No. 647,317. Patented Apr. 10, 1900.

T. W. MURPHY.

COMBINED RAILWAY TIE AND CHAIR.

(No Model.) (Application filed June 24, 1899.)

6 Sheets—Sheet 1.

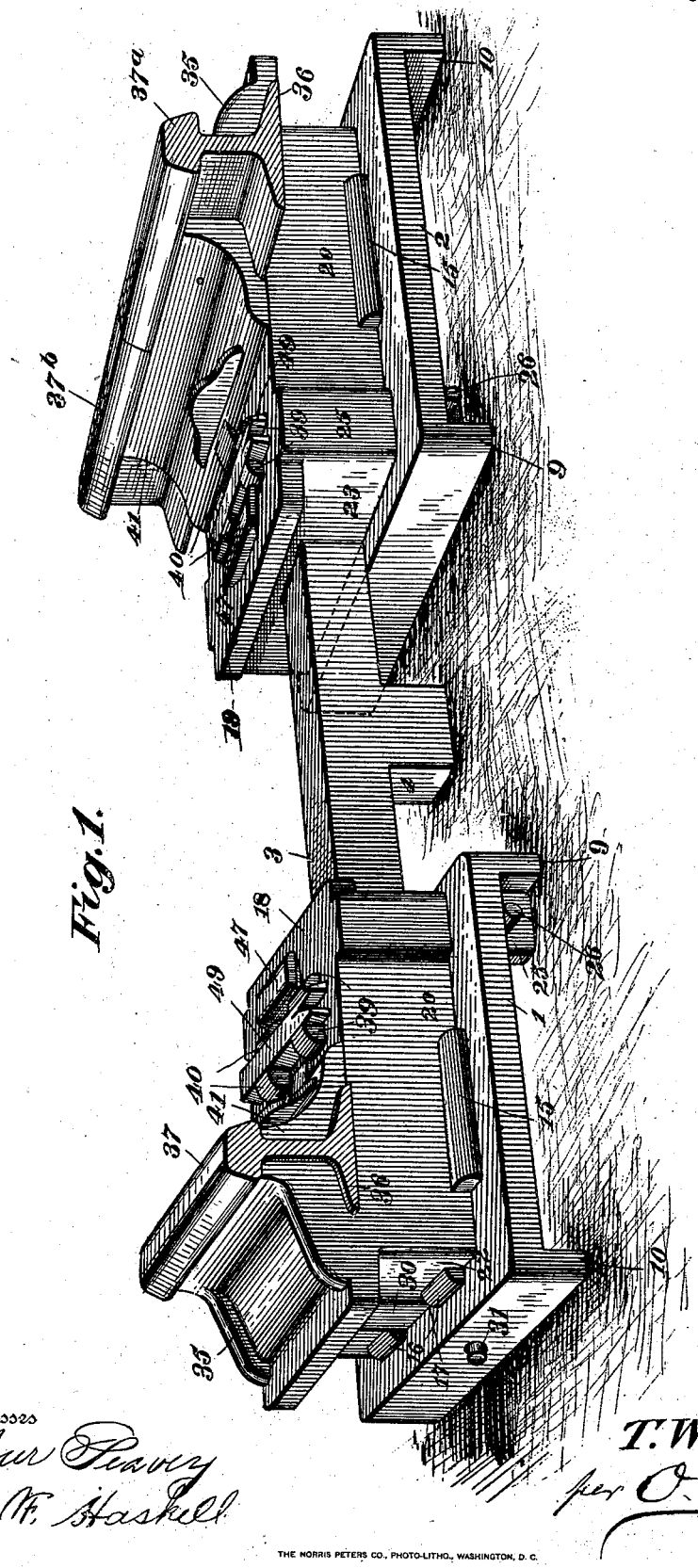

Fig. 1.

Witnesses
Chas. Seavey
M. F. Haskell

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per O. E. Duffy
Attorney

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6 Sheets—Sheet 2.

