B. WOLHAUPTER & E. F. SCHERMERHORN.

REINFORCED RAIL JOINT BAR.

APPLICATION FILED JUNE 10, 1911.

1,131,889.

Patented Mar. 16, 1915.

3 SHEETS-SHEET 1.

Fig. 1.

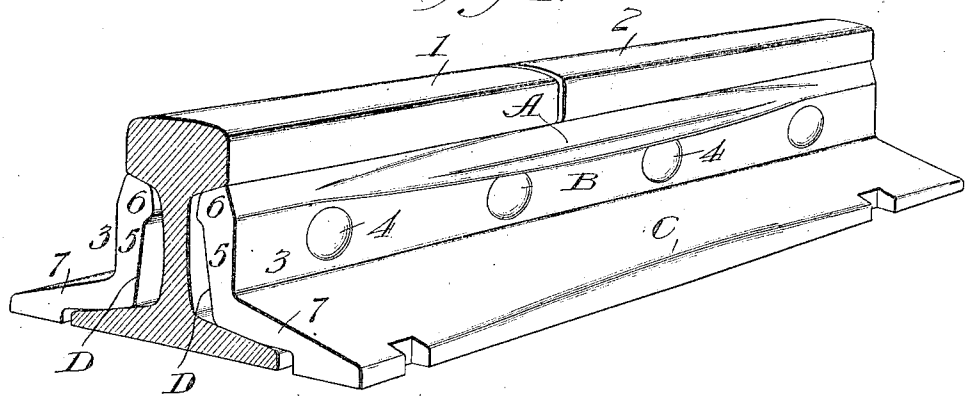
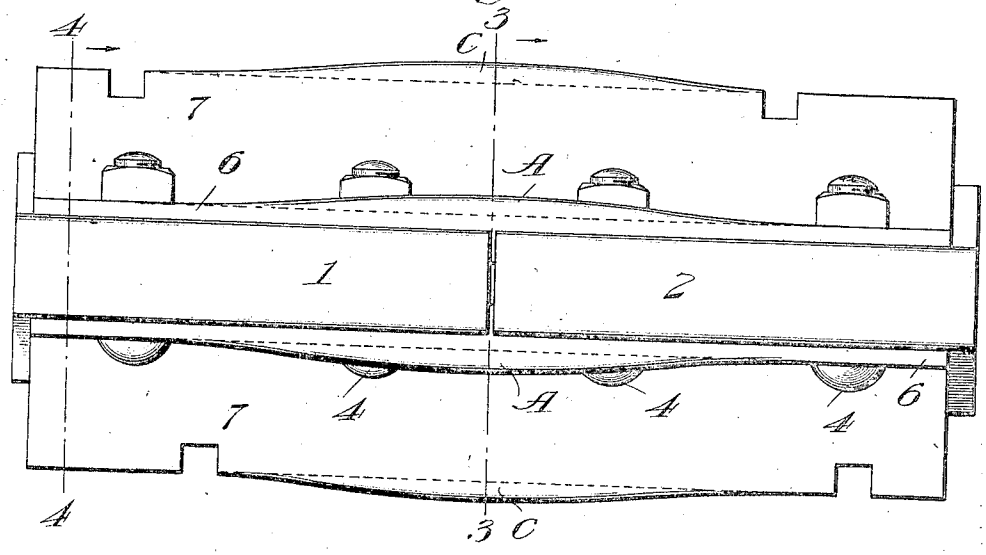


Fig. 2.



Witnesses

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3 SHEETS—SHEET 2.

Fig. 3.

