J. H. BROTHERS.

INSULATED RAIL JOINT.

APPLICATION FILED MAR. 22, 1907.

1,010,850.

Patented Dec. 5, 1911.

4 SHEETS—SHEET 1.

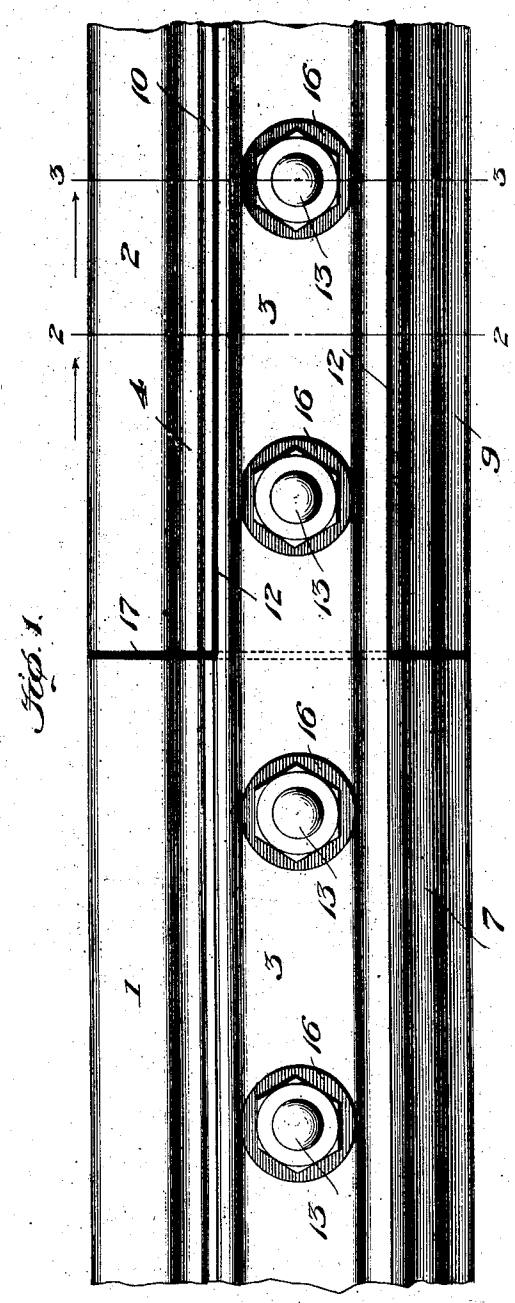

Fig. 1.

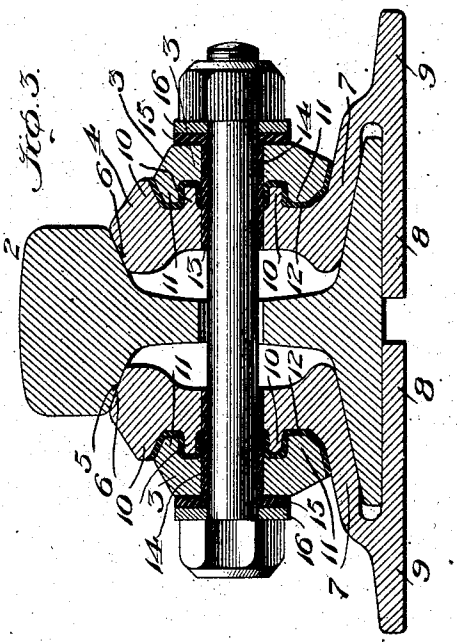

Fig. 3.

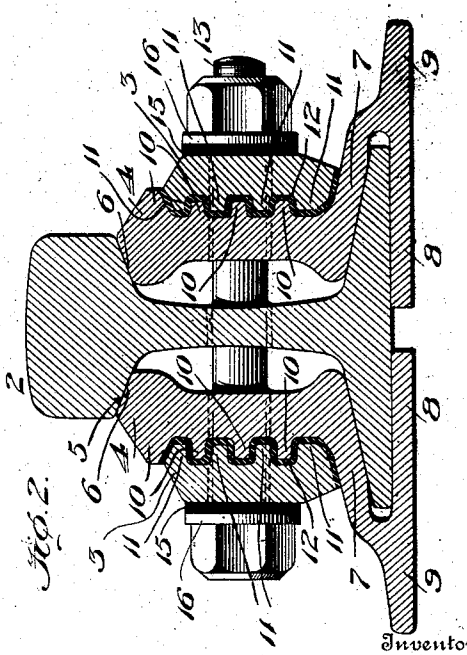

Fig. 2.

