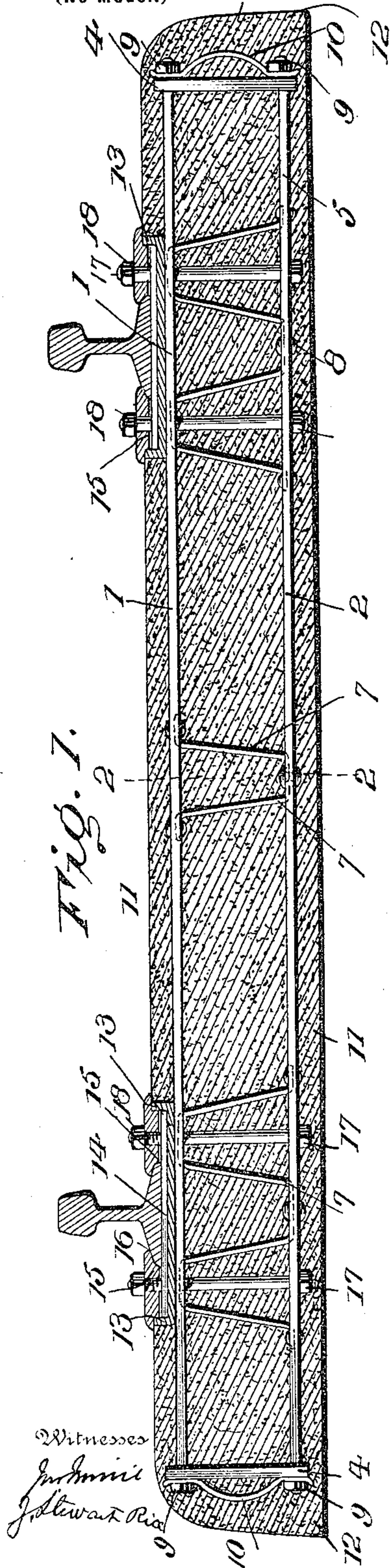


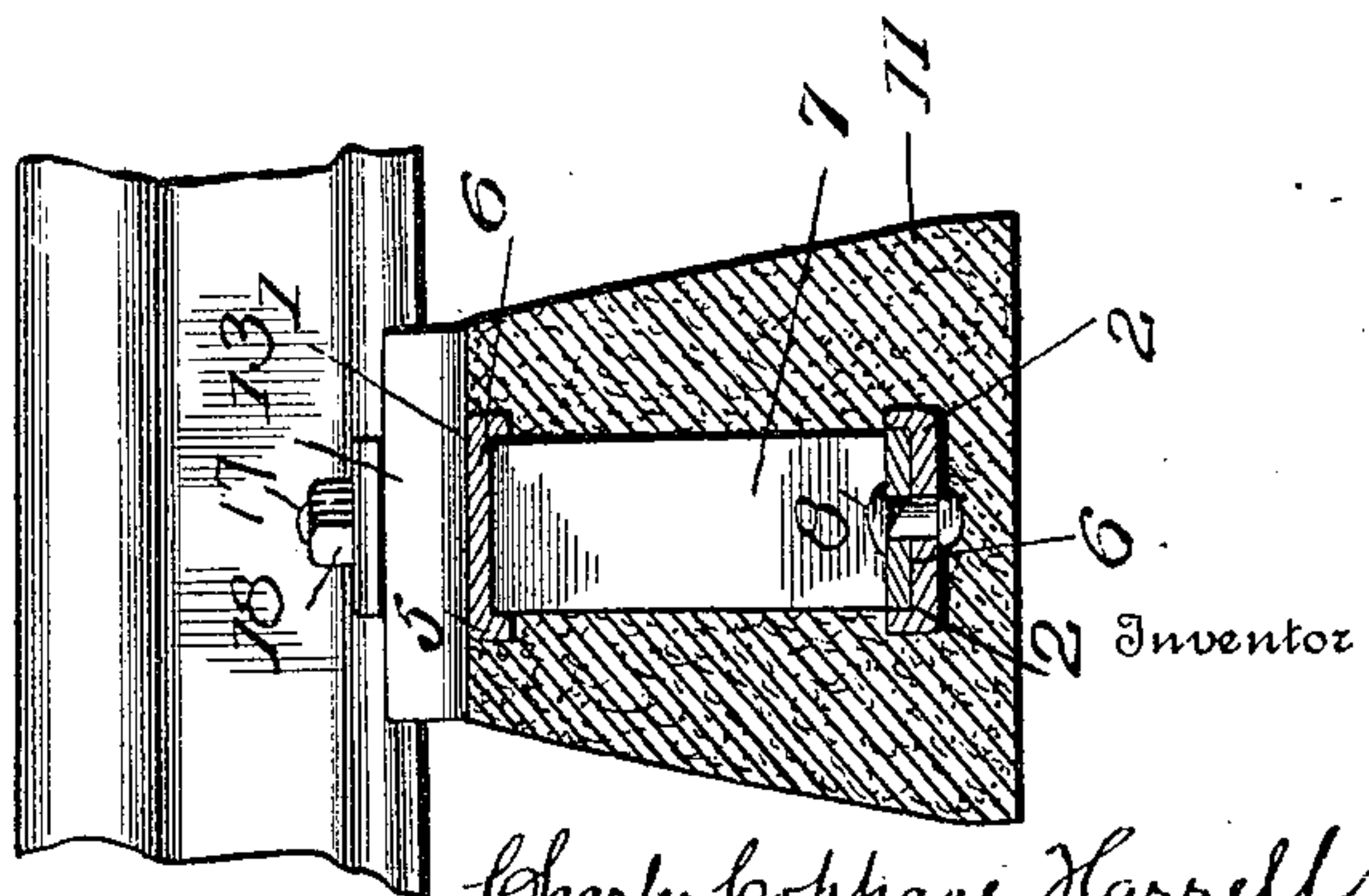
C. C. HARRELL.  
COMPOSITE RAILWAY TIE.

