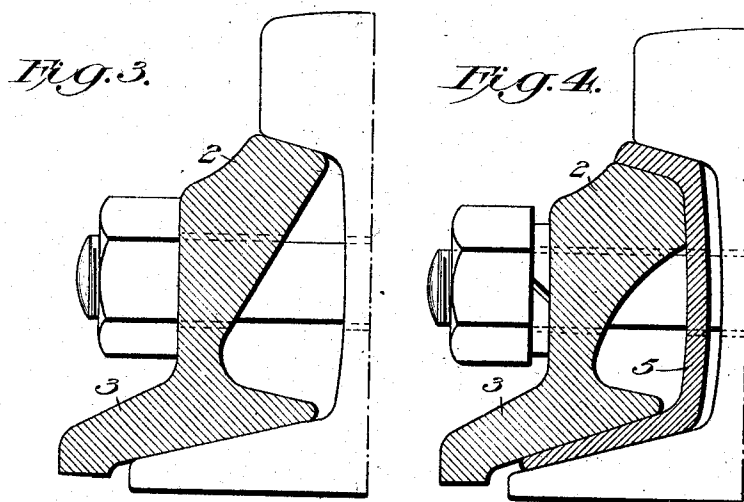
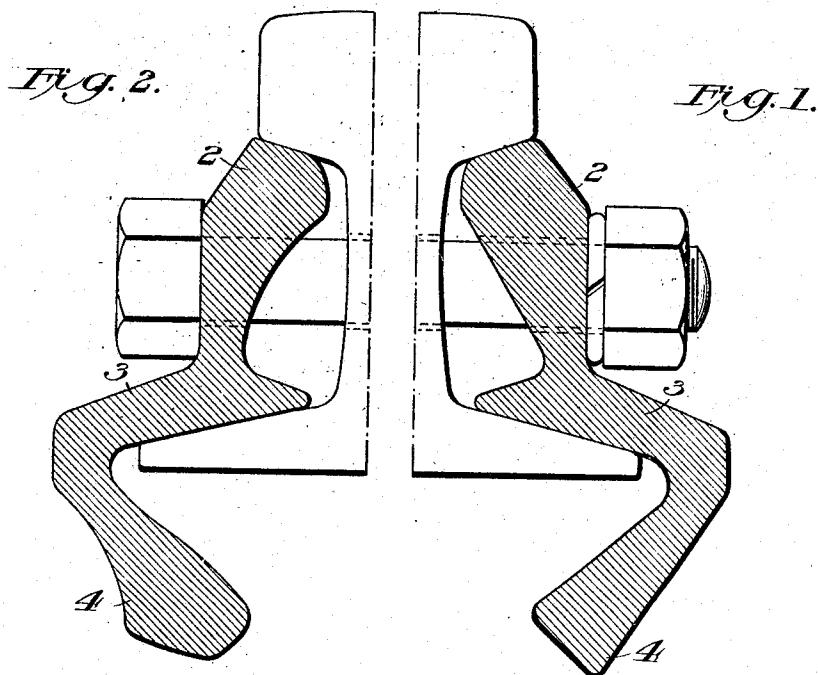


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 SPLICE BAR FOR RAIL JOINTS.
 APPLICATION FILED MAY 11, 1907.

937,116.

Patented Oct. 19, 1909.



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UNITED STATES PATENT OFFICE.

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A PARTNERSHIP.

SPLICE-BAR FOR RAIL-JOINTS.

937,116.

Specification of Letters Patent.

Patented Oct. 19, 1909.

Application filed May 11, 1907. Serial No. 373,062.

To all whom it may concern:

Be it known that we, WILLIAM P. THOMSON and SAMUEL G. THOMSON, of Philadelphia, Philadelphia county, Pennsylvania, have invented a new and useful Splice-Bar for 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 to 4, inclusive, are sectional views illustrating different forms of splice bars embodying our invention.

Our invention has relation to splice bars for railway rail joints, having downwardly and outwardly inclined upper members, and is designed to provide a splice bar having certain novel features of construction which, together with the advantages arising therefrom are hereinafter fully explained, the essential feature of our invention consisting in strengthening the upper member by adding metal on the inside of the bar below the top of the bolt holes and on the outside by providing a substantially vertical bolting face on the bar itself as rolled without the intervention of a bevel washer; this improvement of merging the bevel washers, hitherto required, into the bar itself, and thus provide a substantially vertical bolting face on the bar, derives great importance as an improvement from the fact that the elimination of the upward slipping tendency of the metal providing a vertical bolting face (which metal formerly constituted a washer), makes it possible in this improved construction to secure a more efficient coaction of the truss-member, lying between the head and foot of the rail, with the short foot-member, which is inclined downwardly and outwardly from this upper truss-member. The importance of this increased efficiency is proven in practice and by exhaustive tests because it has been conclusively shown that the weakest point of all types of bars, having an upper truss-member and an outwardly extending foot-member has been at the juncture of these two members. Under our former patent, we reinforced the bar by moving this juncture-point outwardly toward the edge of the rail base, which necessitated a downwardly and outwardly inclined upper truss-member; but our present improvement has so greatly strengthened the upper chord of the upper