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4 SHEETS—SHEET 2.

Fig. 4.

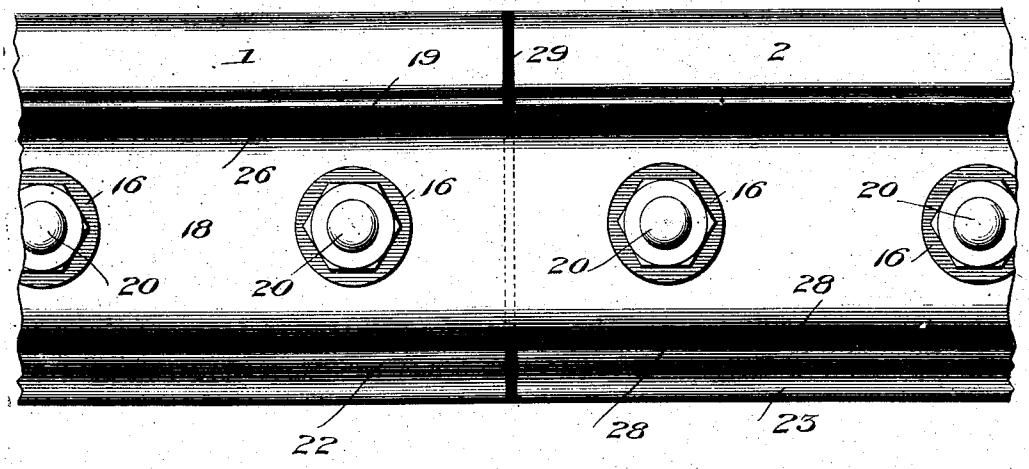
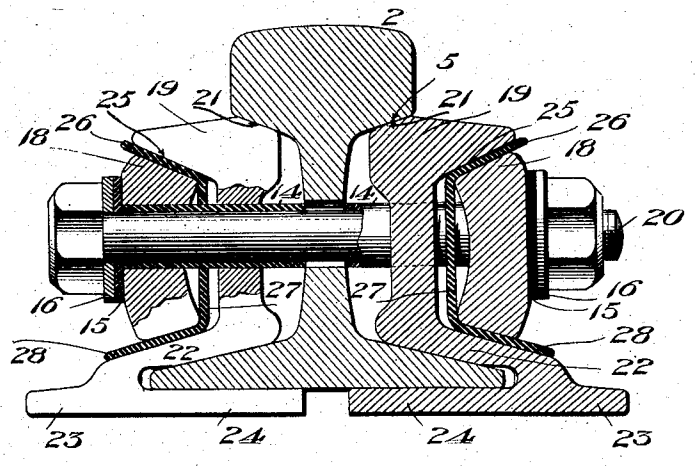


Fig. 5.



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4 SHEETS—SHEET 3.

Fig. 6.

