(No Model.) 2 Sheets—Sheet 1.

A. E. ROBERTS.

RAILWAY CROSS TIE.

No. 456,343. Patented July 21, 1891.

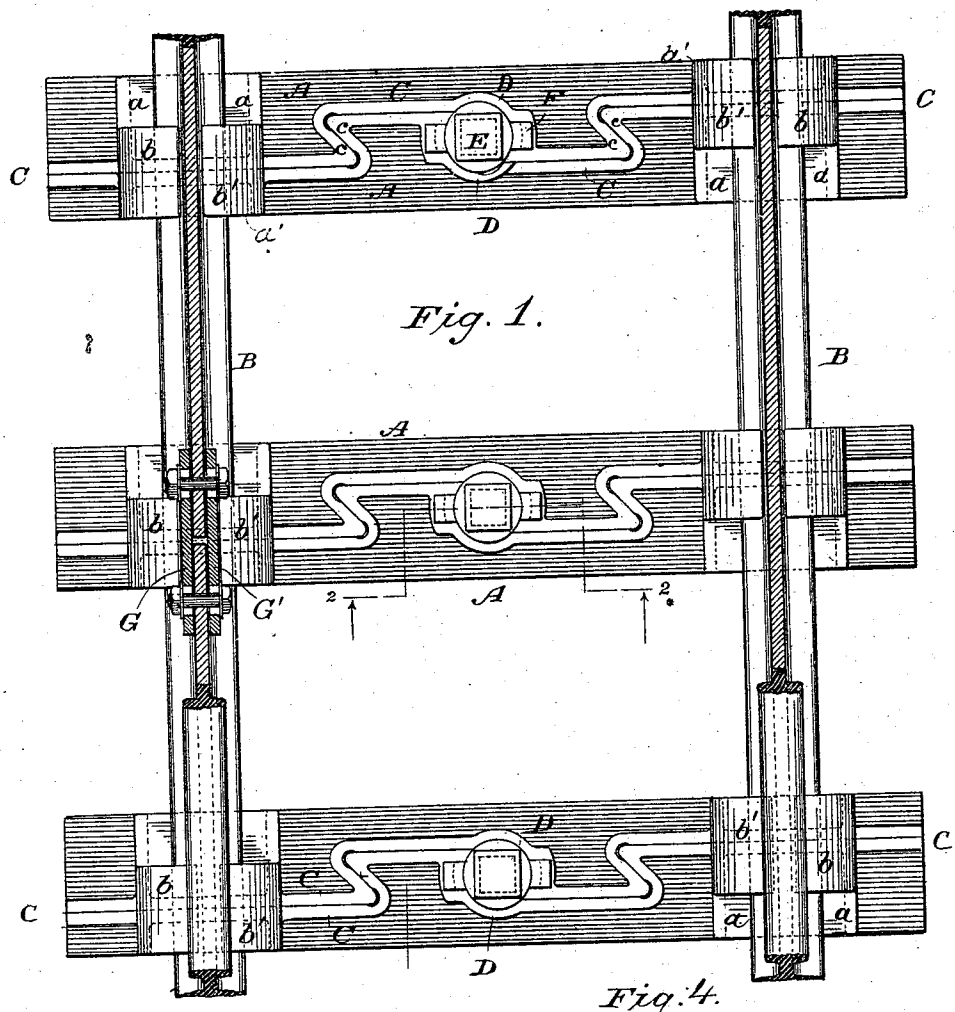
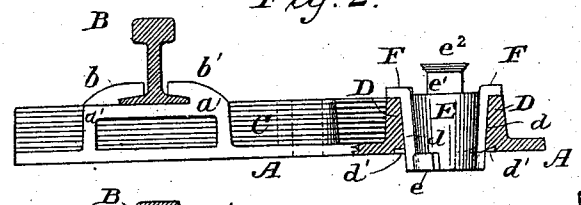
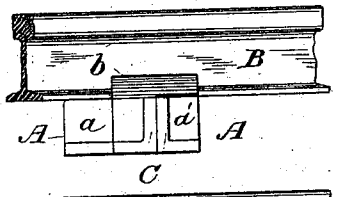


Fig. 1.