truss-member that still greater efficiency in the coaction of the upper truss-member and the outwardly extending foot-member is required, and this increased efficiency we secure by joining the substantially vertical bolting face with the upper surface of the outwardly extending foot-member by means of a fillet which acts as a brace against any decrease in the degree of angularity between these two faces as originally rolled on the bar. It is essential that this fillet shall not be reëntrant, but shall, on the contrary, lie entirely within the angle of closest proximity of these two faces. The extent of the reinforcing metal added to form this fillet depends upon how greatly the upper chord of the upper truss-member of the splice bar has been reinforced, and also upon whether the splice bar is provided with a reinforcing flange extending below the rail base from the outer edge of the aforementioned short foot-member, as it will be readily apparent to any one familiar with the art, that the greater the carrying capacity of the bar, by reason of increased efficiency of the upper chord of the upper truss-member and a balancing efficiency due to the use of a lower truss-member in the form of a freely extending flange below the rail base, the greater in extent the reinforcing fillet will have to be.

Referring to the drawings, the numeral 2 wherever seen designates the upper member of the bar, 3 the foot portion which fits the upper surface of the rail base, and 4 the lower or depending member. In all the forms shown, the upper member 2 has its bolting face in a substantially vertical position. In the form shown in Fig. 3, the depending member 4 is omitted. In the form of the invention shown in Fig. 4, the bar 2 has no depending member extending below the base of the rail, but terminates above the bottom face of the rail. The form of the bar is otherwise, in general, similar to that shown in Fig. 2. Fig. 4 also illustrates the use of an inner coacting bar 5, fitting between the head and base portions of the bar 2 and the head and base of the rail. This member 5 may be either metallic or of insulating character. In the figure, it is shown as composed of metal.

Splice bars embodying our invention although shown as applied to the ordinary T-rail, may be applied to any type of rail.

They may be used on joints which terminate at the adjacent edges of the ties, or which extend over the ties. One or both of a pair of coating bars may embody the invention, said bars being of the same or different lengths.

The invention is, as shown, applicable to splice bars both with and without members extending below the base of the rail, and also to joints in which the depending portions are freely depending or are bolted together. Also on joints in which insulating or other bearing members are interposed between portions of the bars and the adjacent bearing surfaces of the rail. It will be further understood that the various forms shown are illustrative only, and that various other modifications in the form and sectional shape of the bars may be made, provided the essential feature of our invention is retained, viz., the provision of a vertical bolting face on a downwardly and outwardly inclined upper member. The fundamental principle of this reinforcement of a downwardly and outwardly inclined upper member resides in the fact that the upper portion of the outer face of the bar as rolled lies vertically above the lower portion of said outer face, thus securing a much lighter and stiffer member than can be attained in any other way. This method of reinforcement increases the bulk of the metal near the top where it is most efficient and at the same time it retains the merit of the downwardly and outwardly inclined upper member in eliminating the buckling of the foot member; this combination of increased efficiency can not otherwise be obtained without a great waste of metal adjacent to the horizontal neutral axis of the bar. Our new invention consists then of this comparatively light and rigid upper member affording an approximately vertical bolting face, which at the same time joins the member fitting on top of the rail base at a point far enough out to prevent the latter from buckling. This latter feature is particularly important in the case of bars having depending flanges extending below the base of the rail, since this reinforced slanting member reaches farther out than is otherwise practicable and transmits the strains to the lower member in such a way as will cause the entire bar to act with increased efficiency throughout, and without any tendency to buckle. In bars of other types heretofore constructed, the buckling point has been the weakest point, and the full benefit of upper and lower stiffening members of even moderate bulk have not been attained. In our preferred form, having a free flange extending below the rail base, our upper member of increased bulk enables us to construct a bar having comparatively light and rigid upper and lower members which are joined to-

gether by a short foot member and at the same time afford a vertical bolting face without the intervention of a bevel washer. This vertical bolting face on the bar as rolled and the joining of the upper and foot members adjacent to the outer edge of the rail base have hitherto been partly attained by adding an excessive amount of metal adjacent to the horizontal neutral axis of the bar, while the latter feature alone has been attained by the use of light slanting members necessitating the use of bevel washers; but no light and practicable bar has before been made which embodies both of these features together. This is alone accomplished by forming a substantially vertical outer face on the upper member, as shown in our drawings.

