April 28, 1925. 1,535,635

McLEOD THOMSON

HEAD FREE TYPE RAIL JOINT

Filed June 10, 1924 2 Sheets-Sheet 1

Fig. 1.

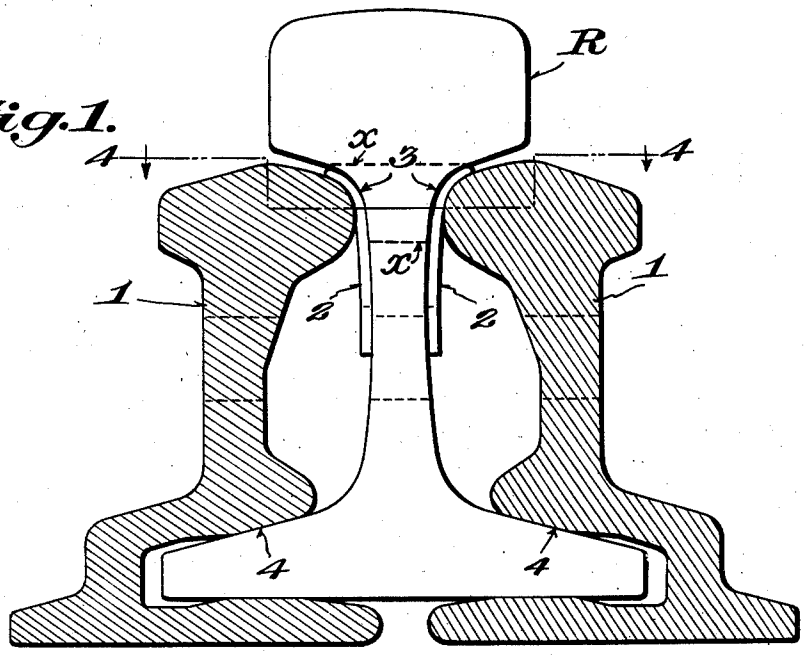


Fig. 2.

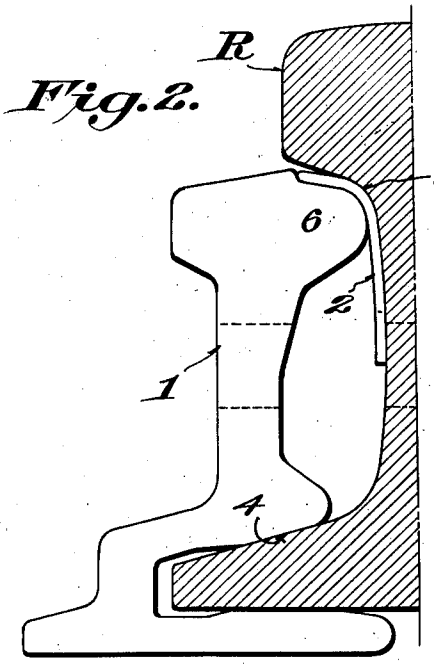
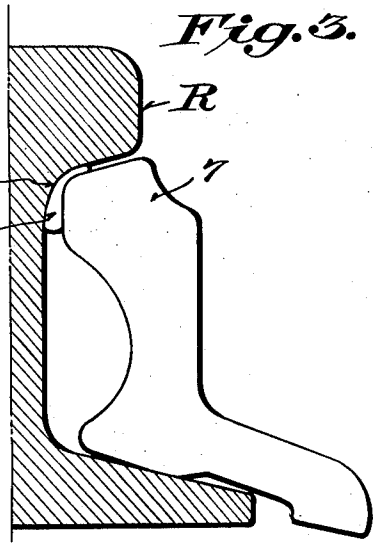


Fig. 3.



Inventor

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By D. P. Wolhaupter

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WITNESSES:-

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Filed June 10, 1924 2 Sheets-Sheet 2