(Application filed May 4, 1900.)

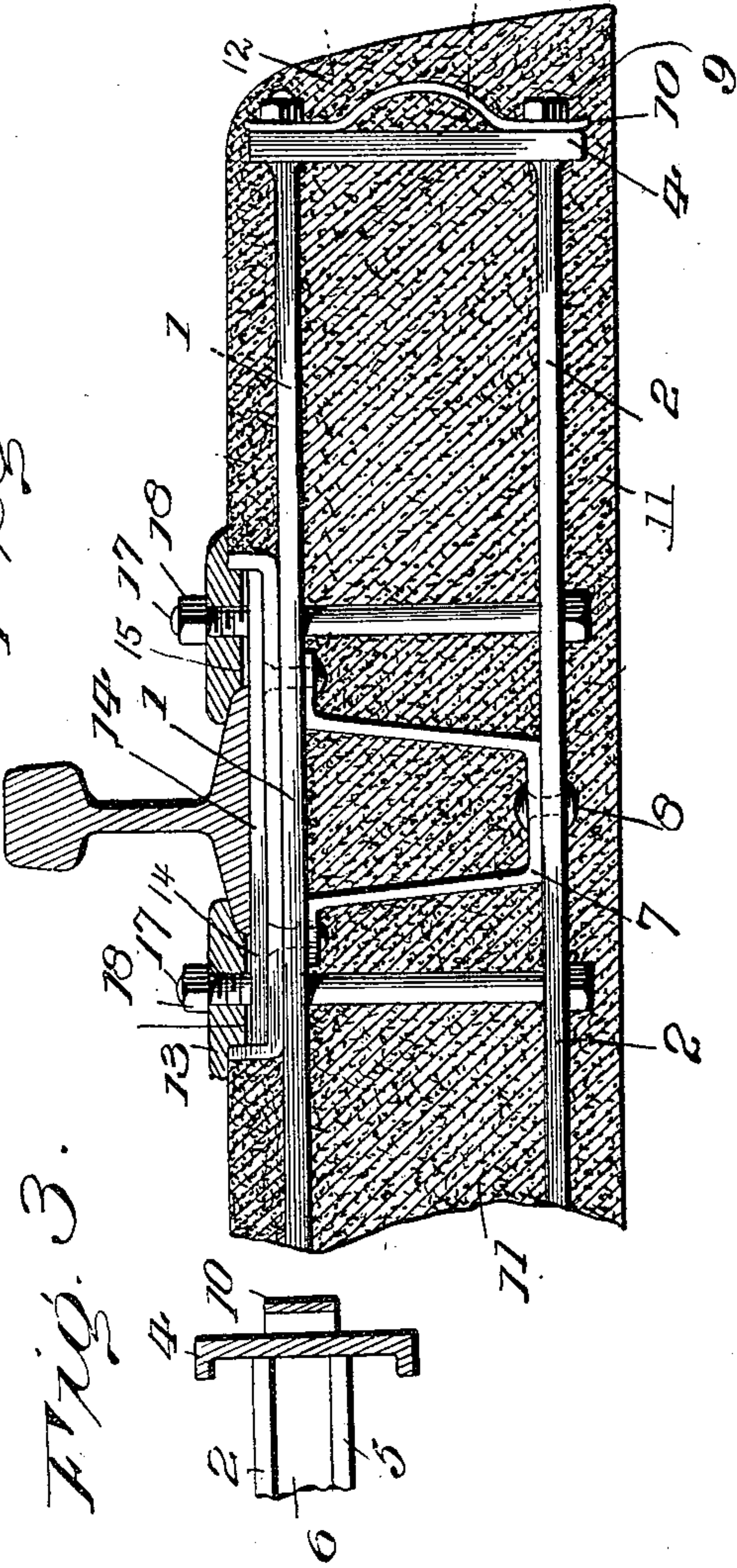
(No Model.)