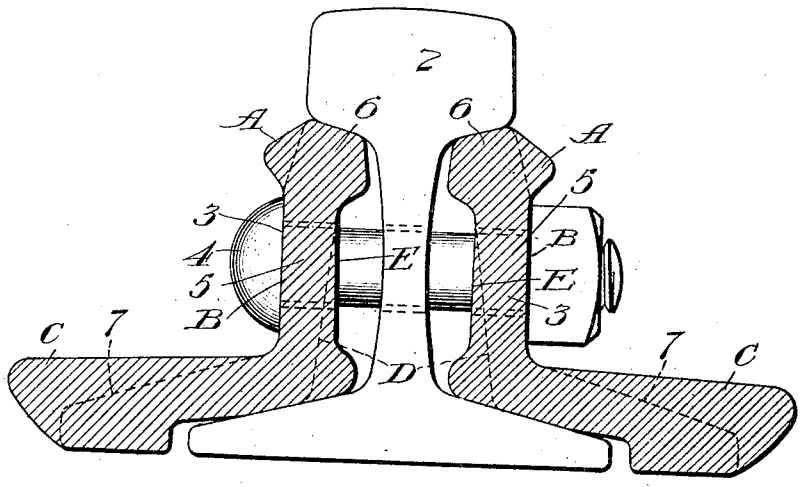
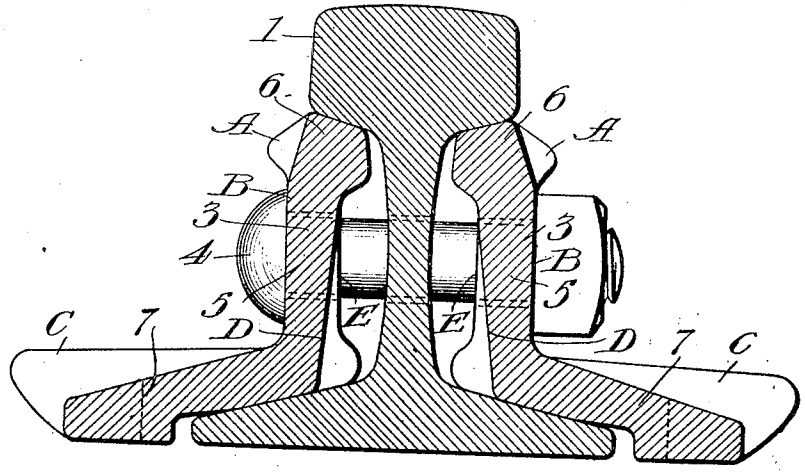


Fig. 4.



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3 SHEETS—SHEET 3.

Fig. 5.

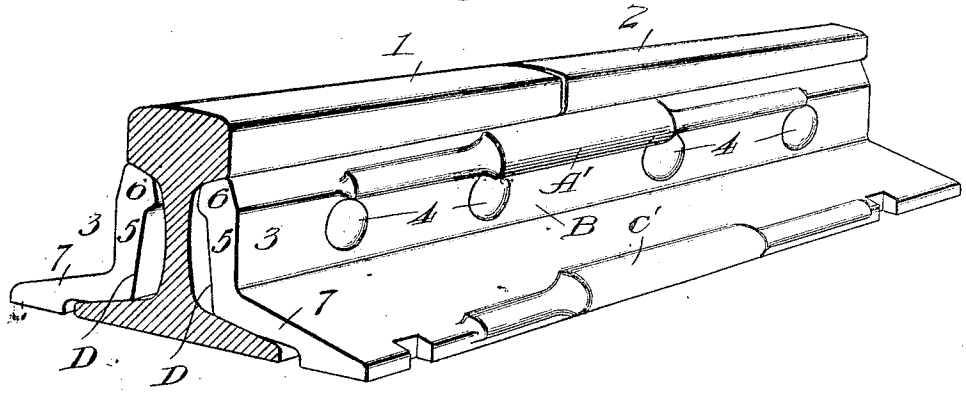
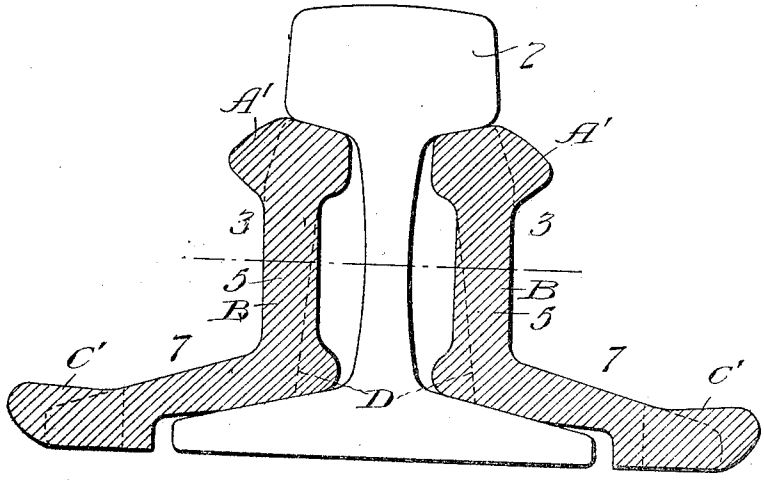


Fig. 6.