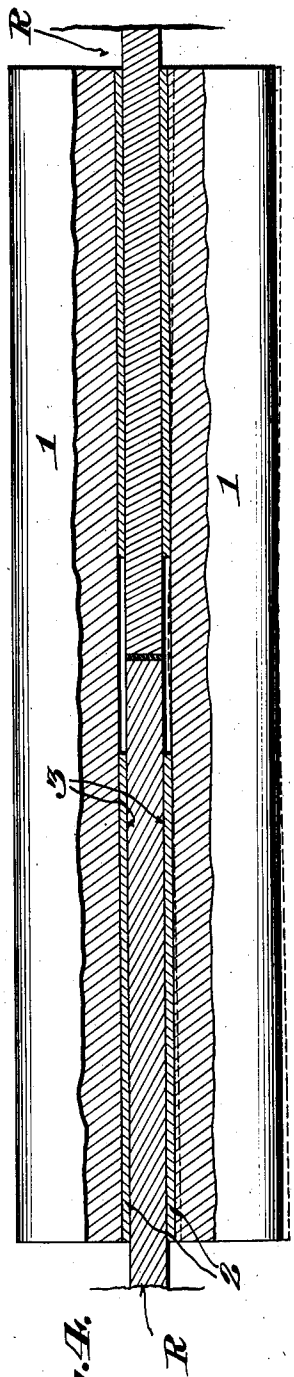


Fig. 4.

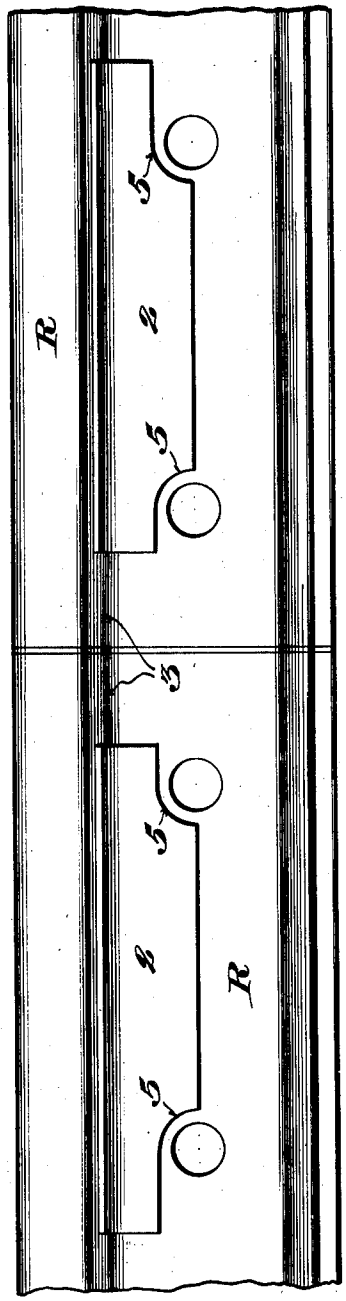


Fig. 5.

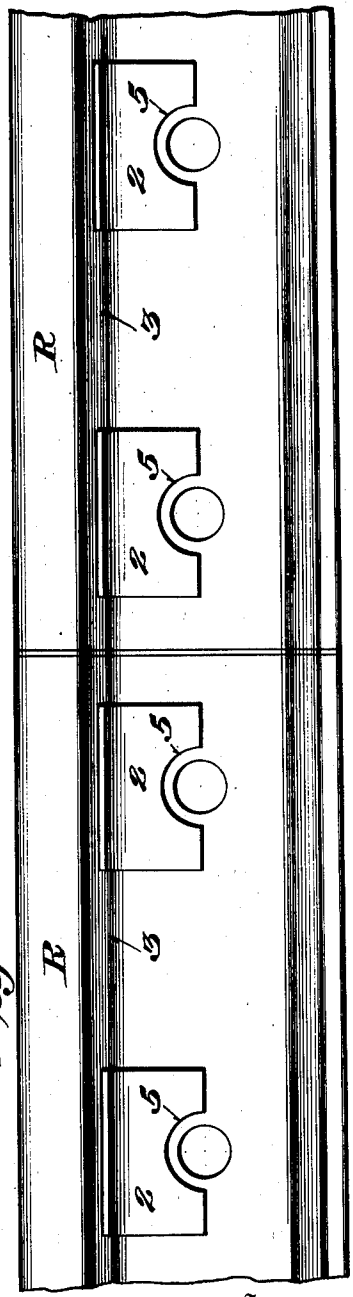


Fig. 6.

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Patented Apr. 28, 1925. 1,535,635

UNITED STATES PATENT OFFICE.

McLEOD THOMSON, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO THE RAIL JOINT COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

HEAD-FREE TYPE RAIL JOINT.

Application filed June 10, 1924. Serial No. 719,151.

To all whom it may concern:

Be it known that I, McLEOD THOMSON, citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Head-Free Type Rail Joints, of which the following is a specification.

This invention relates to the head-free type rail joint originating in the invention of the reissue patent of W. P. Thomson No. 15,773 dated February 19, 1924, and primarily has for its object certain supplementary features of construction which advantageously may be utilized to meet certain conditions and requirements.

