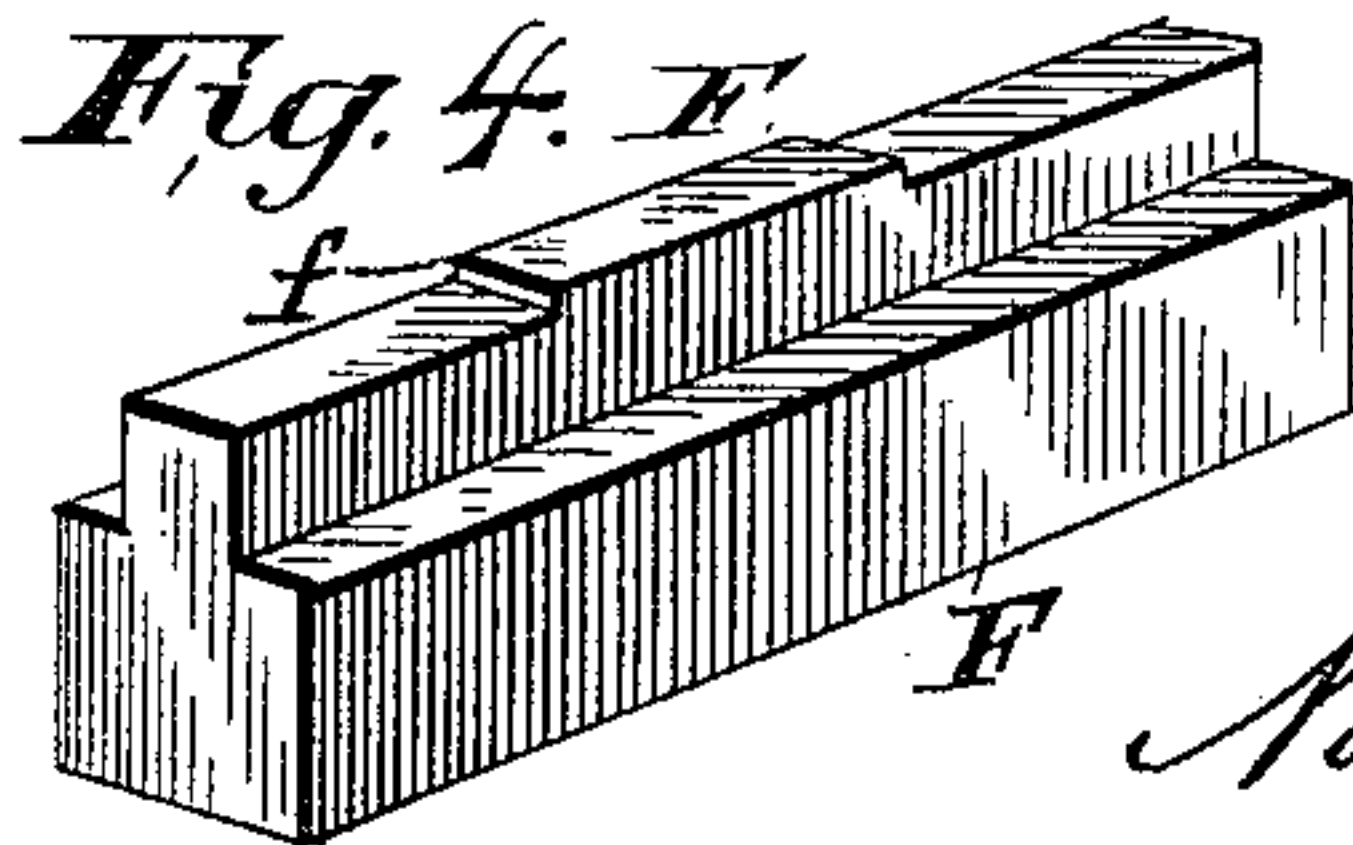
