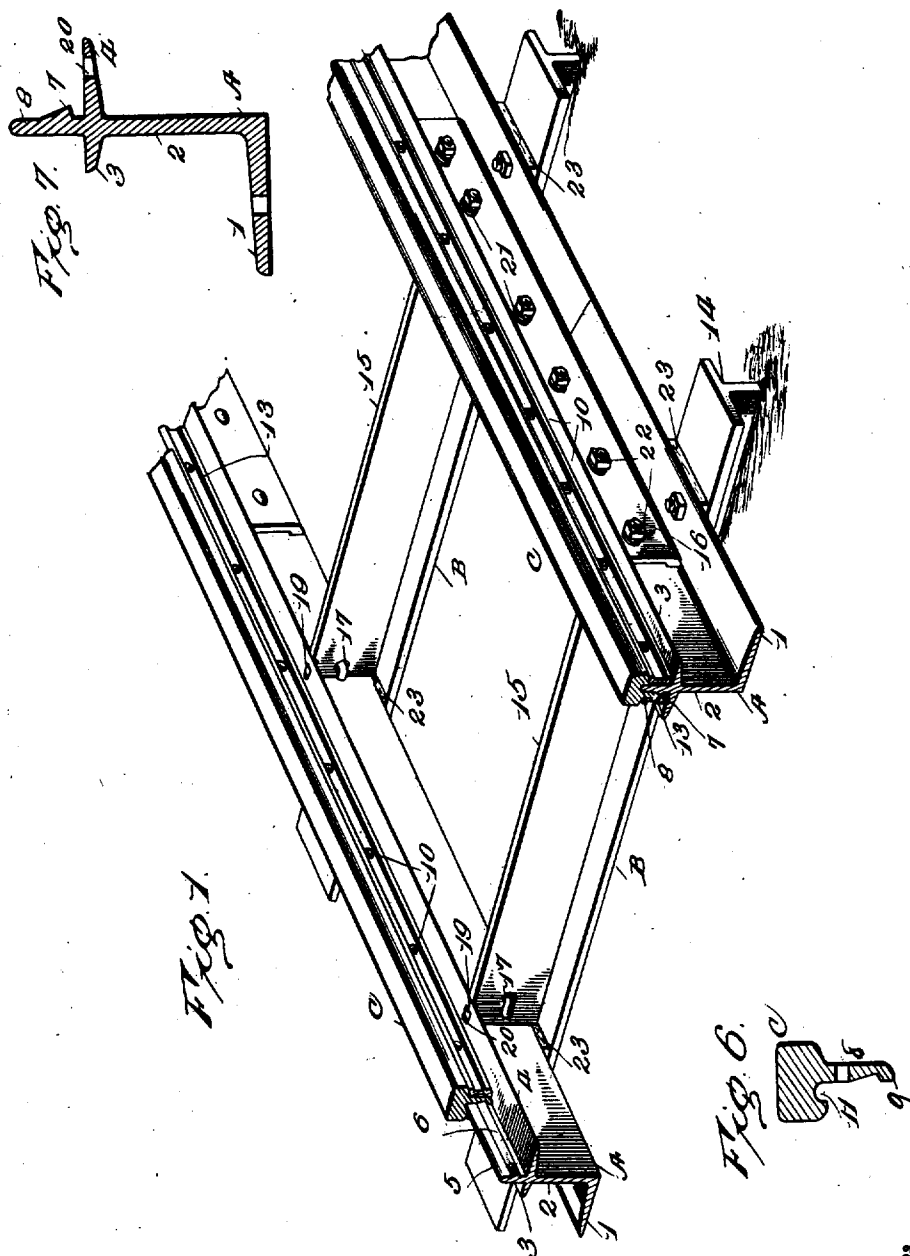


No. 897,592.

PATENTED SEPT. 1, 1908.

