J. A. BONNELL.
Iron Cross-Tie.

No. 207,242. Patented Aug. 20, 1878.

FIG. 1.

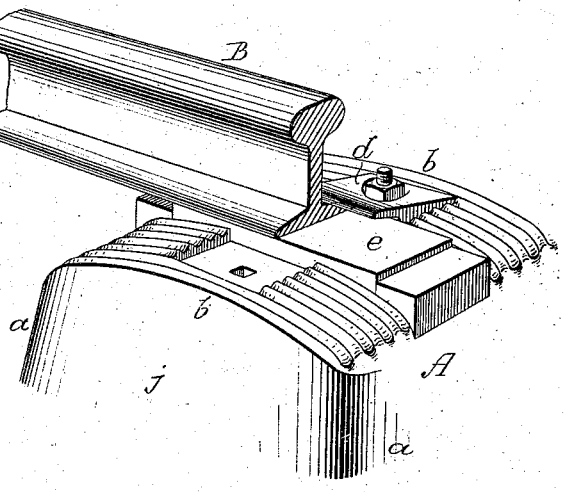


FIG. 2.

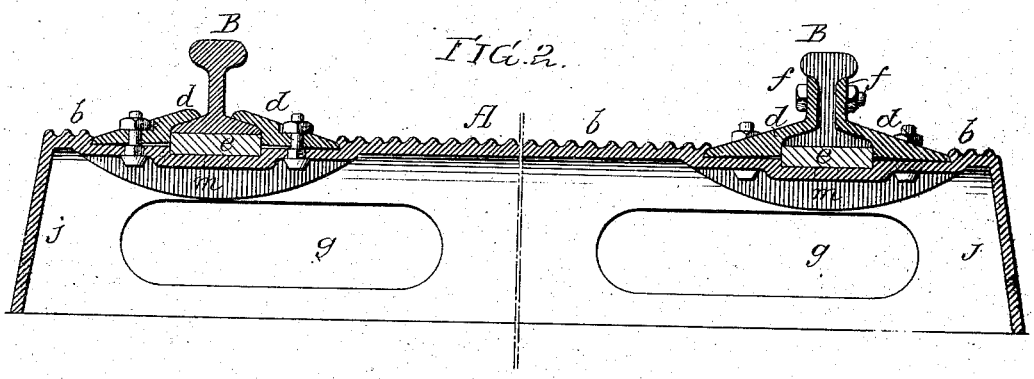
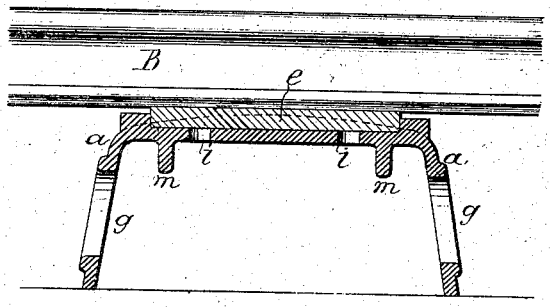


FIG. 3.



Witnesses,
John A. Dumer.
Harry Smith

Inventor.
James A. Bonnell
by his Attorneys
Howson and Son

UNITED STATES PATENT OFFICE.

JAMES A. BONNELL, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR OF ONE-HALF HIS RIGHT TO FRANK C. GOODWIN, OF SAME PLACE.

IMPROVEMENT IN IRON CROSS-TIES.

Specification forming part of Letters Patent No. 207,242, dated August 20, 1878; application filed July 1, 1878.

To all whom it may concern:

Be it known that I, JAMES A. BONNELL, of Philadelphia, Pennsylvania, have invented a new and useful Improvement in the Permanent Way of Railroads, of which the following is a specification:

My invention relates to certain improvements in iron rail-supporting girders or cross-ties for railroads; the objects of my improvements being, first, to lessen the risk of the girder being fractured by blows from the wheels of a car which has left the track, and, second, to guide said wheels when they strike the girder.

