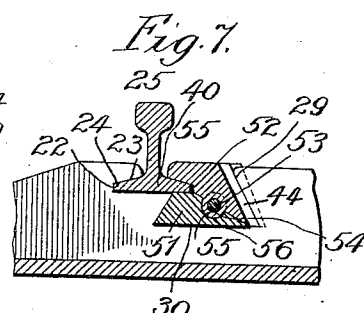
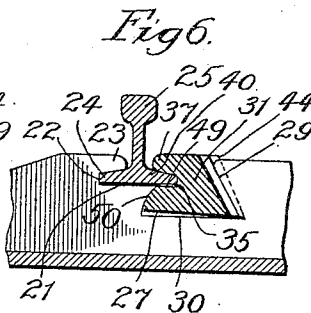
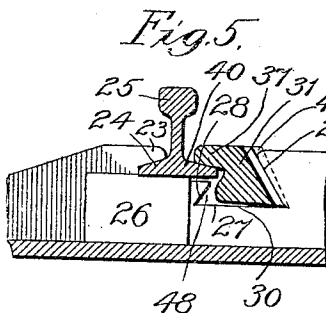
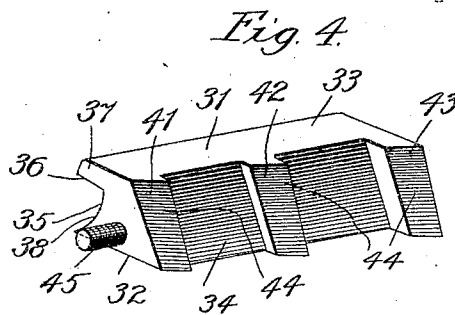
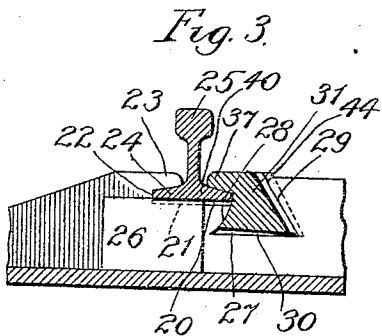
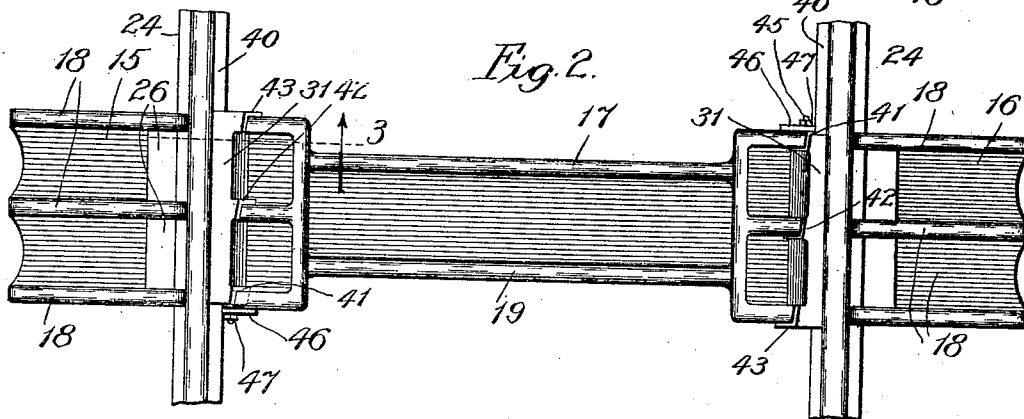
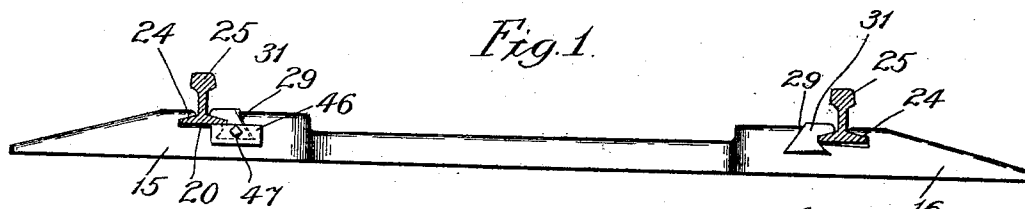