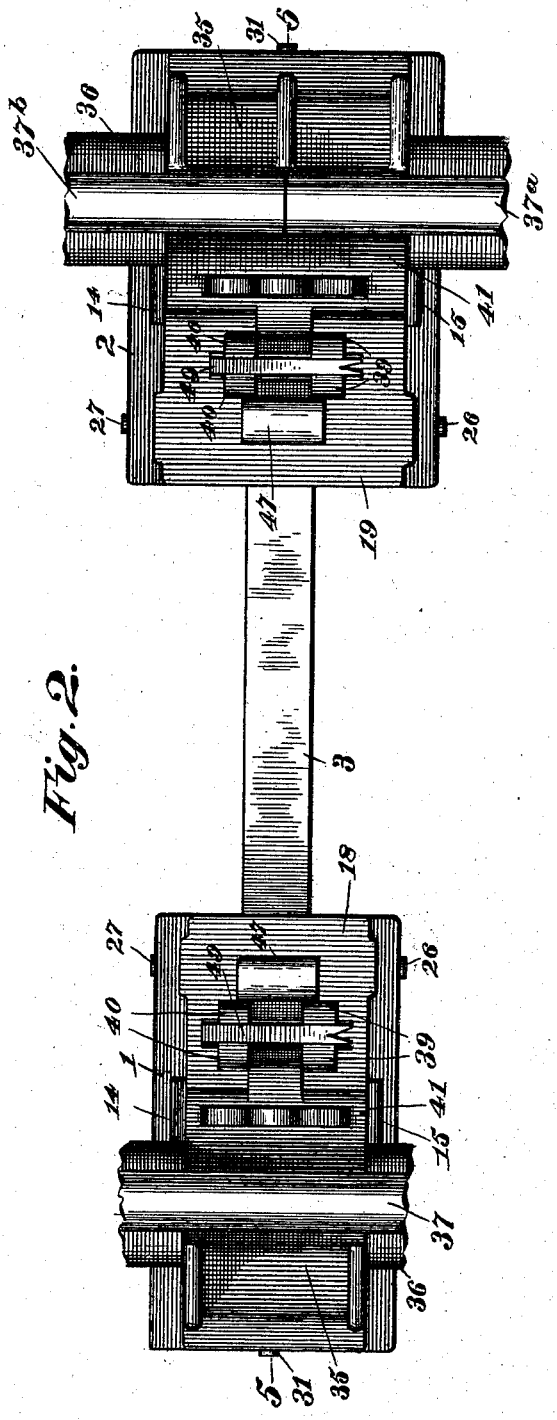

Fig. 2.

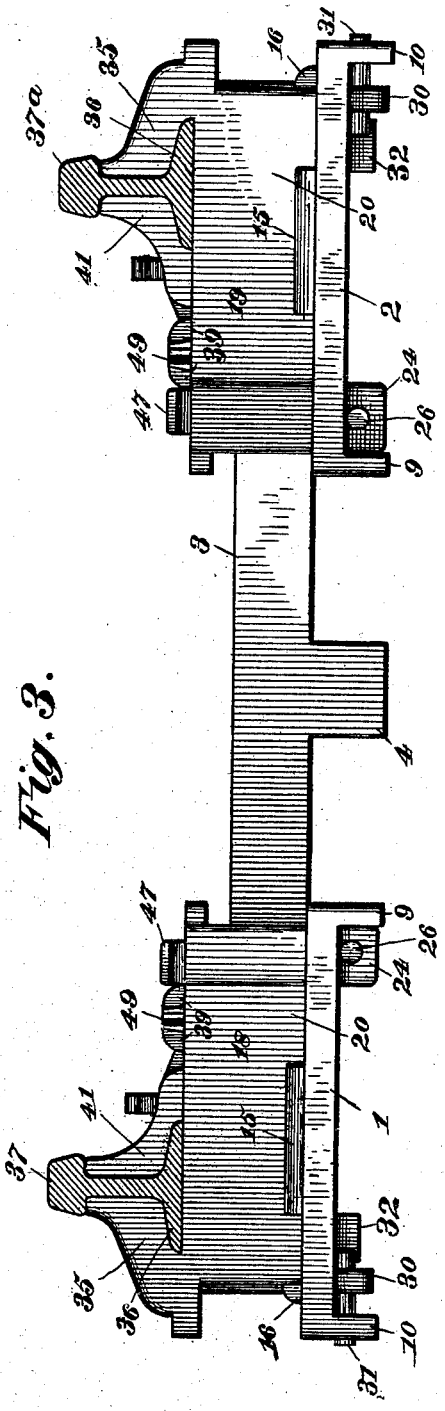

Fig. 3.

Witnesses
Elmer Peavey
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No. 647,317. Patented Apr. 10, 1900.

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COMBINED RAILWAY TIE AND CHAIR.

(No Model.) (Application filed June 24, 1899.)

