

work there is no one thing of so much importance, or that affects tracks so much, as the joints. Considering from this fact the importance of the subject & the amount of money, time & study that has been expended on attempting to perfect rail joints, & yet your committee are strongly of the opinion that the best that has been produced that they have had practical experience with is still lacking, or has failed to fully meet the requirements. Our experience is from the old wrought iron chair to the plain fish-plate with the tie directly under the joint. Then came the 2 tie angle bar & later the 6 hole 40 ins. angle bar supported with 3 ties, & later still the 44 ins. angle bar supported the same as the 40 ins., with 3 ties, & at present we have a 4 hole angle bar supported on 2 ties.

Our experience has been that wherever joints have been supported with a tie directly under them, whether with the plain fish-plate, or the 3 tie 6 hole angle bar, the results have been better than with the 4 hole angle bar with the joint suspended between ties. The new angle bar with 4 bolts & 2 ties, suspended joint, is, we consider, a decided improvement over the old one in its general make-up. Instead of slats in the edges for spikes the holes are through the web or flange. This gives the full benefit of the 4 spikes against spreading, but with the improvements in this joint over the old 2 tie suspended joints we have been unable to see where the defect has been remedied, or the cause removed, or the necessity provided for that we have found to exist with a suspended joint.

The 40 & 44 ins. angle bars have the appearance of a waste of material, & this of course means expense for which no benefit is derived.

Up to the present our experience is & we beg to report, based on experience, that the suspended joint has been a failure, & even with the improvements on the present suspended joint we do not feel free to recommend it as being all that it should be, but, to the contrary, believe that they must get their support from underneath, and we consider that the energy spent & the efforts put forth to produce a satisfactory joint have not been productive of the result desired.

The adoption of the report was moved:

MR. JELLY.—I have had in use the 44-inch angle bar supported joint, also the 4-hole joint non-supported, & I find so far that the supported joint 44-inch angle bar is the best I have used. I do not at all approve of the suspended joint. With the old style we have had in use 56-lb steel, & have had the suspended joint & also the plain angle bar, & you could tell the very first rail length when you had left the suspended joint. The rails with the supported joint were in good order when the others were all battered down in the joints & in very bad shape. I consider that there is a difference of at least 3 years in the life of the rail between the supported & the suspended joints in favor of the supported joints. Of course, so far as the joint is concerned, I do not know that the long angle bars meet with my entire approval. I find that it is too long & that the quarter gets down at the back about 5 or 6 ft. from the joint, & I find that is the weak point. Of course you cannot shorten up the angle bar so long as you have 3 ties under it, but, so far, that is the best rail joint I have had anything to do with.

MR. R. SHANKS.—From what experience I have had I do not favor the suspended joint, but at the same time I cannot altogether approve of the 44-inch bar. I find that in quite a number of cases you have to tighten up bolts. Like Mr. Jelly, I have had a good deal of trouble with the rail giving back from the end of the bar about 2½ ft.

MR. KELLY.—I am much of Mr. Shanks' opinion. I find some difficulty with the 44-inch angle bar. The expansion is the greatest difficulty. I do not find the rails giving

so badly in the quarters, but the expansion is very troublesome. The 73-lb rail has a much higher neck than the lighter one, & with it the suspended joint makes a fairly good joint when well-tested, but with the light rail I think that the suspended joint is a complete failure.

MR. LESLIE.—We have about 80 miles of 44-inch angle bars & about 50 miles of suspended joints on our Eastern Division. My opinion is that the long angle bar with supported joint makes the better joint. We have not had a very great experience with either long or suspended joints, & do not know what the results may yet be; but up to the present the long angle bar has in my opinion proved to be a good substantial joint. Of course, as Mr. R. Shanks said, there may be a tendency to prevent the expansion from closing, thus causing the rail to sink where the shoulder is weak. I find that this is the case very often. Still it comes nearer to making a good substantial joint than anything I have had anything to do with.

MR. MALLOY.—In regard to the question of joints, I am of the same opinion as many others who have spoken, that is that we have not a perfect joint yet. The 40-inch angle bar, though, I find is the nearest perfect that I have yet seen in my experience as a foreman. The only objection I have to the 40-inch angle bar is that I have to expend extra labor on our rails back from about 2½ to 6 ft. from the end of fish plate to give it more support. We always give that part of the rail the preference in order to keep it from sagging down. Otherwise this is the best joint I have ever used. I have always found that the supported joint was the best & gave the most satisfaction, & have always noticed the difference when you got on to the suspended joint, even when sitting in a coach. As far as expansion is concerned, I have had very little experience with the 40-inch bar where the shoulders were narrow, but I did find that the bar hugged the rail the tightest of any angle bar I had anything to do with. However, I do not altogether approve of it, as there is far too much support for the rail back from the end. The full strength of the fish plate is in that part of the rail more than it is at the extreme point. Otherwise I believe it is the best joint we have as far as I have had any experience.