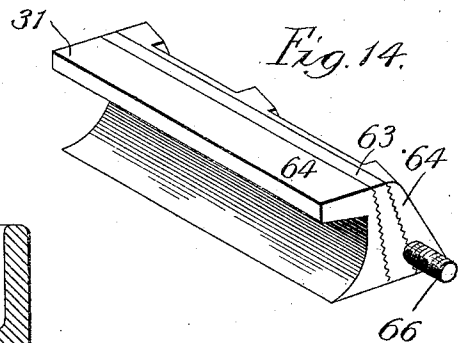
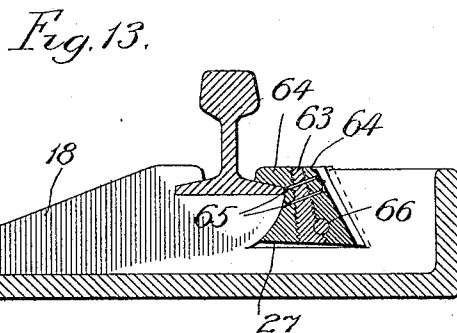
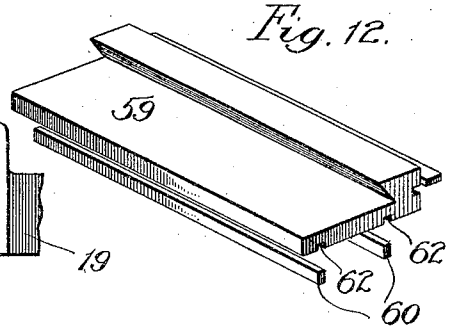
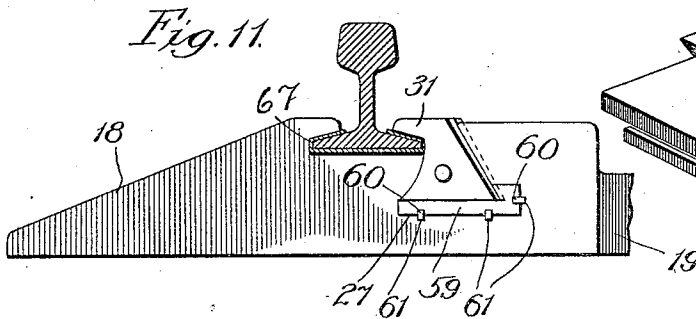
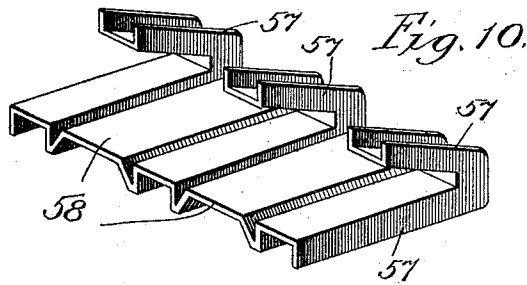
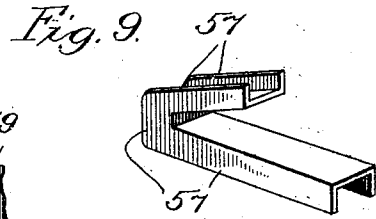
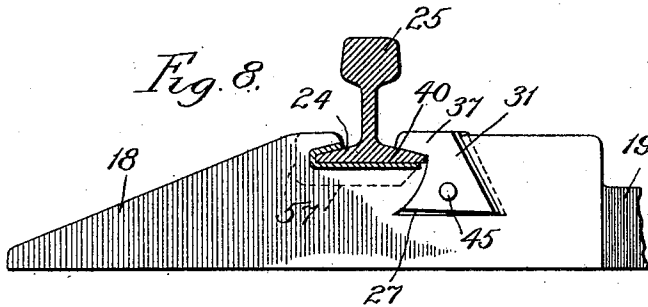
Witnesses:
 Carl B. Gaylord
 Chas. H. Buell

Inventor:
 Charles R. Holden.
 By Dymally, Le, Critton & Miles
 Attys.

C. R. HOLDEN.
RAILWAY ROAD BED CONSTRUCTION.
APPLICATION FILED JAN. 8, 1908. RENEWED JAN. 30, 1909.

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Patented Sept. 7, 1909.
2 SHEETS—SHEET 2.



Witnesses:
Wm. E. Payford,
Chas. H. Buell.

Inventor:
Charles R. Holden.
By *Dunforth, Leighton & Miles,*
Attys.