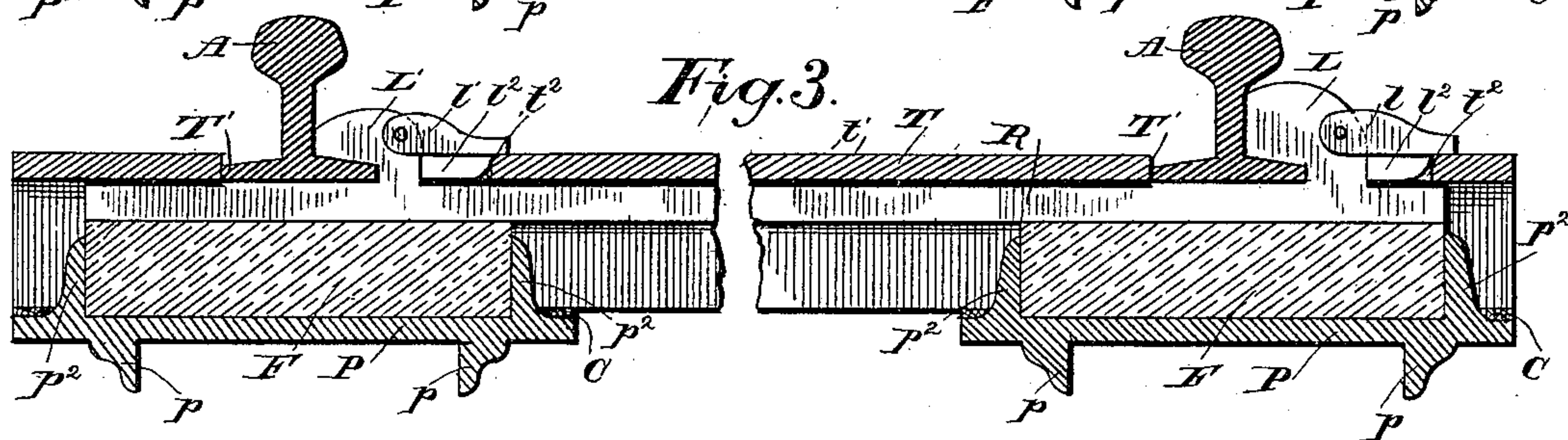
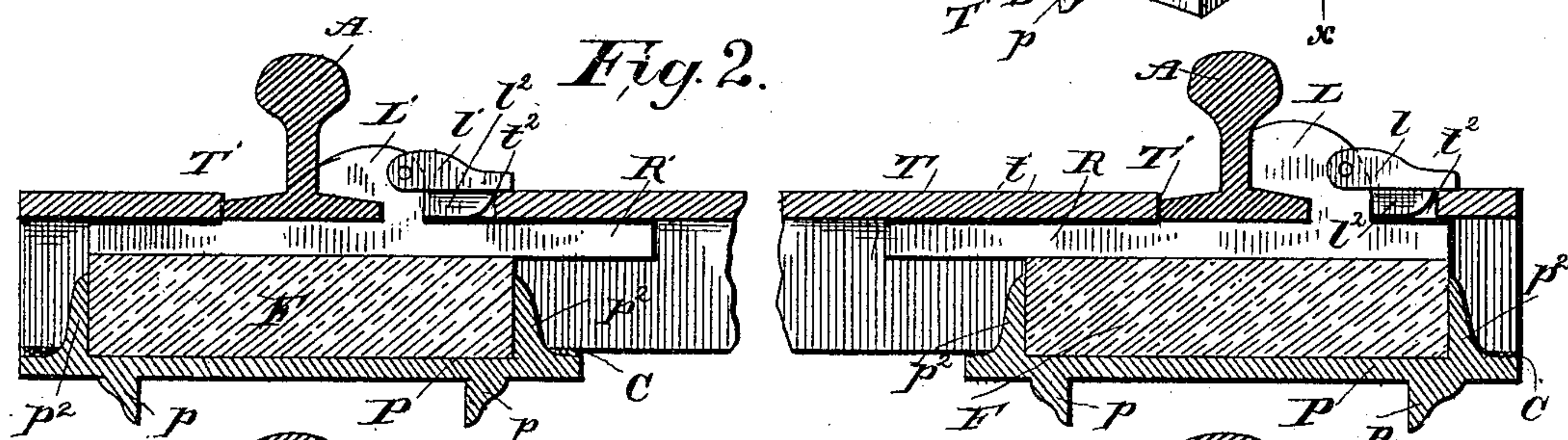
