(No Model.)

# S. D. LOCKE.

## RAILWAY CROSS TIE.

No. 353,691. Patented Dec. 7, 1886.

Fig. 1.

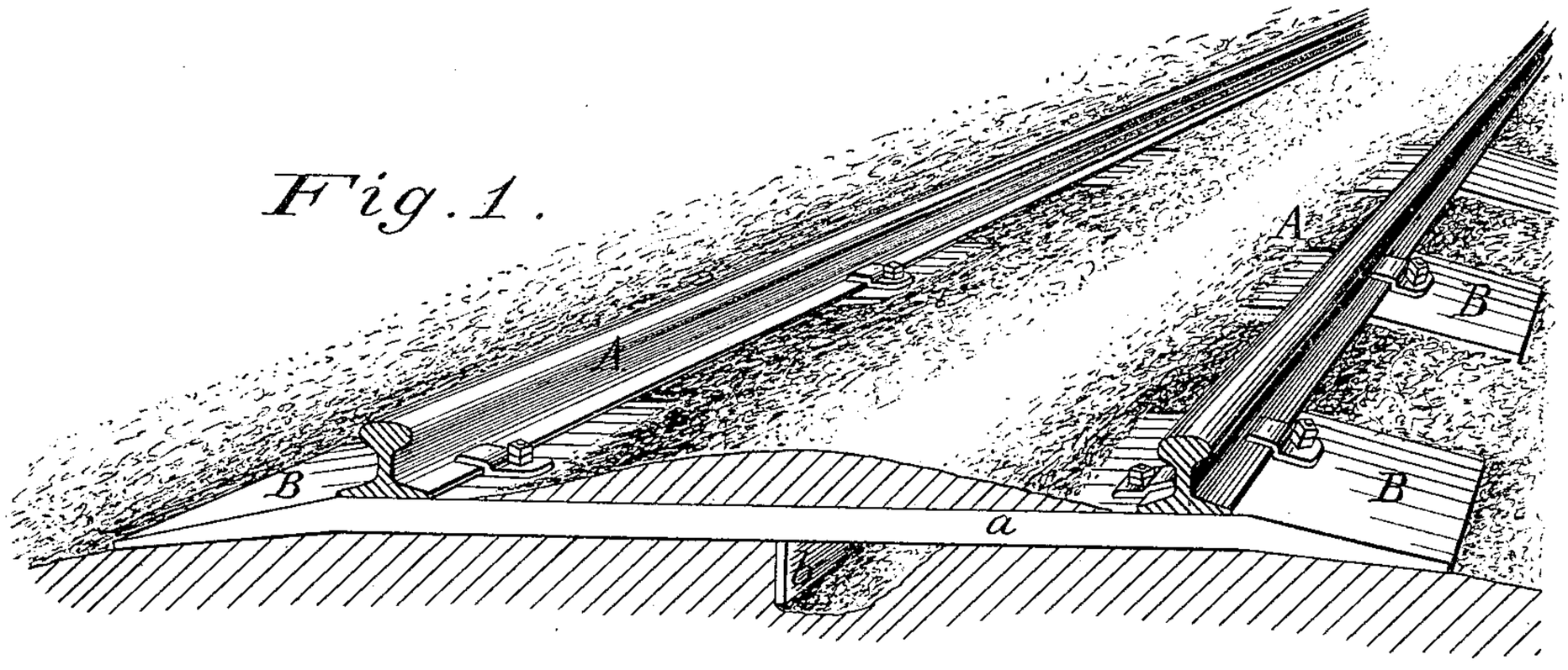



Fig. 2.

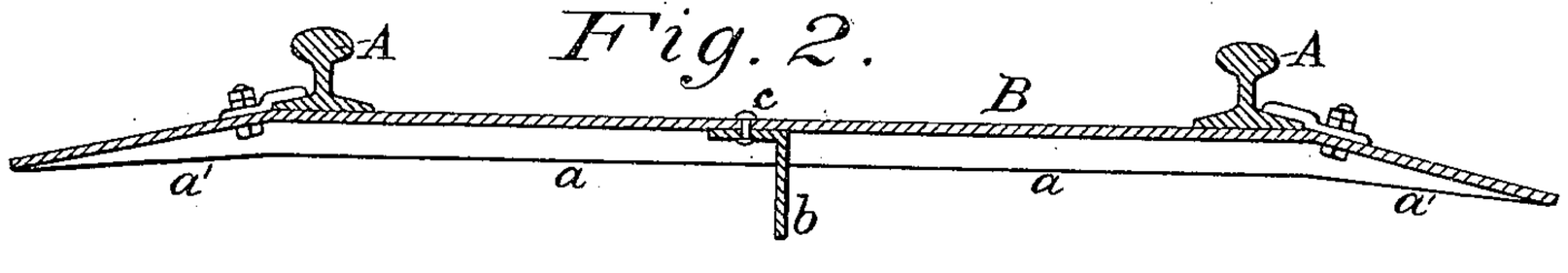



Fig. 3.