UNITED STATES PATENT OFFICE.

CHARLES R. HOLDEN, OF CHICAGO, ILLINOIS.

RAILWAY-ROAD-BED CONSTRUCTION.

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Specification of Letters Patent.

Patented Sept. 7, 1909.

Application filed January 8, 1908, Serial No. 409,876. Renewed January 30, 1909. Serial No. 475,256.

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, more particularly, to improvements in means for securing railway-rails in place on ties provided to receive them; and my object, generally stated, is to provide new and improved means for the purpose stated to the end of improving railway road-bed construction.

Referring to the accompanying drawings—Figure 1 is a face view of a tie, showing rails in cross-section secured thereto in accordance with my invention; Fig. 2 is a top plan view of the construction illustrated in Fig. 1; Fig. 3 is a broken section taken at the line 3 on Fig. 2; Fig. 4 is a perspective view of a key for clamping the rail to the tie; Figs. 5 to 7, inclusive, are views similar to that of Fig. 3, showing three modifications of the key illustrated in Fig. 4; Fig. 8 is a broken face view of one end of a tie having a metal-filler with a rail (shown in cross-section) resting thereon, and a key for clamping the rail to the tie, the filler being shown in cross-section; Fig. 9 is a perspective view of one of the forms of filler which may be employed; Fig. 10 is a similar view of another form of filler which may be used; Fig. 11 is a view similar to that of Fig. 8 of another modification of the construction illustrated in Fig. 3, showing a block of resilient material seated in the tie to afford a resilient seat for the key; Fig. 12 is a perspective view of the block and securing cleats illustrated in Fig. 11; Fig. 13 is a face view of one end of a tie with a rail, shown in cross-section, held in place thereon, and a key, also shown in cross-section, of a type affording resiliency to the construction; and Fig. 14, a perspective view of the key illustrated in Fig. 13.

The tie in connection with which I have chosen to illustrate my invention is preferably of the stamped steel U-shape type illustrated, affording two heads 15 and 16 at its opposite ends connected together by an intermediate section 17. The heads, as shown,

are each formed with three parallel vertical flanges 18, whereas the intermediate section 17 consists of but two such flanges 19.

Each of the flanges 18 has a recess 20 formed in it presenting a horizontal bottom 21 with an undercut-portion 22 affording a shoulder 23, which preferably is in the position illustrated in Fig. 1, to receive the outer flange 24 of a rail 25, which preferably seats upon blocks 26 interposed between the flanges 18 adjacent to the recesses 20 and extending slightly above the bottom walls of the recesses, the rail illustrated being of the ordinary type, though the bull-rail, common to Continental railroads, may be employed. The recesses 20 and shoulders 23 aline with each other on the opposite ends of the tie and extend transversely of the flanges 18, as illustrated in Fig. 2. In addition to the recesses 20 formed in the flanges 18, other recesses 27 are provided in each flange 18 extending below the level of the bottom walls 21 of the recesses 20, and in the construction illustrated in Figs. 1 to 3, inclusive, these recesses have curved walls 28 adjoining the portions 21 of the recesses 20; an opposed tapering wall 29, and a horizontal wall 30, the tapering walls in the flanges of one head tapering in the opposite direction to those in the opposed head, and the tapering walls 29 of each head bearing stepped relation to each other as illustrated in Fig. 2, for a purpose hereinafter disclosed. The rails are clamped in place against the respective blocks 26 by a key 31, which is longitudinally insertible transversely of the flanges 18 into the recesses 20 in the opposed heads. The key of Fig. 4 is of general frusto-conical shape in cross-section having a flat bottom 32 and top 33, a tapering surface 34 on one side and a grooved surface on the other, affording a channel 35 having a slightly inclined upper wall 36 presenting a flange 37 and a curved lower wall 38, as illustrated, the walls 36 and 38 preferably conforming in contour to the upper side of the inner flange 40 of the rail 25, and the curved walls 28 of the recesses 27, respectively.

