

Fig. 1.

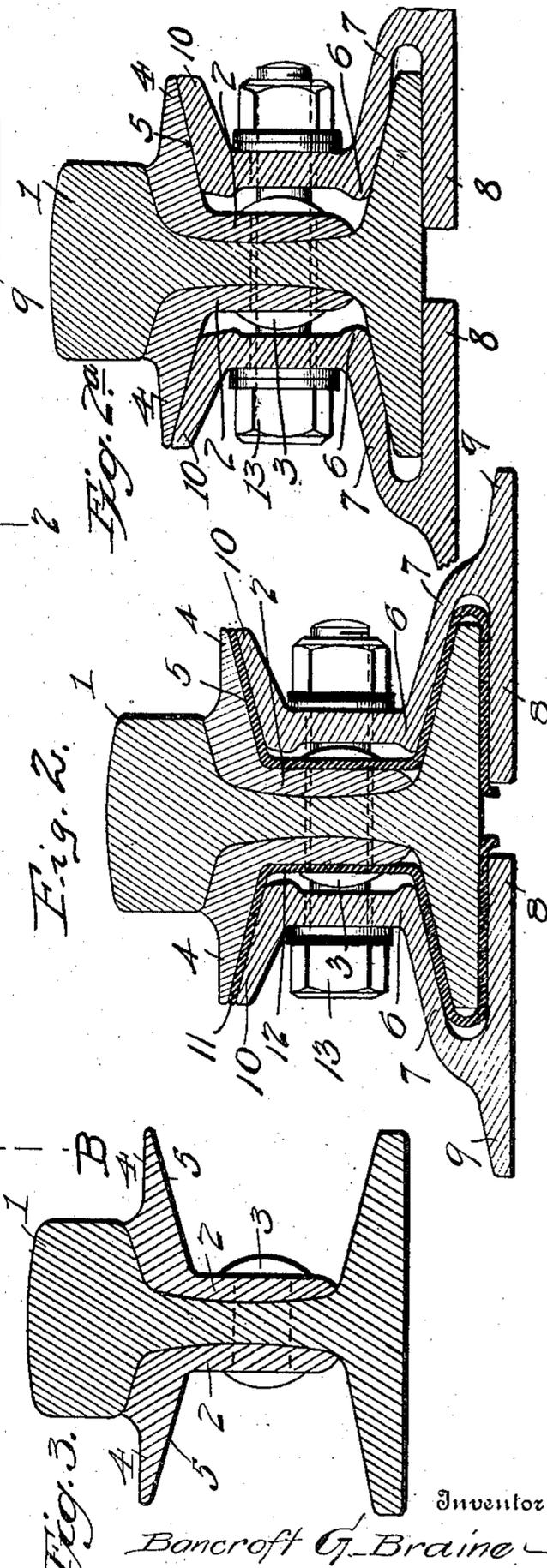


Fig. 2.

Fig. 3.

Witnesses

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 INSULATED RAIL JOINT.
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995,839.

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2 SHEETS—SHEET 2.

Fig. 7.

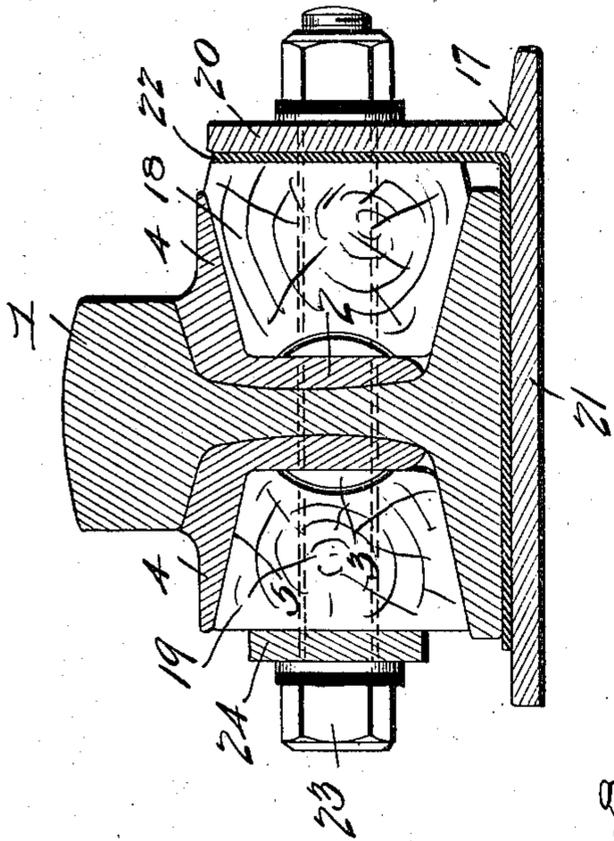


Fig. 6.