Witnesses

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UNITED STATES PATENT OFFICE.

BENJAMIN WOLHAUPTER, OF NEW ROCHELLE, AND EDWARDS F. SCHERMERHORN, OF BROOKLYN, NEW YORK, ASSIGNORS TO THE RAIL JOINT COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

REINFORCED RAIL-JOINT BAR.

1,131,889. Specification of Letters Patent. Patented Mar. 16, 1915.

Application filed June 10, 1911. Serial No. 632,492.

To all whom it may concern:

Be it known that we, BENJAMIN WOLHAUPTER and EDWARDS F. SCHERMERHORN, citizens of the United States, residing, respectively, at New Rochelle, county of Westchester, and State of New York, and at Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Reinforced Rail-Joint Bars, of which the following is a specification.

This invention relates to an improvement in rail joints, and more particularly to the design and construction of a rail joint bar having special reinforcement.

To this end the invention contemplates an improved and practical design of reinforced bar for rail joints capable of application to the rails with the same facility and readiness as the ordinary forms of splice bars or fish plates, while at the same time embodying a reinforcement that secures a maximum strength for the bar at the center of the joint, that is, in the vertical plane of the meeting ends of the rails.

It is therefore the special object of the present invention to so construct and design a reinforced rail joint bar that the metal thereof will be economically distributed by a progressive graduation so as to give to the bar the maximum strength under track loads.

It is well understood by those familiar with the art that a rail joint bar in its capacity as a beam, requires its greatest strength and stiffness of cross section at the center of the joint, or in other words at the center of its span, but this requirement of strength and stiffness gradually decreases from the center to the ends of the joint bar. To meet that condition, and in harmony therewith, this invention has in view a graduated reinforcement of the joint bar of such a character as to dispose the maximum amount of metal at the center of the joint and distribute it in such a manner as to give the bar the maximum stiffness at its center, with the amount of metal decreasing uniformly, or by suitable graduation, toward the two ends of the bar. In the same connection, the invention also contemplates the desirable feature of having the joint bar of lighter and thinner cross section at its ends, and at approximately the location of the neutral axis where the distortion of the fibers and the consequent stresses and strains are the minimum. Also, provision is made by the invention for a gradual transition or merging progressively from the one cross section to the other.

With these and other objects in view, which will readily appear to those familiar with the art 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 the carrying out of the objects above indicated, are necessarily susceptible of structural change without departing from the scope of the invention, but a preferred embodiment thereof is shown in the accompanying drawings, in which—

Figure 1 is a perspective view of a rail joint including reinforced joint bars constructed in accordance with the present invention. Fig. 2 is a top plan view of the rail joint shown in Fig. 1. Fig. 3 is a cross sectional view of the joint at the center thereof on the line of section 3—3 of Fig. 2. Fig. 4 is a cross sectional view at or near the end of the joint on the line 4—4 of Fig. 2. Fig. 5 is a perspective view similar to Fig. 1 showing a modification in the form or character of the graduated reinforcement for the bar. Fig. 6 is a sectional view at the center of the joint shown in Fig. 5, the view omitting the bolts.

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

As shown in the drawings, a rail joint embodying the present invention comprises, in combination with the rails 1 and 2, the oppositely arranged side joint bars 3 and the usual series of joint bolts 4. Hence, the invention involves or requires no change in the general form, and manner of setting up, of the ordinary types of rail joints employing angle bars or splice bars.