The tapering side 34 of the key 31 is provided with a series of flanges 41, 42 and 43 of a number preferably corresponding with the number of flanges on each head of the tie, these key-flanges having surfaces 44

which taper in a horizontal direction at angles to the side of the key and in an upward direction, relative to the side 34 of the key, from their lower to their upper portions, the surfaces 44 thus extending at an angle to the lower side 32 of the key slightly greater than the angle at which the side 34 extends with relation to the bottom of the recesses 27, as illustrated in Figs. 3 and 4, for a purpose hereinafter disclosed. The extent of protrusion of the key-flanges 41, 42 and 43 beyond the side 34 varies successively, the flanges 42 and 43 extending to a greater distance from the side 34 than the flange 41, and the flange 42 to a greater distance than the flange 41, so that the key may be introduced into the recesses 27 in the flanges 18, and the key-flanges be caused to impinge against the walls 29 of the adjacent recesses, as hereinafter described.

To clamp a rail in place on the tie, it is first seated on the blocks 26 to extend into the undercut-portion 22, at its outer flange 24. The key 31 is then inserted at the end carrying the flange 41 through the recesses 27 in the flanges 18, the varying extents of protrusion of the key-flanges and the stepped arrangement of the walls 29 of the recesses 27 permitting the key to be introduced by hand through the recesses 27 approximately to the position illustrated in Fig. 2. The key may then be driven into the final clamping position illustrated in Figs. 2 and 3 by a sledge, or the like. The effect of driving the key as stated is to cause the flanges 41, 42 and 43 to bear, at their tapering surfaces 44, against the tapered walls 29 of the recesses 27 with the result of not only causing the key 31 to wedge in a horizontal direction toward the rail, but of causing the key to turn slightly in the recesses 27 toward the rail 25, thereby turning down the flange 37 against the inner flange 40 of the rail against which it is thus caused to firmly impinge. The curvature of the walls 28 of the recesses 27 is such as to correspond with the arc through which the key moves in its lateral and turning movements when driven into the recesses. Thus the wall 38 of the key is caused to constantly impinge against the walls 28 of the recesses throughout the turning movement of the key. It will be also noted that by providing the curved walls 28 strain upon the parts of the structure during the operation of setting the key is avoided. The key is preferably so proportioned that when initially assembled with the other parts of the construction, it will not fit down against the bottom walls of the recesses 27, and its flanges will not contact throughout their wedging surfaces with the walls 29 of the recesses 27. Thus as the block 26 becomes beaten down by the constant 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 farther into the recesses, with the result of turning the flange 37 into close engagement with the adjacent flange of the rail.

I prefer to provide means for securing the key against accidental displacement, the means shown comprising a bolt which may be in the form of a threaded stud 45 extending from that end of the key which carries the flange 41, as illustrated, or it may be a bolt (not shown) extending longitudinally through the key; and a plate 46 which may be applied to the bolt and against the outer face of the flange 18 adjacent to the key-flange 41, and against which plate a nut 47 screws on the bolt 45. The key 31 is thus not only held in place by the construction described, but the flanges 18 are rigidly reinforced and strengthened with relation to each other.

The construction shown in Fig. 5 is the same as that illustrated in Fig. 3, with the exception that the walls 28 of the recesses 27 are straight instead of curved, and the curved wall 38 of the key is more abrupt in this construction than that illustrated in Fig. 3. The spaces 48 are thus provided between the wall 38 of the key and the recess-walls 28 for receiving the downwardly extending flange of a rail (not shown) of a peculiar type. With a rail in position on the tie as described of the preceding constructions, the operation of the key shown in Fig. 5 is the same as that of the key illustrated in Fig. 4, with the exception that instead of the curved wall 38 bearing against the curved wall 28 of Fig. 3, it bears against the vertical surface of the downwardly extending flange of the rail.

In the construction illustrated in Fig. 6, the channel 35 instead of having a curved wall 38, has a straight, approximately horizontal, wall 49 intersected by a curved wall 50. The block 26 in the previous figures is eliminated in this construction, and the rail 25 is adapted to seat upon the surfaces 21 of the recesses 20. The opposed walls of the channel 35 are spaced apart a greater distance than the thickness of the flange of the rail, to permit the key to be inserted into the recesses 27 and be given a turning movement as described for clamping its flange 37 against the rail.

