

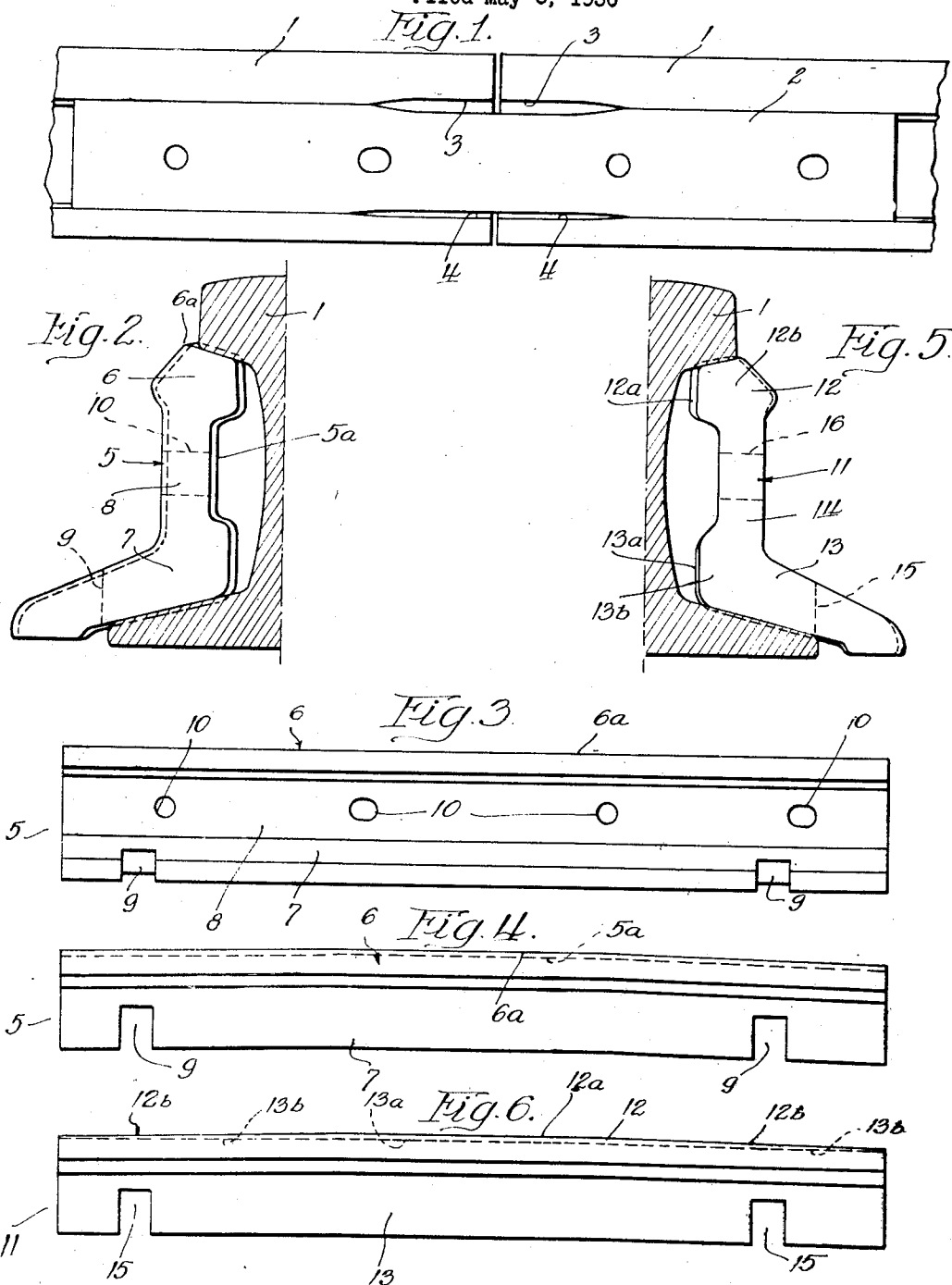
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RAIL JOINT BAR

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## UNITED STATES PATENT OFFICE

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## RAIL JOINT BAR

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This invention relates to rail joint bars, and more particularly to bars adapted for use with worn rails.