6 Sheets—Sheet 3.

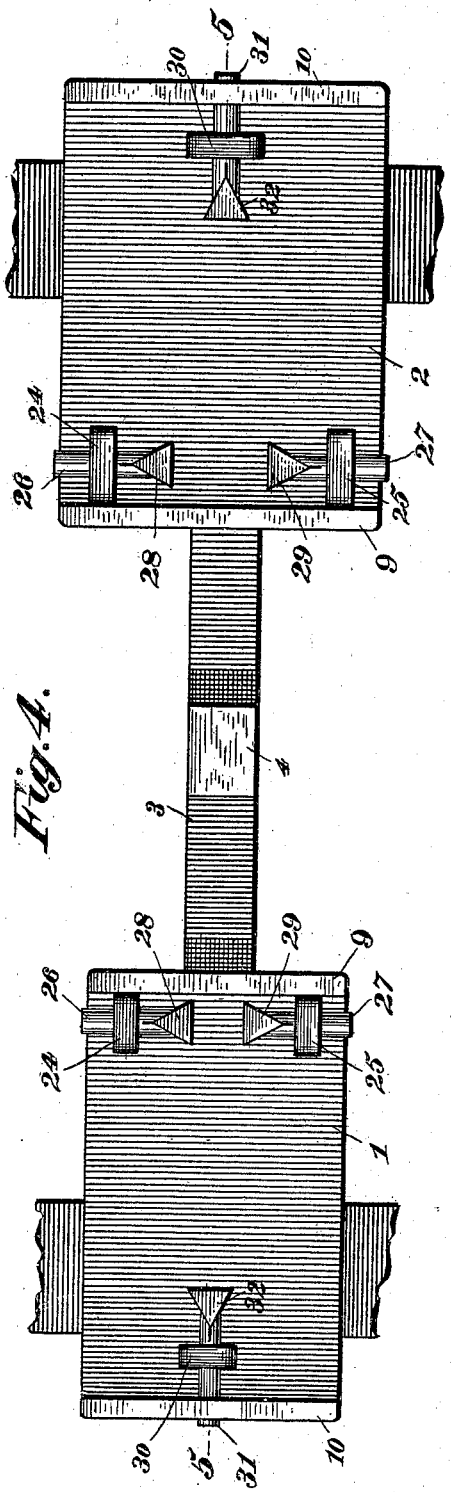

Fig. 4.

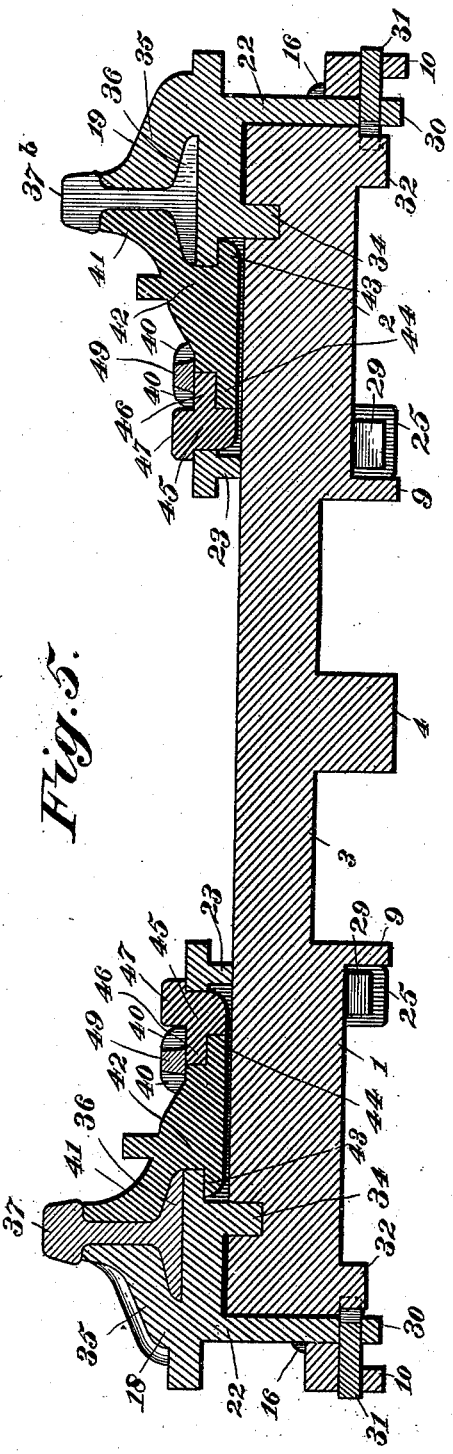

Fig. 5.

Witnesses
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No. 647,317. Patented Apr. 10, 1900.

T. W. MURPHY.

COMBINED RAILWAY TIE AND CHAIR.

(Application filed June 24, 1899.)

(No Model.) 6 Sheets—Sheet 4.

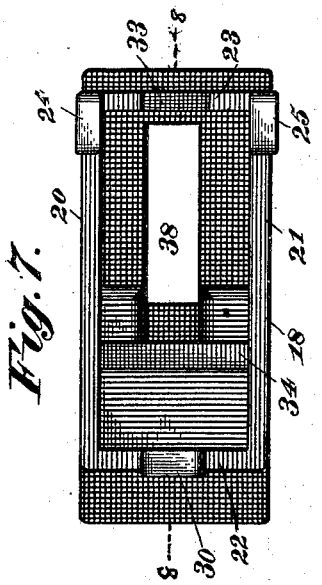

Fig. 7.

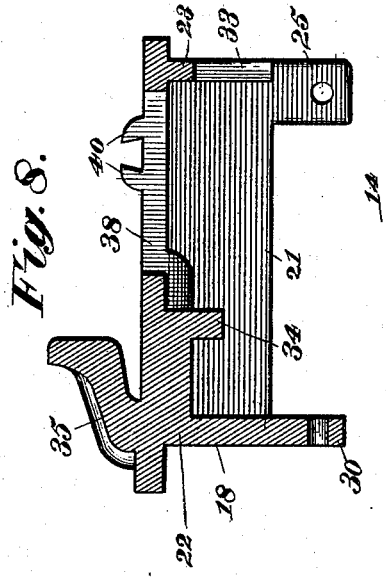

Fig. 8.

