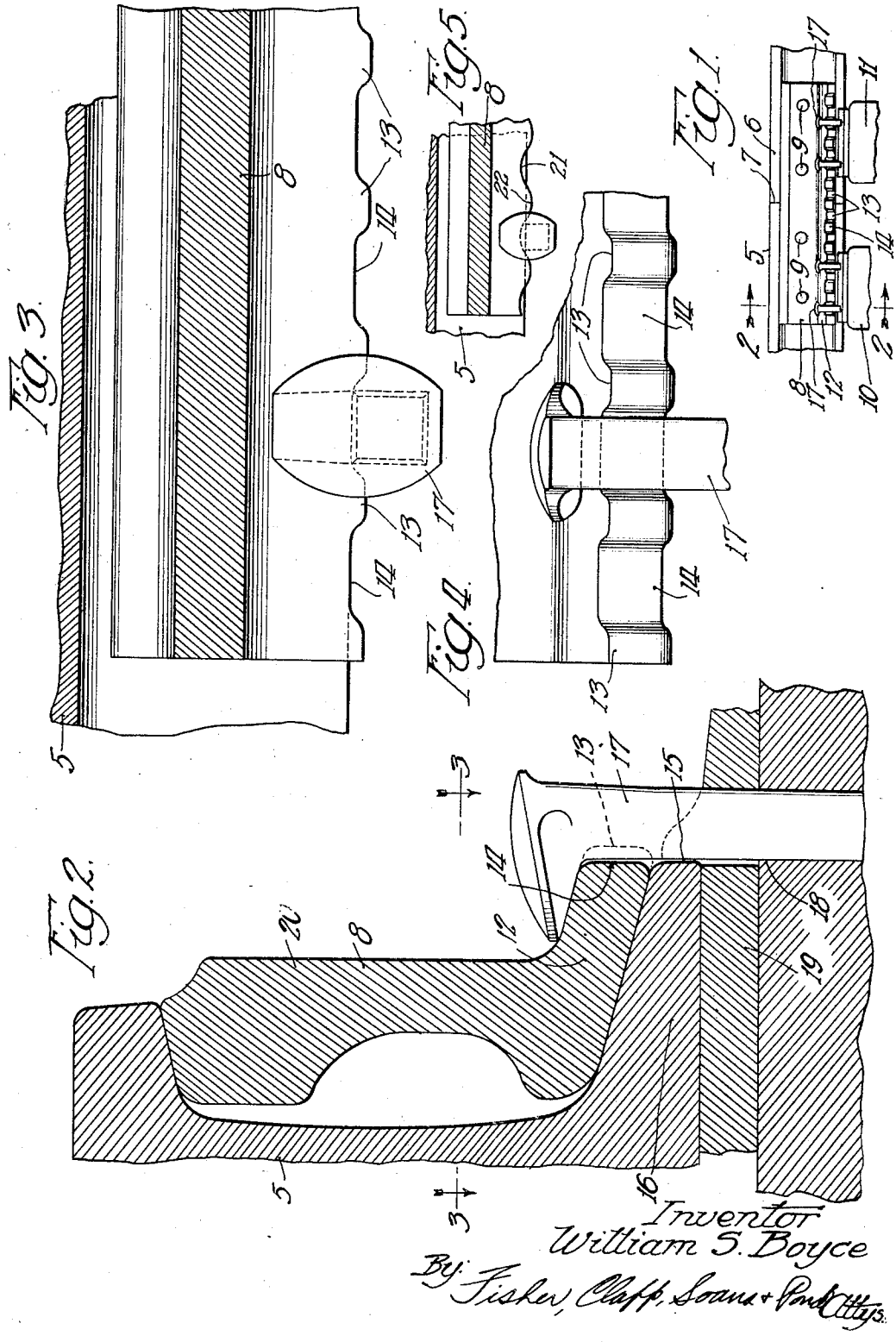
April 19, 1932. W. S. BOYCE 1,854,921

ANGLE BAR FOR RAIL JOINTS

Filed June 18, 1930



Patented Apr. 19, 1932 1,854,921

UNITED STATES PATENT OFFICE

WILLIAM S. BOYCE, OF CHICAGO, ILLINOIS

ANGLE BAR FOR RAIL JOINTS

Application filed June 18, 1930. Serial No. 461,903.

This invention relates to an angle bar for a rail joint and has for its main object to provide an improved angle or rail joint bar which will facilitate the anchoring, both against vertical displacement and horizontal shifting or creeping, of the rail relative to the rail support or tie, without requiring accuracy in the positioning of the tie or ties relative to the location of the joint between the ends of two rails.

Other objects and advantages of my invention will be understood by reference to the following specification and accompanying drawings in which I have illustrated an angle bar embodying a selected form of my invention.

In the drawings:

Fig. 1 is a side elevation on a small scale of a rail joint in which my improved angle bar is used for connecting the adjacent ends of two rails.

Fig. 2 is a partial section on the line 2—2 of Fig. 1.

Fig. 3 is a section on the line 3—3 of Fig. 2.

Fig. 4 is a fragmentary side elevation of a portion of my improved angle bar, and

Fig. 5 is a plan section similar to Fig. 3, but on a smaller scale and showing a modified arrangement.

