

# Electric Railway Department

## A New Trussed Rail Joint on the London Street Railway.

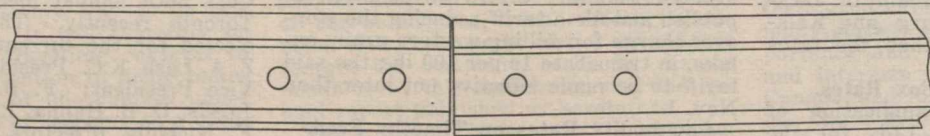
By C. B. King, Manager, London Street Railway.

That necessity is the mother of invention was again proved when we found it necessary to devise some kind of rail joint that could be used to repair tracks more permanently than any we had used previously. Quite a lot of the track had become worn at the joints, by reason of the joints working loose, allowing the ends of the rails to become bent down and badly pounded. It was also realized that some kind of joint was needed which would overcome the peening effect of the wheels causing the rails to arch up in the centre and which increased the bending down of the ends. Various kinds of

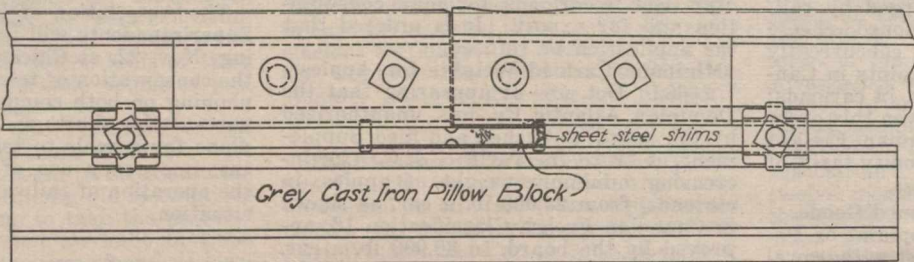
kind of joint that would hold the extreme ends of the rails rigid, and yet with some degree of independence of each other, to that the worn rail might be lifted more than the other.

With these conditions to meet various experiments were made which resulted in a joint shown in the accompanying illustrations. The essential feature of this joint is the special cast steel clip, which clamps the base of the running rail to the base of the inverted rail used as a truss. As these clips are drawn up, the slopes on the bases of the rail cause the truss rail to be raised. This motion is

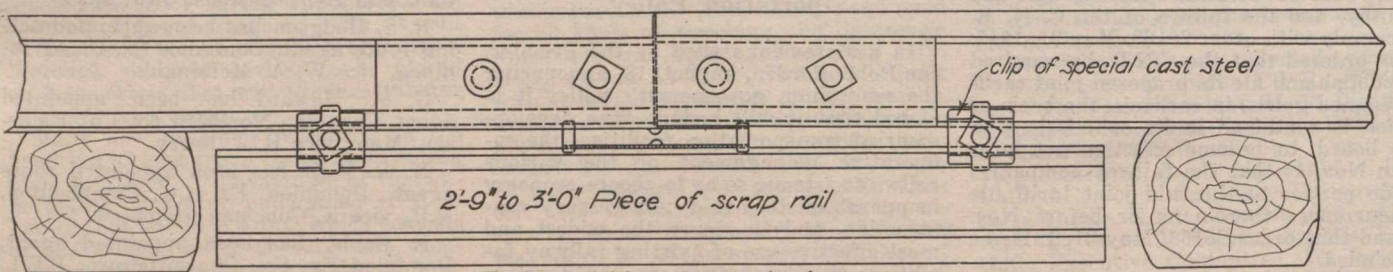
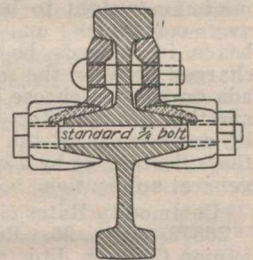
of the clip, it is, however, drawn up as close as possible with the bolt. For an 80 lb. rail, or lighter, a  $\frac{3}{4}$  in. bolt has been found most satisfactory, but with a rail having a thicker base, a  $\frac{5}{8}$  in. or even a  $\frac{1}{2}$  in. bolt may be used. When using a  $\frac{3}{4}$  in. bolt the pillow block used is  $\frac{3}{4}$  in. also, to make a level joint, as is most desirable in laying new rail; but when repairing old rail, one or more sheet steel shims are used, in addition to the pillow block, in order to lift the ends enough, so that when ground off the joint will be level. This is illustrated in the accompanying drawing showing where the posi-



*Position of cupped and depressed joint with plates removed before lifting*



*Position of cupped and worn joint after being lifted and made ready for grinding*



*Position of joint after grinding*

### Trussed Rail Joint, London Street Railway.

Old fish plates or angle bars must be changed from side to side or made smaller so as to permit the lifting of one rail as shown. Plates are needed in this joint to hold the rails in line only, so that common bar irons may be used as fish plates.

Insert, under pillow block casting, a steel shim, thick enough to raise the least worn rail so that

joints on the market had been tried but without success as they would loosen again in a very short time. It was found with all of those tried that the extreme ends of the rails would begin to loosen, as was shown by the gresh rust, soon found, for only an inch or so at the ends between the rail and the joint plates. This looseness would continue to grow away from the ends of the rails, even while the bolts were yet perfectly tight, until it reached the ends of the plates, when the bolts would begin to show signs of looseness, and then very shortly all the plates and bolts would become quite loose. This demonstrated that the rails needed some

when ground off the end will have a sharp corner.

Insert on top of pillow block casting, and under cupped rail only, a steel shim of proper thickness, so that when ground off the cup has disappeared.

To make a level joint, when no grinding is necessary, no steel shims are necessary.

transmitted to the ends of the running rails, through the cast iron pillow block which has been previously inserted between the truss rail and the ends of the running rails, thereby lifting the ends of the rails so as to take out the downward bends and to overcome the arching caused by the peening of the wheels. The extent of such lifting depends upon the thickness of the base of the rail, the thickness of the pillow block, and the extent to which the clips are drawn up. The size of the bolt may also influence this, so that these details must be adjusted for each joint, according to its worn condition. As it is desirable to make use of the full strength

Should the joint be inclined to rise above the level, break a pillow block, and insert one half outside the clips, at ends of truss rail, as shown by dotted lines.

In case of rail with a very thick base, a smaller diameter bolt, and a proportionately thinner pillow block, must be used.

tions of badly pounded rail are usually found; quite a distance below the original level. When the truss rail and pillow block with the necessary shims and clips are attached, the ends of the rail are bent upwards, so as to be slightly above the original level; just enough, however, so that, when this extra elevation is ground off, the cupping or other battering of the rail will have completely disappeared, as, or even better, than in new track. The truss rail used is scrap, equal in weight or heavier than the running rail, though it is not necessarily of the same section.

When the characteristics of this joint leaving the ends level, and just as good