These objects I attain in the manner which I will now proceed to describe, reference being had to the accompanying drawing, in which—

Figure 1 is a perspective view of one end of my improved rail-supporting girder, showing the rail secured on one side only; Fig. 2, a transverse vertical section of a railroad-track with my improvements; and Fig. 3, a longitudinal view of the track, showing a transverse section of the girder.

A is the girder, which is made of metal, preferably cast-iron, and has flaring sides *a* merging into the top *b*, the latter being rounded transversely, as shown in Figs. 1 and 3, and provided with transverse ribs, as shown in Fig. 2. In the top of the girder, near each end of the same, is a recess, to which is adapted a block, *e*, of wood or other comparatively elastic material, and two clamping-blocks, *d d*, of metal.

The block *e* serves as a support for the rail B, which is confined to said block by the inner ends of the clamping-blocks *d*, said ends resting upon the flanges of the rail, and being pressed firmly down upon the same by means of suitable bolts and nuts.

In order to retain the opposite ends of the clamping-blocks, the ends of the recesses in the girder are undercut, and the ends of the clamping-blocks are beveled for adaptation to said undercut ends of the recess.

Where a joint occurs between two rails the clamping-plates *d* are provided with vertical extensions *f*, which bear against the web of the rail, and are secured to the same by bolts and nuts, in the same manner as ordinary fish-plates, these extensions *f* performing the same duty as said fish-plates.

In the recessed portions of the girder, beneath each block *e*, are formed openings *i*, which serve to carry off any water which enters the recess, and thus prevent the saturation of the block *e* and the tendency to rot which would be caused thereby. To facilitate the passage of the water to these openings the under side of the block may have longitudinal and transverse grooves formed in it.

Ribs *m* are formed on the under side of the recessed portions of the girder, these ribs tending to strengthen said recessed portions and enable them to resist the strains to which they are subjected.

Openings *g* are formed in the sides of the girder to lighten the same, and for the same purpose the ends *j* of the girder, instead of being closed, as shown in the drawing, may be left open.

I am aware that a metal girder-tie with abruptly-inclined sides meeting at an abruptly-rounded upper edge is shown in the English Patent No. 1,009 of 1863; but if a car left the rails the contact of the wheels with such ties as these would result disastrously, both to the rolling-stock and to the ties, owing to the shocks which both would sustain by the attempt of the wheels to pass over the abrupt ridges presented by the ties. My improved girder, however, has an extended and gently-rounded upper surface, merging with more abrupt curves into the slightly-flaring opposite sides of the girder, so that the wheels of a car which has left the track will ride without very severe shocks over the girders and over the ballast between the same, the said ballast extending, as usual, nearly to the tops of the girders. In the event, also, of a car leaving the track, the ribs on the top of the girder serve to guide the flanges of the wheels in a line parallel with the track, and thus tend to overcome, to a certain extent, the tendency of one displaced car to drag the others from the track.

The block *e* projects slightly above the top of the girder A, so that the rail bears upon said block alone, and is thereby supported with that elasticity which is so important in

the permanent way of a railroad. The fastening, however, is perfectly secure, owing to the firm gripe of the blocks *d* upon the flanges of the rail.

The blocks *d* can be readily removed or replaced, all that is necessary in removing the block being the unscrewing of the nut on the confining-bolt and the elevation of that end of the block adjacent to the rail, so as to withdraw its beveled end from the undercut end of the recess in the girder. In replacing the block this operation is reversed.

I do not desire to claim, broadly, a hollow metal rail-supporting girder; nor do I claim the use of an elastic rail-supporting block in connection with such girder; but

I claim as my invention—

1. The within-described metal cross-tie or girder, having opposite side flanges or ribs, *a a*, and a top rounded gently transversely, and merging with abrupt curves into the said sides, all as set forth.

2. A rail-supporting girder or tie having a transversely-ribbed top, as and for the purpose set forth.

3. The combination of the recessed girder A, having openings *i*, with the rails B, the interposed elastic blocks *c*, and clamping-blocks *d*, as set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JAMES A. LONNELL.

Witnesses:

HARRY A. CRAWFORD,

HARRY SMITH.