In a rail joint using bars of ordinary type, wear develops at the center one-third of the bar, in a short bar, or at the center one-fourth of the bar, in a long bar. A short bar is a bar of approximately twenty-four inches in length and a long bar may be thirty-six inches or more in length. This wear is concentrated at the center of the joint, both the rail ends and the bars becoming worn, the wear at the head of the joint being greater than at the foot or flange of the joint. This center wear is characteristic of rail joints of ordinary type and is familiar to those skilled in the art. As wear progresses, the bars are pulled into the rail by bolt tension, there being draw space between the head and the flange of the bars and the webs of the rail ends, for this purpose. When this draw space has been used up, the bars must be removed and replaced. The bars which replace the worn bars, must have tight center contact with the rail ends to assure proper tightness of the joint.

It is known to provide crowned bars to be used with worn rail ends, such bars being of increased fishing height at their center portions to fit into the worn rail ends. Such bars are not adapted for use with new or unworn rails. It is also known to provide curved bars for fitting to worn rails. The curved bar is known in the art as a bar which is curved inwardly lengthwise of the bar so as to extend further inward at its center portion than at its end portions, such bar being of suitable fishing height to fit worn rail to which it is applied. In such a bar the head and the flange, as well as the web element, are all curved lengthwise of the bar and have the same degree of curvature. The curving of the web element is objectionable as rendering it difficult to accurately punch the bolt holes. The curving of the flange to the same extent as the head is objectionable, since this tends to dispose the spike slots outwardly beyond the rail flange so that the spikes will not act to maintain the gauge of the track. A further objection to the curved bar of present type, above referred to, is that the head and the flange have the same degree of inward curvature and the difference in wear between the head and the flange of the rail is not accommodated.

One of the main objects of my invention is to provide a rail joint bar properly shaped to fit worn rails, such bar being capable of use with but slightly worn or unworn rail. A further object

is to provide a bar which accommodates the difference in wear between the head of the rail and the flange thereof. Another object is to provide a bar in which the flange has but slight curvature so that the spike slots may be so disposed as to assure contact of the spikes with the rail flange. Further objects and advantages of my invention will appear from the detailed description.

In the drawing:

Figure 1 is a side view of a rail joint of ordinary type showing the center wear of the joint, the bar being shown as a flat strap;

Figure 2 is an end view of a curved bar of present type as applied to a rail end;

Figure 3 is an outer side view of the bar of Figure 2;

Figure 4 is a plan view of the bar of Figure 2;

Figure 5 is an end view of the bar of my invention as applied to a rail end;

Figure 6 is a plan view of the bar of Figure 5.

In Figure 1 of the drawing I have shown, semi-diagrammatically, a rail joint of ordinary construction comprising the rail ends 1 at each side of which is disposed a bar 2, these bars being secured to the rail ends by bolts passing through the bars and the webs of the rail ends. The bolts have been omitted, and the bar 2 has been shown as a flat strap, for clearness of illustration. After the joint has been in service for some time, wear develops at the center of the joint, both the bars and the head and the flange of the rail ends being worn. The wear of the rail head is greater than the wear of the rail flanges, as will be clear from Figure 1 in which the head wear is indicated at 3, the flange wear being indicated at 4. After the bars 2 have been worn out, due either to the draw space being used up or undesirable looseness at the center of the joint, they are removed and replaced by other bars suitably shaped to fit the worn rail ends. It is known to provide curved bars for this purpose. In Figure 2 I have shown a curved bar 5 of known type applied to a worn rail end 1. This bar is curved inwardly lengthwise and throughout its entire cross section, head 6, flange 7 and web element 8 of the bar being all similarly curved. When this bar is applied to worn rail, the center portion 5<sup>a</sup> thereof projects inwardly beyond the end portions of the bar so as to fit into the worn rail ends. In this bar the flange 7 has a decided inward curvature with the result that the spike slots 9 are disposed outwardly beyond the flange of the rail, which is objectionable. It will also be noted that the web

element 8 is curved inwardly lengthwise of the bar but has its sides vertical and straight, this curvature of the web element being objectionable as rendering it difficult to accurately punch the bolt holes 10 therethrough.