*Fig. 2.*



*Fig. 3.*



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# UNITED STATES PATENT OFFICE.

CHARLES COPPAGE HARRELL, OF BAINBRIDGE, GEORGIA.

## COMPOSITE RAILWAY-TIE.

SPECIFICATION forming part of Letters Patent No. 667,698, dated February 12, 1901.

Application filed May 4, 1900. Serial No. 15,511. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES COPPAGE HARRELL, a citizen of the United States, residing at Bainbridge, in the county of Decatur, State of Georgia, have invented a certain new and useful Improvement in Composite Railway-Ties, of which the following is a specification, reference being had to the accompanying drawings.

10 This invention relates to railway-ties of that class known in the art as "composite" ties.

It has for its object, among others, to provide an improved tie of this type having a tie member both at the top and bottom of the tie so disposed that the top member will act as a tie when the load is on each end, with a support intermediate the ends, the bottom member serving the same function as the top member when the load is supported at each end—as, for example, when excessive tamping has been done under the ends of the tie. The whole is embedded in concrete or analogous material, which serves as the compression member of the tie or truss. I employ a girder or framework composed of substantially parallel upper and lower bars connected at their ends to cap-pieces, with means for adjustment, so the parts may be tightened after the body of the concrete has hardened in order to take up all the slack, stretch of the bolts, &c., and the caps are then covered with cement, a strap-shaped washer being employed, which constitutes an anchor for the cement employed to cover the said ends. Preferably, though not necessarily, the top and bottom bars, as well as the end plates, may be of channel-iron and the braces employed between the top and bottom bars fitted within the channels thereof. This gives greater rigidity and prevents separation or relative movement of the parts in case the securing-bolts or other means become loosened or otherwise inoperative.

45 Other objects and advantages of the invention will hereinafter appear, and the novel features thereof will be particularly pointed out in the appended claims.

50 The invention in its preferable form is clearly illustrated in the accompanying drawings, which, with the numerals of reference

marked thereon, form a part of this specification, and in which—

Figure 1 is a vertical longitudinal section through the tie. Fig. 2 is a vertical cross-section on the line 2 2 of Fig. 1. Fig. 3 shows a cross-section of one of the end plates and the anchor-bar, and Fig. 4 is a view similar to Fig. 1 with slight variation in structural features.

Like numerals of reference indicate like parts throughout the several views.