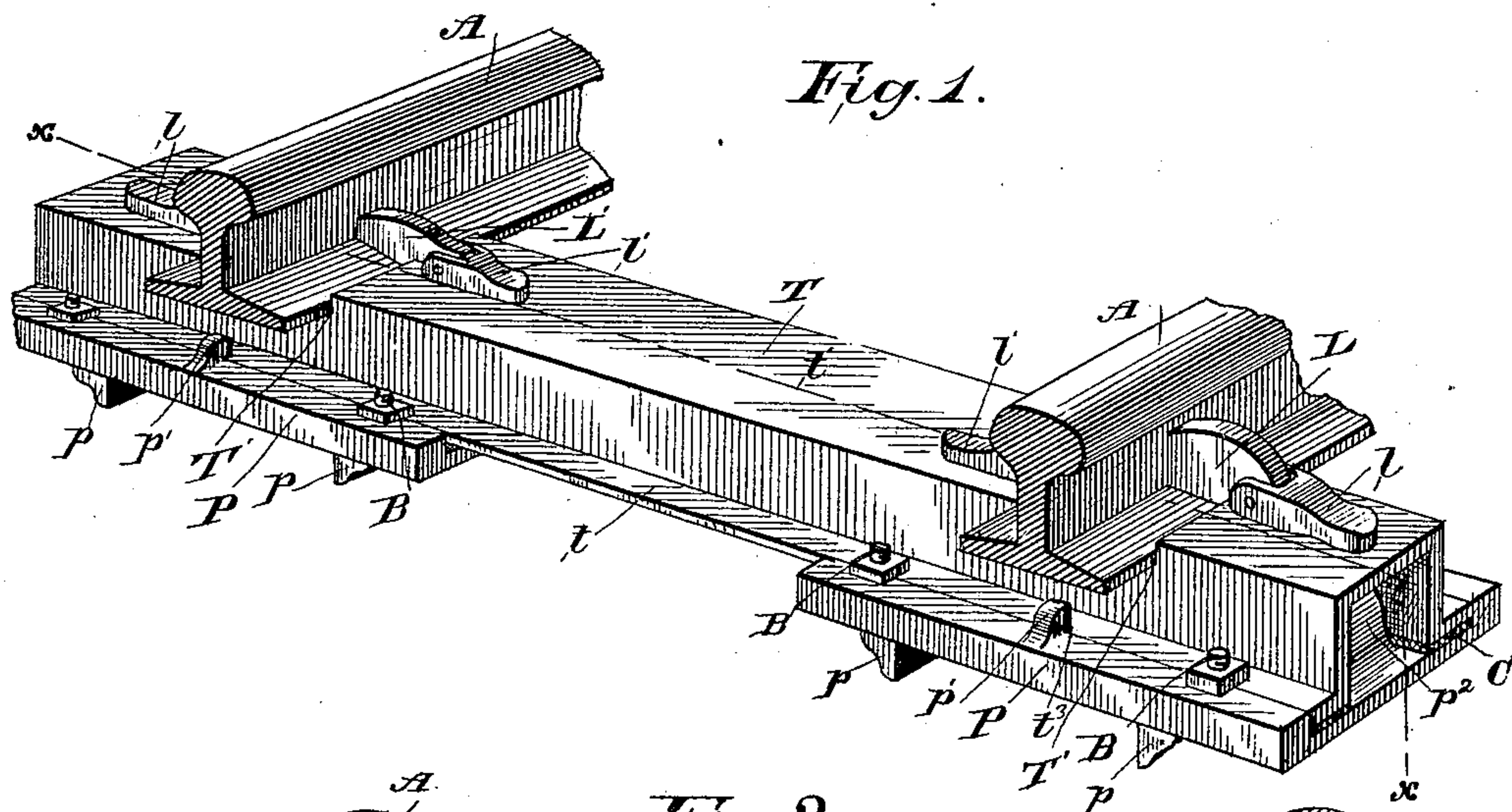