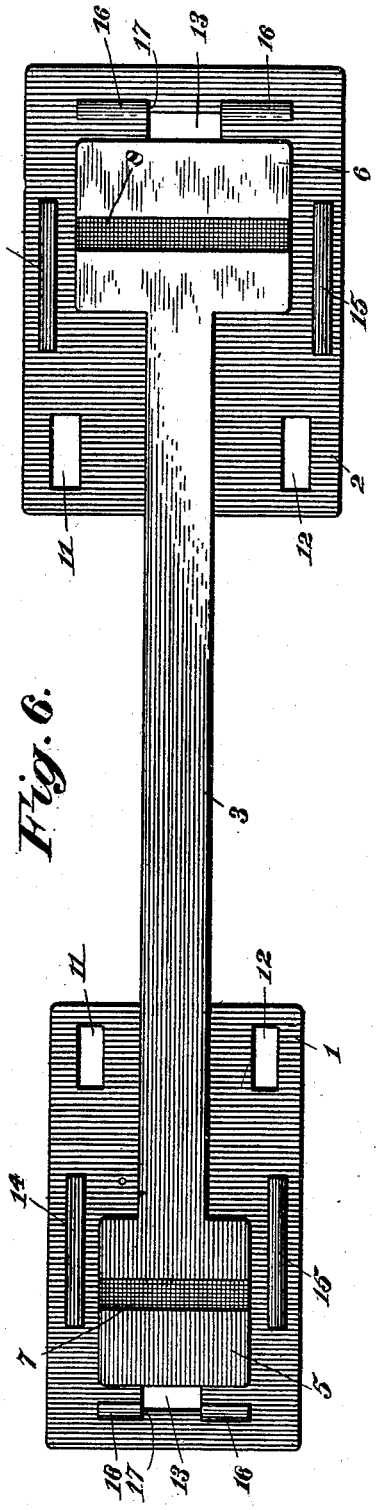

Fig. 6.

Fig. 10.

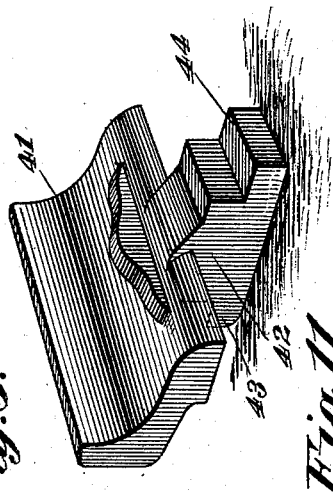

Fig. 9.

Fig. 11.

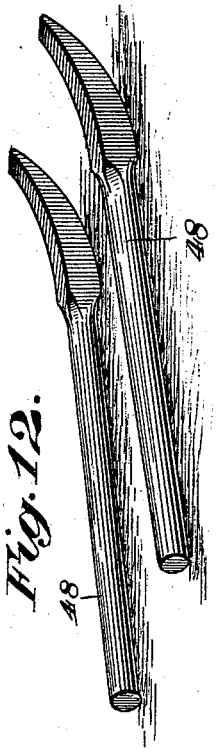

Fig. 12.

Witnesses
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No. 647,317. Patented Apr. 10, 1900.

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COMBINED RAILWAY TIE AND CHAIR.

(Application filed June 24, 1899.)

(No Model.) 6 Sheets—Sheet 5.

Fig. 13.

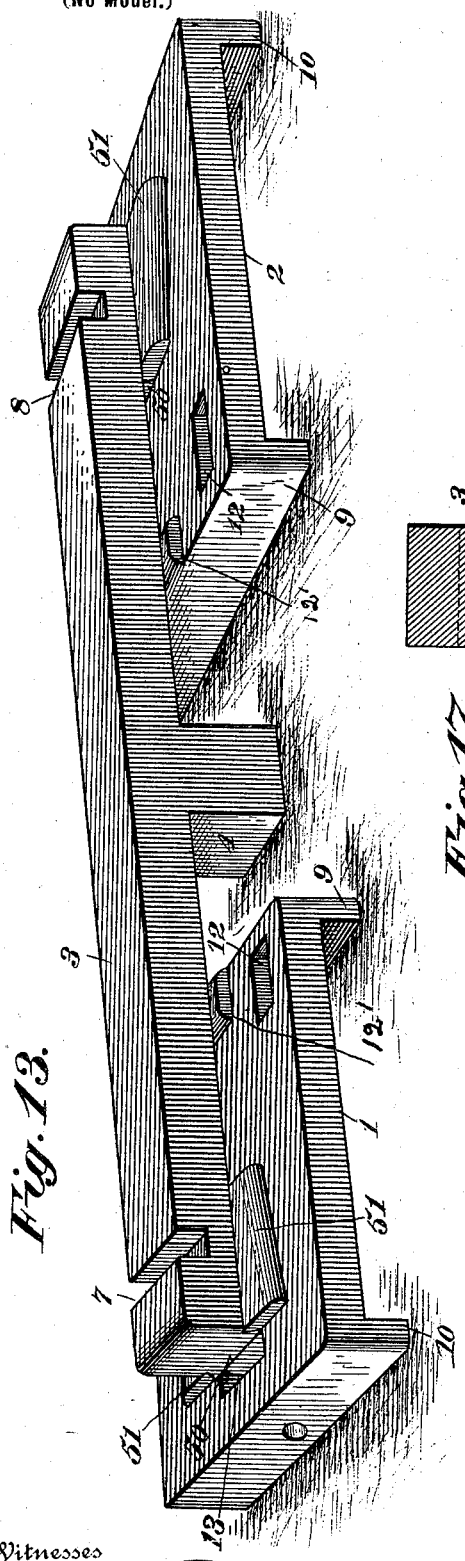


Fig. 14.