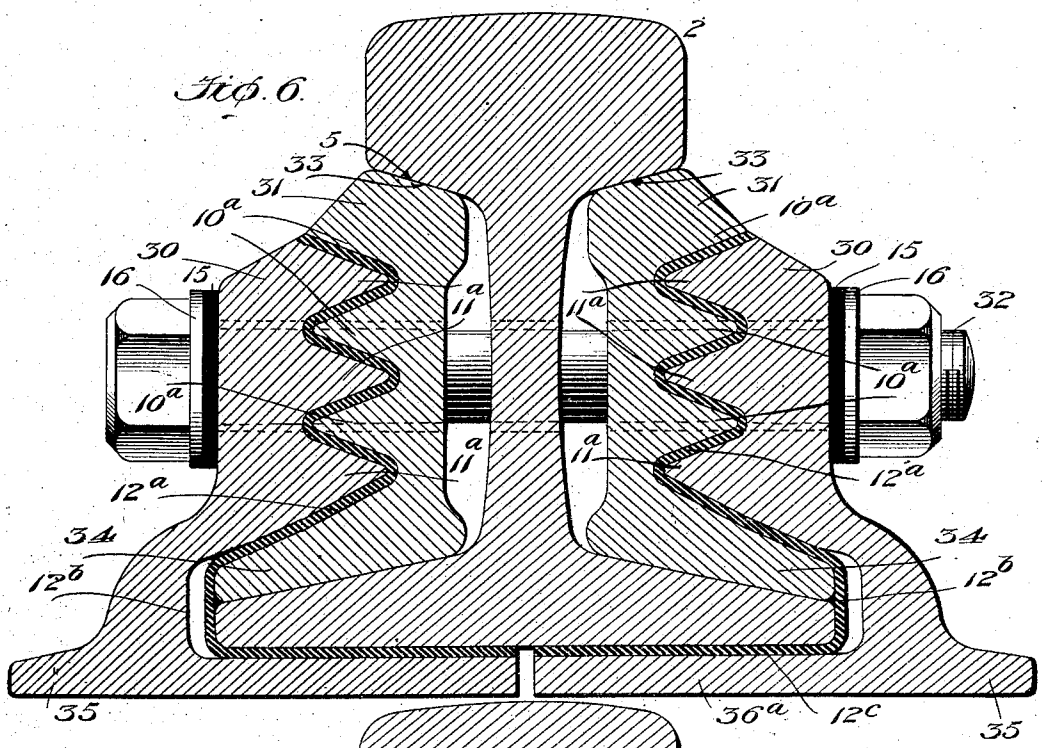
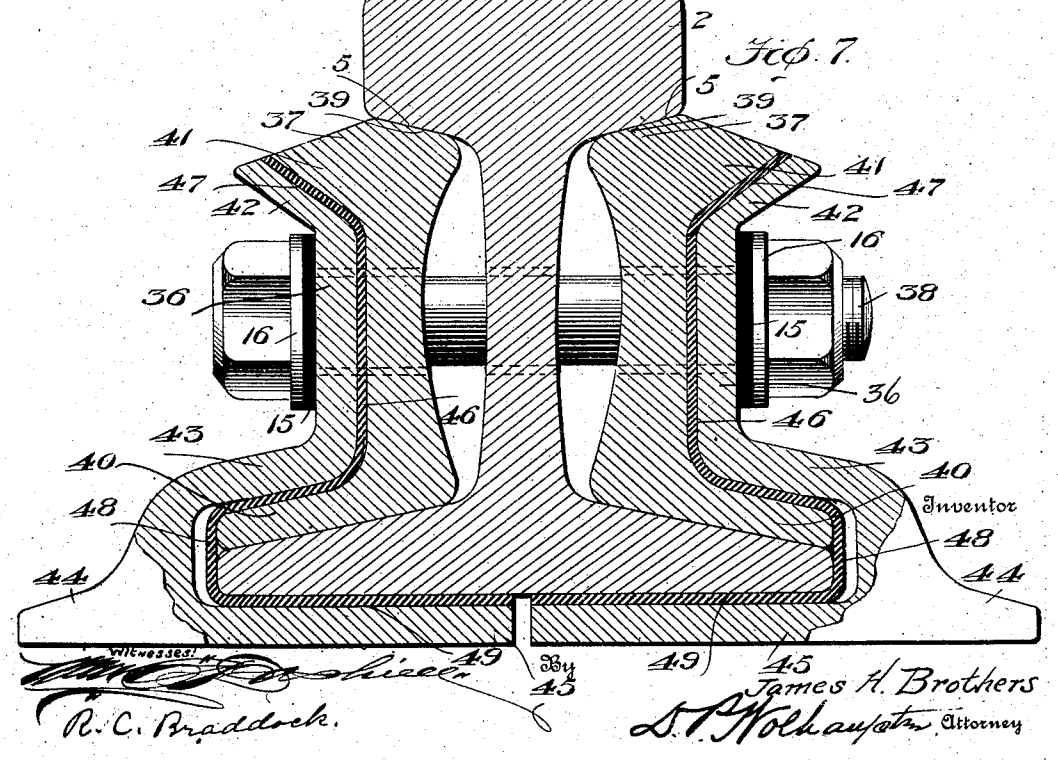


Fig. 7.



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4 SHEETS—SHEET 4.

Fig. 8.