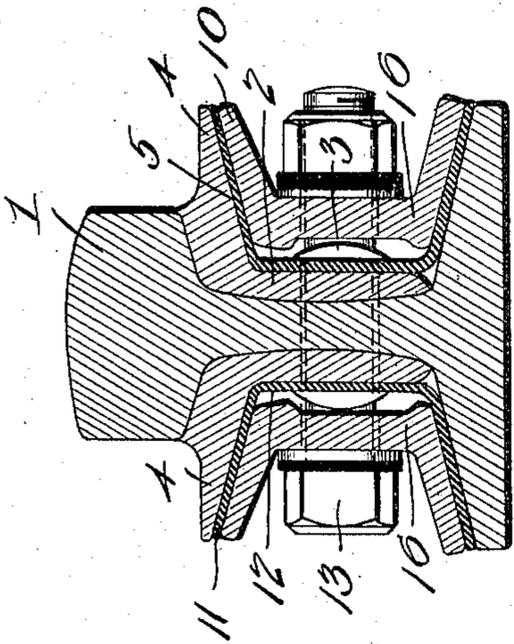


Fig. 5.

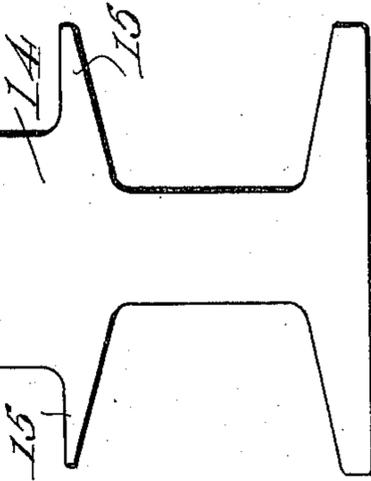


Fig. 8.

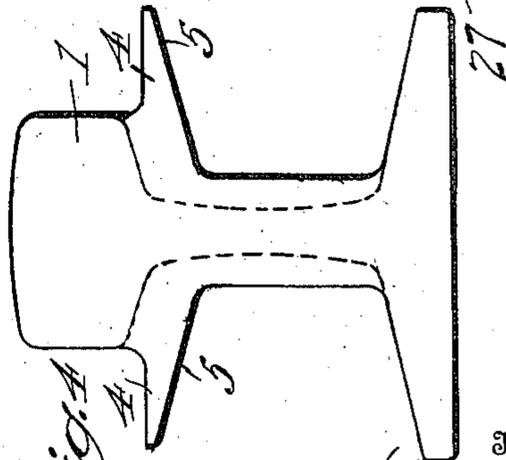
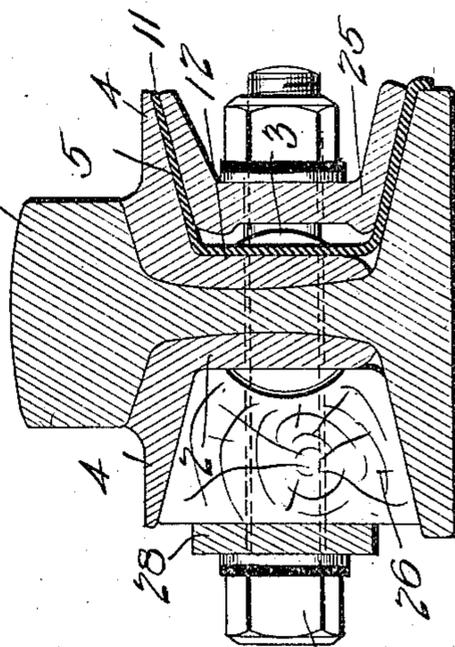


Fig. 4.

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UNITED STATES PATENT OFFICE.

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INSULATED RAIL-JOINT.

995,839.