In Figure 5 I have shown a bar 11 constructed in accordance with my invention, as applied to worn rail 1. This bar comprises a head 12, flange 13 and a connecting web 14. The head element 12 is curved inwardly lengthwise of the bar so that the center portion 12<sup>a</sup> thereof projects inward toward the web of the rail to a greater extent than the end portions 12<sup>b</sup>. The web element 14 is uncurved and straight lengthwise of the bar, and the flange or foot element 13 is curved inwardly lengthwise of the bar so that its center portion 13<sup>a</sup> projects inward toward the web of the rail to a greater extent than the end portions 13<sup>b</sup>. In this bar the head and the flange are both curved inwardly lengthwise of the bar so that their inner sides are convexed lengthwise of the bar, but these elements are curved independently so that they accommodate differences in wear between the head and the flange of the rail. My bar thus accommodates difference in wear between the head and the flange of the rail, which is advantageous as assuring accurate fit of the bar to the rail end. A further advantage of my bar is that the flange element 13 need have but slight inward curvature, so that the spike slots 15 thereof are disposed to assure contact of the spike with the rail flange for maintaining the gauge of the track. It will also be noted that the web element 14 of my bar is free from inward curvature, its sides being vertical and straight. This is a decided advantage over the curved bar of present type in which the web element is curved lengthwise of the bar, in that the bolt holes 16 are disposed perpendicular to the plane of the web 14 and can be punched with accuracy and facility. The bar of Figure 5 is shown in plan view in Figure 6 from which it will be noted that the degree of inward curvature of the flange is less than that of the head.

The bar of my invention illustrated in Figures 5 and 6 may vary in fishing height, depending upon the rail to which such bar is to be applied. In Figure 5 I have shown my bar as applied to worn rails, the inward curvature of the head and the flange elements being such that the bar fits accurately into the worn head and flange of the rail. Such a bar is also capable of being used on new rail or rail which is but slightly worn or unworn rail. When applied to rail which is new or is not worn to an appreciable extent, the ends of the bar may be flexed inwardly slightly by bolt tension so as to be pulled into tight fishing contact with the rail ends. In this connection, it is noted that the head 12, which has the greater inward curvature, is of much less width than the flange 13 and can readily be pulled inwardly to the rail without placing the entire cross section of the bar, particularly the flange, under excessive or objectionable lateral stresses. In this respect, the slight inward curvature of the flange, relative to the head, is advantageous when fitting the bar to

new rail or rail which is not worn to an appreciable extent.

Preferably the inward curvature or concavity of the outer side of the head and the outer side of the flange of the bar is less than the inward curvature or convexity of the inner sides of these elements. This is advantageous as properly disposing the spike slots 15, as previously stated, and also has the advantage that the ends of the head of the bar do not project outwardly beyond the rail head to an objectionable extent. In this respect my bar is a distinct improvement over the ordinary incurved bar of Figure 2, in which the ends of the head of the bar project outwardly beyond the rail head to an objectionable extent, as indicated at 6<sup>a</sup>. I have shown the curvatures of the head and the flange elements of the bar as defined by straight lines though such elements may be true curves. It will also be understood that my invention is applicable to bars of various types, either crowned or of uniform fishing height, as well as to bars of other than normal fishing height.

What I claim is:

1. A rail joint bar having a head element and a foot element adapted for both center and end fishing contact with the rail ends when the bar is applied in a joint, both of said elements being curved inward of the bar when the bar is out of a joint and free from lateral tension, said elements having different degrees of curvature.

2. A rail joint bar having a head element and a foot element adapted for both center and end fishing contact with the rail ends when the bar is applied in a joint, said elements being curved inward when the bar is out of a joint and free from lateral tension and having different degrees of curvature, the inner side of one of said elements having a different degree of curvature than the outer side thereof.

3. A rail joint bar having a head element and a foot element adapted for both center and end fishing contact with the rail ends when the bar is applied in a joint, the inner sides of the respective elements being convexed laterally lengthwise of the bar and having different degrees of curvature, when the bar is out of a joint and free from lateral tension.

4. A rail joint bar having a head element and a foot element adapted for both center and end fishing contact with the rail ends when the bar is applied in a joint, the inner sides of the respective elements being convexed laterally lengthwise of the bar and the head element having a greater degree of curvature than the foot element, when the bar is out of a joint and free from lateral tension.

5. A rail joint bar comprising a head element, a foot element and a web element, the head element and the foot element constituting the contacting elements of the bar and being adapted for both center and end fishing contact with the rail ends when the bar is applied in a joint, one of said elements being curved inwardly and of a different degree of curvature than the other contacting element and the web element being substantially straight laterally.

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