2 Sheets—Sheet 1.

# COMBINED RAILWAY TIE AND RAIL FASTENING.

Patented July 12, 1887.



Witnesses  
Wm R Davis  
W E Boulter.

Inventor  
Norman S. White  
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Attorney

(No Model.)

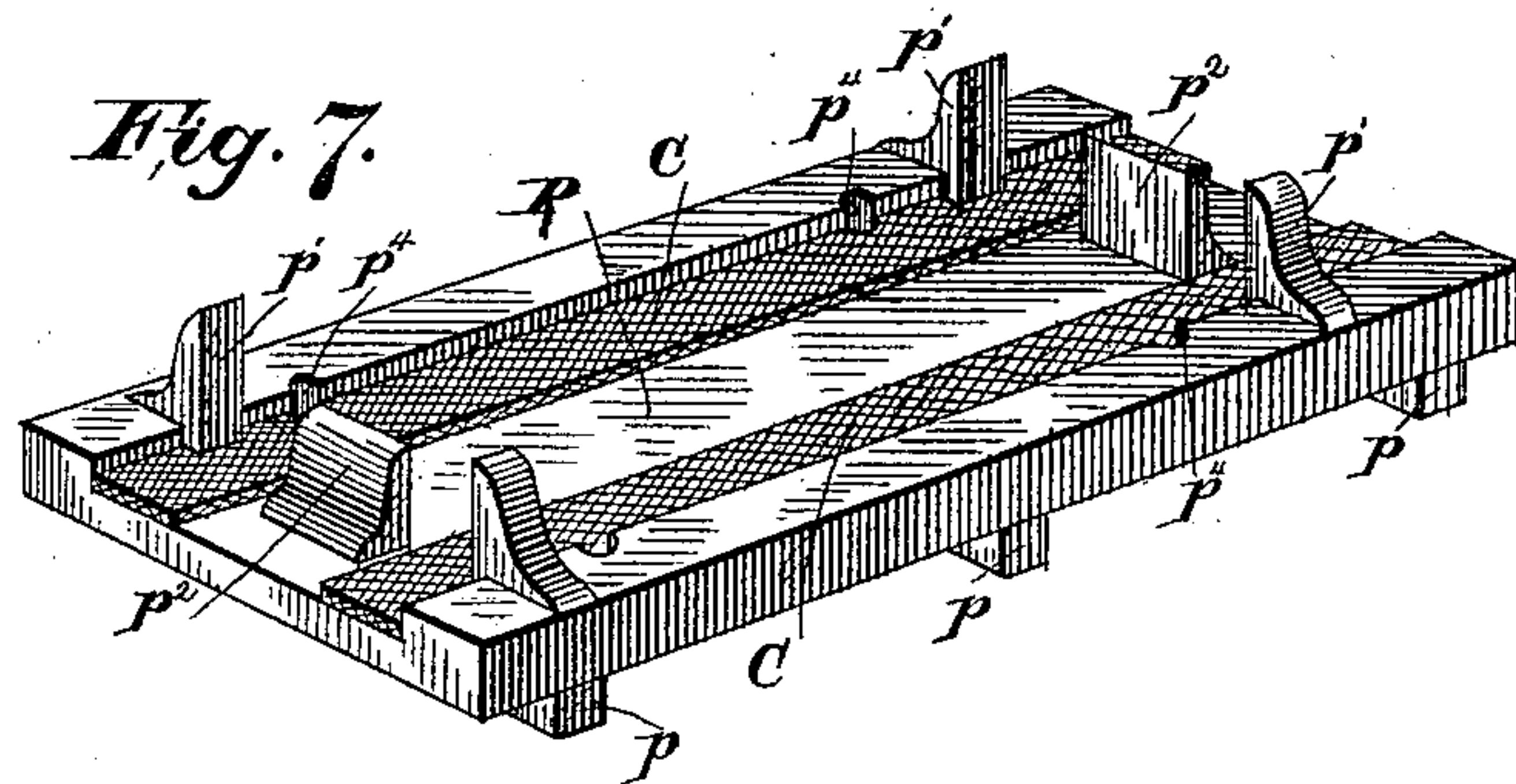
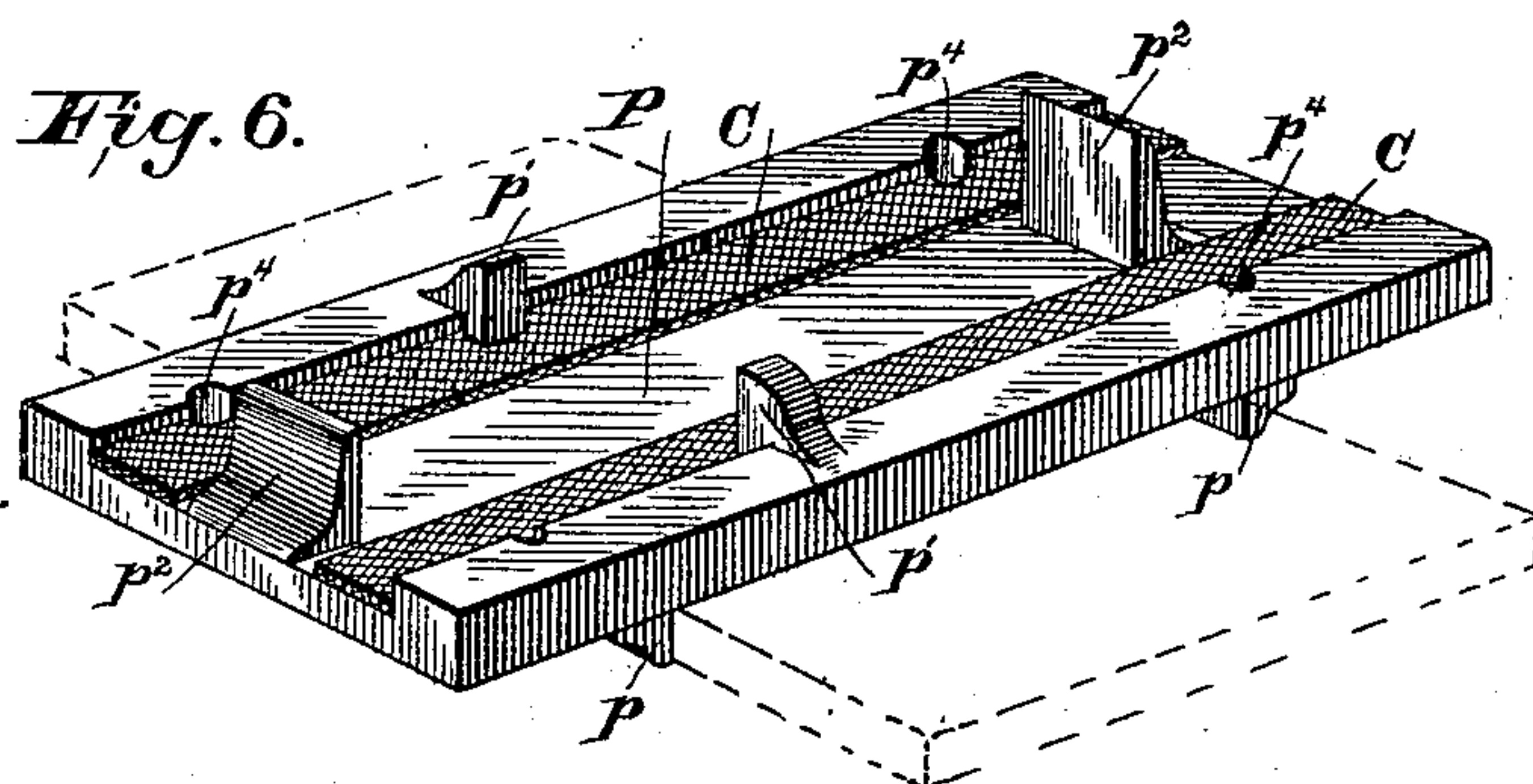
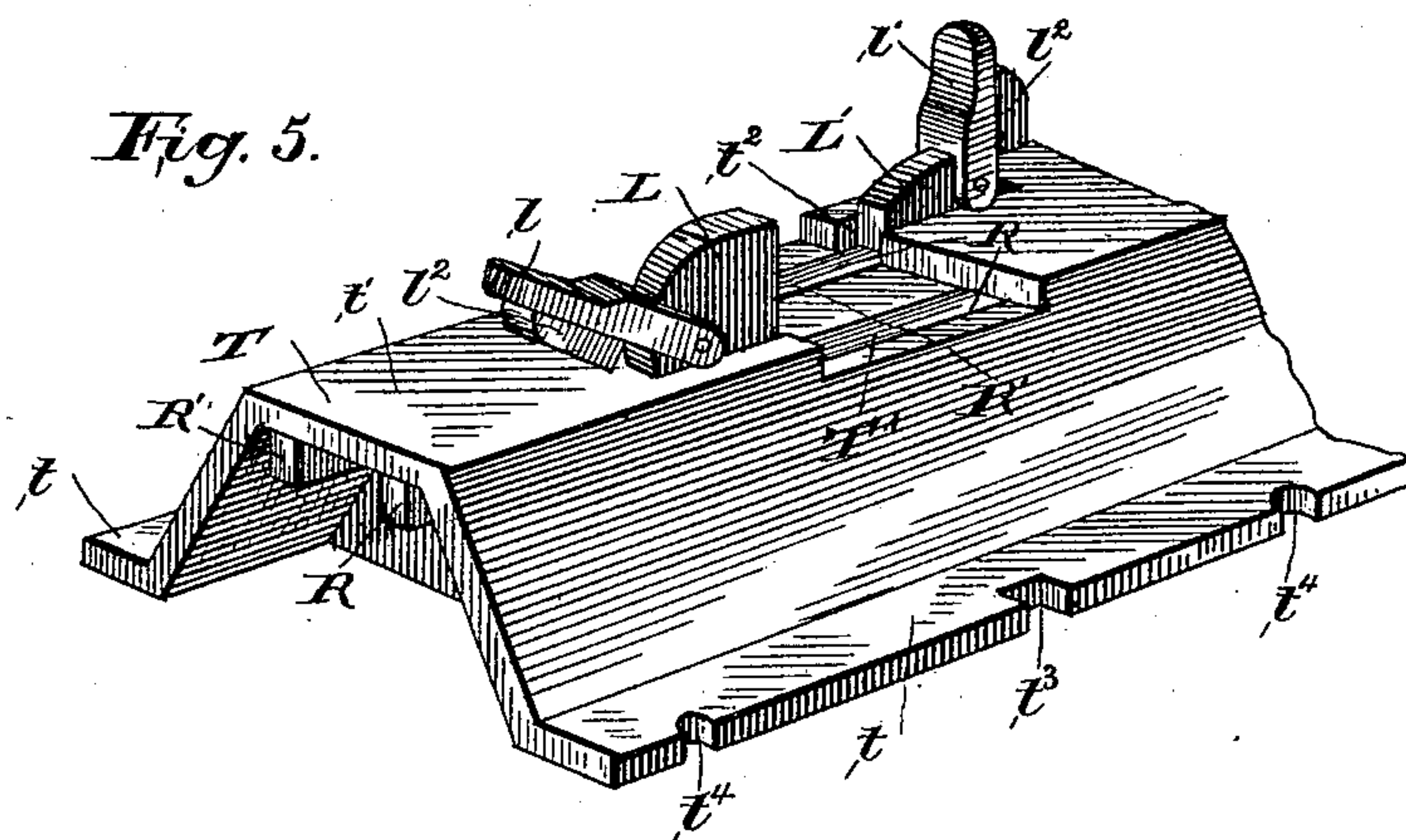
2 Sheets—Sheet 2.