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Application filed June 27, 1907. Serial No. 381,026.

To all whom it may concern:

Be it known that I, BANCROFT G. BRAINE, a citizen of the United States, residing at New York city, in the county of New York and State of New York, 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 more particularly to the design or construction of the rails or rail-sections embodied in the joint, whereby a broad and substantial bearing is provided for the insulation at the under sides of the rail heads, and at the same time an added reinforcement of the rail-sections is secured.

To this end the invention contemplates an insulated rail joint wherein the joint parts are associated with a rail end, whose cross section is so modified by supplemental extension pieces or sections, (forming a rigid part of the rail), as to provide what may be termed rail head extensions projecting beyond the plane of the sides of the rail head, and presenting inclined bearing faces of materially greater extent than the area of the under sides of the heads of standard rails. The practical object accomplished by this construction, in an insulated rail joint, is to provide a broad and substantial bearing for the insulating material at the under sides of the rail heads, that is to say, to effectually increase the bearing area for the insulating material with a consequent decrease of the fiber strain, thus enabling the material to better withstand the load imposed.

Hence, as a general object, the invention has in view a construction which provides for such a bearing for the insulation beneath the rail heads as to more thoroughly safeguard the insulating material from flowing or cutting out under the pressure of the load imposed on the rails by the passing trains, it being well understood by those familiar with the art that, in practice, owing to the relatively small area at the under sides of the standard 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 the intention of the present invention to obviate this as much as possible by providing

said lateral extensions at the under sides of the rail head.

The essential features of the invention involved in carrying out the foregoing objects are necessarily susceptible to a wide range of structural modification, and to embodiment in various forms of joints, without departing from the scope of the invention, but a few practical applications of the invention 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. 2^a is a cross-sectional view on the line A—B of Fig. 1. Fig. 3 is a detail view of a rail modified to meet the conditions of the present invention by having united therewith supplemental side rail-sections. Fig. 4 is an end view similar to Fig. 3 of an integrated rail formation embodying the present invention, showing by dotted lines the departure or modification from the conventional lines of a standard rail. Fig. 5 is an elevation of an insulating end post shaped to conform to the cross section of the modified rail-section. 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 form of joint embodying the present invention. Fig. 8 is a similar view of another modification exemplifying the invention.

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

As indicated above, the distinctive feature of the present invention resides in so modifying the cross sectional design or form of the standard rail sections as to provide extended bearings at the under sides of the rail heads thereby presenting broad and substantial bearing faces for the insulating material located at the top of the joint bars or splices, and at the same time reinforcing or strengthening the rail body itself along the lines where the greatest pressure of the load is exerted. This may be accomplished in different ways, but a practical means of securing the desired result is to provide a standard rail or rail-section 1, upon opposite sides thereof, with supplemental side rail-sections or pieces 2 riveted or otherwise rigidly se-

cured, as at 3, to the web of the rail so that the said supplemental sections constitute in effect a rigid and permanent part of the rail itself, as plainly shown in Fig. 3 of the drawings. The said supplemental side rail sections 2 are of angle formation, the same having vertical portions closely fitting the rail sides, and at the upper ends of said vertical portions being provided with angularly disposed and laterally projecting parts 4 which may be properly characterized as rail head extensions, inasmuch as said parts 4 closely register with and fit against the under sides of the rail heads and thereby receive the pressure of the load transmitted through these portions of the rail.

The head extensions of the supplemental rail-sections 2 project laterally from the rail sides to a plane beyond the sides of the rail head and are formed at their under sides with the inclined extended bearing faces 5 which are of materially greater extent than the area of the under sides of the head of the standard rail. These inclined extended bearing faces 5 at the under sides of the rail head extensions 4 afford a bearing for the insulating material which may be arranged at the top of the joint bars or splices according to the character of joint which may be made up in connection with the modified rail-section.