Fig. 4.

Fig. 2.





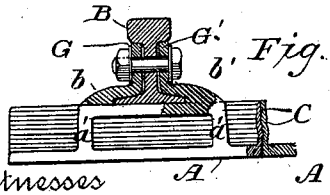


Fig. 3.

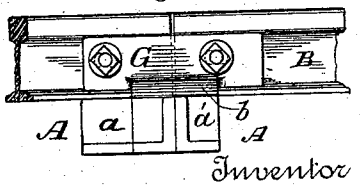


Fig. 5.

Witnesses

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(No Model.) 2 Sheets—Sheet 2.

A. E. ROBERTS.

RAILWAY CROSS TIE.

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Fig. 7.

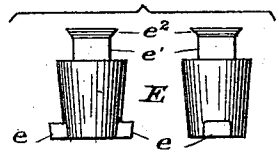


Fig. 8

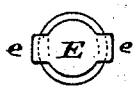


Fig 6

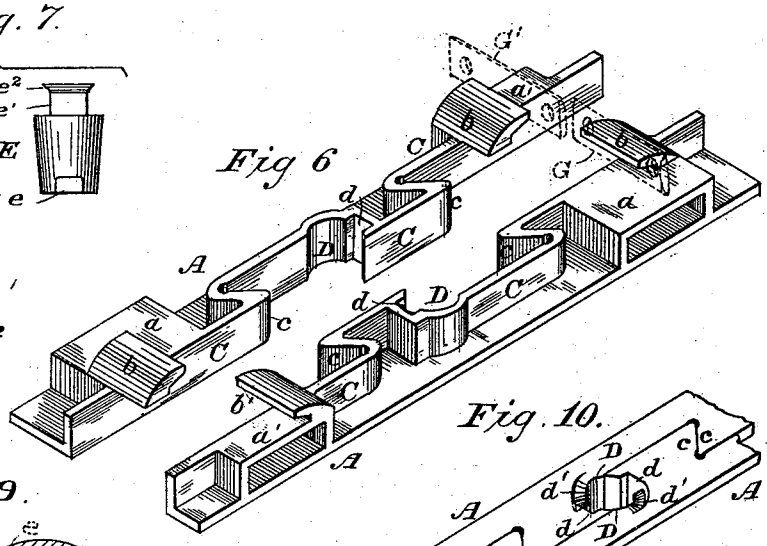


Fig. 9.

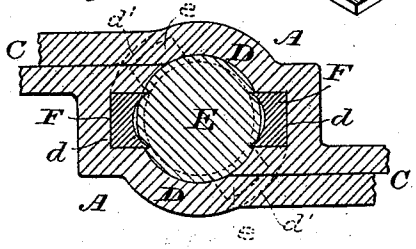


Fig. 10.

Fig. 11.



Fig. 12.

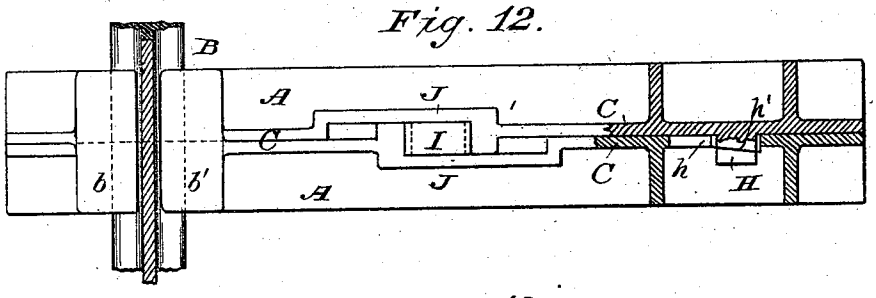


Fig. 13.