N. S. WHITE.

COMBINED RAILWAY TIE AND RAIL FASTENING.

No. 366,546.

Patented July 12, 1887.



Witnesses  
Wm R Davis  
W. C. Goulter

Inventor  
Norman S. White  
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# UNITED STATES PATENT OFFICE.

NORMAN S. WHITE, OF KARNs CITY, PENNSYLVANIA.

## COMBINED RAILWAY-TIE AND RAIL-FASTENING.

SPECIFICATION forming part of Letters Patent No. 366,546, dated July 12, 1887.

Application filed October 22, 1886. Serial No. 216,953. (No model.)

*To all whom it may concern:*

Be it known that I, NORMAN S. WHITE, a citizen of the United States, residing at Karns City, in the county of Butler and State of Pennsylvania, have invented certain new and useful Improvements in Combined Railway-Ties and Rail-Fastenings; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

Referring to the drawings, Figure 1 is a perspective view of a portion of a railway-track, showing my improvements. Fig. 2 is a longitudinal section taken on line *xx* of Fig. 1. Fig. 3 is a like view showing the locking devices at both ends of the tie connected together. Fig. 4 is a perspective view of the filling for the tie. Fig. 5 is a like view of a portion of a tie slightly modified in form, with the filling, and showing the locking devices for the rails. Figs. 6 and 7 are like views of the ground-plates or chairs for the ties.

It is well known that the use of wooden ties for railways is becoming more and more expensive, especially in certain sections of the country where the supply of timber from which the ties are produced is nearly exhausted.

The object of my invention is to produce a cheap and durable metallic tie, simple in construction and readily laid, to take the place of the ordinary wooden tie.

The further object of my invention is to dispense with bolts or chairs for securing the rail to the tie, and to provide means whereby the load, instead of being wholly supported by the tie, is transferred to the ground upon which such tie rests, or to the ground through a ground-plate or chair.

The further object of my invention is to provide means for anchoring the tie securely in place and for securing the same against displacement when laid on a stone ballast.

The further object of my invention is to provide means whereby the usual gaging of the road may be dispensed with.

To these ends the invention consists in the

construction of the tie, the combination therewith of locking devices and a filling, and a more or less elastic seat, substantially as hereinafter fully described, and as set forth in the claims.

In the drawings, T indicates the metallic tie, which is preferably U-shaped in cross-section, as shown in Fig. 1, or substantially of that shape, as shown in Fig. 5, and provided with seat-flanges *t*.

The rails A are secured to the tie as follows: Near each end of the tie T, and in its upper face, is formed a recessed seat, T', for the reception of the foot of the rails A, said recessed seat forming a slot or opening in the tread or upper face, *t'*, of the tie T, and from the opposite edges of the said seat, along the vertical faces of the tie, extend slots *t''* *t''*.

The locking devices consist of two rods or bars, R R', from which project the locking lugs or dogs L and L', to which is pivoted a locking-latch, *l* and *l'*, respectively, having on its under side a projection, *l''*, that fits into slot *t''* and locks the dogs and its rod against endwise motion.

The locking dog or lug L is of such form that its vertical face will extend over the web of the rail from its foot to its tread, and is placed on the outside thereof, while the dog or lug L' simply projects over the foot of the rail.

The object of making the outer locking-dog of greater dimension is to hold the rail against lateral displacement under the action of the flanges of the wheels of the rolling-stock, this being of great advantage, especially on curves, where the lateral pressure on the rails is often very great, thus insuring greater stability and durability to the roadway.

The lugs or dogs L L' are preferably formed on their guide rods or bars and engage the foot of the rails, as shown. If desired, these guide rods or bars may be made of such length as to extend from one rail-seat to the other, as shown in Fig. 3, each bar being provided with two locking-dogs, so that both rails may be locked to the tie simultaneously. In this case each bar will carry a locking-dog, L and L', the former locking the rail from the outside and the latter from the inside of the track, as will be readily understood.