To exemplify the practical features of the invention, there is shown in Figs. 1 and 2 of the drawings a rail joint of the well known continuous type and embodying in its organization the service rails 1—1 modified as described, and the opposite side joint bars 6—6. The side joint bars 6—6 are substantially of the same design as the corresponding bars employed in the said continuous type of rail joint, each of said bars having formed integrally with its foot flange 7 (which overlies the rail base), the bottom base section 8 arranged horizontally beneath the bottom of the rail and affording a base support therefor; said side joint bars 6 being further provided at the juncture of the foot flange 7 and base section 8 with the usual reinforcing and spiking flange 9. In adapting the said continuous type of bars 6 to the modified rail-section, each of said bars 6 is further provided at its top edge with the angularly disposed inclined top bearing flange 10 lying beneath the opposing face of the rail head extensions 4, said top bearing flange 10 presenting an inclined bearing face substantially paralleling the inclined bearing face 5 of the head extension 4 so as to firmly clamp between said two faces the top flange piece 11 of a side insulating sheet 12 interposed between the side of the rail and the side joint bar 6. The insulating sheet arrangement 12 is duplicated at both sides of the joint, as plainly shown in

Fig. 2 of the drawings, and the lower portion of said insulating sheet is preferably extended continuously about the base flange of the rail and between such base flange and the bottom rail receiving portion 7—8 of the side joint bar. It will thus be seen that in the form of joint described, the insulating material at the top of the said joint bar or splice member 6 is afforded a broad and substantial bearing at the under sides of the rail heads, which is of greater extent than that allowed for in the standard constructions where there is no extension of the under sides of the rail heads.

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. Furthermore, it will be obvious that such 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 and 2 is illustrated as having the joint bars insulated with respect to only one rail, and only the joint bolts for that rail provided with suitable insulating means, but to effectually complete the insulation there is employed an insulating end post 14 interposed between the rail ends, and of a design corresponding to the cross-sectional design of the modified rail-section. The form of this insulating end post 14 is clearly shown in Fig. 5 of the drawings which illustrates the same as corresponding in shape to the cross section of a rail with the exception of being provided at the under side of its rail head portion with the side inclined head extensions 15 which serve to insulate the head extensions 4 of the opposing rail ends in cases where both of the rails are of the modified design claimed herein.

Another modification of the invention is shown in the joint illustrated in Fig. 6 of the drawings, which figure illustrates a joint made up with opposite channel bar sections 16 forming the splice members in place of joint bars of continuous type such as suggested in Fig. 2 of the drawings. In other respects, the joint shown in Fig. 6 is the same in construction and function as the joint shown in Fig. 2, so similar reference characters will apply to similar parts in the said figures of the drawings.

A further application of the invention is exemplified in Fig. 7 of the drawings illustrating the modified rail-section utilized in connection with a Weber type of joint including in its construction an angle joint

shoe 17 and the opposite wooden filler blocks 18 and 19 arranged respectively at opposite sides of the rails and fitting in the channels formed between the base flanges and the side rail head extensions 4. The angle shoe 17 is of the conventional form, the same embodying the usual upright side bar or girder 20, and the base section or base piece 21 extending entirely beneath the rail bottom or rail base. Also, in the design of joint shown in Fig. 7, an insulating sheet 22 may be interposed between the side joint bar 20 of the shoe and the adjacent wooden filler block 18 and extended beneath the rail base between the latter and the base section 21 of the shoe. The joint bolts 23 are provided with the usual insulating expedients and extend through the usual bolt holes in the side joint bar or girder 20, and in the bolt plate or strip 24 arranged on the outer side of the filler block 19 which is located at the side of the joint opposite the joint plate 20. In this form of joint, in so far as the wooden filler blocks subserve insulating functions, the same are provided with extended broad bearings at the under sides of the rail heads.

Another modification of the invention is suggested in Fig. 8 illustrating a joint having at one side a channel bar section 25 with the insulating sheet 12 interposed between the same and the adjacent rail side, and at its opposite side having a wooden filler block 26 corresponding in position and function to the wooden filler block 19 shown in Fig. 7 of the drawings. Also, in said form of joint shown in Fig. 8, the bolts 27, provided with suitable insulating means, are arranged to extend through the channel bars 25 at one side of the joint, and at the opposite side of the joint through the wooden filler block 26 and the bolt plate or strip 28, all in the manner well understood by those familiar with the art.