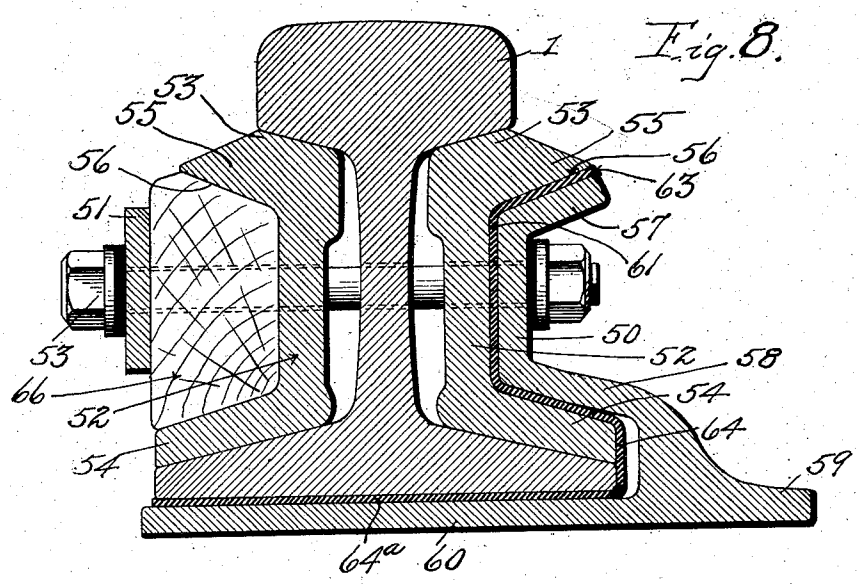
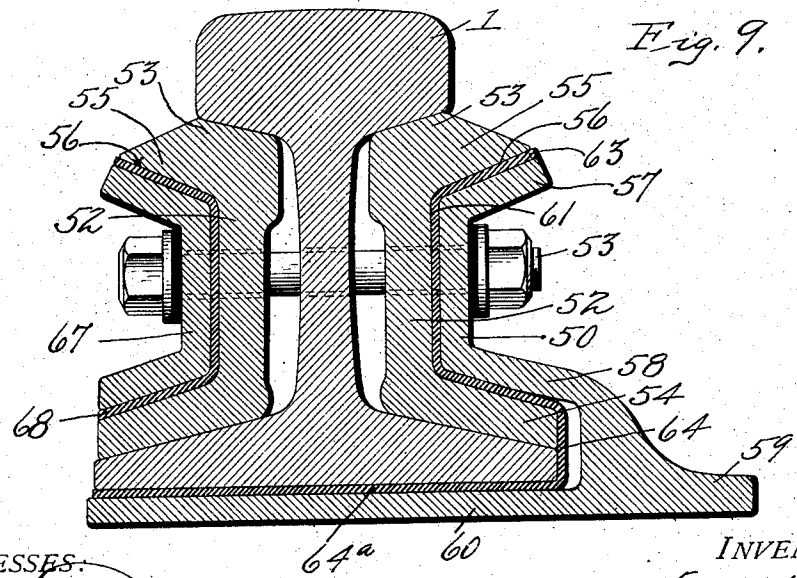


Fig. 9.



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UNITED STATES PATENT OFFICE.

JAMES H. BROTHERS, OF NEWARK, NEW JERSEY, ASSIGNOR TO THE RAIL JOINT COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

INSULATED RAIL-JOINT.

1,010,850. Specification of Letters Patent. Patented Dec. 5, 1911.

Application filed March 22, 1907. Serial No. 363,921.

To all whom it may concern:

Be it known that I, JAMES H. BROTHERS, a citizen of the United States, residing at Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Insulated Rail-Joints, of which the following is a specification.

This invention relates to the art of insulated rail joints, and has special reference to certain novel and practical improvements therein designed to provide a solid metallic bearing support at the under sides of the rail heads, and also to maintain an effective insulation throughout the joint.

To this end the invention contemplates an insulated rail joint wherein no insulation is interposed directly between the sides of the rails and the metallic bars of the joint next to the same, thereby allowing the heads of the rails to take a solid, direct bearing on the said joint bars, and permitting of the provision of such a bearing or bearings for the insulating members or material as to more effectually safeguard the same from flowing, or cutting out, under the pressure of the load imposed on the rails by the passing trains.