Referring now to the drawings, I have indicated in Fig. 1, the end portions of two rails 5 and 6 which are joined, the ends of the rails abutting or nearly abutting as indicated at 7. In more or less standardized practice, the ends of two rail lengths are connected by means of a pair of angle bars, one disposed on each side of the rail and connected to each other by means of bolts extending through suitable openings in the two angle bars and through the interposed webs of the rails.

The angle bars used on both sides of the rail, i. e. on the inside and outside, may conveniently be of like construction. Accordingly, I have illustrated only one side of the rail and one angle bar as applied to one side of the rail joint. In Fig. 1, I have illustrated my improved angle bar at 8 connected to the rails 5 and 6 and to the angle bar on the opposite sides of the rails by means of bolts 9.

Some railroads have adopted a standard requirement that each rail joint be located immediately over a tie while other railroads have adopted a standard requirement that the rail joint be supported by two ties, one located at each end of the angle bars, in which case the abutting ends of the rails are disposed intermediate the ties. Still other railroads make no special requirement as to the location of the ties with respect to the rail joint.

Where there are definite requirements as to the location of the ties with respect to the joint between the rail ends, the base flanges of the angle bars used by such railroads often extend beyond the edges of the base flanges of the rail and the extending or projecting edge portions of the angle bar flanges are provided with punched-out notches of considerable depth, which permit a spike to be driven into the supporting tie through the notches. The notches are ordinarily of such depth that the spike will be positioned closely adjacent the edge of the rail base flange. This practice has been found quite objectionable for the reason that the punching-out of metal to form the spike receiving notches results in the production of numerous incipient fractures which, in time, result in complete breakdown of the angle bar and ultimately of the rail joint.

In order to overcome this objection of weakened angle bars, some railroads have adopted as standard, or at least for experimental purposes, an angle bar in which the base flange is only of such width that its outer edge will be substantially coplanar with the outer edge of the base flange of a rail to which the angle bar is applied. The spikes may then be driven into the tie closely adjacent the outer edges of both the rail base flange and the angle bar base flange.

Where the base flange of an angle bar is of the last described type, i. e. of narrow width and free from spike receiving notches, there is a more or less serious objection present by reason of the fact that there is a total loss of the anti-creeping function of the spikes when used in angle bars having notches for receiving the spikes. Hence, it appears

that an advantage gained by avoiding weakening of the angle bars is more or less offset by the loss of the anti-creeping effect of the spike when notched angle bars are used.

Another long recognized objection to the notched type of angle bar is found in the fact that because of the weakening effect of the punched notches, it has heretofore been necessary to limit the number of notches to the absolute minimum requirement for each installation which ordinarily has been two notches, one located adjacent each end of the angle bar. The necessary limitation of the number of notches and the consequent limitation as to the location of the spike with respect to the length of the angle bar also involves the necessity of accurately positioning the rail supporting ties in such position that the spikes will enter the same at a point spaced well inwardly from either side of each tie. Such positioning of the ties often requires the expenditure of much labor and consequent expense, especially where new rails are being laid on old road bed. It is further objectionable to shift the ties from their original position where the road bed has been well packed to relatively unpacked road bed, since such shifting would require constant raising and filling under the ties to maintain the level of the rails.

By my present invention, I overcome all of the objections above noted which result from the various practices heretofore indulged in by various railroads while at the same time obtaining substantially all of the benefits of each of the various practices above outlined.

As shown in Fig. 1, the rail joint is supported by two ties designated 10 and 11 respectively, the tie 10 being located substantially under the end of the angle bar 8 and the tie 11 being located well inwardly from the other end of the angle bar 8. Where the tie is located with respect to the end of the angle bar as the tie 10 is located with respect to the angle bar 8, the notch provided in the prior notched type of angle bar would be located well within the width of the tie so that a spike driven through the notch would be well anchored in the tie and because of the notched angle bar, it would have considerable anti-creeping effect on the rail. However, in instances where the tie is positioned with respect to the end of the angle bar as is the tie 11 with respect to the angle bar, it would be impractical to drive a spike into the tie at the location of a notch in the prior art notched type bars for the reason that if the spike would enter the tie at all, it would be so near the side of the tie as to split the latter, whereby all practical holding power of the spike would be lost.

In my improved angle bar, the base flange 12 is provided in its outer edge with a plurality of projections 13 which form recessed seats 14. The recessed seats thus formed are spaced longitudinally of the bar and thus afford a wide selection of locations in which the spike may be driven into the tie. Hence, it is not important that the tie be accurately positioned with respect to the rail joint or end of the angle bar where my improved angle bar is used.

As clearly shown in Figs. 2 and 3, the arrangement is preferably such that the recessed seats 14 are substantially coplanar with the outer edge 15 of the rail base flange 16. A spike 17 may then be positioned at one of the recessed seats 14 so that the inner side 18 of the spike is disposed closely adjacent the outer edges of both the rail base flange and the angle bar base flange to thereby prevent sidewise displacement of the rail. The projecting base flange portions 13 of the angle bar are obviously effective to engage the opposite sides of the spike so as to prevent creeping of the rail.

