No. 795,365. PATENTED JULY 25, 1905.

A. T. PALMER.

RAIL JOINT.

APPLICATION FILED MAY 6, 1904.

2 SHEETS—SHEET 1.

Fig. 1.

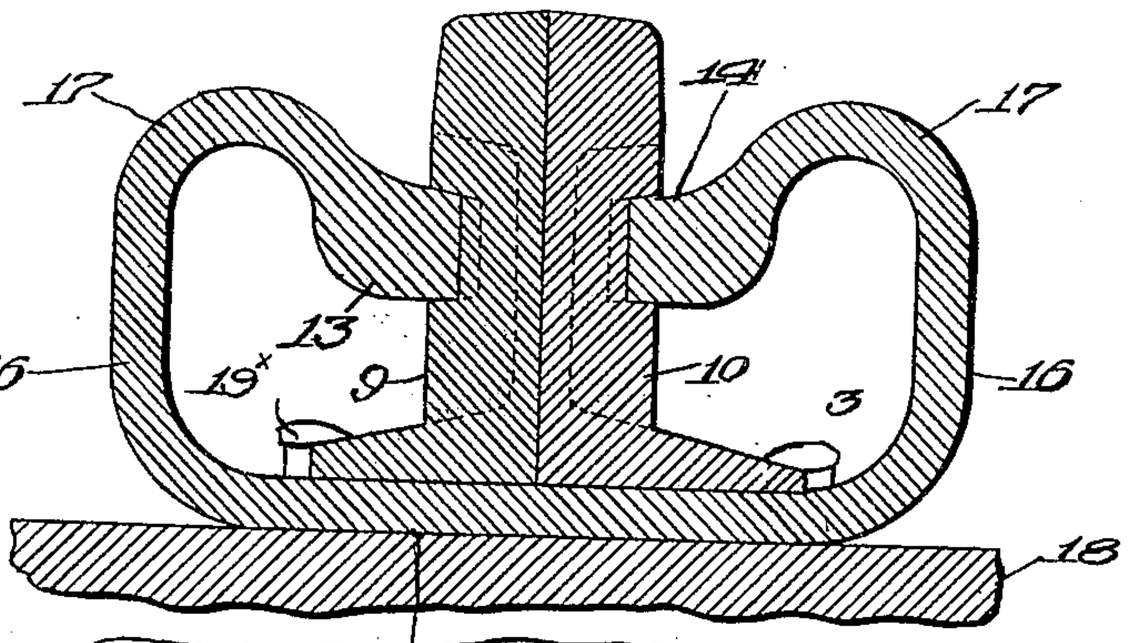



Fig. 2.