MR. BRENNAN.—I would prefer the plain strap to any other for my part, but I have had little experience with suspended or supported joints.

MR. J. SHANKS.—I have had some experience with the iron angle bar used on 60-lb. rails, & find it to be a complete failure, as the rails cut into the angle bars so badly that they are split right up & down the same as if there was no support under the head of the rail at all. Of course the old plain fish plate did very well with the 56-lb. rail when supported by a good joint tie. As for the angle bar, for the heavier 72-lb. rail, I could not really find any fault with that. As far as I have had any experience of it it has answered the purpose very well. I have not been bothered any with rails bending, but I think it is a waste of material, & might be shortened up to about 40 inches or as short as could be used on 3 ties to prevent the creeping of the rail. As for throwing out of line on account of hot weather, I have not been troubled with anything of that kind, but this may be caused from a number of trains going over the road, which shakes them around considerably & causes rails to creep. With only a few trains it might possibly be worse, & in using the 40-inch angle bar, or something as short as we can use to use slots on the next side to the joint, I think it would be an improvement to use the ¾ bolt with a square nut. As to the hexagonal nut I do not think very much of it, as it is impossible to keep wrenches in good enough condition to tighten up the bolts properly, & it is only a matter of time until

some of them will become nearly round, which would make it impossible to tighten them, & they would have to be renewed. As for the suspended joint that we use on the 73-lb. rail, there is no doubt it is a great improvement over the old iron ones we used to use on the 60-lb. rail, as we get the strength of our inside spikes on account of being directly through the angle parts of the fish plate. At the same time I think that the rail as a general thing batters worse on a suspended joint both on heavy & light rails.

MR. MORIN.—I have not had much experience with 72-lb. steel rails. I have only been a little while with Mr. Shanks, & have not had much time to learn about joints. Of course I have always had the old 56 & 60-lb. rail with straight fish plate & angle bar fish plate, & find the old angle bar of very little use. The old fish plate answered fairly well with the 56-lb. rail. I have not had much experience with these new fish plates. With double tracks I think it would be a very good idea not to have both ties the same size on the joint, but have one large & one small, because when the wheel gets off one end of rail the other goes down more. Where there is good ballast we used 73-lb. rail with 4 bolt holes, & results are pretty good as long as the joints are properly fixed & the ties pretty well together—not more than 4 inches between each. There is a good deal of trouble on account of ties not being properly fixed up & bad ties being used. Of course the old straight fish plates would answer better for such places.

An amendment by Messrs. Jelly & Graham, that the report be laid over for future discussion, was carried.

MISCELLANEOUS BUSINESS.

MR. LESLIE.—Some years ago the New England Roadmasters' Association adopted the principle of putting the big end of tie inside of curves. No doubt some of the roadmasters here can enlighten us as to this practice. I have been trying that method & would like to ask gentlemen here what their opinion of this is.

THE PRESIDENT.—I think it would be well to have this subject brought up at our next annual meeting.

MR. CARON exhibited to the members his patent nut lock.

It was decided to hold the next annual meeting of the Association at Toronto on the third Wednesday of September, 1899, & the following subjects were decided on for discussion, the names appended to each being those of the Committees appointed to report on them.

1. TRACK TOOLS.—J. Drinkwater, A. McAuley, & W. Shanks.

2. EXPANSION OF DIFFERENT WEIGHT OF RAILS.—J. Shanks, J. Graham, & J. Leslie.

3. PLACING OF TIES & TRIMMING BALLAST.—E. Murphy, T. Hickey, & J. Malloy.

The question of publishing the proceedings in pamphlet form was left to the Executive Committee.

On motion of Messrs. Jelly & Graham it was decided to recognize THE RAILWAY & SHIPPING WORLD as the organ of the Association.

On the motion of the same members a resolution was adopted expressing condolence with the family of the late Mr. Thomas Newman, C.P.R. Roadmaster at Schreiber, Ont.

THE PRESIDENT.—Before closing I would like to say a few words in connection with the Association. I believe it was organized for the purpose of getting together & discussing railway matters, which would eventually prove a benefit to each member & also a benefit to the roads represented by roadmasters who attend these meetings. Now, I think the roadmaster is in perhaps a little different position than any other employe of a railway. In fact, he is in rather a peculiar position. He is all right when he starts from the beginning as a