To unlock the rail from the tie it is simply necessary to lift the locking-latches *l* and *l'* to



bring the projections  $l^2$  thereon out of their respective slots  $l^2$  and slide the locking-dogs away from the rail, the length of said slots  $l^2$  being sufficient to withdraw the dogs clear of the foot of the rails A.

Whether separate rods are employed for the locking-dogs of each rail, or whether said dogs are arranged in pairs on one rod extending from one rail to the other, it is obvious that a very extended bearing-surface is provided for the said dogs, and that no lateral pressure that can be brought to bear upon said dogs would cause the bars to break, and even should a bar break almost at any point there would still be sufficient hold to keep the dogs in engagement with the rails.

To properly secure the tie in position, I employ anchor or ground plates or chairs P, provided on their under sides with two or more ribs,  $p$ , that, when sunk in the ground, will anchor the tie securely in its position, and when the plates or chairs P are laid in stone ballast, to prevent lateral motion on the ballast, a plank (shown in dotted lines, Fig. 6) may be slipped between two of the ribs  $p$ , so as to more securely hold the plate and tie T. The latter is seated in a recess formed in the upper face of the plate P, and from the opposite walls of the said recess project two or more lugs,  $p'$ , that engage recesses or notches  $t^3$ , formed in the tie-flanges  $t$ , to hold the tie T against endwise movement. To further consolidate the tie and its seat-plate, holes may be formed in said plate for the reception of bolts B, the nuts or heads of which tie the two together, semi-cylindrical recesses  $t^4 p^4$  being formed in the tie-flange  $t$  and the projecting wall of the recess in the plate P, respectively, for said bolts, as shown.

To impart to the tie a certain degree of elasticity, I interpose cushions C, of a more or less elastic material—such as rubber, paper, leather, &c.—between the seat-flanges  $t$  of the tie and the chair or anchor-plate P; and to impart to the tie the required strength at the points where the load is supported thereby, I insert a filling, F, of metal or other suitable material, recessed along its opposite edges to form the necessary spaces, within which slide the rods R R' of the locking devices or rail-fasteners.

In practice I propose to make the tie very light, and, as hereinbefore stated, propose to relieve the tie of all or practically all the pressure exerted by the load. To this end I interpose an elastic cushion between the tie and its anchor-plate P, and employ for the filling F a more or less elastic material—as, for instance, wood or paper pulp or other simple or compound material of sufficient strength to support the load; or a rigid material—such as metal—may be employed for the said filling F, which is seated directly on the anchor-plate or chair P, which forms a rigid bearing therefor. If a metallic filling F is employed, this may be made hollow also and recessed, so that a block of wood or of other more or less elastic

material may be inserted to form a bearing, which, when the tie is slightly depressed by the load, will support the same. This filling is held against endwise displacement on the anchor-plate P by lugs or ears  $p^2 p^2$ , projecting therefrom between the cushions C, and between which lugs or ears the filling F is seated.

As shown in Fig. 4, the filling F has an offset,  $f$ , which projects slightly into the rail-seat when the tie is depressed by the passage over the rail of a train of cars, and thus supports the load, sufficient room being left between the bars R and R' and the top of the tie to permit this slight depression of the said tie.

The upper face offset  $f$  of the filling F lies flush with the bottom of the recess or seat T', formed by the vertical walls of the tie, and it is obvious that when a train of cars passes over the ties the latter will be depressed on their elastic cushions, and the entire load or pressure, or practically so, will be transferred from the tie to the filling F, so that a very light tie can be employed. This arrangement has also another advantage, in that the bars R R' of the locking devices are also more or less depressed, thereby holding the locking-dogs more firmly to the foot of the rails and locking them more rigidly to their seats, thus effectually preventing any accidental displacement of the locking-dogs by the vibration of the rails.

If desired, the anchor-plate may be dispensed with, in which case the seat-flanges of the tie are made of such width as to afford a firm bearing for the tie on the road-bed. The filling F is then held against endwise motion by means of bolts passing transversely through the tie T and through elongated openings or slots in the filling, so as to give the tie the necessary vertical play on the filling.

The advantages derived from my improved tie and mode of securing the rails thereto and anchoring the ties in the road-bed may be briefly enumerated as follows, to wit: greater durability and safety, a greater bearing-surface on the road-bed, simplicity and economy of construction and application, and economy in transportation of the ties.

The tie itself giving the gage of the road, the usual labor of setting the rails to gage is dispensed with and the spreading or canting of the rails is avoided, hence securing the whole of the tread of the rails as a bearing-surface for the wheels, avoiding undue wear of said rails, and preventing the slipping of locomotive-drivers when the train runs on an upgrade. A saving is also effected in the maintenance of the road and in laying, removing, and replacing the ties, as the old ties, when unfit for use, may be made use of, which is hardly ever the case with a wooden tie.