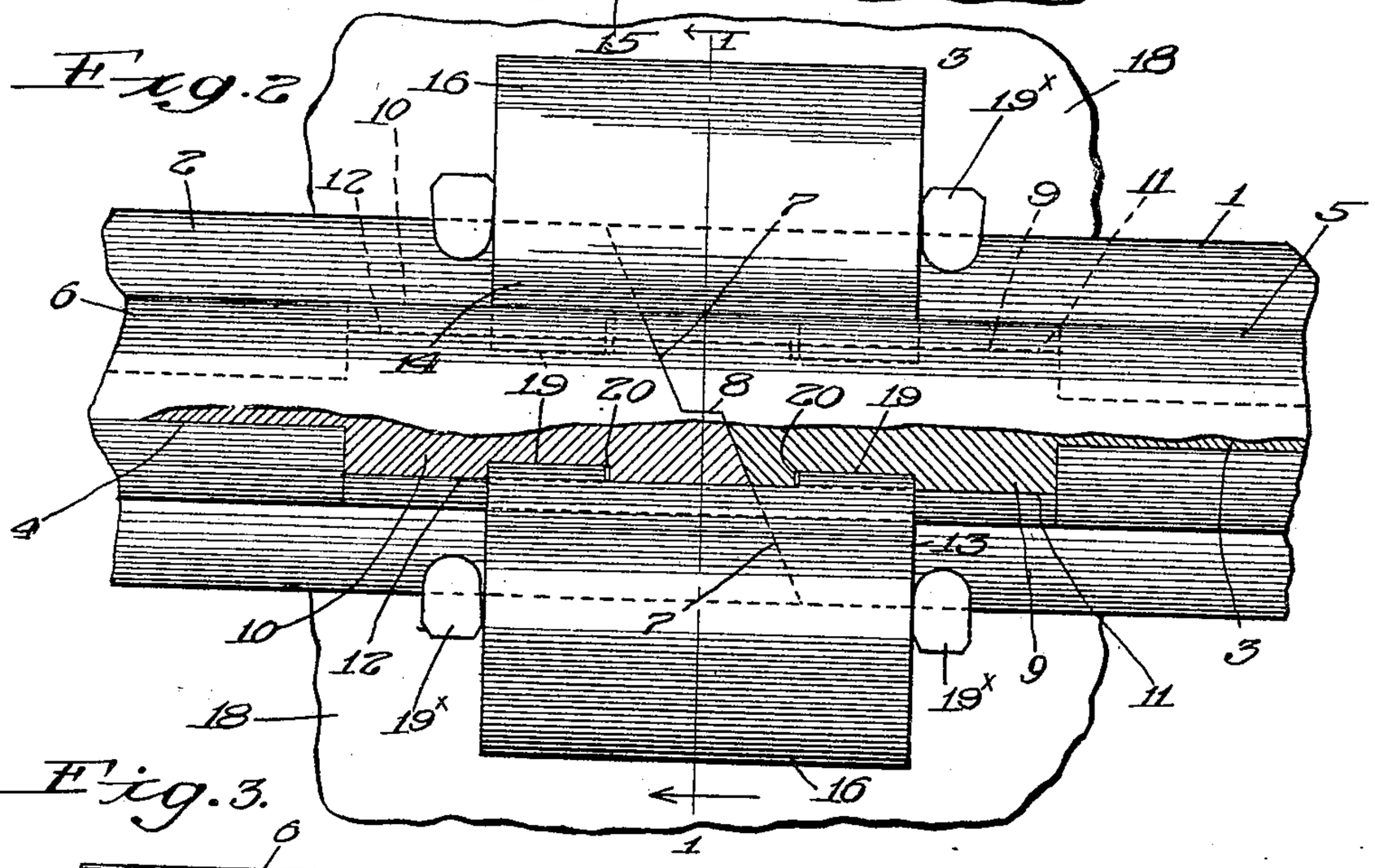
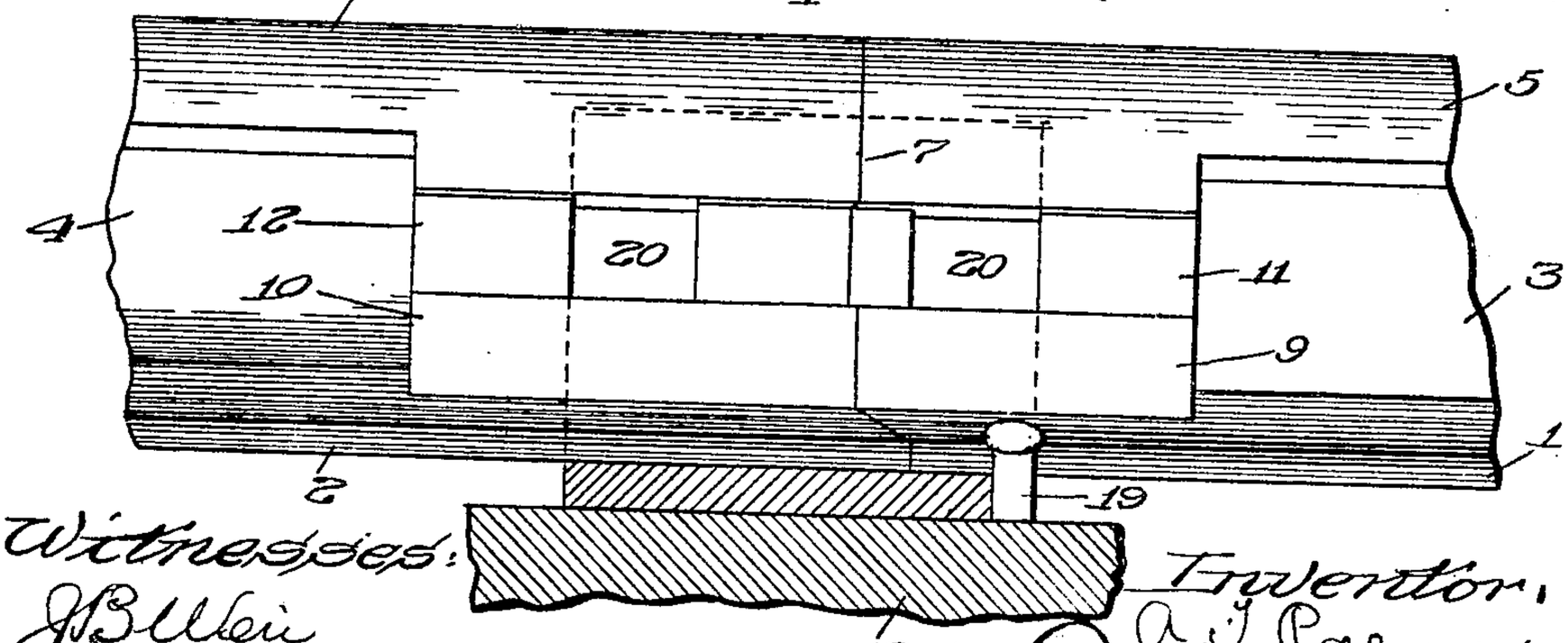