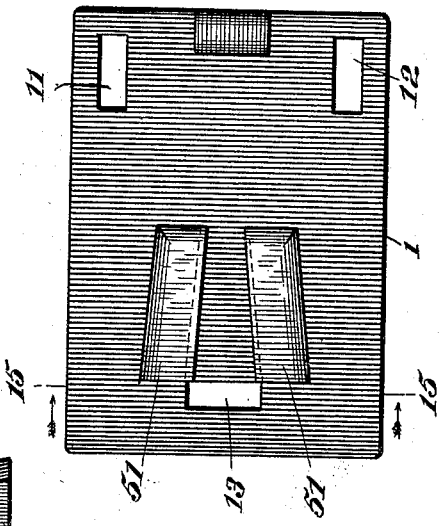


Fig. 17.

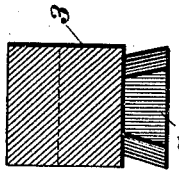


Fig. 15.

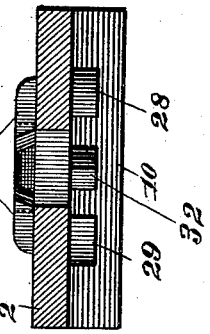
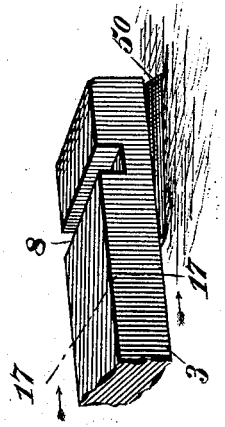


Fig. 16.



Witnesses

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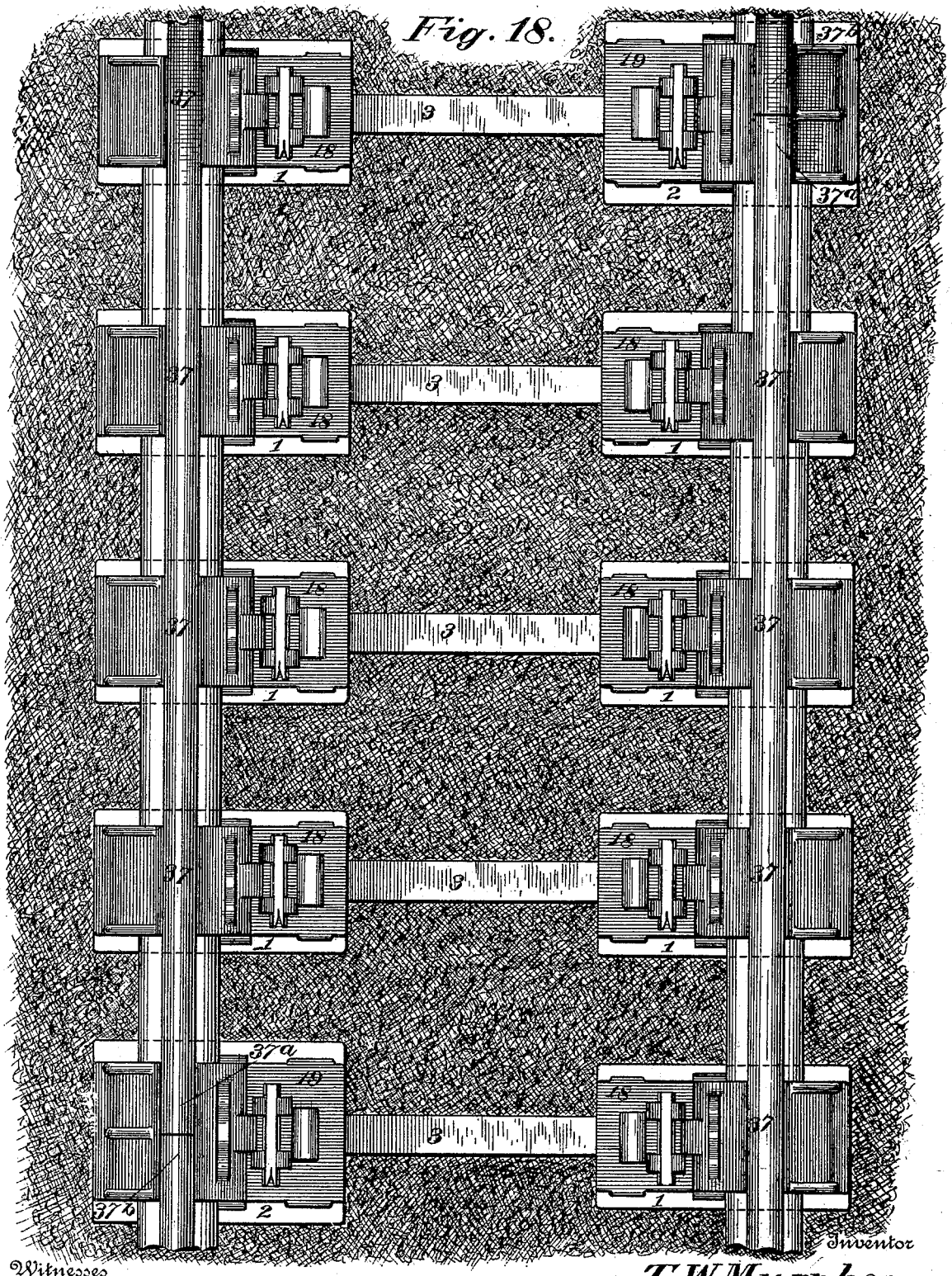
T. W. MURPHY.