While in the forms of joint already described, the modified rail body is shown provided with separate supplemental side rail-sections, it will, of course, be understood that the modified design of rail can be formed integrally in the first instance by casting or rolling processes as suggested in Fig. 4 of the drawings. Also, it will be understood that in making up a rail joint in accordance with the present invention, either one or both of the rails to be connected may be of a modified design without affecting the invention, and therefore various changes in the form, proportion, and arrangement of parts 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, a rail section provided at the underside of its head with supplemental extension pieces rigid with and

carried by the rail, said extension pieces being located beneath the rail head within the fishing spaces and provided with laterally projecting head-extensions which project beyond the plane of the sides of the rail head, separate outer splice members fitting beneath said head-extensions and over the rail flanges, joint bolts for fastening the splice members in position, and insulating means.

2. In an insulated rail-joint, the rail section, supplemental extension pieces located beneath the rail head within the fishing spaces and provided with laterally projecting head extensions which project beyond the plane of the sides of the rail head, independent fastening means for rigidly securing said extension pieces to the rail web and beneath and against the rail head, separate outer splice members fitting beneath said head-extensions and over the rail flanges, joint bolts, and insulating means.

3. A rail joint comprising a fish plate formed with a downwardly and inwardly inclined upper surface broader than the adjoining under side of the rail head, a filler block interposed between the upper surface of the fish plate and the rail head, the under surface of said block being inclined to correspond with the upper surface of the fish plate, said inclined surface extending inwardly beyond the inner edge of the fish plate, the upper and inner surface of said block fitting closely against the under side of the rail head and the web of the rail whereby the filler block can have no inward movement and the fish plate may move inwardly on the filler block.

4. A rail joint comprising a fish plate formed with an upper surface broader than the adjoining under side of the rail head, a filler block interposed between the upper surface of the fish plate and the rail head, the under surface of said block extending inwardly beyond the inner edge of the fish plate, the upper and inner surfaces of said block fitting closely against the under side of the rail head and the web of the rail, whereby the filler block can have no inward movement and the fish plate may move inwardly on the filler block.

5. A rail joint comprising a fish plate formed with a downwardly and inwardly inclined upper surface broader than the adjoining under side of the rail head, the lower surface of the fish plate inclining outwardly and downwardly to adapt it to bear on the upper surface of the base of the rail and being broader than the upper surface of the fish plate, a filler block interposed between the upper surface of the fish plate and the rail head, the under surface of said block having a bearing on the fish plate substantially equal in width to the upper surface of

the fish plate and being correspondingly inclined said inclined surface extending inwardly beyond the inner edge of the fish plate, the upper and inner surfaces of said block fitting closely against the under side of the rail head and the web of the rail whereby the filler block can have no inward movement and the fish plate may move inwardly on the filler block.

6. A rail joint comprising a fish plate formed with an upper surface broader than the adjoining under side of the rail head, the lower surface of the fish plate inclining outwardly and downwardly to adapt it to bear on the upper surface of the base of the rail and being broader than the upper surface of the fish plate, a filler block interposed between the upper surface of the fish plate and the rail head, the under surface of said block having a bearing on the fish plate substantially equal in width to the upper surface of the fish plate, said under surface extending inwardly beyond the inner edge of the fish plate, the upper and inner surfaces of said block fitting closely against the under side of the rail head and the web of the rail, whereby the filler block can have no inward movement and the fish plate may move inwardly on the filler block.

7. A rail joint comprising a fish plate formed with a downwardly and inwardly inclined upper surface and a lower surface inclining outwardly and downwardly to adapt it to bear on the upper surface of the base of the rail, a filler block interposed be-

tween the upper surface of the fish plate and the rail head, the under surface of said block engaging the upper surface of the fish plate and being correspondingly inclined and extending inwardly beyond the inner edge of the fish plate, the upper surface of said filler block fitting closely against the under side of the rail head and the inner surface thereof engaging the web of the rail, whereby the filler block will be held against inward movement and the fish plate may be adjusted inwardly on the filler block and on the base of the rail to take up the wear.

8. A rail joint comprising a fish-plate having its under surface broader than its upper surface and downwardly and outwardly inclined to adapt it to fit over the base of the rail, a filler block interposed between the upper surface of the fish plate and the under side of the rail head and bearing against the web of the rail, the under surface of said filler block bearing directly on the upper surface of the fish plate and extending inwardly beyond the inner edge of the plate whereby the fish plate may move inwardly on the filler block to take up wear and the filler block will be held rigidly against inward movement.

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

BANCROFT G. BRAINE.

Witnesses:

BENJ. WOLHAUPTER,
K. McNALLY.