(No Model.)

# T. J. McTIGHE.

## STREET RAILWAY CONSTRUCTION.

No. 443,947. Patented Dec. 30, 1890.

Fig. 1.

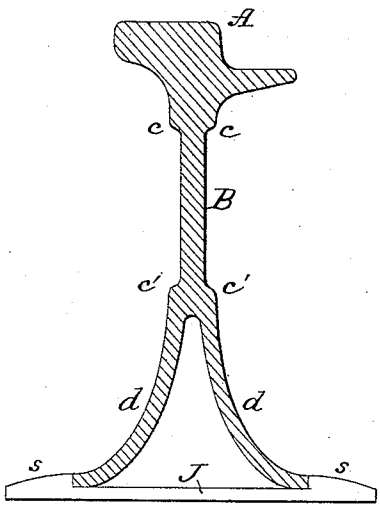



Fig. 2.

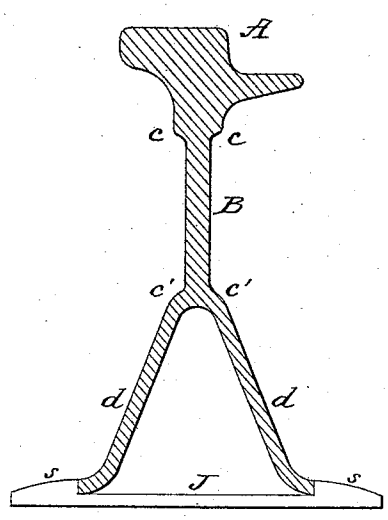



Fig. 3.

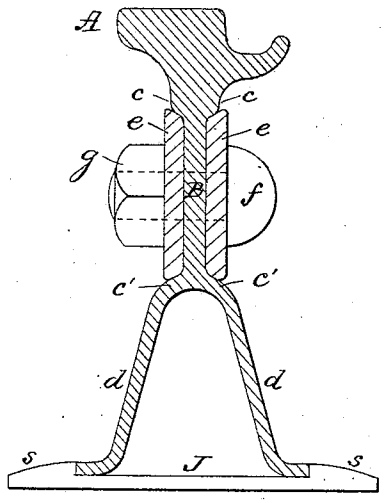



Fig. 4.

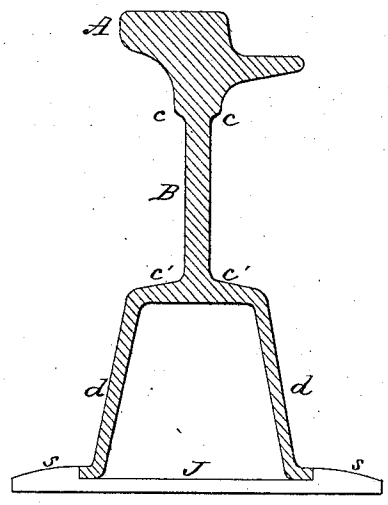
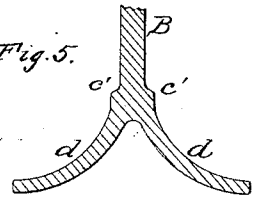



Fig. 5.




WITNESSES:

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# UNITED STATES PATENT OFFICE.

THOMAS J. McTIGHE, OF NEW YORK, N. Y., ASSIGNOR OF ONE-HALF TO JOHN F. BARRY, OF SAME PLACE.

## STREET-RAILWAY CONSTRUCTION.

SPECIFICATION forming part of Letters Patent No. 443,947, dated December 30, 1890.

Application filed September 11, 1890. Serial No. 364,637. (No model.)

*To all whom it may concern:*

Be it known that I, THOMAS J. McTIGHE, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Street-Railway Construction; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to an improved form and construction of railway.

In the growing use of electricity as the propelling power for street-cars it has been found that the great additional weight due to the electric motors and gearing is too much for the ordinary type of flat or tram rail, which is usually laid down resting directly upon longitudinal sleepers, which in turn rest at considerable intervals upon cross-ties. This construction has usually been rendered necessary in order to make room between the rails for the paving stones or blocks. As a substitute for the above construction, and for the purpose of giving sufficient rigidity to the structure, a form of T-rail has been adopted and is commonly known as a "girder-rail." Such rails consist of the head, the web, and the ordinary flange or base extending equally in both directions from the foot of the web. Here again, however, owing to the depth required, usually, for the paving-blocks and the layer of sand or other material in which they are bedded, it has been found necessary to use chairs, which are provided below with spike-holes for attaching them to the cross-ties and above with means for receiving and clamping the rail-flange. Such construction has been found very durable and stiff; but its stiffness is no greater than that secured by the girder proper, and in addition the cost of laying such a railway is greatly enhanced by the necessity of having a chair for every cross-tie under each line of rails. By my invention I am able to entirely dispense with the chairs and extend the girder construction downwardly in such a manner as to greatly increase the stiffness of the structure, while practically not using any greater weight of metal per yard than would be rendered necessary by the use of chairs under a rail of less depth.