COMBINED RAILWAY TIE AND CHAIR.

(Application filed June 24, 1899.)

(No Model.) 6 Sheets—Sheet 6.

Fig. 18.



Witnesses
Chas. Deavey
M. F. Haskell

Inventor
T. W. Murphy,
per O. E. Duffy
Attorney

UNITED STATES PATENT OFFICE.

TIMOTHY W. MURPHY, OF WASHINGTON, DISTRICT OF COLUMBIA.

COMBINED RAILWAY TIE AND CHAIR.

SPECIFICATION forming part of Letters Patent No. 647,317, dated April 10, 1900.

Application filed June 24, 1899. Serial No. 721,775. (No model.)

To all whom it may concern:

Be it known that I, TIMOTHY W. MURPHY, a citizen of the United States, residing at Washington, in the District of Columbia, have invented certain new and useful Improvements in a Combined Railway Tie and Chair; and I do hereby 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.

My invention is in the nature of a combined railway tie and chair whereby the rails are firmly locked to the tie and held against spreading.

It has been the experience of railroad men and the public that a very large proportion of the loss of life and property by railroads is due to accidents caused by the spreading of the rails. This spreading is caused by lack of sufficiently strong and secure supports and ties and lack of proper durable means for connecting the ties and rails. In the ordinary way in which wooden ties, ordinary chairs, and fish-plates and spikes are used numerous kinds of defects are liable to develop by the old method, any of which would permit of the spreading of the rails under heavy lateral strains. The wood of the ties is liable to rot out without showing the defect, no matter how careful and faithful the track walker or inspector may be, and this will loosen the spikes, leaving but very little support against lateral strain. The continuous contracting and expanding of the wood due to dry and wet and of the metal due to heat and cold also contribute to the loosening of the spikes. The absence or inefficiency of nut and bolt fastenings are also responsible for many accidents.

The object of this invention is to provide means whereby the possibility of all such accidents is avoided and whereby the rail, either intermediate of or at the joints, will be firmly clamped and held on strong and durable chairs without fish-plates, bolts, or nuts and the chairs themselves firmly held to strong metallic ties in such a manner that nothing short of the destruction of the metal will permit of the displacement or spreading of the rails.

With this object in view my invention consists in the improved construction, arrangement, and combination of the parts of a combined railway tie, chair, and joint, as hereinafter fully described, and afterward specifically pointed out in the appended claims.

In the accompanying drawings, Figure 1 is a perspective view of the invention complete, the rails being shown in section. Fig. 2 is a top plan view, the rails being broken away. Fig. 3 is a view in side elevation, the rails being shown in section. Fig. 4 is a bottom plan view, the rails being broken away. Fig. 5 is a longitudinal sectional view on the broken lines 5 5 of Figs. 2 and 4. Fig. 6 is a top plan view of the bases and connecting-bar or cross-tie, all the upper parts being removed. Fig. 7 is a bottom plan of one of the chairs. Fig. 8 is a longitudinal section on the broken line 8 8 of Fig. 7. Fig. 9 is a perspective view of the movable rail-clamping jaw detached. Fig. 10 is a similar view of the key-block for locking the movable jaw laterally. Fig. 11 is a perspective view of the dovetail key for locking the movable jaw and locking key-block against vertical displacement. Fig. 12 is a perspective view of the bars for prying out the key-block. Fig. 13 is a perspective view of a modification illustrating a cross-tie and base-plates made separable. Fig. 14 is a top plan view of one of the separable base-plates. Fig. 15 is a detail sectional view on the broken line 15 15 of Fig. 14. Fig. 16 is a detail perspective view of one end of the separable cross-ties. Fig. 17 is a detail sectional view on the broken line 17 17 of Fig. 16. Fig. 18 is a top plan view of a section of road constructed in accordance with my invention.

Like numerals of reference indicate the same parts wherever they appear in the several figures of the drawings.