Any unskilled laborer can lay or repair a track, and any broken or worn-out part can be replaced with facility and without injury to the other parts.

I would have it understood that I do not desire to claim, broadly, a metallic tie, as I am aware that such have heretofore been used.



What I claim is—

1. The combination, with a railroad-tie, of a rail-fastening consisting of an endwise-sliding bar provided with lugs projecting therefrom, and arranged to lap the foot of each rail, and latches pivoted to said bar for locking the same firmly to the tie, as described.

2. A rail-fastening consisting of a bar provided with locking-dogs arranged to engage the feet of the rails on one side of their webs, in combination with locking-dogs arranged to engage the feet of the rails on the opposite side of the web, as and for the purpose specified.

3. The combination, with a railroad tie and rails, of rail-fastenings consisting each of a bar provided with projecting lugs to lap the feet of the rails and pivoted latches adapted to engage and seat in openings in the tie to lock the bar against movement, as and for the purpose specified.

4. The combination, with a railroad tie provided with laterally-projecting and recessed seat-flanges, of a chair or anchor-plate provided with lugs or ears arranged to project into said recesses to hold the tie against longitudinal displacement on the plate, substantially as and for the purpose specified.

5. The combination, with a railroad-tie provided with laterally-projecting and recessed seat flanges, of a chair or anchor-plate having a recess in its upper face for the reception of the tie-flanges and lugs or ears arranged to project into the recesses of the said tie-flanges to hold the tie against lateral and longitudinal displacement on the plate, substantially as and for the purpose specified.

6. The combination, with a railroad-tie provided with laterally-projecting and recessed seat-flanges, of a chair or anchor-plate having a recess in its upper face for the reception of the tie-flanges, vertical lugs or ears projecting into the recesses in the flanges, and two or more transverse ribs on its under side, substantially as described, for the purpose specified.

7. The herein-described chair or anchor-plate for railroad-ties, provided in its upper face with a recess for the reception of the tie, vertical lugs or ears projecting into said recess, and transverse ribs formed on the under side of the plate, substantially as and for the purpose specified.

8. The combination, with a railroad-tie, of a ground or seat plate therefor, ribbed on its under side, and an elastic cushion interposed between said tie and plate, for the purpose specified.

9. A hollow metallic railroad-tie provided with depressed seats for the rails, slide-bars extending within the tie to both seats, and locking-dogs connected in pairs to said bars, and projecting above the tie and operating to lock

the rails to their seats, substantially as described.

10. The combination, with a hollow metallic railroad-tie slotted in its upper face or tread to form depressed seats for the rails, and an elastic seat or bearing for the tie, of a filling for said tie underneath the rail-seats and a rigid seat for said filling, as described, for the purpose specified.

11. The combination, with a hollow metallic railroad-tie slotted in its upper face or tread to form depressed seats for the rails, fasteners movable lengthwise on the tie to lock the rails thereto, and an elastic seat or bearing for the tie, of a filling for said tie underneath the rail-seats and a rigid bearing for said filling, as described, for the purpose specified.

12. The combination, with a hollow metallic railroad tie slotted in its upper face to form depressed seats for the rails, and an elastic seat or bearing for said tie, of bars arranged and sliding within the tie, a locking-dog connected with said bars and projecting above the upper face of the tie to lock the rails thereto, a filling below the rail-seats and bars of the locking-dogs, and a rigid bearing for said filling, substantially as and for the purpose specified.

13. The combination, with a hollow metallic railroad-tie slotted in its upper face to form depressed seats for the rails, a chair or anchor-plate for said tie, and elastic bearings interposed between the seat-flanges of the tie and the anchor-plate, of bars arranged to slide within the tie, a locking-dog connected with said bars and projecting above the upper face of the tie to lock the rails thereto, and a filling for the tie, provided with an offset below the rail-seats, substantially as and for the purpose specified.

14. The combination, with a hollow metallic railroad-tie provided with laterally-projecting recessed seat-flanges and slotted in its upper face to form depressed seats for the rails, a chair or anchor-plate recessed in its upper face to receive the tie-flanges and provided with locking studs or lugs engaging the recesses thereof, and transverse ribs on its under side, and an elastic bearing interposed between the seat-flanges of the tie and the said anchor-plate, of bars arranged to slide within the tie, a locking dog or dogs connected with said bars and projecting above the upper face of the tie to lock the rails thereto, and a filling for the tie below the rail-seats, substantially as and for the purpose specified.

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

NORMAN S. WHITE.

Witnesses:

WILLIAM E. BOULTER,  
WM. R. DAVIS.