The construction illustrated in Fig. 7 has its key 31 formed of two sections 51 and 52 hinged together, as indicated at 53, by a rod 54 passing through registering lugs 55 which fit into recesses 56 in the opposed sections. The section 51 is preferably constructed of a shape adapting it to snugly fit the recesses 27 when the key is driven into place and thus cooperate with the surfaces 21 in forming a seat for the rail. When the key 31 of this construction is driven into place, the turn-

ing movement produced by the engagement of the flanges 41, 42 and 43 with the walls 29 of the recesses 27 for clamping the flange 37 against the rail-flange 40, is effected only

5 of the section 52.
In Figs. 8 to 10, inclusive, are shown two types of fillers for application to the rail-seats and undercut-portions 22 when the blocks 26 are not provided, and the wear 10 upon the inner sides of the rail-treads necessitates the transverse adjustment of the rails upon the ties; or for application to the ties preliminary to the initial assembling of the rails on them to avoid the impairment of the rail-seats under the stress of wear to which 15 they are subjected. Fig. 9 shows a filler stamped from sheet steel and adapted to be applied to a single flange, as illustrated in Fig. 8, the filler being of the general V-shape as illustrated, with flanges 57 about its outer edges permitting it to be held against 20 displacement on the rail-seats to which they are applied. In the construction of Fig. 10 the fillers instead of being formed separate, one for each of all the flanges 18 of a head, 25 are united in one piece, preferably a drop-forging, by a series of webs 58 interposed between the filler-sections, the whole being thus rendered unitary, with the advantage 30 of enabling the fillers to be quickly applied and serve the triple function of taking up wear on the rail, and strengthening the tie-flanges, and affording a continuous rail-seat.

The constructions illustrated in Figs. 11 35 to 14, inclusive, are designed to afford slight resiliency or give to the structure as opposed to the hard, intensely rigid, impingement of the parts of the construction when it is desired that the rails rest directly upon the 40 bottom walls of the recesses 20. This result is accomplished in the structure illustrated in Fig. 11 by enlarging the recesses 27, as shown, to receive a block 59 of wood or relatively soft material, or of any other material 45 having slight elasticity, which spans the flanges of the head to which it is applied, and may be secured in place in any suitable manner, as by cleats 60 fitting in notches 61 in the walls of the recesses 27 and registering 50 notches 62 in the block, the purpose of this construction being to afford a slight give on the parts to which strain is exerted when a track is being traversed by a train.

As another means for obtaining the desired resiliency, the key 31 may contain a 55 section 63 of wood, soft metal, or other suitable material, secured between two sections 64, 64 of hard metal, the three sections being fastened together as by rivets 65, it being desirable in this case, though not indis- 60 pensable, that the means for holding the key in place after application to the tie, be a bolt 66 passing entirely through the key and preferably through one of the metal sections 64 65 and the wood section 63, for receiving a nut

(not shown) which coöperates with a plate (not shown) as described of the structure in Fig. 1, the manner of assembling the constructions of Figs. 11 to 14, and the operation of the key of these structures, being the same as that of the construction illustrated in Fig. 1. 70

While I have shown in the constructions illustrated in Figs. 1, 2, 3, 4 and 5 a block of relatively resilient material for seating the 75 rail on the tie, it is manifest that such block is not indispensable, and that the rails may seat directly upon the bottom surfaces of the recesses 20, which in conjunction with each other afford a rail-seat. It is likewise mani- 80 fest that instead of seating the rails upon the surfaces 21 of the recesses 20 of the constructions shown in Figs. 6, 7, 11 and 13, a block 26 may be provided to form the seat as described of the constructions of the pre- 85 vious figures.

While I have illustrated my invention in connection with a tie of a peculiar construction involving two heads, each with three flanges, and an intermediate section of but 90 two, I do not wish to be understood as limiting my invention to such a construction, as a tie having but two parallel flanges, or any suitable number of flanges may be used without departure from my invention. It is also 95 within my invention to employ a shoe or plate constructed with the rail-seat and key, as described, which plate may then be secured to the tie-proper of metal, wood, concrete or any other suitable material as is 100 well understood in the art.

By providing a key which not only has a lateral wedging action, but in addition a tilting movement, the wear of the rail-seat, whether it be of wood or metal as described, 105 may be readily compensated for by the further driving in of the wedge by striking it with a sledge, or the like, and thus the rails may be quickly and effectively again fastened in place. 110

As a means for insulating the rail 25 from the tie to make its use possible where the block system is used, I may interpose between the rail and the tie a strip 67 of insulating material such as felt, which may be 115 applied to the portions 21 and undercut portions 22 of the recesses 20 and folded over the inner flange 40 of the rail where the key 31 engages it, as illustrated in Fig. 11. Thus the rail may be insulated from the tie in a 120 simple and efficient manner.