J. W. COOPER.
STRINGER AND TIE.
APPLICATION FILED AUG. 24, 1907.

2 SHEETS—SHEET 1.



Witnesses
M. J. Moore
W. K. Hudson

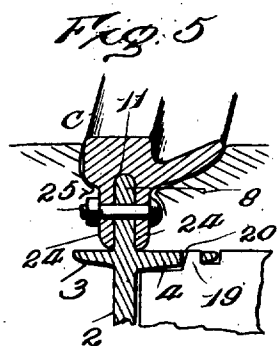
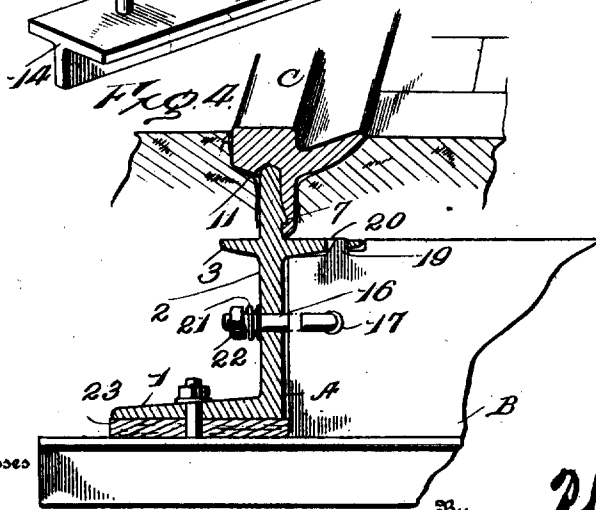
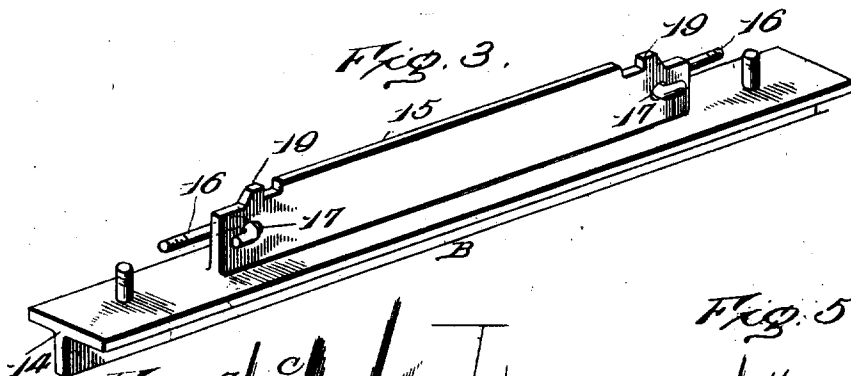
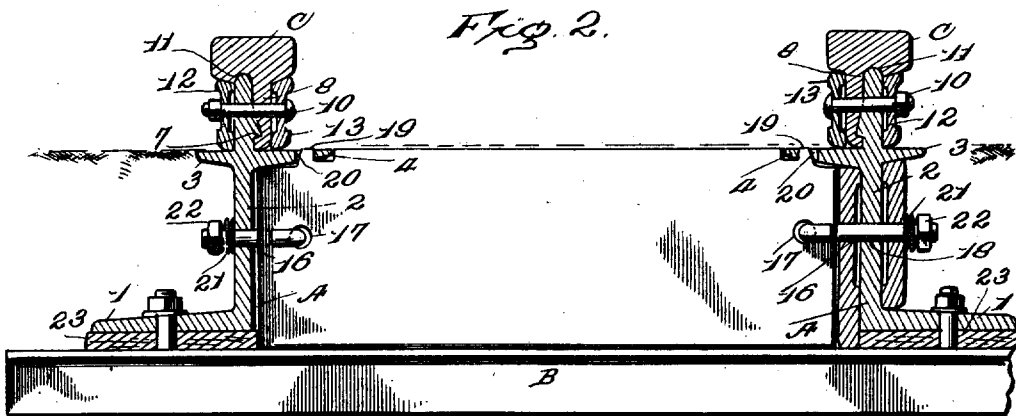
Inventor
John W. Cooper
By *J. H. O. Racy*
Attorneys

No. 897,592.

PATENTED SEPT. 1, 1908.

J. W. COOPER.
STRINGER AND TIE.
APPLICATION FILED AUG. 24, 1907.

2 SHEETS—SHEET 2.



Witnesses

Ms Anne
W. P. Woodson

Inventor

John W. Cooper

Ph.D. Macy.

Attorneys

UNITED STATES PATENT OFFICE.

JOHN W. COOPER, OF BOSTON, MASSACHUSETTS.

STRINGER AND TIE.

No. 897,592.

Specification of Letters Patent.

Patented Sept. 1, 1908.

Application filed August 24, 1907. Serial No. 389,989.