Hence, a distinctive object of the invention resides in the provision of means for obviating placing the insulating material between the rails and joint bars which underlie the rail heads, such disposition of the insulating material causing the latter to be in contact with both the rails and the joint bars throughout, but owing to the relatively small area at the under sides of the rail heads, at which point the greatest pressure of the load is exerted, the insulation is ordinarily rapidly worn away through a flowing or cutting action.

It is therefore the purpose of the present invention to provide a construction which obviates the necessity of placing insulating material directly between the rail sides and heads and the adjacent joint bars, and at the same time providing a novel arrangement of filler members and splice bars whereby the bearing area for the insulating material is increased to a greater extent than the area of the under sides of the rail heads.

In other words, the invention provides a novel construction, combination, and arrangement of parts serving to effectually increase the bearing area for the insulating material, and decrease the fiber strain, thus enabling the material to better withstand the load imposed.

With these and many other objects in view, which will more readily appear as the nature of the invention is better understood, the same consists in the novel construction, combination, and arrangement of parts hereinafter more fully described, illustrated, and claimed.

The essential features of the invention involved in carrying out the objects above indicated are necessarily susceptible to a wide range of structural modification, and to embodiment in various forms of construction, without departing from the scope of the invention, a few of the prefererd embodiments of which are shown in the accompanying drawings, in which:—

Figure 1 is a side elevation of one design of rail joint embodying the present invention. Fig. 2 is a cross sectional view on the line 2—2 of Fig. 1. Fig. 3 is a similar view on the line 3—3 of Fig. 1. Fig. 4 is a side elevation of another form of joint embodying the invention claimed herein. Fig. 5 is a cross sectional view of the joint shown in Fig. 4, the line of section being taken irregularly across the joint, in the plane, and at one side of the plane, of one of the joint bolts. Fig. 6 is a cross sectional view of a modified form of joint embodying the present invention. Fig. 7 is a similar view of another modified form of joint embodying the present invention. Figs. 8 and 9 are cross sectional views similar to Figs. 6 and 7 showing other modified forms of joints embodying the present invention.

Like references designate corresponding parts in the several figures of the drawings.

As indicated above, a distinctive feature of the present invention resides in an insulated joint having outer splice bars, inner filler members or filler bars next to the rails, and insulation between the splice bars and the filler members, the latter being arranged to engage the under side of the rail head, and having flanges, the area of which flanges is greater than the area of the under side of the rail head, whereby an increased bearing area is provided for the insulation with a consequent reduction of the fiber strain. This thought may be embodied in several forms of construction, and is exemplified

by the design of joint shown in Figs. 1, 2 and 3 of the drawings. This joint fundamentally involves in its general organization the service rails 1 and 2, the oppositely arranged splice bars 3 extending the full length of the joint between the two rails, and the filler members, or filler bars, 4 arranged at the inner sides of the splice bars and taking a direct bearing against the rails and beneath the under sides 5 of the rail heads. The filler members 4 are not coextensive in length with the splice bars 3 and therefore do not extend the full length of the joint, as each rail end has fitted thereto a pair of the filler members 4 arranged respectively upon opposite sides thereof and terminating at the end of the rail, as plainly shown in Fig. 1 of the drawings. All of the said filler members are preferably duplicates in design and construction, and each of the same essentially consists of an upright portion or girder formed at its upper edge with a bearing head 6 taking a solid bearing directly against the under side of the rail head, and at its lower edge each filler member is shown as provided with an outwardly deflected inclined foot flange 7 overlying the upper side of the rail base and having formed integrally therewith the bottom base section or base plate 8 arranged horizontally beneath the rail base and constituting a base support therefor. At its lower outer corner formed by the juncture of the foot flange 7 and base section 8, each filler member is provided with an outstanding reinforcing and spiking flange 9 subserving the usual functions of a flange of this character.