The reinforcement of splice bars beneath the base of the rail has received too much attention in comparison with the equal necessity for strength in the upper member. This improvement, then, is most efficient in distributing the metal at the greatest distance from the horizontal neutral axis of the bar, in providing a vertical bolting face on the bar itself as rolled, and in general, in causing the various members of the bar to act with increased capacity and without any tendency to buckle or kick partly out of contact with the top face of the rail base, all of which advantages enable us to make a comparatively light practicable bar, easy to roll, and which, as a constituent part of the structure comprising a rail joint, makes it possible to construct a rail joint equaling any unbroken rail in vertical and lateral stiffness, and retaining at the same time a sufficient degree of resiliency to prevent the battering of the rail ends. This has hitherto been attempted in many ways but never before accomplished by the use of a sufficiently reasonable amount of metal to be practicable. Our improvement, however, disposes metal so advantageously that our attainment of said result is practicable both from the commercial and the manufacturing standpoint.

We claim:

1. In a rail joint, a splice bar having a head member whose greatest horizontal thickness is adjacent to the horizontal plane of the tops of the nuts of the joint bolts, a foot member fitting the base of the rail, and a web member joining the foot member adjacent to the middle point of the latter in a substantially narrow neck portion, said web member having a substantially vertical outer face, which extends from the point of greatest thickness of the head member down to and joining the upper face of the foot member, and an inner face inclined upwardly and inwardly from the foot member to the point of greatest thickness of the head member, substantially as described.

2. In a rail joint, a splice bar having a

head member whose greatest horizontal thickness is adjacent to the horizontal plane of the tops of the nuts of the joint bolts, a foot member fitting the base of the rail, and a web member joining the foot member adjacent to the middle point of the latter in a substantially narrow neck portion, said web member having a substantially vertical outer face, which extends from the point of greatest thickness of the head member down to and joining the upper face of the foot member, and an inner face inclined upwardly and inwardly from the foot member to the point of greatest thickness of the head member, the thickness of the web member where it joins the foot member being substantially equal to the thickness of the rail web, substantially as described.

3. In a rail joint, a splice bar having a head member whose greatest horizontal thickness is adjacent to the horizontal plane of the tops of the nuts of the joint bolts, and having a substantially vertical inner face adjacent to but standing free from the rail web, a foot member fitting the base of the rail, and a web member joining the foot member adjacent to the middle point of the latter in a substantially narrow neck portion, said web member having a substantially vertical outer face, which extends from the point of greatest thickness of the head member down to and joining the upper face of the foot member, and an inner face inclined upwardly and inwardly from the foot member to the point of greatest thickness of the head member, substantially as described.

4. In a rail joint, a splice bar having a head member whose greatest horizontal thickness is adjacent to the horizontal plane of the tops of the nuts of the joint bolts, a foot member fitting the base of the rail, and a web member joining the foot member adjacent to the middle point of the latter in a substantially narrow neck portion, said web member having a substantially vertical outer face, which extends from the point of greatest thickness of the head member down to and joining the upper face of the foot member, an inner face inclined upwardly and in-

wardly from the foot member to the point of greatest thickness of the head member, and another coacting splice bar at the same side of the rails, substantially as described.

5. In a rail joint, a splice bar having a head member whose greatest horizontal thickness is adjacent to the horizontal plane of the tops of the nuts of the joint bolts, a foot member fitting the base of the rail, and a web member joining the foot member adjacent to the middle point of the latter in a substantially narrow neck portion, said web member having a substantially vertical outer face, which extends from the point of greatest thickness of the head member down to and joining the upper face of the foot member, and an inner face inclined upwardly and inwardly from the foot member to the point of greatest thickness of the head member, the foot member having a portion extending below the rail base; substantially as described.

6. In a rail joint, a splice bar having a head member whose greatest horizontal thickness is adjacent to the horizontal plane of the tops of the nuts of the joint bolts, a foot member fitting the base of the rail, and a web member joining the foot member adjacent to the middle point of the latter in a substantially narrow neck portion, said web member having a substantially vertical outer face, which extends from the point of greatest thickness of the head member down to and joining the upper face of the foot member, and an inner face inclined upwardly and inwardly from a point below the bolt holes to the point of greatest thickness of the head member, substantially as described.

In testimony whereof, we have hereunto set our hands.

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SAMUEL G. THOMSON.

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