In Figs. 1 and 2, I have illustrated tie plates 19 interposed between the base of the rail and the tie in accordance with the practice as adopted by many railroads. Tie plates having standard punching for spikes may readily be used at the joints where my improved angle bar is used, since the location of the spike with respect to the angle bar is not restricted as in the case of the prior art punched angle bars. It is, of course, to be understood that the tie plates are desirably, if not necessarily, located entirely over ties so as to be fully supported thereby and that where prior art punched angle bars are used, it is necessary to accurately position the tie so that the tie plate will be located entirely over the tie and with the further requirement that the tie and tie plate be so positioned that the spike holes in the tie plate will register with the punched notch of the angle bar. Obviously, with my improved angle bar, only a minimum amount of shifting will be required to align the spike holes of a tie plate with one of the recessed seats in the edge of the angle bar.

The structure of the vertical web portion 20 of my improved angle bar may be of any desired form and the thickness of the base flange 12 may be of any desired thickness to provide the required strength. The recessed seats 14 and projections 13 may readily be formed by swaging or by rolling operation as an incident of the rolling of the angle bar. By thus forming the projections and seats, I avoid the formation of incipient fractures, such as above referred to.

The outer edge of the base flange 12 of my improved angle bar may be provided throughout its length with a plurality of alternately arranged seats and projections as above described or, if desired, a series of such seats and projections may be formed adjacent each end of the angle bar or at any

other desired location in the length thereof. Preferably, the entire length is provided with regularly spaced seats and projections which in this instance are illustrated as being of such proportions that the projections are considerably narrower than the widths of the seats. By this means, a wide range of adjustment, i. e. of possible spike positions, is provided.

In Fig. 5, a modified arrangement of alternate seats and projections is shown. In this form the seats and projections are formed by alternately arranged, substantially like undulations 21 and 22. Preferably, the undulations 21 are recessed into the edge of the base flange of the angle bar (with respect to the normal edge thereof) substantially the same amount that the undulations 22 extend outwardly from said edge. Hence, if the normal edge of the bar is aligned with the edge of a rail base flange, there will be a plurality of spaced angle bar portions projecting beyond the edge of the rail base flange while the latter projects the same amount beyond the bottom of the inward undulations. Spikes may be driven selectively between any of the adjacent projecting undulations to provide the anti-creeping effect of the spike on the rail. This form is desirable in some instances for the reason that the angle bar need be of no different (either heavier or lighter) weight than the heretofore used angle bars having a narrow base flange, the edge of which is normally aligned with the edge of the rail base flange. It will be observed that the metal extending beyond the rail base flange in my modified construction is substantially equal in bulk to that recessed into the flange beyond the normal edge thereof. Hence, the weight and cost of my improved, modified form, of bar need be no greater than that of the prior art forms of angle bars while at the same time, having the desirable feature herein described. In some respects this modified form of structure is somewhat easier to manufacture and accordingly of further advantage.

I am aware that changes may be made in the above described construction without departing from the spirit of my invention, the scope of which should be determined by reference to the following claims, the same being construed as broadly as possible consistent with the state of the art.

I claim as my invention:

1. An angle bar having a base flange provided with a series of projections on its outer edge forming a series of recessed seats spaced longitudinally of the bar, said projections and the recesses formed thereby being of such size and shape as to be adapted to be swaged in the base flange.

2. An angle bar having a base flange provided with a series of projections on its outer edge forming a series of recessed seats spaced longitudinally of the bar, said projections and the recesses formed thereby being of such size and shape as to be adapted to be rolled in the base flange as an incident to the rolling of the angle bar.

3. An angle bar for a rail joint, having a base flange, the width of said flange being such that the outer edge thereof will be substantially coplanar with the adjacent edge of the base flange of a rail to which the angle bar is adapted to be applied, and a series of recessed seats spaced longitudinally of the bar at relatively narrow intervals for receiving a spike selectively in a wide range of locations relative to the length of the bar.

4. An angle bar for a rail joint, having a base flange provided with a series of uniformly spaced projections at relatively narrow intervals on its outer edge forming a series of recessed seats spaced longitudinally of the bar for selectively receiving a spike in a wide range of locations relative to the length of the bar.

5. An angle bar for a rail joint, having a base flange provided on its outer edge with a series of projections of less width than the spaces intermediate the projections, said spaces forming a series of recessed seats spaced longitudinally of the bar for the purpose described.

6. An angle bar for a rail joint, having a base flange provided on its outer edge, throughout its entire length, with a plurality of alternately arranged, substantially like undulations forming projections adapted to position a spike longitudinally of the angle bar.

7. An angle bar for a rail joint, having a base flange provided on its outer edge, with a series of alternately arranged, substantially like undulations forming projections adapted to position a spike longitudinally of the angle bar.

8. An angle bar for a rail joint, having a base flange, the width of said flange being such that the normal outer edge thereof will be substantially coplanar with the adjacent edge of the base flange of a rail to which the angle bar is adapted to be applied, and a series of alternately arranged, substantially like undulations forming projections for the purpose described.

WILLIAM S. BOYCE.