.

The recesses 40 have their walls 42 so positioned from the walls 41 thereof that when
 60 the plates 35 are applied to the tie-flanges, as hereinafter described, the surfaces 55 of the key will bear not only against the walls 33 but the walls 42, as represented in Fig. 2.

To clamp a rail in place on the tie, it is
 65 first seated on the portions 26 and 27 of the

recesses 25 and 36 to extend at its outer flange 29 into the undercut portions 27 and
 38 of the flanges 24 and plates 35. The key 44 is then inserted at the end carrying the
 70 flange 53 through the recesses 31 and 40, the varying extents of protrusion of the key-flanges and the stepped arrangement of the walls 33 and 42, as described, permitting the
 75 key to be introduced by hand approximately to the position illustrated in Fig. 2. The key may then be driven into the final rail-securing position, illustrated in Fig. 2, by a sledge or the like. The effect of driving
 80 the key as stated is to cause the flanges 53 and 54 to bear at their tapering surfaces 55 against the tapered walls 33 and 42, with the result of not only causing the key 44 to wedge in a horizontal direction toward the
 85 rail, but of causing it to turn slightly in the recesses 31 and 40 toward the rail 30, thereby turning down the flange 50 against the inner flange 52 of the rail against which it is thus caused to firmly impinge. The curvature of the walls 32 and 41 is such as
 90 to correspond with the arc through which the key 44 moves in its lateral and turning movements when driven into position, as described. Thus the wall 51 of the key is
 95 caused to constantly impinge against the walls 32 and 41 throughout the turning movement of the key. The key is preferably so proportioned that when initially assembled with the other parts of the construction,
 100 it will not fit down against the bottom walls 34 and 43, and its flanges will not contact throughout their wedging surfaces with the walls 33 and 42. Thus as the rail-seats 26 and 37 become beaten down by the constant
 105 use of the track causing the fastening means for the rails to become somewhat loosened, the desired readjustment of the key with relation to the tie and rail may be quickly and readily effected by merely driving the key
 110 farther into the recesses, with the result of turning the flange 50 into close engagement with the adjacent flange of the rail.

The function of the plates 35 is that of reinforcing the flanges 24 at those points
 115 where the greatest strain occurs, namely, upon the rail-seats and the fixed abutments for the flange of the rail opposite to that against which the keys operate. The main
 120 advantage to be derived by the use of these plates is the preventing of spreading of the rails by the fracturing or giving way of the shoulders 28, and this is accomplished by reason of the fact that should a shoulder 28
 125 give way, or the metal thereof become fractured, the rail tending to spread away from the key would thus be forced into the undercut portion 38 of the adjacent plate 35, with the result of causing the plate 35 to resist lateral movement of the rail by reason of the bearing of its wall 42 against the key, which
 130 latter, by reason of its great area of con-

tact at the surface 51, cannot yield. The plates 35 by reason of the interlocking operation described serve to effectually reinforce the tie flanges at points where the latter are most liable to meet with impairment, and thus the tie may be constructed of comparatively light material.

The plates 35 may be secured to the flanges 24 as by the small rivets 56, shown in Fig. 3, extending through round holes in the flanges 24 and plates 35, in which they fit comparatively snug, or by rivets or bolts 56 passing through longitudinally elongated openings 57 in the plates 35 and openings in the flanges 24. The purpose of fastening the plates 35 to the flanges 24 is to hold them in flatwise relation to the tie flanges so that the plates will not be displaced when the keys are being driven into place. It is to be understood that the plates should be capable of slight longitudinal movement relative to the flanges 24 and thus when the rivets 56 are employed in the connection shown in Fig. 3, they should be formed of such material that they will readily give way and permit the plate to move in case the tie becomes so impaired that the plates are brought into operation.

Where the form of U-shaped tie employed is that illustrated in Fig. 6 involving a central reinforcing rib extending longitudinally of each flange along its inner surface, the plates, instead of being of the shape represented in Fig. 5, are channeled to afford grooves 58 into which the ribs extend. The plates 35 are thus interlocked with the flanges 24 and any tendency of the plates to rise is positively avoided.