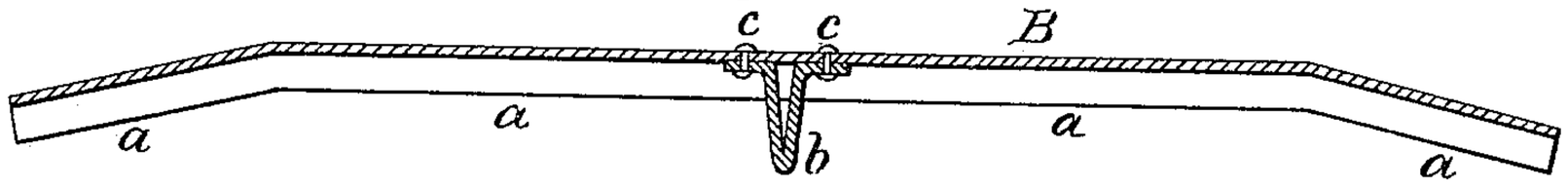



Fig. 4.

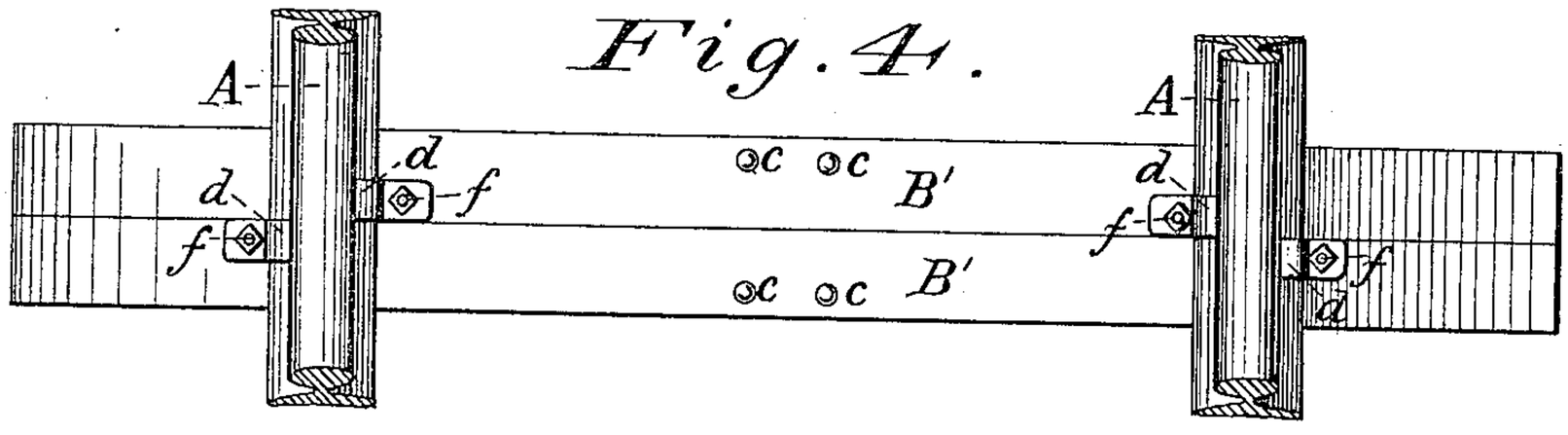
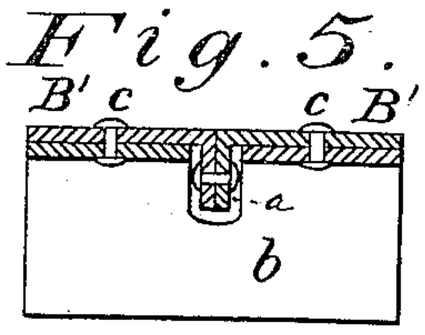



Fig. 5.




WITNESSES=

W. Lovegrove.

E. J. Locke.

INVENTOR=

Sylvanus D. Locke

# UNITED STATES PATENT OFFICE.

SYLVANUS D. LOCKE, OF HOOSICK FALLS, NEW YORK.

## RAILWAY CROSS-TIE.

SPECIFICATION forming part of Letters Patent No. 353,691, dated December 7, 1886.

Application filed May 5, 1886. Serial No. 201,136. (No model.)

*To all whom it may concern:*

Be it known that I, SYLVANUS D. LOCKE, of Hoosick Falls, in the county of Rensselaer and State of New York, have invented certain new and useful Improvements in Railway Cross-Ties, of which the following is a specification.

My invention relates to the employment in railways of iron or steel for cross-ties for supporting the rails, and is an improvement on the cross-tie shown and described in my application No. 200,268, filed April 27, 1886, to which reference is made for a more particular description hereof.

The objects of my improvement are, first, to produce a cross-tie that can easily be formed or rolled in a rolling-mill and that shall be light while having the requisite strength and stiffness as well as the necessary superficial area to support the great loads carried; second, to provide iron or steel ties with vertical cross-flanges or anchor-plates to hold the ties from slipping endwise or the track from lateral displacement, and, third, to construct a cheap cross-tie rolled as to its body in two longitudinal sections riveted together.