To this and other ends my invention consists in the form and construction as hereinafter more fully described and claimed.

In the accompanying drawings, which form part of this specification, Figure 1 is a transverse section of one form of my proposed rail resting in a flat chair-plate. Fig. 2 is a modification of the same. Fig. 3 is another modification also illustrating the mode of applying the splice-bars. Fig. 4 is another modification. Fig. 5 is a detailed section showing a modification of the foot of the rail when the total depth is not required to be so great as in the other figures.

Referring now to Fig. 1, I construct the rail by rolling or otherwise with any desired shape of head A and web B, which I prefer to make of about the same depth as that used in a corresponding weight of girder-rail, so as to permit the use of the ordinary splice-bars, for which purpose I form the rail with the shoulders *c* and *c'*. Thus far the rail may be said to be of the form ordinarily adopted in the manufacture of T-rails. Below the shoulders *c'* the base of the structure or girder is in the nature of a box-rail whose cross-section is that of an inverted U or V; but the precise configuration may be considerably modified, according to the judgment of the manufacturer or user. In Fig. 1 I have shown this inverted and channeled base as consisting of the two members *d*, which gradually spread apart as the depth of the girder increases, so as to afford a substantial width of base as constituted by the lower portions of the two members *d*. This construction may be accomplished in various ways—such, for instance, as the primary rolling of these members in the form of extra wide flanges on the base of an ordinary girder and then bending them downwardly to the finished form shown. In Figs. 2, 3, and 4 the same general idea prevails, and the corresponding parts are designated by the same letters of reference. In Fig. 3 I have also illustrated the preferred manner of splicing adjoining rails together—namely, the flat splice-bars *e* with the transverse bolts *f* and nuts *g*. In Fig. 5 I have

illustrated the same general principle of the improved form of rail, but with the depending flanges *d* or box-rail base of less depth than in the previous cases. This form of rail is well adapted to rest directly on cross-tie chairs in such cases as permit the use of shallow paving-blocks or paving material in the form of sheet-asphalt or other analogous material. In all cases I find it desirable, in order to avoid excessive wear on the ties and to prevent the spreading of the base of the rail, to allow it to rest on the flat chair-plate J, which is provided with retaining-shoulders *s*, embracing the edges of the rail-base, as shown in the drawings. The spikes which are used to hold the chair-plates in position on the cross-ties may obviously be so located that the head of the spike projects inwardly over the edge of the rail-base.

It will be evident that a rail of this character when constructed of a total depth of, say, nine inches will be very much stiffer vertically than the ordinary type of girder-rail sustained on elevated chairs placed on the cross-ties, for the reason that the greater depth of girder is preserved throughout the rail length, and the stiffness thus afforded exists between the cross-ties as well as over them. Evidently, also, the tendency of any downward thrust from passing cars to spread the members *d* of the base is completely counteracted by the shoulders *s* on the chair-plate.

As a practical result of the foregoing construction, I may state that by its means a girder-rail having a total depth of, say, nine inches can be constructed without calling for any more metal in the aggregate than would be required for the ordinary elevating chair type of girder-rail having a head and web of equal weight, including in the latter case the chairs rendered necessary. Such being the case, it is obvious that without increasing the first outlay I am able to secure a very considerably stiffer construction.

I claim as my invention—

1. In railway construction, the combination, with a T-rail having its base or flange extending downwardly, of a chair-plate having shoulders embracing the edges of the rail-base.

2. In railway construction, a rail having a head of suitable form, a box-rail base, and an intervening web, in combination with a chair-plate having shoulders embracing the edges of the rail-base.

3. In railway construction, a rail having a head of suitable form and a web depending from said head and spreading below into a channeled base, in combination with a chair-plate having shoulders embracing the edges of the rail-base.

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

THOMAS J. McTIGHE.

Witnesses:

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