

W. P. & S. G. THOMSON.  
RAIL JOINT.  
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944,298.

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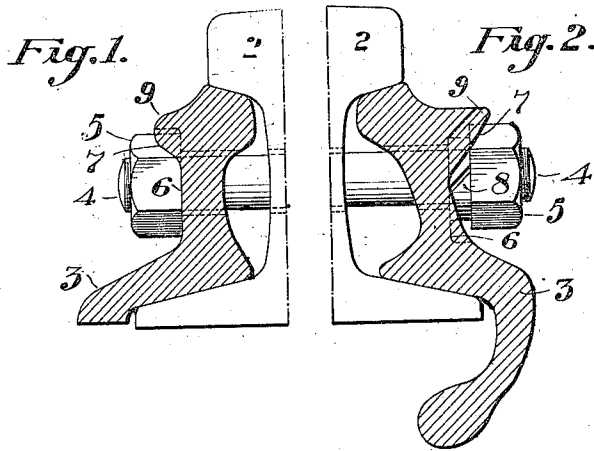


Fig. 3.

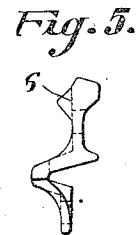
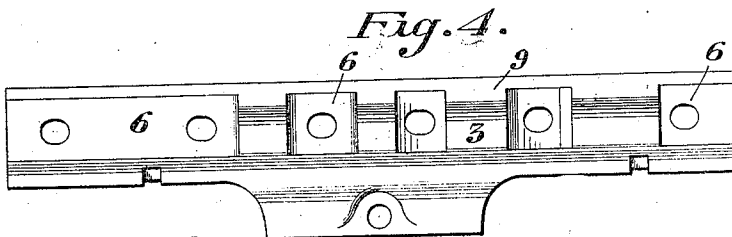
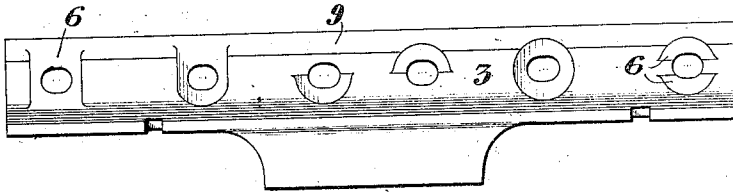
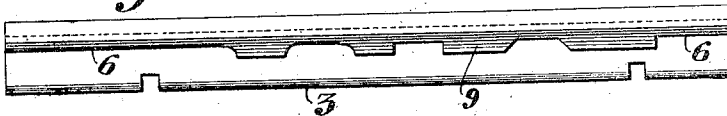


Fig. 6.



WITNESSES

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INVENTORS

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# UNITED STATES PATENT OFFICE.

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## RAIL-JOINT.

944,298.

Specification of Letters Patent.

Patented Dec. 28, 1909.

Application filed December 14, 1908. Serial No. 467,332.

*To all whom it may concern:*

Be it known that we, WILLIAM P. THOMSON and SAMUEL G. THOMSON, both of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented a new and useful Improvement in Rail-Joints, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figures 1, 2 and 5 are sectional views showing different embodiments of our invention; Figs. 3 and 4 are side elevations of different forms of bars also embodying our invention; Fig. 6 is a top plan view of the bar shown in Fig. 4.

Our invention has relation to rail joints, and is designed to provide a very great increase in the vertical stiffness of a splice bar, and at the same time provide ample clearance for wheel flanges, even although there may be sharp flanges on badly worn rails, and also provide sufficient clearance above each bolt hole to permit the nuts to be tightened on the vertical gripping faces adjacent to the bolt holes without interference from the portion above each bolt hole on account of its projection outside of the inner face of the nut and below the top of the nut.

We are aware that various attempts have been made to reinforce a splice bar by providing an enlarged head, but the metal has hitherto been placed so high on the head of the bar that it interfered with a proper clearance for wheel flanges, and therefore, under certain well known conditions, caused wheel flanges to strike in a dangerous manner. There have also been certain attempts to add metal to the upper portion of the head and at the same time provide a clearance for wheel flanges, but in all such attempts, the metal has always been added above the tops of the nuts or above the tops of the nut locks, with the result that an insignificant reinforcement was secured because the space between the two horizontal planes which will clear the wheel flanges and the nuts, respectively, is very small. This addition of metal between the aforesaid horizontal planes also had in mind what has hitherto been regarded as the best practice of making reinforce-

ments in splice bars without the necessitating an increase in the length of bolts over standard practice. The restriction of previous reinforcements within such narrow limitations has accounted for the insignificant strengthening of the bar which has been hitherto secured.