To provide for an effective insulation between the splice bars and the filler members, and at the same time increase the bearing area for the insulation, each filler member 4, in the design of joint shown in Figs. 1, 2 and 3, is provided at the outer side thereof with a plurality or series of bearing projections 10. These bearing projections are illustrated as being in the form of a series of cross sectionally rectangular flanges or ribs disposed in parallelism longitudinally of the filler member or bar and arranged in spaced relation, whereby there is necessarily alternated with said projections or flanges intervening correspondingly shaped recesses which are designed to receive therein a complemental series of similar projections or flanges 11 projecting from the inner side of the splice bar 3. Hence, in the construction described, it will be observed that each filler member has offset or projected from its outer side a series of spaced bearing projections or flanges which overlap and register with a complemental series of similar projections at the inner side of the splice bar, and between these registering faces of the filler member or bar and the splice bar is interposed a sheet of insulating material 12 which sinuously follows the space between the filler member and splice bar and the complemental projections or flanges thereof, as plainly shown in Figs. 2 and 3 of the drawings.

By reason of the construction described, it will be observed that while each filler member or bar 4 takes a solid metallic bearing under the head of the rail, the same presents a bearing surface for the insulation of greater area than the area of the under side of the rail head, inasmuch as the combined areas of the bearing faces of the series of projections is obviously greater than the area of the under side of the rail head bearing on top of the filler member or bar.

In the form of joint just described, the same is completed by the employment of the usual series of joint bolts 13, and to provide for a proper bolt insulation any of the well known bolt insulating expedients may be employed, such for instance as insulating bushings or sleeves 14 lining the bolt holes in the filler members and splice bars, and the insulating washers 15 separate from or integral with the outer ends of the bushings or sleeves 14 and arranged between the outer faces of the splice bars and the backing washers 16 which are disposed, as usual, at the inner sides of the heads and nuts of the bolts. In connection with the insulation of the joint, it is to be further observed that by reason of the discontinuity of the filler members 4, that is the employment of filler members for each rail (which filler members terminate at the end of said rail), the joint can be effectively insulated by having a one end insulation only therefor, that is, having the insulating material applied to the parts associated with one of the rails instead of being associated with both. Hence, for convenience of illustration, and to suggest an economical use of the insulation, the joint in Figs 1, 2 and 3 is illustrated as having the splice bars insulated with respect to only one rail, and only the joint bolts for that rail provided with insulating means above referred to. The insulation of the joint described is completed by the employment of the end post or equivalent insulation 17 interposed between the rail ends and also between the ends of the discontinuous filler members 4, as indicated in Fig. 1 of the drawings.

Another embodiment of the invention is shown in the joint illustrated in Figs. 4 and 5 of the drawings. This joint includes the service rails 1 and 2, the continuous splice bars 18 and the discontinuous filler members or bars 19, and the joint bolts 20. In this construction, the splice bars and the filler members occupy the same relation to each other and to the rail ends as the corresponding splice bars and filler members of the joint shown in Figs. 1, 2 and 3 of the

drawings, and also the joint bolts 20 are shown as provided with the same insulation as the joint bolts 13, which insulation is indicated by the same reference characters. Furthermore, it will be observed that in the joint shown in Fig. 5 of the drawings, each of the filler members 19 is illustrated as provided at its upper edge with a bearing head 21 for engagement at the under side of the rail head, and at its lower edge is provided with an outwardly deflected inclined foot flange 22 overlying the rail base and having formed integral therewith the outstanding reinforcing and spiking flange 23 and the bottom horizontal base section or base plate 24 arranged beneath and supporting the rail base. In these particulars the filler members 19 are similar to the filler members 4, previously referred to, but in the form of joint now being described, each filler member 19 has its upright portion or girder in the form of a channel bar, which produces at the upper edge thereof not only the bearing head 21 but also an outwardly extending bearing projection or flange 25 whose bearing face is of greater area than the area of the under side of the rail head and is designed to bear on the upper outturned flange 26 of the side insulating sheet 27. This side insulating sheet 27 is interposed between the filler member 19 referred to and the splice bar 18 which registers in the channel of the filler member, and said insulating sheet 27 is also provided at its lower edge with a lower outturned flange 28, said flanges 26 and 28 being interposed respectively between the top and bottom edges of the splice bar and the opposing inclined faces of the filler member.

In Figs. 4 and 5 of the drawings the joint is illustrated as having the side insulating sheets arranged in connection with the filler members of both rails, and the insulation of the joint is completed by the employment of the end insulation or end insulating post 29 interposed between the rail ends and also between the ends of the discontinuous filler members 19.