To all whom it may concern:

Be it known that I, JOHN W. COOPER, citizen of the United States, residing at Dorchester station, Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Stringers and Ties, of which the following is a specification.

This invention relates to the construction of railroads and deals more particularly with the rails, stringers and ties, which, in accordance with this invention, are of metal and formed in a novel manner and connected so as to provide a substantial structure and admit of the tread portions of the rails being renewed at a comparatively small cost and without necessitating disturbance of the road-bed.

For a full understanding of the invention and the merits thereof and also to acquire a knowledge of the details of construction and the means for effecting the result, reference is to be had to the following description and accompanying drawings.

While the invention may be adapted to different forms and conditions by changes in the structure and minor details without departing from the spirit or essential features thereof, still the preferred embodiment is shown in the accompanying drawings, in which:

Figure 1 is a perspective view of a portion of a railroad embodying the invention. Fig. 2 is a transverse section of the railroad. Fig. 3 is a perspective view of a tie. Fig. 4 is a sectional view of a grooved rail, such as used for street railways, illustrating the application of the invention. Fig. 5 is a sectional view of a modification. Fig. 6 is a cross section of the rail. Fig. 7 is a transverse section of the stringer.

Corresponding and like parts are referred to in the following description and indicated in all the views of the drawings by the same reference characters.

The railroad comprises stringers or sleepers A, ties B and rails C. The several parts are of metal and are connected in a substantial manner. The rails, which in the present instance consist of tread portions and securing and bracing flanges, are removable to admit of their renewal without requiring loosening of the stringers or movement of the ties. The stringers or ties A consist of L-beams, one wing constituting the base or foot and the other wing forming a vertical

support for the tread portion or rail C. The foot or base 1 tapers slightly towards its outer longitudinal edge. A vertical wing 2, forming the upright, is provided near its upper longitudinal edge with oppositely disposed flanges 3 and 4, which in addition to strengthening and bracing the part 2 laterally, support the tread portion C and the flanges cooperating therewith. A flange 5 projects above the lateral flanges 3 and 4 and is in line with the flange or support 2 and has the rail or tread portion C connected directly thereto. The several parts 1, 2, 3, 4 and 5 are of integral formation, being rolled at one and the same time, thereby obviating the formation of joints. The rail supporting flange 5 has a longitudinal off-set 6 upon one side near one of the lateral flanges to provide a shoulder 7 under which a portion of the flange of the rail or tread portion C engages to form interlocking means whereby vertical displacement of the rail or tread portion C is obviated.

The rail C comprises a tread portion and a projecting flange 8, the latter adapted to lie alongside the vertical rail supporting flange 5 and be bolted or secured thereto. The flange 8 is provided near its lower edge with a lip or rib 9 to engage under the shoulder 7, thereby preventing vertical displacement of the rail. Corresponding openings are formed in the flanges 5 and 8 to receive bolts 10. A groove 11 is formed in the under side of the ball or tread portion of the rail adjacent to the flange 8 and forms a seat in which the upper edge of the rail supporting flange 5 is seated. In assembling the parts, the rail C is placed upon the flange 5 with the upper edge of the latter seated in the groove 11, after which the rail is rocked to cause the lip or rib 9 to engage under the shoulder 7. To admit of the rocking of the rail C upon the flange 5, the seat 11 and the upper edge of the flange 5 are made rounding in transverse section. Splice bars or fish plates 12 and 13 are placed upon opposite sides of the flanges 5 and 8 and are secured thereto by the bolts 10. These splice bars or fish plates engage under the projecting side portions of the ball or tread of the rail and also rest upon the lateral flanges 3 and 4, thereby materially bracing and supporting the tread portion of the rail.

The ties B comprise a lower portion 14 of T-form and a vertical flange 15, the latter being in the plane of the vertical flange of the T portion 14. The vertical flange 15 termi-

nates some distance from the extremities of
 the base or lower portion 14 and its ends are
 adapted to abut against the inner sides of
 the vertical members of the stringers A,
 5 whereas the projecting portions of the lower
 or base portion 14 extend beneath said
 stringers and are bolted or otherwise fast-
 ened to the foot 1 thereof. Hooked bolts 16
 connect opposite end portions of the flanges
 10 15 with the stringers and pass through open-
 ings in each, the hooked end of the bolt pass-
 ing through the opening 17 near the end of
 the flange 15 and the body portion of said
 bolt passing through the opening 18 in the
 15 vertical wing or member 2 of the stringer.
 The flange 15 is cut away at its upper edge
 for a short distance from each end to receive
 the lateral flange 4 near the upper end of the
 stringer, a projecting portion 19 being left to
 20 pass through an opening 20 of the flange 4,
 thereby supplementing the action of the
 fastenings 16 when connecting the ties and
 stringers.