Our invention consists in rolling or otherwise forming a bar with the reinforcement on the outside lying between the far wider limitations of the horizontal plane, which will clear the wheel flanges and a horizontal plane at the bottom of the bolts, and then reaming or slotting or otherwise removing a portion of this reinforcing metal above the center line of each bolt to permit the inside face of the head, or of the nut, of the bolt to bear on a vertical gripping face. Our invention thus provides a very great reinforcement of a splice bar above the center line of the bolts and the use at the same time of the same length of bolts as was possible when reinforcements were made entirely above the tops of the nuts. Our invention also provides that a portion of the outer face of the web of the bar which lies between horizontal planes at the top and bottom of the bolt holes shall remain intact and extend in the same plane for the full length of the bar; thus on any bar embodying our invention there is an unrecessed outer face through which at least a portion of each bolt hole passes.

It will be noted that our improvement is applicable to an angle bar without a member extending below the rail base as well as to any form of bar which has such an extension below the rail base; in other words, our improvement belongs essentially to that portion of any splice bar which lies above the center of the bolts.

The precise nature of our invention will be best understood by reference to the accompanying drawings, in which we have shown a number of different embodiments of the invention and which will now be described, it being premised, however, that these forms are illustrative only and that the principle of our invention may be applied to bars of various other forms.

In all of the figures of the drawings, we

have shown our improved joint as applied to rails of ordinary T-section, but the joint is also applicable to rails of other sections.

In these drawings, the numeral 2 whenever seen designates one of the joint rails; 3 a splice bar; 4 the joint bolts; 5 the securing nuts; 6 the vertical gripping faces for nuts; 7 the reinforcing metal outside of the surface 6 and below the top of the nut 5; 8 a nut lock; 9 the raised edges bounding the vertical surfaces 6, after the milling or slotting has been done.

In the construction shown in Fig. 1, the reinforcing metal 7 is removed only high enough to permit the nut to turn, and the upper portion of the reinforcing metal is allowed to extend continuously along the outer side of the head of the bar; this bar also lies entirely above the bottom surface of the rail base, and also stands free from the web of the rail so that a tight fit may be secured and wear may be taken up.

Fig. 2 shows a bar with a member extending below the bottom surface of the rail base and in this instance the member is a freely depending flange; the vertical surface extends not quite as high as the top of the nut, as an intervening nut lock 8 spaces the nut far enough away from the vertical surface to permit the nut to turn, without interference from the portion of reinforcing metal which is allowed to remain above the highest portion of the surface 6; the milling in this instance is along a diagonal line above the vertical surface 6, instead of along a horizontal line as in Fig. 1.

Figs. 3, 4, 5 and 6 show several different ways of providing the vertical gripping faces 6 and reinforcements, and will be readily understood by those skilled in the art.

It will be noted that the milling may be done in such a manner as shown in Fig. 2, so that a vertical gripping face is secured, which is not necessarily quite as high as the tops of the nuts when they are in their highest position. This is possible where nut locks are used, which space the nut far enough away from the vertical face to permit some of the reinforcing metal to remain below the top of the nut and between the nut and the vertical face. The deficiency in the top members of angle bars has hitherto been so great that the addition of even such a small amount of metal lying between the nut and the vertical face and between the horizontal plane at the top of the nut and the top of the nut lock is valuable. This reinforcement of the head is obtainable in various other ways where auxiliary washers or plates are used, necessitating the additional expense, and to many engineers, the objectionable feature of auxiliary washers and longer bolts, and our invention, therefore, provides a means for securing this large reinforcement without the objectionable features.

It will be apparent, as indicated in Fig. 3, that the under side of the reinforcing rib may be horizontal, instead of inclined, thus forming a rib with a sharp corner extending along the lower outer edge. The only difference which this change requires would be a heavier milling.

This application is in part a division of our pending application, Serial No. 375,339, filed May 23, 1907.