In Figs. 7, 8, 9 and 10, my invention is illustrated as applied to a concrete tie, the description of the construction therein shown being as follows: In molding the concrete to form the tie, an undercut abutment 59 affording a shoulder 60 is provided near each end thereof for engagement with the outer flanges of the rails which seat upon the top of the tie as illustrated in the drawings of one rail, transverse recesses 61 affording bearing-surfaces 62 being also formed in the tie to extend partway under the rail-seats. In the process of forming the tie two metal plates 63, like the plates 35, are molded into each end-portion of the tie to extend parallel with each other and flank the ends of the adjacent abutment 59. As hereinbefore stated, the rails are applied to the top of the tie to engage at their outer flanges with the abutments. The key 44 is then inserted through the openings in the plates 63, as described of the construction illustrated in Figs. 1 to 6, and the recess 61 in the tie, whereupon it is driven into close engagement with the inner flange of the rail. Should the concrete abutment give way under stress the rail in moving outward,

should the plates become loosened in the tie, will tend to draw the plates longitudinally of the tie and thus the walls 42 of the recesses 61 in the plate, adjacent to the rear side of the key, will be forced against the key to cause the latter to bear against the broad surface-area afforded by the surface 62, and thus the rail will be firmly held by the nose-portions, or abutments, on the plates.

Referring to Figs. 11 to 18, inclusive, in which I have illustrated another embodiment of my invention in connection with a U-shaped tie, the tie illustrated is of the U-shaped type affording upwardly extending flanges 64, 64 joined at their lower edges by a plate 65, the upper lateral edge-portions of each flange 64 having a reinforcing rib 66 of rectangular shape in cross-section extending throughout the length of the tie. It is designed that each end of the tie be constructed with rail-securing means hereinafter described, but as the constructions of such means at each end of the tie are identical, the following description will be limited to but one of these means. The flanges 64 are provided in their upper edge-portions with recesses 67 which aline with each other, the metal of the flanges adjacent to the end walls 68 of the recesses 67 being struck up to form lugs, or abutments, 69. The flanges 64 also contain recesses 70, each of which has a curved concave wall 71 and a straight tapering wall 72, these walls converging upward and toward each other as illustrated in Fig. 13. Fitting flatwise against the outer faces of the flanges 64 adjacent to their recessed portions are plates 73, each of which has an inwardly turned flange 74 fitting under the adjacent rib 66, and extending at lugs 75 thereon through openings 76 in the tie flanges 64. These plates, which are secured to the tie-flanges by bolts 77 passing through these flanges and plates, contain recesses 78 and 79 which correspond, respectively, with the recesses 67 and 70 of the tie-flanges 64 with which they aline, as illustrated. Each plate at its opposite ends carries inwardly-turned lugs 80 forming stops which rest upon the upper surfaces of the tie-flanges, as clearly illustrated in Fig. 11. The plates 73 also have inwardly turned lips 81, which, when the plates are positioned on the tie-flanges 64 as described, extend across them adjacent to the abutments 69, as clearly illustrated in Fig. 11, the portions of the plates 73 extending above the lips 81 affording shoulders 82 for a purpose hereinafter described. The ends of the plates 73 opposite to those which carry the lips 81, extend upward beyond the recesses 79 a considerable distance above the tie-flanges 64 and the walls of the recesses 70, as illustrated in Fig. 12. As a means for affording the desired seating sur-