In order to neutralize vibration and pre-
 25 vent rigidity of the parts, spring washers 21
 are mounted upon the outer ends of the bolts
 16 and are confined between the vertical
 wings 2 of the sleepers and the nuts 22
 threaded upon the outer end of said bolts 16.
 30 Shims or pieces of wood 23 are interposed be-
 tween the horizontal flanges 1 of the sleepers
 and the projecting portions of the ties.
 These shims or blocks of wood 23 prevent
 pounding of the rails and excessive wear of
 35 the rolling stock and give a degree of elas-
 ticity about equal to the accustomed wooden
 ties.

The splice bar or fish plate 12 extends the
 entire length of the sleeper or rail and is ar-
 40 ranged upon the side of the rail supporting
 flange 5 opposite to that against which the
 flange 8 bears. In some instances it is pre-
 ferred to provide the rail C with spaced
 flanges 24, as indicated in Fig. 5, said flanges
 45 embracing the rail supporting flange 5.
 The three flanges are connected by bolts
 passing through registering openings formed
 therein. When the rail C is provided with
 spaced flanges 24, it is not feasible to pro-
 50 vide an interlocking joint between said
 flanges 24 and the flange 5, hence the rail is
 simply slipped upon the flange 5 and secured
 thereto by bolts or fastenings 25. In the
 construction shown in Fig. 4, which is spe-
 55 cially adapted for street railroads, no splice
 bars are provided and it is not necessary
 to bolt the flange 5, because the surface of
 the street abutting against opposite sides
 of the flanges 5 and 8 prevent lateral dis-
 60 placement thereof and the interlocking
 joint between said flanges prevents vertical
 displacement of the rail.

Figs. 1 and 2 show the invention adapted
 for solid tread rails, such as commonly em-
 ployed for steam railroads, whereas Figs. 4 65
 and 5 show the invention adapted for grooved
 rails as commonly employed for street rail-
 ways.

It will be understood that the rails, when
 worn or otherwise rendered unfit for future 70
 efficient service, may be removed and re-
 placed by new ones without disturbing the
 sub-structure consisting of the stringers and
 ties, hence repairs may be made expedi-
 tiously and at a comparatively small cost. 75

The vertical flanges 15 of the ties being of
 uniform lengths, act as gages to insure the
 rails and sleepers being spaced apart and
 uniform, with the result that the railway is
 of like gage, and in construction does not re- 80
 quire spacing of the rails by moving one in
 and the other out, in order to properly and
 uniformly space the same.

Having thus described the invention, what
 is claimed as new is:

1. In combination, a stringer having a 85
 lateral flange provided with an opening, a
 tie having a projection to pass through the
 opening in the lateral flange of the sleeper
 and to interlock therewith, and positive con- 90
 necting means between the tie and stringer.

2. In combination, a stringer having a
 lateral flange provided with an opening, a
 tie having a lower portion extending beneath
 the stringer and having a vertical flange 95
 abutting against the stringer and formed with
 a projection to pass through the opening in
 the lateral flange thereof, and positive con-
 necting means between the stringer and tie.

3. In railroad construction, the combina- 100
 tion of parallel stringers having basal flanges
 forming extended supports and provided at
 or near their upper edges with vertical and
 opposite lateral flanges, rails seated upon
 said vertical flanges and having pendent 105
 flanges lapped alongside said vertical flanges
 and secured thereto, and ties, each tie hav-
 ing a lower portion of T form and a vertical
 flange terminating a distance from the ends
 of said lower T portion, the ends of the ver- 110
 tical flanges of the ties abutting against the
 stringers and having projecting portions in-
 terlocking with the lateral flanges thereof,
 and having the end portions of the ties ex-
 tended beneath the stringers and forming 115
 supports therefor, and positive connecting
 means between the stringers and ties.

In testimony whereof I affix my signature
 in presence of two witnesses.

JOHN W. COOPER. [L. s.]

Witnesses:

V. B. HILLYARD,
 W. N. WOODSON.