We claim:

1. A splice bar for rails having bolt holes therethrough and having a portion of its bolting face below a horizontal plane at the center of said holes slanting downwardly and outwardly, and a portion of said face above said plane projecting outwardly to a point outside of the outer edge of the rail head, a recess in said outwardly extending face and an abrupt projection above said recess, said bar to lie entirely below the lower outer edge of the rail head; substantially as described.

2. A splice bar for rails having holes for connecting bolts and an upper face inclined downwardly and outwardly from the lower outer edge of the rail head, said bar having portions of a bolting face which extends outwardly beyond the outer edge of the rail head above said holes and which is recessed to allow nuts to turn on vertical outer gripping faces, said gripping faces being also partly formed by an outer face lying in substantially the same plane and extending the full length of the bar; substantially as described.

3. A splice bar for rails having an upper face slanting downwardly and outwardly from the lower outer edge of the rail head, said bar having holes for connecting bolts, and also having the upper portion of its bolting face extending outwardly beyond the head of the rail, said upper portion being recessed to form vertical faces adjacent to said bolt holes, and said vertical faces lying in substantially the same plane as an outer face which extends in substantially the same plane for the full length of the bar; substantially as described.

4. A splice bar for rails having holes for connecting bolts, and also having adjacent to said bolt holes vertical faces recessed from slanting portions and lying outside the head of the rail and each of sufficient area to permit a nut to turn freely into a tightened position, said bar having a portion of its outer face above a portion of said vertical face inclined upward and outward, and a portion of its outer face below a portion of said vertical face inclined downward and outward, substantially as described.

5. In a rail joint, a splice bar to stand free from the rail web and having bolt holes therethrough, and also having a portion of its bolting face lying in substantially the

same plane for the full length of the bar adjacent to the center line of the bolt holes, said bar also having an outwardly inclined face, intersecting a horizontal plane at the top of the bolt holes, portions of said face above the center line of the bolt holes being recessed adjacent to the bolt holes to form a clearance for a nut to turn into a tightened position; substantially as described.

6. In a rail joint, a pair of similar splice bars at opposite sides of the rail, and which may be used interchangeably, each of said bars having an upper face inclined downwardly and outwardly from the lower outer edge of the rail head, said bar having holes for connecting bolts and having a portion of its bolting face lying in substantially the same plane for the full length of the bar adjacent to the center line of said holes, said bar also having recessed portions to complete a vertical gripping face for a nut, said face lying outside of the rail head and in the same plane above and below said bolt holes; substantially as described.

7. A splice bar for rails to lie entirely below the lower outer edge of the rail head and having holes for clamping bolts, a portion of the outer face of said bar lying in substantially the same plane for the full length of the bar adjacent to the center line of said holes, and another portion of its outer face being altered from the general alignment of the bar adjacent to only a portion of all of said bolt holes; substantially as described.

8. In a rail joint, a splice bar having a face inclined downwardly and outwardly from the lower outer edge of the rail head and having a longitudinal rib extending along its outer face adjacent to its top, the under portion only of said rib being recessed beyond the outer edge of the rail head to form clearances for nuts to turn on the outer face of the bar a portion of said outer

face extending for the full length of the bar in substantially the same plane, substantially as described.

9. In a rail joint, a splice bar to lie entirely below the lower outer edge of the rail head and having a longitudinal rib along its outer face adjacent to its top, and bolt holes below said rib, the lower portion of said rib vertically above each bolt hole being recessed to form a vertical bolt gripping face lying in substantially the same plane as said outer face at the mid-section of the bar and the upper portion of said rib projecting abruptly beyond said vertical face, substantially as described.

10. A splice bar for rails to lie entirely below the lower outer edge of the rail head and having a concave channel in its outer face running lengthwise of the bar, said channel lying entirely outside of the rail head and being formed by a vertical face interposed between two outwardly extending and diverging faces, portions of said channel faces being recessed to form vertical gripping faces for bolts, substantially as described.

11. A splice bar for rails, having a stiffening rib extending along its outer face adjacent to its top, said bar having an upper face inclined downwardly and outwardly, a portion of said rib being recessed to form a portion of a vertical gripping face for a bolt, another portion of said gripping face being formed by an outer face of the bar lying in substantially the same plane throughout the entire length of the bar; substantially as described.

In testimony whereof, we have hereunto set our hands.

WILLIAM P. THOMSON.  
SAMUEL G. THOMSON.

Witnesses:

S. E. PATTERSON,  
MCLEOD THOMSON.