face for the rail to be secured to the tie and for bracing the tie-flanges 64, I provide a filler-block 83 of general I-shape, which fits between the tie-flanges 64 and recesses on the plate 65. At opposite ends of the block are plate-extensions 84, of less width than the body-portion of the block, these plate-extensions fitting in the alining recesses 67 and 78 and overlapping, at depending lips 85, the outer sides of the plates 73, as clearly indicated in Fig. 15. By this construction a seating surface for a rail is afforded equal to the width of the tie. The rail, as for example the one represented at 86, seats on the block 83 in a position in which its outer flange 87 bears against the lips 81 and under the shoulders 82 at opposite sides of the tie. The recesses 70 and 79 are so located in the tie-flanges 64 as to cause the walls 71 of the recesses 70 and the corresponding walls of the recesses 79 to terminate at approximately the outer edge of the inner flange 88 of the rail. The rail is clamped in position on the tie by means of a key, as for instance the key 44 of the preceding figures, this key being adapted to be inserted transversely of the tie into the recesses 70 and 79 to be wedged against the inner flange 88 of the rail and the walls of the recesses 70 and 79 described of the constructions represented in Figs. 1 to 3 inclusive. It will thus be noted that should the abutments 69 of the tie-flanges 64 give way, under stress of wear for any cause, the rail will be prevented from becoming laterally displaced because of its engagement with the lips 81, any tendency of the plates 73 to move lengthwise of the tie under stress of the rail bearing against these lips being overcome by the interlocking action afforded by these plates with the tie-flanges and wedge 44, the tapering walls 89 of the recesses 79 in the plates engaging with the rear side of the key, thereby forcing the latter at its curved surface against the walls 71 of the recesses 70 in the tie-flanges, and thus holding the plates 73 in position for insuring the proper positioning of the rail.

In Figs. 19 to 22, inclusive, my invention is illustrated in connection with a tie of the I-beam type. In this construction, the upper portion of the tie represented at 90 is formed with horizontal flanges 91. Portions of the metal forming the outer edge-portions of these flanges are slit and bent upward to form two opposed lugs 92 near the outer end-portion of the tie, which project above the top surface of the flanges 91. The flanges 91 also have opposed depending lips 93 formed with horizontal lateral extensions 94, it being preferred that these lips be formed by slitting the metal of the edge-portions of the flanges 91 and stamping it to the desired shape. The set of lugs 92 are so spaced from the set of lips 93 as to afford a seating surface 95 between

them of sufficient width for seating the rail. Secured to the tie at opposite sides thereof at the flanges 91 are clips 96, each of which is formed with a horizontal plate-portion 97 which fits under the adjacent tie-flange 91 and rests near one end on the upper surface of the adjacent lip-flange 94, the opposite end of each plate being somewhat restricted in width and carrying an upwardly extending member 98, preferably formed integrally therewith, which fits at its lower end-portion in the adjacent recess 99 formed by slitting and bending the metal to produce the lugs 92. Each member 98 is provided at one end with a shouldered portion 100 which rests upon the adjacent flange 91, and at its opposite end with a lug 101 which extends above the tie and transversely thereof and abuts against a plate 92^a which fits between the lugs 101 and 92, a shoulder 102 being provided on each member 98 above each of the lugs 101. Each plate 96, intermediate its ends, also carries an upwardly extending angular shaped lug 103 which projects above the surface of the tie, the inwardly turned flanges 104 of the lugs 103 bearing against a plate 105 secured between them and shoulders 106 on the tie formed by cutting and bending the metal thereof to form the lips 93, each of the flanges 104 being formed with a concave wall 107, for a purpose hereinafter described. Each plate 96 also carries an upwardly projecting member 108 formed with a tapering surface 109, and with an inwardly turned lug 110, the latter extending across the top surface of the adjacent tie-flange 91. The provision of the lugs 103 and 108 affords a recess in each plate 96, the walls 107 and 109 of these recesses converging in an upward direction with relation to each other, as clearly represented in Fig. 19. The plates may be secured together on the tie in the position described by bolts, or the like, 111 passing through the pairs of members 98 and 108, as clearly illustrated in Fig. 20. In this construction, I prefer to employ a block 111^a of resilient material, such as wood, as a seat for the rail, as for instance the rail illustrated at 112, this block resting upon the seating surface 95 of the tie. The rail 112 seats upon the block 111^a and extends at a flange 113 thereon under the shoulders 102 and against the lips 101, in which position it is rigidly clamped by the key 44, which extends into wedging engagement with the bearing surfaces 107 and 109 of the plates 96 and the outer flange 114 of the rail, as described of the construction illustration in the preceding figures, the key of this construction, however, differing from that of the key illustrated in connection with the other constructions in the particular that it has its under side cut away as indicated at 115, to permit it to be intro-