Fig. 3.

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2 SHEETS—SHEET 2.

Fig. 4.

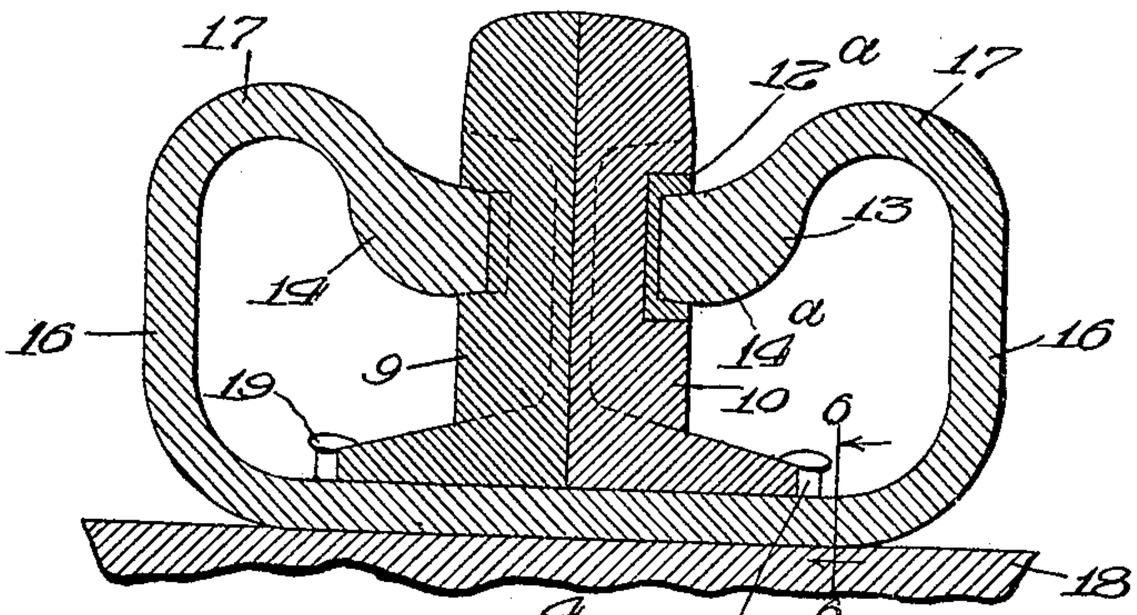



Fig. 5.