A further modification of the invention is suggested in Fig. 6 of the drawings illustrating a joint comprising the usual service rails, the outer continuous splice bars 30, the discontinuous filler members or bars 31, and the joint bolts 32, the latter being provided with suitable insulation such as described. In this form of joint, the filler members 31 bear the same relation to the rails and to the splice bars as already pointed out, but each of said filler members 31 terminates on the upper side of the rail base, that is, said member is provided at its upper edge with a bearing head 33 for engagement with the under side of the rail head and at its lower edge with an outwardly deflected foot flange 34 overlying the rail base, while on the other hand the outer continuous splice bar has formed integrally with its lower edge the outstanding reinforcing and spiking flange 35 and the bottom horizontal base section or base plate 36^a underlying the rail base.

The form of joint shown in Fig. 6 is similar to the joint illustrated in Figs. 2 and 3 in the particular of each filler member 31 being provided at the outer side thereof with a series of offstanding bearing projections or flanges 10^a which overlap and register with a series of complemental bearing elements or flanges 11^a projected from the inner side of the splice bar, and an insulating sheet 12^a sinuously follows the zigzag space between the said overlapping flanges 10^a and 11^a. However, in this form of joint, a further modification suggested is to have the projections or flanges 10^a and 11^a of a triangular or V-shape in cross section instead of cross sectionally rectangular, as previously referred to. Furthermore, in the modification shown in Fig. 6, the said insulating sheet 12^a is illustrated as having an extension or apron 12^b projecting over the outer edges of the flange 34 and the rail base flange, and a bottom continuation 12^c from the extension or apron 12^b insulates the base section 36^a from the bottom of the rails.

It will be observed that in the construction shown in Fig. 6 the combined areas of the bearing faces of the projections or flanges 10^a provide an extended bearing surface for the insulation of greater area than the area of the bearing between the filler member and the under side of the rail head.

A still further modification of the invention is shown in Fig. 7 of the drawings, which illustrates a joint comprising the usual service rails, the outer continuous splice bars 36, the discontinuous filler members 37, and the joint bolts 38, the latter being provided with insulating means such as described. Each filler member 37 is illustrated as provided at its upper edge with a bearing head 39 for engagement beneath the rail head, and at its lower edge with a foot flange 40 overlying the rail base. Also, the splice bar 36 is illustrated as having its upright or girder member of a channel formation so as to produce at the upper edge of the splice bar an outturned angularly disposed bearing flange 42 arranged parallel with, and lying opposite the offstanding bearing flange 41 projected outwardly from the upper portion of the filler member. Furthermore, the splice bar 36 is formed with a lower flange member 43 overlying the foot flange 40 of the filler member. The said lower flange member 43 has formed integrally therewith the outstanding reinforcing and spiking flange 44 and with the bottom horizontal base section 45, which latter

underlies the rail base. A side insulating sheet 46 is interposed between the splice bar and the filler member, and is provided at its upper edge with a top flange 47 interposed between the flanges 41 and 42 of the filler member and splice bar, and at its lower edge the side insulating sheet is formed with an apron extension 48 extending over the outer edges of the foot flange 40 and the rail base flange and having continued therefrom a bottom insulating section 49 lying between the base section 45 and the rail base. It will be observed that the formation of the individual filling members 37 provides an extended bearing surface for the insulation, which is of greater area than the area of the contact between the filler members and the under side of the rail head.