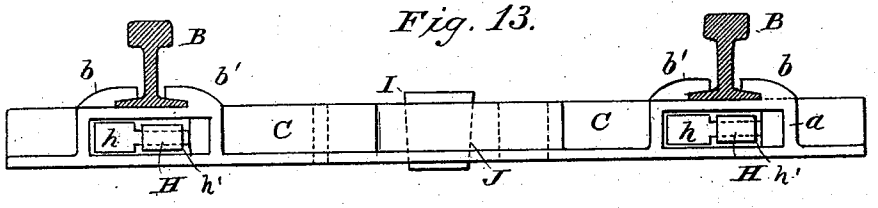
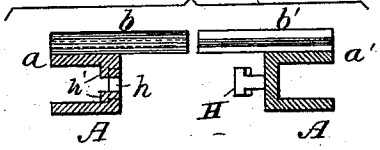


Fig 14.



Witnesses

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UNITED STATES PATENT OFFICE.

ALBERT E. ROBERTS, OF NORWALK, OHIO.

RAILWAY CROSS-TIE.

SPECIFICATION forming part of Letters Patent No. 456,343, dated July 21, 1891.

Application filed April 5, 1890. Serial No. 346,655. (No model.)

To all whom it may concern:

Be it known that I, ALBERT E. ROBERTS, a citizen of the United States, residing at Norwalk, county of Huron, State of Ohio, have invented certain new and useful Improvements in Railway Cross-Ties; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it pertains to make and use the same.

My invention relates to railway cross-ties made, preferably, of metal, and its object is to make a strong and enduring tie that will absolutely prevent the spreading of the rails, and that may be applied to them without the use of spikes or of any bolts, except at the meeting-point of two rail-sections.

The accompanying drawings show my invention in the best form now known to me; but obviously other forms than those here shown might be used, and the details of construction varied or changed within the skill of a good mechanic to adapt it to varying conditions or location without departing from the spirit of my invention, as set forth in the claims at the end of this specification.

Some of the features described and shown herein are also described, shown, and claimed in my application for a patent on railway cross-ties, Serial No. 362,059, filed August 15, 1890, the subject-matter of which was divided out of this application, and such features are not therefore claimed herein.

Figure 1 is a plan view of a short section of railway-track embodying my invention. Fig. 2 is a view in sectional elevation of a portion of one of the cross-ties. Fig. 3 is a similar view of a portion of a cross-tie formed with plates or flanges for making a "fish-joint" connection at abutting rail ends. Fig. 4 is an end view of the tie shown in Fig. 2. Fig. 5 is a similar view of the tie shown in Fig. 3. Fig. 6 is a perspective view of the two main parts or sections of my tie. Fig. 7 is two side views of my locking plug or key. Fig. 8 is a plan view of the same. Fig. 9 is an enlarged horizontal section of the plug inserted in its socket. Fig. 10 is a bottom plan view of a portion of the tie. Fig. 11 is a perspective view of a key for locking the plug against rotation. Figs. 12, 13, and 14 are views of one of the many modifications which may be made on my device.

My tie is composed of two main parts or sections A A, preferably made just alike and so shaped as to be reversible or interchangeable, as desired. Near the ends of each section are raised chairs *a a'*, upon which the rails B B are seated. Clip-lugs *b b'* are formed upon the chairs and suitably shaped to take over and embrace the rail base-flanges. It will be observed that these clip-lugs both point in the same direction on the tie-section, the lug *b* embracing the outer flange of one rail, while the lug *b'* embraces the inner flange of the other rail, and that the lugs overhang or project about half their width beyond the inner face of the tie-section, so as to overlap the other section and stand in line with the opposing lugs on that section. A vertical rib or strengthening-flange C extends along the inner face of the section, following its irregular contour. This face is shaped to form inclined interlocking hooks *c c* at any point between the rails, but preferably near them, and the hooks when closed together absolutely prevent the separation of the two sections, unless they are moved endwise. At the center of each section there is formed a half-socket D for the reception of a locking plug or key E, so shaped that when the two sections are fitted together and interlocked a perfect socket is formed, into which the plug may be driven tightly. When the plug is driven into the socket, the sections of the tie are forced endwise into very firm clamping contact with the rail-bases, as the plug bearing-face of each section lies on that side of the socket which is in the direction of the open faces of the clip-lugs. The socket is preferably made conical and the plug E properly shaped to fit into it and force all the parts home. In order to prevent this plug from becoming loosened and possibly working out of the socket, it is provided with two projecting lugs *e e* on its lower end, and these lugs, when the plug is in place, stand just through the tie and in the plane of its lower surface. The socket has grooves *d* along its sides, which permit the lugs *e e* to pass through when the plug is inserted. By partially rotating the plug the lugs *e e* will be moved out of line with the grooves, and there-