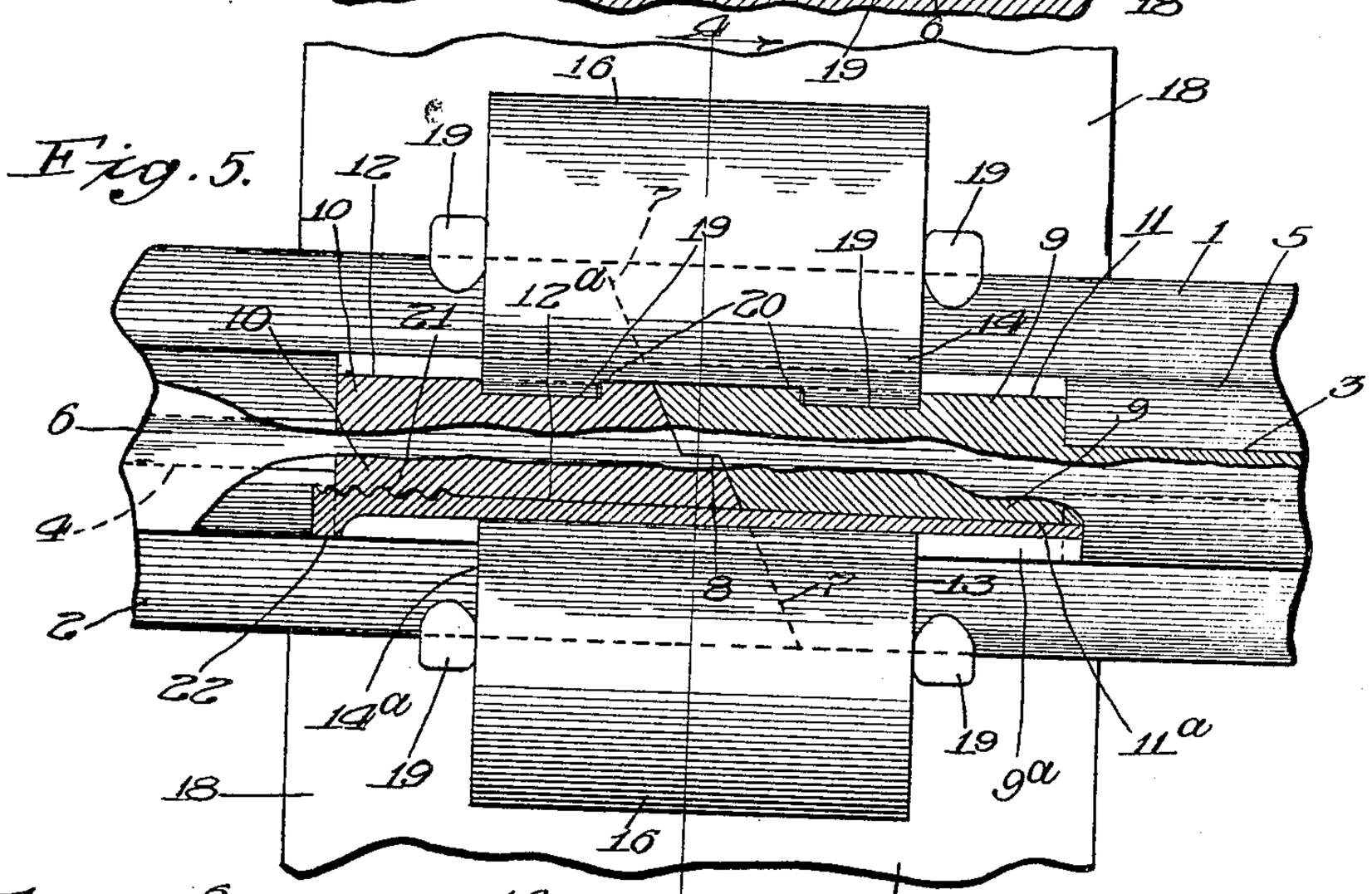
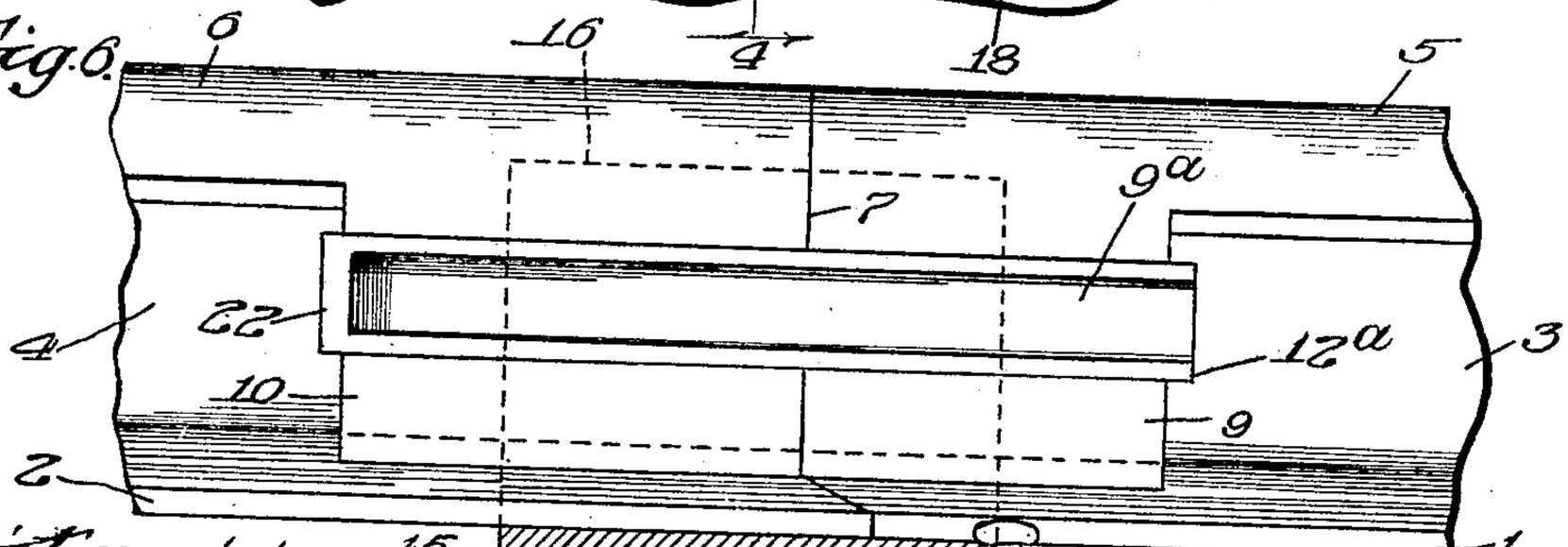