duced over the unmutilated portion 116 of the tie extending between the lips 93. It will thus be noted that should the lugs 92 of the tie-flanges 91 give way under stress of wear for any cause, the rail 112 will be prevented from becoming laterally displaced on account of its engagement with the lugs 101 because of the rigid interlocking of the plates with the tie and wedge 44.

10 What I claim as new, and desire to secure by Letters Patent, is—

1. The combination of a support for a rail, means for keying the rail to the support, and a reinforcing member for said support constructed and arranged to prevent lateral displacement of the rail on said support should the latter give way at the portion thereof at which a side of the rail bears.

2. The combination of a support for a rail provided with an abutment for a side of the rail, means for keying the rail to said support against its abutment, and a reinforcing member for said support constructed and arranged to prevent lateral displacement of the rail on said support should the abutment on the latter give way.

3. The combination of a support for a rail provided with an abutment for a side of the rail, means for keying the rail to said support against its abutment, a reinforcing member for said support provided with an abutment for said side of the rail and constructed and arranged to prevent lateral displacement of the rail on said support should the abutment on the latter give way.

4. The combination of a support for a rail, means for keying the rail to said support, and a plurality of reinforcing plates constructed and arranged to prevent lateral displacement of the rail on said support should the latter give way at the portion thereof against which a side of the rail bears.

5. The combination of a support for a rail provided with an abutment for a side of the rail, means for keying the rail to said support against its abutment, and a plurality of reinforcing plates for said support constructed and arranged to prevent lateral displacement of the rail on said support should the abutment on the latter give way.

6. The combination of a support for a rail formed with an abutment for a side of the rail, means for keying the rail to said support against its abutment, and a plurality of reinforcing plates for said support each provided with an abutment for said side of the rail and constructed and arranged to prevent lateral displacement of the rail on said support should the abutment on the latter give way.

7. The combination of a support for a rail, an abutment on said support for one of the sides of the rail, a second abutment on the support, a reinforcing member coöper-

ating with said support and provided with an abutment for the said side of the rail and a second abutment beyond the second abutment on said support, and a key adapted to be moved into rail-flange-engaging position on the support against said second abutment on the support and said second abutment on the reinforcing member.

8. The combination of a support for a rail, an abutment on said support for one of the sides of the rail with a rail-seat on the support adjacent to said abutment, a second abutment on the support extending below said rail-seat, a reinforcing member coöperating with said support and provided with an abutment for the said side of the rail and a second abutment beyond the second abutment on the support, and a key adapted to be moved into rail-flange-engaging position on the support against said second abutment on the support and said second abutment on the reinforcing member.

9. The combination of a support for a rail, an abutment on the support for one of the lateral flanges of the rail, a second abutment on the support, a plurality of reinforcing plates coöperating with said support and each provided with an abutment for the said flange of the rail and a second abutment beyond the second abutment on said support, and a key adapted to be moved into rail-flange-engaging position on the support against the second abutment on the support and the second abutments on the reinforcing plates.

10. The combination of a support for a rail, an abutment on the support for one of the lateral flanges of the rail, a second abutment on the support, a reinforcing member coöperating with said support and provided with an abutment for the said flange of the rail and a second abutment beyond the second abutment on said support, and a key adapted to be applied to the tie against the second abutment on the support and the second abutment on the reinforcing member and constructed and arranged to be moved transversely of said support and in such movement be turned down and toward the adjacent rail-flange, for the purpose set forth.

11. The combination of a support for a rail provided with a recess adapted to receive the rail, an abutment on the support for one of the lateral flanges of the rail, a key adapted to be inserted into said recess and engage the rail therein for securing the latter to the support, and a reinforcing member coöperating with said support and provided with an abutment for a flange of the rail and with an abutment for engaging with said key, for the purpose set forth.