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

1. The combination with a rail, of a support for the rail provided on its upper portion 125 with a recess, an abutment for one of the lateral flanges of the rail, a key provided with rail-flange-engaging means and insertible into said recess transversely of the support to engage with the wall of the recess, 130

and means for turning down the rail-flange-engaging means against the other flange of the rail.

2. The combination with a rail, of a support for the rail provided on its upper portion with a recess, an abutment for one of the lateral flanges of the rail, a key provided with rail-flange-engaging means and insertible into said recess transversely of the support to engage with a wall of the recess, and means for producing a turning movement of the key to cause its rail-flange-engaging means to bear down and against the other flange of the rail.

3. The combination with a rail, of a support for the rail provided on its upper portion with a recess, an abutment for one of the lateral flanges of the rail, a wedge-key provided with rail-flange-engaging means and insertible into said recess transversely of the support to engage with a wall of the recess, and means for producing a turning movement of the key to cause its rail-flange-engaging means to bear down against the other flange of the rail.

4. The combination with a rail, of a support for the rail provided on its upper portion with a recess, an abutment for one of the lateral flanges of the rail, a key provided with rail-flange-engaging means and insertible into said recess transversely of the support to engage with a wall of the recess, and means for wedging the key toward the rail and for turning the key in the recess for forcing the rail-flange-engaging means down and against the rail.

5. The combination with a rail, of a support for the rail provided on its upper portion with a recess, an abutment for one of the lateral flanges of the rail, a key provided with rail-flange-engaging means and insertible into said recess transversely of the support, and wedging means on the key adapted to engage a wall of the recess at a point above the resistance point at the opposite side of the key, whereby the key is caused to turn in the recess.

6. The combination with a rail, of a support for the rail provided on its upper portion with a recess having a curved wall, an abutment for one of the lateral flanges of the rail, a key provided with rail-flange-engaging means and insertible into said recess transversely of the support to engage with a wall of the recess, and having a curved wall adjacent to said rail-flange-engaging means adapted to bear against the curved wall of the recess, and means for wedging the key toward the rail and for turning the key in the recess for forcing the rail-flange-engaging means down and against the rail.

7. The combination with a rail, of a support for the rail provided on its upper portion with a recess having upwardly tapering walls, an abutment for one of the lateral

flanges of the rail, a key of general frusto-conical shape in cross-section provided with rail-flange-engaging means and insertible into said recess transversely of the support to engage with the tapering walls of the recess, and means for wedging the key toward the rail and for turning the key in the recess for forcing the key-flange down and against the rail.

8. The combination with a rail, of a support for the rail provided with a plurality of upwardly extending flanges containing recesses, abutments for one of the lateral flanges of the rail, a key provided with rail-flange-engaging means and insertible into said recesses transversely of the support, and wedging flanges on said key adapted to engage with walls of the recesses and force the rail-flange-engaging means against the rail.

9. The combination with a rail, of a support for the rail provided with a plurality of upwardly extending flanges containing recesses, abutments for one of the lateral flanges of the rail, a key provided with rail-flange-engaging means and insertible into said recesses transversely of the support, and wedging surfaces on the key constructed and arranged to bear against walls of the recesses and wedge the key toward the rail and turn it in the recesses to force the rail-flange-engaging means down and against the rail.

10. The combination with a rail, of a support for the rail provided with a plurality of upwardly-extending flanges containing recesses, abutments for one of the lateral flanges of the rail, a key provided with rail-flange-engaging means and insertible into said recesses transversely of the support, wedging-flanges on the key adapted to engage with walls of the recesses when the key is moved therein and turn the rail-flange-engaging means down and against the other flange of the rail, and means for so moving the key in the recesses and maintaining it in rail-flange-engaging position against displacement.

11. The combination with a rail, of a support for the rail provided with a plurality of upwardly extending flanges containing recesses having walls arranged in stepped relation, abutments for one of the lateral flanges of the rail, a key provided with rail-flange-engaging means and insertible into said recesses transversely of the support, and wedging flanges on the key constructed and arranged to bear against the walls of the recesses arranged in stepped relation and wedge the key toward the rail and turn it in the recesses to force the rail-flange-engaging means down and against the rail, for the purpose set forth.

CHARLES R. HOLDEN.

In presence of—

RALPH SCHAEFER,
A. U. THORIEN.