Fig. 6.

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# UNITED STATES PATENT OFFICE.

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## RAIL-JOINT.

No. 795,365 Specification of Letters Patent. Patented July 25, 1905.

Application filed May 6, 1904. Serial No. 206,600.

*To all whom it may concern:*

Be it known that I, ALPHONSO T. PALMER, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Rail-Joints, of which the following is a full, clear, and exact specification.

My invention relates to joints for sustaining the ends of railway and other analogous rails and holding the same in alinement and against creeping; and the invention has for its primary object to provide an improved form of joint which will accomplish these ends without necessarily employing bolts or fish-plates.

The invention also has for its object to provide a joint of an improved form in which the division-line between the rails may be formed in an oblique direction instead of at right angles to the longitudinal axis of the rail, and thus prevent the wheel-treads from bumping, as heretofore, when passing from one rail to another and also from laminating the edges of the rails.

With these ends in view my invention consists in certain features of novelty in the construction, combination, and arrangement of parts by which the said objects and certain other objects hereinafter appearing are attained, all as fully described with reference to the accompanying drawings, and more particularly pointed out in the claims.

In the said drawings, Figure 1 is a vertical cross-section of my improved rail-joint taken on the line 1 1, Fig. 2. Fig. 2 is a plan view thereof with one side in longitudinal section. Fig. 3 is a side elevation with the clamp cut away at the side of the rail. Figs. 4, 5, and 6 are views similar to views 1, 2, and 3, respectively, illustrating a modification hereinafter described, Fig. 4 being a section on the line 4 4, Fig. 5, Fig. 5 a plan view with both sides of the rail-head cut away to disclose the ends of the clamp, and Fig. 6 a side elevation with the clamp cut away on the line 6 6, Fig. 4.

The drawings show the meeting ends of two rails where the joints are located, and these rails comprise foot-flanges 1 2, webs 3 4, and heads 5 6, respectively, all of the usual or any suitable form. The abutting ends of the rail, however, are cut on the bias, as better shown in Fig. 2 and as indicated by the line 7, and this cut is provided with an offset or longitudinal shoulder, as indicated by the line 8, so that the wheel-treads will not pass abruptly from one rail to the other when they are separated by contraction or otherwise; but it will be seen that the entire surface of each of the cut faces 7 8 of the rail is in a vertical plane, so that the vertical diameter of the rail will not be lessened at any point, and consequently its ability to resist vertical stress will not be impaired by thus forming the ends on the bias.