The head-free type joint referred to is distinguished from other rail splicing structures in the characteristic of having head clearance from the underside of the rail head and a loading engagement at the head fillet of the rail, at the same time utilizing, in a new way, the wedge formation at the head fillet of the present standard rails whereby the head of the bar will have an upwardly and outwardly sliding bolt-tightening engagement with the rail head fillet. Many practical advantages accrue from these characteristic features and functions of the head-free type rail joint, and all of these advantages are conserved by the present invention which contemplates the employment of offsetting members or plates in such a way that the head of the bar will not only have head clearance from the undersides of the rail heads throughout the joint, but also will have no contact at all at the center or medial part of the joint. Principal objects to be attained by this supplement or addition to the invention of the reissue patent referred to are to make the joint quite efficient throughout the midsection of the splice bar by relieving that section of the necessity of withstanding all of the upright and transverse load strains, and also to relieve the end portions of the rails within the joint from any excess of pressure which might be exerted at the center of the joint due to any inwardly or upwardly convexed camber or irregularities left on the bar by the rolling mill operation. In that case, it will be understood that a central camber on that part of the bar head which has a loading engagement with the head fillet of the rail will have a tendency, when the bolts are tightened, to exert a somewhat greater pressure on the end portions of the rails at the center of the joint than elsewhere throughout the joint, with the result possibly of encouraging somewhat increased chafing between the rail ends and the bar at the center of the joint and tending to make the joint "high" at the center. With that condition in view the present invention proposes a structure which entirely will eliminate the effect of any camber or irregularity in the bar, at the same time providing increased flexibility in the joint bar enabling it better to accommodate itself to the rail wave motion in the rail and leaving the ends of the rails within the joint entirely free from loading engagement with the joint bars so that the movement of the rail ends within the joint due to temperature changes will not chafe or wear the bar heads.

Also, the invention contemplates a structure which can be utilized to convert old or conventional joint bar sections to the head-free type of rail joint.

With these and other objects in view which will more readily appear to those familiar with the art as the nature of the invention is better understood, the same consists in the novel combination of features, hereinafter more fully described, illustrated and claimed, and while a wide range of structural modification may be resorted to in carrying out the invention, certain practical and preferred embodiments thereof are shown in the accompanying drawings, in which:—

Figure 1 is a central vertical transverse sectional view of a rail joint, of the head-free type showing the features of the present invention employed in connection therewith.

Fig. 2 is a vertical half-end view of a rail joint embodying the present invention showing a modification that may be resorted to in the seating of one of the offsetting plates.

Fig. 3 is a view similar to Fig. 2 showing a conventional type rail joint bar converted, by the present invention, to a head-free type bar, performing the functions of a bar of that kind.

Fig. 4 is a sectional view on the line 4—4 of Fig. 1 showing the disposition of the offsetting plates to relieve the bar head from all rail contact at the center of the joint.

Fig. 5 is an inside elevation of the rail joint with the joint bar removed showing

one form of the offsetting plates that may be employed.

Fig. 6 is a similar view to Fig. 5 showing the use of a plurality of short offsetting plates between each rail and the joint bar.

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

The present invention requires no change in the construction of the rail nor in the construction of the joint bar, but in all forms of the invention the joint bar is of less fishing height than that of the rails so as to have clearance at least from the outer portion of the underside of the rail head in order that the bar head may have an indirect solid engagement with the rail head fillet to bring the head of the bar into solid resistance to load deflections. That may be clearly seen from the illustration of Fig. 1 of the drawings.

In Fig. 1 of the drawings the section there shown is at the center of the joint so that the rail end R appears in elevation, the two joint bars 1—1 in section and the offsetting plates 2 in end elevation. Thus, it will be apparent that the use of the offsetting plates 2 provides for holding the head of each joint bar entirely free from rail contact at the center of the joint, while at the same time permitting the bar to function as a head-free type. For that purpose each of the offsetting members or plates 2 is so shaped as to follow the contour of the head fillet 3 of the rail head, the outer surface of said plates also being adapted to the contour of the inner portion of the bar head so that the offsetting plates may be said to partake of and follow the wedge formation of the rail at the head fillet portion thereof between the dotted lines *x*—*x* of Fig. 1 of the drawings. Consequently, since each joint bar takes a fishing bearing on the upper inclined side of the rail flange as at 4 it will be evident that the tightening of the bolts will cause the foot of the bar as at 4 to ride inwardly and upwardly on the rail flange with a corresponding upward and outward movement of the head portion of the bar on its bearing member 2, causing the upper portions of the two joint bars to move outwardly against the heads and nuts of the bolts, the effect of which is to lock the nuts. Likewise the vertical load imposed on the rails by the traffic exerts a downward force or pressure on the rails so that the wedge portions thereof at their head fillets naturally have the tendency to spread apart the heads of the two bars forcing them outwardly in the same way that they are forced outwardly by the tightening of the bolts, thereby maintaining a tight joint.