That others skilled in the art may make and use my invention, I will describe its construction and operation, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 is a perspective view, with a cross-section in the foreground, of a railway, showing my improvements. Fig. 2 is a longitudinal section forward of the center, showing the longitudinal rib or flange tapering from the rail outward, and also showing the central cross-flange or anchor. Fig. 3 is a longitudinal section showing the rib or flange continued to the ends of the tie and another form of the cross-anchor. Fig. 4 is a plan or top view of a cross-tie, showing broken sections of the rails secured thereto; and Fig. 5 is a view in cross-section of a cross-tie and one form of anchor-plate cut through the rivets that secure the plate.

Heretofore the cross-ties supporting the rails (as affirmed in the aforesaid application) have been made of wood, that last on an average only about six years. Many attempts have been made to construct them of iron that, properly coated to prevent oxidation, would be almost indestructible. These attempts, for one reason or another, have all been failures. Either the ties have been too costly or too heavy and massive, or they have offered too narrow a seat for the rails, or have covered too small an area of the road-bed. The demand is for an iron or steel tie that shall cost but a little more than a common wooden tie. If heavy and massive, as those made of stone, the track, if uneven, is too unyielding, and the rails and rolling-stock are sooner pounded or worn out. If the rails rest on a narrow seat on the tie, they are much more liable to break and the number of ties to the mile will be greatly increased. A very serious objection to the use of iron or steel ties has been the insecurity of the track against lateral displacement. The light iron or steel ties, and particularly the rolled-metal ties, as heretofore made, offer but little resistance against end slipping or displacement. Not being anchored in the roadway, as is the wooden tie with its embedded ends and irregular outline, the metal tie has been insecure in its position, and the track therefore liable to dangerous slidings or displacements. The iron or steel tie must be firmly anchored in the roadway, and at the same time it must be strong and inflexible.

To meet all of these requirements, some of them conflicting, is the object of this invention.

A represents the ordinary T-rails, and B the double or single flanged cross-tie shown in the aforesaid application No. 200,248, but without the vertically bent-down ends constituting the anchors therein shown and claimed. In lieu of these end anchors, I use herein an independent plate, *b*, rolled, cut and punched of the form desired, and firmly secured crosswise of the tie by rivets or bolts *c*. This anchor-plate should at least extend the full width of the tie, and reach down eight inches or more in the roadway. With the earth firmly packed underneath the ties and against the anchor-plates, the track (if the latter are broad enough) will be securely held against lateral slipping or displacement. This separate central anchor-plate may be on the tie wherever desired; but I prefer to use it about or at the center of the tie, as shown. If two to each tie are used, they should be put near the ends of the tie, say, near the rails.

The form of tie I prefer, and which is one of the parts of this invention, is represented in Figs. 4 and 5. It consists of two angle-bars rolled of the desired form and then punched and riveted or bolted together, as shown. In practice it is found quite difficult to roll a plate, B, with a flange, *a*, deep enough to secure the requisite strength and stiffness of the tie without making it heavy. It is, however, quite easy with V-shaped rollers to roll simple angle-bars, and by rolling them with one web, say, four or five inches wide, and the other, the narrow web, say, two or three inches wide, and bolting or riveting the two bars B′ with their narrow webs together, as shown, a cheap and effective tie is secured. Of course the anchor-plate *b* is as well adapted to this form of tie, or almost any form of tie, as to that shown in Figs. 1, 2, and 3. This tie B′ B′ should be bent down to conform to the slope of the roadway, as shown in Figs. 2 and 3.

The rails may be secured to the ties in any desired way; but I prefer to use the simple clip *d*, of forged or cast metal, and use one on each side of each rail to a tie. These clips have shoulders against which the edges of the flanges of the rails abut, and their upper portions firmly clamp the flanges and so securely hold the rails on the ties, where they are secured by bolts *f*, that pass through them and holes punched in the ties. These holes are punched near the vertical ribs or flanges *a*, and are so gaged apart as to give the proper width of track. They should also be so punched as to bring the clips on each section of the tie and opposing each other, as shown in Fig. 4.

What I claim is—

1. In a railway, a cross-tie rolled in two separate longitudinal sections or angle-bars and riveted together, the whole being bent down as to its ends to conform to the slope of the roadway, substantially as described.

2. In a railway, a cross-tie rolled in two separate longitudinal sections and riveted together as to their vertical flanges, combined with a central anchor-plate to hold the track against lateral slipping or displacement, substantially as described.

3. In a railway, a metallic cross-tie rolled in two longitudinal sections, with their vertical flanges riveted together, and having the rails secured to each section by shouldered and clamping clips, combined with a central anchor-plate, substantially as described.

SYLVANUS D. LOCKE.

Witnesses:
N. W. LOCKE,
E. J. LOCKE.