Referring to the drawings by numerals, 1 and 2 indicate the base-plates, which may be cast or otherwise formed integral with the connecting-bar or cross-tie 3, the latter being formed with a depending central foot 4 to prevent bending at that point. The base-plates are rectangular in form, the ends of the cross-tie reaching somewhat beyond their longitudinal center and lying in their transverse cen-

ter, each tie being formed with an enlarged head, as at 5 and 6, at its ends, said heads each having a transverse groove in its upper face in line with the rails, as at 7 and 8.

The base-plates 1 and 2 are each provided with downwardly-projecting end flanges, as at 9 and 10, reaching to the plane of the foot 4, the flanges 9 being at the inner ends and the flanges 10 at the outer ends of their respective plates. The base-plates are further provided with vertical elongated slots or openings 11, 12, and 13 and upwardly-projecting ribs or flanges 14, 15, and 16, the slots 11 and 12 being near the inner corners and parallel with the cross-tie and the slots 13 near the outer ends of the plates, their inner walls being in line with the outer faces of the heads 5 and 6. The ribs or flanges 14 and 15 are alongside of but a short distance from and parallel with the side faces of the heads and the ribs or flanges 16 in the same positions relative to the outer faces of the heads, the middle portions of ribs 16 being cut away, as at 17. The tie-heads 5 and 6 and the base-plates 1 and 2, as well as the chairs 18 and 19, about to be described, are duplicates in construction; but the head 6, chair 19, and base-plate 2 are larger and stronger than their opposites, the latter being intended to clamp and support a rail intermediate of its ends, while the former are intended to clamp and support the abutting ends of two adjacent rails. In Figs. 1 to 6 the parts are illustrated in the form to support a rail on the left and a joint on the right, while in Fig. 18 I show the parts arranged in the same manner and also arranged to support a rail at each end intermediate its joints, the smaller base-plates, tie-heads, and chairs being used at both ends of the ties in the last-named arrangement.

18 indicates the lighter chair for use on the bed-plate 1, and 19 the heavier chair for use on base-plate 2. As before stated, they are of the same construction, each being provided with downward-depending side flanges 20 21 and end flanges 22 and 23, the side flanges being provided with thickened downward-depending lugs 24 and 25, adapted to enter slots 11 and 12 of the base-plates and be secured therein by pins 26 and 27, having split ends, which will be expanded when driven in against wedge-shaped lugs 28 and 29 on the under side of the base-plate. End flange 22 has a similar lug 30, which passes down through slot 13 and is secured by a similar split-ended pin 31, which when driven will be expanded by a similar wedge-shaped lug 32 on the under face of the base-plate. The end flange 23 is notched at 33 to straddle the tie, and when the chair is in place on the base-plate the side and end flanges are seated in the spaces between the tie-head and the ribs 14, 15, and 16. Under the top plate of each chair is a transverse rib 34 to fit in the transverse groove of the tie-head.

Each chair is formed with a solid clamping-jaw 35 to overhang the outer half of the base flange 36 of rail 37. The chair is provided with a central longitudinal slot 38 and lugs 39 40 in pairs on each side thereof, said lugs being undercut on their adjacent faces. Movable clamp-jaw 41 is provided with a key 42, depending from its under face to fit in slot 38 in the chair, provided with an outer flange 43 to slip under the top of the chair and a similar inner flange 44. A key-block 45 slips into that part of slot 38 not occupied by key 42 and secures the movable jaw against inward movement in the slot, a flange 46 overlapping flange 44 of the movable jaw. The key-block 45 has an overhanging head 47, which may be withdrawn by means of small crowbars 48, as shown in Fig. 12, the point of one of them being placed under each side of the head and both operated simultaneously. The top of the flange 46 and of the inner edge of the movable jaw are flush with the top of the chair and meet between the two pairs of undercut lugs 39 and 40. A dovetail key 49, driven between the undercut sides of the lugs 39 and 40, overlaps these parts and prevents them from being vertically misplaced, the key being split at the end to permit of its being spread, when desired. Where a solid rail is clamped, I have marked it 37, and where two rails abut each other in the chair I have marked them 37^a and 37^b.

As before stated, the base-plates 1 and 2 may be made integral with the tie; but they may also be made separate therefrom, as illustrated in Figs. 13 to 17. In these figures I show the tie without the enlarged heads, although this is not necessarily so. The head may be used or not, as may be desired, and under each end of the tie is formed a wedge-shaped dovetail lug 50, which is adapted to engage in a recess between the undercut ribs or lugs 51 on the upper face of the base-plates, the smaller ends of the lug 50 and of the recess being inward. The dovetail arrangement holds the tie tight upon the base-plate, and the wedge shape prevents the further separation of the base-plates after the lugs have been drawn into the recesses. At the inner edges of the base-plates are knobs or projections 12′ for supporting the tie level with the top of the undercut ribs 51 of the base-plate. By means of this arrangement a tie or a base plate may be renewed when broken or faulty without the necessity of renewing the solid tie and base-plates, thus economizing to that extent.