12. The combination of a support for a rail provided with a recess adapted to receive the rail, an abutment on the support

for one of the lateral flanges of the rail, a key adapted to be inserted into said recess and engage the rail therein for securing the latter to the support, and a reinforcing member coöperating with the support and provided with a recess affording opposed walls, one of which forms an abutment for a flange of the rail, and the other of which engages with the key, for the purpose set forth.

13. The combination with a support for a rail provided with a recess to receive the rail, an abutment on the support for one of the lateral flanges of the rail, the support containing a second recess adjacent to and extending below said first-named recess, a key adapted to be inserted into said second-named recess and engage the rail on the support for securing it thereto, and a reinforcing member coöperating with the support and provided with an abutment for a flange of the rail, and with an abutment for engaging the key, for the purpose set forth.

14. The combination of a support for a rail provided with a recess adapted to receive the rail, an abutment on the support for one of the lateral flanges of the rail, a second recess in the support adjacent to and extending below said first-named recess, a key adapted to be inserted into said second-named recess and engage at one of its sides with the rail on the support for securing it thereto, and a reinforcing member coöperating with the support and provided with an abutment for the flange of the rail with which said first-named abutment is adapted to engage, and with an abutment adapted to engage with a side of the key opposed to that at which it engages with the rail, for the purpose set forth.

15. The combination of a support for a rail provided with a recess adapted to receive the rail and afford a seat for it, and an abutment for one of the lateral flanges thereof, a second recess in the support adjacent to and extending below said rail-seat, a key adapted to be inserted into said second-named recess and engage at one of its sides with the seated rail for securing it on the support, and a reinforcing member coöperating with the support and containing a recess affording a rail-seat and a rail-flange-engaging abutment, said reinforcing member also containing a second recess having a wall adapted to engage with the side of the key opposed to that at which the key engages with the rail, for the purpose set forth.

16. The combination with a support for a rail provided with a recess adapted to receive the rail and afford a seat therefor, the

recess having an undercut wall affording an abutment for one of the lateral flanges of the rail, a second recess in the support adjacent to and extending below said rail-seat, a key adapted to be inserted into said second-named recess and engage one of its sides with the seated rail for securing the latter on its support, and a reinforcing member coöperating with the support and containing a recess provided with an undercut portion affording a rail-flange-engaging abutment, said reinforcing member containing a second recess having a wall adapted to engage with the side of the key opposed to that at which the key engages with the rail, for the purpose set forth.

17. The combination with a support for a rail comprising a U-shaped tie provided in its opposed flanges with recesses adapted to receive a rail, abutments on the tie for one of the lateral flanges of the rail, a key adapted to be inserted into said recesses and engage with the rail for securing the latter to the tie, and a reinforcing member located between the flanges of the tie, and provided with an abutment for a flange of the rail and with an abutment for engaging with the key, for the purpose set forth.

18. The combination of a support for a rail comprising a U-shaped tie provided in its opposed flanges with recesses adapted to receive a rail, abutments on the tie for one of the lateral flanges of the rail, a key adapted to be inserted into said recesses and engage with the rail for securing the latter to the tie, and plates extending longitudinally of the tie, adjacent to the flanges, and each provided with an abutment for a flange of the rail and with an abutment for engaging with the key, for the purpose set forth.

19. The combination of a support for a rail comprising a U-shaped tie having reinforcing ribs extending along a portion of its opposed flanges, said flanges containing recesses adapted to receive a rail, abutments on the tie for one of the lateral flanges of the rail, a key adapted to be inserted into said recesses and engage with the rail for securing the latter to the tie, plates extending longitudinally of the tie flanges and adjacent to the inner surfaces thereof, provided with recessed portions corresponding with the ribs on the flanges, and abutments on the plates for engaging with a flange of the rail and with the key, for the purpose set forth.

CHARLES R. HOLDEN.

In presence of—

W. B. DAVIES,
R. A. SCHAEFER.