fore will prevent the withdrawal of the plug until it is turned back. On the lower face of the sections I prefer to form cam-faces or inclined surfaces d' d' for the lugs to bear against, so that in rotating the plug it is drawn more firmly into the socket. In order to prevent any possible accidental rotation of the plug, I insert keys F into the grooves d and drive them down until their lower ends stand through the sections and directly in the path (or across it) of the lugs on the plug. I prefer to make the inner face of these keys concave, as shown in Figs. 9 and 11, so that the sharp edges will bite into the plug and securely lock everything in place. On top of the plug I form a square shank e', which may be engaged by a wrench, when it is turned, and I prefer to form an overhanging head e^2 on the shank to aid in removing the plug from the socket.

In order to dispense with the loose fish-plate joints which are now commonly used to connect the abutting ends of the rails, and which are the source of endless trouble in railways because of their liability to wear or shake loose, I shall form some of my ties with projecting flanges G G′ upon the clip-lugs b b' upon one or, it may be, upon both ends of the tie-sections. These flanges fit into the hollow of the rail between the head and base in a manner precisely similar to the approved style of fish-plates, and are provided with elongated bolt-holes through which the clamping-bolts may pass to secure them to the abutting rail ends, as shown in Figs. 1, 3, and 5, by full lines, and in Fig. 6 by dotted lines. By thus forming the fish-plates integral with the metal tie a firm solid support for the rail ends is secured, and one that will not easily become worn or shaken loose. Other means than bolting may be employed to secure these fish-plates, if desired. I merely show the bolts, for the reason that they are simple and easy of illustration.

The modified form of tie shown in Figs. 12, 13, and 14 has many features to commend it; but I prefer the form just described. In the modification the tie-sections A A are connected at or near each end by means of a headed pin H on one section passing through a hole and slot h in the other section, the endwise movement of the sections forcing the head of the pin up the inclined ledges h' at each side of the slot and drawing the sections firmly together. A key or wedge I is driven into the double recess J, formed at the center of the tie, half in each section, and forces the sections endwise into firm clamping contact with the rail-bases.

Instead of the interlocking devices such as above described for holding the tie-sections together, I may use bolts or any other form of clamp that will be best adapted to the purpose.

What I claim as new and useful, and desire to secure by Letters Patent, is—

1. A railway cross-tie divided longitudinally into two main interlocking parts, each part having clip-lugs which engage the bases of both rails on corresponding sides, and suitable means for securing the interlocking parts together, substantially as set forth.

2. A railway cross-tie divided longitudinally into two main parts, each of which is provided with clip-lugs to engage the bases of both the rails on corresponding sides, and with suitable integral devices which interlock with and clamp it to the other part, substantially as hereinbefore set forth.

3. A railway cross-tie composed of two main parts or sections having clip-lugs which engage the rail-bases and arranged to move oppositely in the act of clamping the rail, and interlocking projections from each section which slide upon inclined surfaces on the opposite section to draw them firmly together in the act of clamping on the rails, substantially as hereinbefore set forth.

4. A railway cross-tie composed of two main parts or sections having clip-lugs which embrace the rail-bases and arranged to move oppositely in the act of clamping the rails, with inclined interlocking devices to draw the sections together, and a central wedge or key which forces the sections into firm clamping contact on the rails, substantially as hereinbefore set forth.

In testimony whereof I hereunto set my hand, this 2d day of April, 1890, at Cleveland, Ohio, in presence of two witnesses.

ALBERT E. ROBERTS.

Witnesses:
WM. A. SKINKLE,
O. J. DEISNER.