It will be observed from Figs. 5 and 6 of the drawings that the offsetting members or plates 2 are arranged in spaced relation upon opposite sides of the meeting ends of the rails within the joint, and these offsetting plates may consist of relatively long one-piece plates 2 spanning a pair of bolt hole positions in the joint as shown in Fig. 5, or may consist of short spaced plates one for each bolt hole position as shown in Fig. 6. In either construction the medial or center part of the joint bar is free from rail contact thereby eliminating the effect of any camber or irregularity which may be prominent on the center part of the head of the bar (as suggested in Fig. 4 of the drawings), and thereby leaving the rail ends at the center of the joint free to move under the rail wave motion and free to work back and forth due to temperature changes without chafing or wearing the joint bar, thus prolonging its utility and life.

Various expedients may be resorted to for holding the offsetting members or plates 2 from displacement or movement longitudinally of the joint, but a practical means for accomplishing that result is shown in the drawings and consists in notching such plates as at 5 for interlocking engagement with the bolts; also if desired as suggested in Fig. 2 the inner part of the bar head may be recessed or notched as at 6 to provide a seat in which the offsetting member or plate may be interlocked with the bar.

That phase of the invention which provides for converting an old or conventional type joint bar into the head-free type bar is illustrated in Fig. 3 of the drawings wherein a rail head fishing type bar designated by the reference numeral 7 is of less fishing height than that of the rail to which it is applied and an offsetting member or plate 8 is shaped to the inner contour of the head of said bar and also to the rail head fillet at 9. This structure, when the bolts are being tightened, would function as the head-free type joint aforesaid as the head of the bar would have clearance from the outer portion of the underside of the rail head and the bearing member or plate 8 would necessarily follow or adapt itself to the upward and outward movement of the bar head. In this form of the invention as well as in any of the other forms it may be desirable to provide a more positive engagement between the head of the bar and the offsetting plate by knurling or milling coacting surfaces or faces, but in all embodiments the spaced offsetting plates are so arranged as to provide an indirect engagement between the heads of the bars and the rail head fillets so as to bring the heads of the bars into solid resistance to load deflections.

From the foregoing it is thought that the construction and function of the herein described invention will be apparent without further description and it will be understood

that 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 thereof.

I claim:—

1. A rail joint including rails, a joint bar having a bearing on the rail flanges and clearance throughout from the undersides of the rail heads, and offsetting members arranged to provide an engagement for the bar head at the rail head fillets to bring the bar head into solid resistance to load deflections.

2. A rail joint including rails, a joint bar having a bearing on the rail flanges and clearance throughout from the undersides of the rail heads, and a plurality of spaced offsetting members interposed between the bar head and the head fillets of the rails.

3. A rail joint including the rails, a joint bar having a bearing on the rail flanges, and clearance from the rail heads, said bar also having a loading engagement at the head fillets of the rails only at opposite sides of the center of the joint.

4. A rail joint including the rails, a joint bar having head fishing clearance throughout from the undersides of the rail heads and a fishing engagement with the rail flange, said bar head being free of all rail contact at the center of the joint and having a loading engagement at the head fillets of the rails at both sides of the center of the joint.

5. A rail joint including the rails having a wedge formation at their head fillet portions, a joint bar having head fishing clearance throughout from the rail heads and offsetting plates for the bar head fitting and following the contour of the wedge-like head fillet portions of the rail, said plates being arranged to leave the bar head free of all rail contact at the center of the joint.

6. A rail joint including the rails, a joint bar having rail base fishing contact and head fishing clearance from the rails, and offsetting plates engaging the rail head fillets and the bar head at opposite sides of the center of the joint, said plates having upwardly and outwardly inclining outer surfaces and arranged to leave the bar head free of all rail contact at the center of the joint.

7. A rail joint including the rails, a joint bar having head fishing clearance throughout from the underside of the rail heads, and offsetting plates fitting and following the contour of the head fillets of the rails, and arranged to leave the bar head free of all rail contact at the center of the joint, said plates having means preventing longitudinal displacement thereof.

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

McLEOD THOMSON.

Witnesses:

MILTON MARKLEY,

ELISABETH H. FACTLU.