The ends of the rails, unlike ordinary railway-rails, are provided with bosses or thickened portions 9 10, respectively, on both sides, and these bosses may be flush with the sides of the heads, as shown in Fig. 1, and are provided with longitudinal grooves 11 12, respectively, so arranged that the grooves 11 on one rail will match or register with the grooves of the adjacent rail, and thus constitute continuous grooves from end to end on the thickened portions of the rails, the thickened portions or bosses 9 serving to stiffen the rails at their ends and to supply the rigidity heretofore afforded by the fish-plates and also serving for the accommodation of the grooves 11 12 without weakening the webs 3 4. The grooves 11 12 are for the reception of the inturned ends 13 14 of a clamp, which is substantially C-shaped and has a base portion 15 passing under the foot of the rails, and two side portions 16 which are curved upwardly and thence downwardly, as shown at 17, for the sake of greater flexibility. This clamp is of sufficient width to overlap the diagonal line of conjunction between the abutting ends of the rails and is of such form and proportion that when driven onto the enlargements or thickened portions of the rails with its ends in the grooves thereof will firmly clamp the rails together and support them against downward movement. It is preferable, however, that the clamp be placed directly upon the tie 18 and secured against longitudinal movement by spikes $19^{\times}$ or other suitable means, so that by forming the ends 13 14 of the clamp with inwardly-projecting lugs 19, seated in corresponding countersinks 20 in the inner walls of the grooves 11 12, the creeping of the rails will be prevented. As shown in Fig. 2, the countersinks 20 are slightly longer than the lugs 19 to allow for the expansion and contraction of the rails.

In assembling the parts the clamp is first driven onto the end of one of the rails with its ends 13 14 engaging in the grooves 10 12,

for example, and then the rail is brought into an abutting position with the other rail, so that by driving the clamp outwardly from the first rail it may be driven onto the other rail.

The ends 13 14 of the clamp are enlarged or wider than the portions 16 17, so that the clamp will have the requisite flexibility, while these ends will possess sufficient frictional contact with the rails to accomplish the purpose. These ends are also slightly beveled or tapering in cross-section, as shown in Fig. 1, so that they will seat firmly into their respective grooves, which are of complementary formation.

In the form of my invention shown in Figs. 4 to 6 the construction on one side is the same or substantially the same as the construction already described; but on the opposite side the clamp is formed with a plain end $14^a$, the lugs 19 being omitted, and instead of being seated in a groove formed directly in the enlargements 9 10 it is seated in the groove $9^a$ of a wedge, which wedge in turn is seated in registering grooves $11^a$ $12^a$, formed in the enlargements 9 10. The bottom of the groove $9^a$ in the wedge and the inner edge of the clamp are parallel with the longitudinal axis of the rail; but the back of the wedge and the bottoms $11^a$ $12^a$ are tapered or formed at an angle with respect to said axis, so that the wedge in being driven between the rail and the end of the clamp will bear uniformly against the end of the clamp and force it outwardly with equal pressure from side to side. Ordinarily the wedge will possess sufficient friction to retain itself in position; but, if desired, one end of the wedge and one of the enlargements—the enlargement 10, for example—near its inner end may be provided with serrations 21, which interlock after the wedge has been driven home. This end of the wedge is also preferably formed with a driving-head 22.

Having thus described my invention, what I claim as new therein, and desire to secure by Letters Patent, is—

1. In a rail-joint, the combination of two rails arranged end to end and having thickened portions at said ends provided with longitudinal grooves and a clamp having its ends brought toward each other at opposite sides of the rails and bearing in said grooves and its intermediate portion passing under the rails.

2. In a rail-joint, the combination of two rails arranged end to end and having thickened portions at their ends, provided with longitudinal grooves, a clamp passing around the under side of the rails and having its ends brought toward each other at opposite sides of the rails and on one side seated directly in said longitudinal grooves, and a wedge driven into the grooves on the under side and engaging the other end of the clamp.

3. In a rail-joint, the combination of two rails arranged end to end and having their contiguous ends formed at an oblique angle to the longitudinal axis of the rails with an offset in the dividing-line, the webs of the rail being thickened at said ends, and clamping means for holding the ends of said rails in alinement.

4. In a rail-joint the combination of two rails arranged end to end and having their contiguous ends formed at an oblique angle with the longitudinal axis of the rails with an offset in the dividing line or plane, the entire end of each rail being situated in a plurality of vertical planes.

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