The invention is further exemplified by the modification shown in Fig. 8 of the drawings. The joint illustrated in this figure of the drawings is similar in its general design, and essential features, to the joint shown in Fig. 7, and embodies the usual service rails, the continuous splice bars 50 and 51, the discontinuous filler members 52 and the joint bolts 53^a, the latter being provided with suitable insulating means, preferably such as described. Each filler member 52 is provided at its upper edge with a bearing head 53 for engagement beneath the rail head, and at its lower edge with a foot flange 54 overlying the rail base. The said bearing head 53 at the upper edge of each filler member is formed with an outwardly extending bearing projection or flange 55 whose bearing face 56 is of greater area than the area of the under side of the rail head, and in the form of the joint shown in Fig. 8 of the drawings, the said offstanding bearing projection or flange 55 of the filler member 52 at the outside of the rail is adapted to overlie an outturned angularly disposed bearing flange 57 deflected outwardly from the upper edge of the continuous splice bar 50 located at the outer side of the joint. It will be observed that the said outer splice bar 50 is provided with an upright girder member of a channel formation producing the said upper bearing flange 57 and the lower flange member 58 overlying the foot flange 54 of the filler member 52. The said lower flange member 58 of the outer splice bar 50 has formed integrally therewith the outstanding reinforcing and spiking flange 59, and the bottom horizontal base section 60. In this embodiment of the invention, a distinctive feature thereof resides in the fact that the integral base section 60, carried by the outer splice bar 50, is of a width coextensive with, or greater than, the width of the rail base so as to extend entirely under the rail base to the inside of the rail, as plainly shown in Fig. 8 of the drawings. To provide for an effective insulation of the parts coöperating with the said outer splice bar 50, a side insulating sheet 61 is interposed between said splice bar and the filler member 52, which side insulating sheet is formed at its upper edge with a flange extension 63, interposed between the bearing projection or flange 55 and the bearing flange 57. At its lower edge, the said insulating sheet is formed with an apron extension 64 extending over the outer edges of the foot flange 54 and the rail base, and having continued therefrom a bottom insulating section 64^a lying between the full width base section 60 and the rail base. Another distinctive feature of the design of joint, shown in Fig. 8 of the drawings, resides in associating with the filler member 52 arranged at the inside of the rail, a wood or equivalent block 66 acting in the capacity of a supplemental filler piece, and also as an insulating member between the filler member proper 52 and the continuous splice bar 51. In this construction, the element 51 subserves the functions of the continuous splice bar of the joint, while also acting in the capacity of the bolt plate which is ordinarily arranged against wooden filler blocks in joints employing the latter. However, in this connection, it will be observed that by making the wooden filler block 66 continuous throughout the joint, the same would serve the double function of an insulator and a splice bar, but in any arrangement, with the wooden block 66 used alone or in combination with the bar 51, it will be observed that the bearing projection or flange 55 of the main filler member 52 has a bearing on the upper correspondingly beveled side of the said wooden block 66, thus carrying out the prominent feature of the invention herein emphasized.

A rearrangement of the joint shown in Fig. 8 is suggested in Fig. 9 of the drawings, which illustrates a joint embodying all of the structural features of the one shown in said Fig. 8, with the exception of substituting for the wooden block 66 at the inner side of the joint, a channel or equivalent splice bar 67 having interposed between the same and the adjacent filler member 52, a side insulating sheet 68 of substantially the same form as the corresponding insulating sheet shown in Fig. 5 of the drawings.

Other modifications will suggest themselves to those skilled in the art, and it will be understood that various changes in the form, proportion, and minor details of construction may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

I claim:—

1. In an insulated rail joint, the rails, splice-bars provided with a plurality of projections, filler members arranged against the rails and also provided with a plurality of

projections overlying those of the splice-bars and presenting bearing surfaces whose combined area is greater than that of the under side of the rail heads, and insulation interposed between the splice bars and the filler members.

2. In an insulated rail joint, the rails, splice-bars provided at their inner sides with a series of longitudinal bearing projections, filler members arranged next to the rails and provided at their outer sides with a series of longitudinal bearing projections occupying a complemental relation to the projections of the splice-bars and overlying the latter, and insulating material interposed between the splice bars and the filler members.

3. In an insulated rail joint, the rails, splice-bars, filler members having a bearing under the rail heads and provided with supporting base sections underlying the rail bases, and insulation interposed between the splice-bars and the filler members.

4. In an insulated rail joint, the rails, splice-bars, filler members having a bearing under the rail heads and provided with a supporting base section underlying the rail bases, said filler members having projections presenting a bearing surface of greater area than the area of the under side of the rail heads, and insulating material interposed between the splice-bars and the filler members.

5. In a rail joint, an outside bar having at least two laterally extending upper bearing faces for insulating material above the rail base, said bar extending opposite both rails of the joint, and an inner bar supported by and insulated from said faces and contacting with one rail only.

6. In a rail joint, an outer bar extending opposite both joint rails, and having at least two laterally extending upper bearing faces for insulation, an inner bar to contact with one rail only and having at least two laterally extending under bearing faces for insulation, and insulating material interposed between said insulation bearing faces.

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

JAMES H. BROTHERS.

Witnesses:
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BENJA. WOLHAUPTER.