Combined metal ties and chairs constructed as hereinbefore described may be used, as before stated, either at the joints of rails or between the rails at other places than the joints, and their application is fully illustrated in Fig. 18, in which the invention is shown applied in both situations. In repairing or refitting a rail already built with

wooden ties my improved tie and chair can be first placed at the joints and in a number of places between, leaving the remaining wooden ties until they are worn out, when they can be replaced with those of my invention until the whole road is thus equipped, there being so little wear that the first placed in position will be as solid and perfect as the last. It will of course be understood that with a new road as many may be used as is desired, the whole road being built with my invention, if so elected. Rails may be slipped in position laterally from the inside, instead of, as heretofore, from end to end or endwise.

Of course the first cost of equipping a railroad with my new tie and chair would far exceed the old method, as the new steel rail did the old iron rail; but when a road is once equipped it will last, it may be said, forever, and I may add that the avoidance of accidents, wreckage of engines, cars, and suits for damages would soon pay for the laying of the entire railroad-bed with my improved tie, besides the assurance of safety to passengers. The improved tie and chair may be adapted to the underground trolley and form the tie and chair for the yoke with good results.

While I have illustrated and described the minute details of construction of the various parts composing my invention, I desire it to be understood that I do not restrict myself thereto, but hold that any slight changes or variations, such as might be made by the ordinary mechanic after inspecting my specification, would be clearly included within the limit and scope of the invention.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent of the United States, is—

1. The combined tie and base-plates, the base-plates being provided with supporting-flanges and with undercut ribs on the upper faces, converging inwardly, and the tie with dovetail wedge-shaped lugs on its under faces to engage between the undercut ribs, said base-plates having openings to receive lugs on the chairs, and the ties having transverse grooves to receive ribs of the chairs, whereby the chair may be secured to the base and tie substantially as described.

2. In a combined railway tie and chair, the combination with the tie secured to end base-plates and provided with transverse grooves in its upper surfaces near its ends, of the chair secured to the base-plate, straddling the tie and provided with ribs fitting the transverse grooves, substantially as described.

3. In a combined railway tie and chair, the combination with the tie, a base-plate secured thereto at each end, and a chair secured to the base-plate and tie at each end, the base-plates having slots and wedge-shaped lugs on their under surfaces adjacent to the slots, and the chairs having lugs projecting through the slots and split keys through the lugs with their split ends in contact with the wedge-shaped lugs, substantially as described.

4. In a combined railway tie and chair, the combination with the tie, a base-plate secured thereto at each end, and a chair secured to the base-plate and tie at each end, the ties having enlarged heads with transverse grooves, the base-plates having side and end slots and ribs, and the chairs having ribs fitting the grooves of the tie-heads, side flanges fitting between the tie-heads and the base-plate ribs and lugs to pass through and be secured in the slots, substantially as described.

5. The herein-described railway-chair comprising a top plate longitudinally slotted to receive a movable jaw and provided with a transverse rib on its under face, side flanges depending from the top plate and provided with lugs or extensions with holes to receive securing-pins, an outer end flange provided with a similar lug or extension, and an inner end flange notched to straddle a tie, substantially as described.

6. The herein-described railway-chair comprising a top plate longitudinally slotted to receive a movable jaw and provided with a transverse rib on its under face, side flanges depending from the top plate and provided with lugs or extensions with holes to receive securing-pins, an outer end flange provided with a similar lug or extension, and an inner end flange notched to straddle a tie and formed with a rigid overhanging rail-clamping jaw, substantially as described.

7. The herein-described railway-chair comprising a top plate longitudinally slotted to receive a movable jaw and provided with a transverse rib on its under face, side flanges depending from the top plate and provided with lugs or extensions with holes to receive securing-pins, an outer end flange provided with a similar lug or extension, and an inner end flange notched to straddle a tie and formed with a rigid overhanging rail-clamping jaw in combination with a movable jaw seated in the slot, a dovetail key to prevent vertical displacement and a key-block to prevent inward displacement, the dovetail key locking both the jaw and key-block, substantially as described.

8. The combination with the chair longitudinally slotted and provided with a fixed jaw, of a movable jaw in the slot having a flange to engage under one end wall of the slot, a key-block in the slot overlapping the opposite end, undercut ribs on the upper surface in pairs on opposite sides of and at right angles to the slot, and a dovetail key adapted to be driven between the ribs overlapping both the jaw and key-block, substantially as described.

9. A railroad-tie comprising the central portion having slots on its upper surface for the reception of a chair, a downwardly-extending wedge-shaped projection dovetailed as

shown in combination with a base-plate having correspondingly-wedge-shaped upwardly-extending projections whereby the tie and base-plate are held firmly in a locked position as shown.

10. A railroad cross-tie locked to separate bases, said bases having an upper bearing-piece for the tie, and downwardly-projecting flanges to project into the road-bed, said flanges having end openings to receive securing-pins, substantially as set forth.

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

TIMOTHY W. MURPHY.

Witnesses:
O. E. DUFFY,
M. F. HASKELL.