Referring particularly to the construction and design of each joint bar 3, the same is preferably of the angle bar type and consists of the upright web or splice member 5 formed at its upper edge with the usual bearing head 6 that engages beneath the rail heads, and at its lower edge provided with the inclined outwardly projecting foot flange 7 which overlies and rests upon the inclined top surface of the rail flanges. These are the usual elements of the conventional angle bar for rail joints, but in addition thereto, the present invention contemplates the feature of a graduated reinforcement for the bar so as to dispose the maximum amount of metal at the center of the joint and to gradually and uniformly decrease the amount of metal toward the two ends of the bar. Also, it is proposed to provide a progressive change in cross section of the bar whereby the same shall be of a lighter and thinner cross section at its end than at the center. This special reinforcement and distribution of metal in the body of the bar is effected primarily by a thickening of the bar at its center, and gradually decreasing the amount of metal toward the two ends of the bar. In other words, the joint bar is reinforced by adding metal to the body thereof at its central portion in its bearing head as indicated at A, in its web part, as indicated at B, and in its foot flange, or foot piece, as indicated at C, the resultant cross section being plainly shown by the corresponding reference letters in Fig. 3 of the drawings.

The central reinforcement A at the head of the joint bar may be in the form of an outstanding continuous unshouldered rib that tapers from its maximum projection at the center of the bar toward both ends of the bar, and the terminals of the said reinforcing rib merge into the outer surface or face of the bar body. The center reinforcement B in the web part of the bar is a thickening of the bar at that point, and this thickening is tapered off or gradually decreased toward the ends of the bar as is evident from the illustration in Figs. 1 to 4 inclusive of the drawings. The center reinforcement C in the foot flange of the bar consists of a thickening and widening of said flange at the center of the bar and the tapering off of this thickening and widening toward the ends of the bar, as may be plainly seen from Figs. 2, 3 and 4 of the drawings.

In addition to the graduated reinforcing features above referred to, there is combined therewith the progressive change in cross section hereinbefore mentioned, and in connection with this latter feature it may be explained that at each end the joint bar is made relatively thin as indicated at D by inclining the inner face of its web downwardly and outwardly, since the point D is the approximate location of the neutral axis where the distortion of the fibers and the consequent stresses and strains are the minimum. From D the thickness is gradually increased toward the center of the joint by making the inner face of the web substantially vertical as at E in Figs. 3 and 4. Likewise, from the ends of the bar the foot flange thereof increases in thickness toward the center.

From the foregoing description it will be observed that by reason of the difference in design or cross section between the central and end portions of the bar it is possible to distribute a maximum amount of metal into the central part of the bar and to give to that part of the bar an I-beam formation wherein an enlarged head portion, having a projection both inwardly and outwardly, is connected with an enlarged foot portion by a substantially vertical and relatively narrow web-portion.

In Figs. 5 and 6 of the drawings there is illustrated a modification wherein the reinforcement, particularly at the top and bottom edges of the joint bar is effected by stepped ribs A′ and C′, producing graduated steps performing the function of the elements A and C hereinbefore referred to. In other respects the modified structure is the same as the bar already described, and similar references will apply to similar parts in the different figures.

Various changes in the form, proportion and minor details of construction, as fall within the scope of the appended claims, may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

We claim:

1. A splice bar provided with a central portion having therein an I-beam distribution of metal, and end portions having therein an L-beam distribution of metal.

2. A splice bar provided with a central portion having a horizontally enlarged head and a substantially vertical web connecting with said head, and end portions having downwardly and outwardly inclining webs.

3. A splice bar provided at its central part with an I-beam distribution of metal including a horizontally enlarged head having an outwardly projecting rib which decreases in depth and width toward the relatively thinner ends of the bar.

4. A rail joint bar provided at its central part with a substantially vertical inner face, and at its end portions with inclined inner faces.

5. A rail joint bar having its central part thickened and its end portions relatively thinner than, and of a different cross section from, the thickened part, the thickness of the bar body being gradually increased from the end portions toward the center by

changing the angle of the inner face of the web part of the bar.

6. A rail joint bar having its central part thickened and provided with a substantially vertical inner face, and its end portions relatively thinner than said thickened part and provided with inclined inner faces.

In testimony whereof we hereunto affix our signatures in the presence of two witnesses.

BENJAMIN WOLHAUPTER.
EDWARDS F. SCHERMERHORN.

Witnesses:
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