In carrying out my invention I employ a top bar 1 and the bottom bar 2, substantially parallel therewith, these two bars being joined at their ends by the end plates 4. As illustrated in Figs. 1, 2, and 3, these bars and end plates are of substantially the cross-section shown—that is, they are flanged along their opposite edges, as seen at 5—and in the channel 6 thus formed are designed to rest the horizontal portions of the intermediate braces. These braces 7 (of which there may be more or less, as may be deemed most expedient) are disposed between the top and bottom plates, and in the form seen in Figs. 1 and 2 their horizontal portions are received in the channels 6 of the top and bottom plates and are secured there by bolts or analogous means 8, which pass vertically through the horizontal portions of the braces and through the bars. It is evident, however, that other means may be employed for connecting the braces and the top and bottom bars.

The ends of the bars 1 and 2 extend through openings in the upper and lower ends of the end plates, as shown, and receive nuts 9, while 10 are metallic plates or anchor-bars having near their ends openings through which pass the ends of the bars 1 and 2 and confined between the ends of the outer faces of the end plates. These nuts are to be tightened up after the cement in which the frame is embedded has set. The metallic framework thus constructed is embedded in cement, concrete, or analogous material 11, as shown, and after the plastic material has set the nuts on the ends of the top and bottom bars are tightened to the extreme safe load, and then the end pieces, together with the nuts and strap-washers, are covered over with cement 12, and the whole thus rigidly held in such a



manner as to prevent separation of the parts or their working loose.

13 is a channel-plate supported upon the top bar 1 and embedded in the cement, and in the channel thereof is located a filling 14, of vulcanized fiber or the like, upon which the rail rests.

15 designates rail-chairs or the like having a boss portion 16, which enters between the outer or opposite edges of the base of the rail and the adjacent vertical walls of the channel-plate 13, the horizontal portions or flanges of these chairs resting upon the outer faces of the base of the rail and upon the outer edges of the vertical side flanges of the plate 13 and upon the top of the concrete. Bolts 17, the heads of which are embedded in the cement or concrete base beneath the bottom plate 2, pass through the concrete or analogous material 11, through the upper bar 1, and through the channel-plate 13, the cushion 14, and the chairs and receive nuts 18, by means of which the chairs are held down in position and the rail firmly secured.

While the above constitutes what I at the present time consider the preferable form of my invention, it is evident that variations and modifications in the structural features thereof may be resorted to without departing from the spirit of my invention, and I therefore do not intend to restrict myself to such form, but reserve the right to vary the details thereof to such an extent as properly comes within the scope of my invention and the protection prayed. For instance, in Fig. 4 I have shown the top and bottom plates as not being of channel-iron, and the braces 7 have their horizontal portions bearing directly against the adjacent flat faces of said bars. So, also, the braces vary in form, each being substantially the same as the central brace seen in Fig. 1, instead of those shown upon the opposite sides of said central brace in said Fig. 1. In Fig. 1 the bolts 17 pass through the horizontal portions of the double brace, while in Fig. 4 they do not. Other like changes may be found desirable in practice and clearly come within the intent and purpose of my invention as set forth in the following claims.

What I claim as new is—

1. In a new article of manufacture, a framework comprising upper and lower bars, means for connecting the ends thereof, and rigid intermediate braces, the whole being embedded in plastic material, substantially as described.

2. A framework for a composite tie, the same consisting of bars, intermediate braces and means joining the ends of said bars and provided with anchors projecting longitudinally from said ends, substantially as described.

3. A framework for a composite tie consisting of longitudinal upper and lower channel-

bars, intermediate braces having their upper and lower portions set in the channels of said bars, and means extending from the top to the bottom of the tie and joining the ends of said bars, substantially as described.

4. A framework for a composite tie consisting of upper and lower channel-bars, intermediate braces having portions set in the channels of said bars, and channel-bars and securing means joining the ends of said bars, substantially as described.

5. A framework for a composite tie consisting of upper and lower channel-bars, intermediate braces having portions engaged in the channels of said bars, plates joining the ends of said bars, nuts on the outer ends of the bars and anchoring devices retained by said nuts, substantially as described.

6. A framework for a composite tie consisting of upper and lower bars, intermediate braces secured thereto, plates at the ends of said bars, nuts on the outer ends of the bars, and strap-washers interposed between said nuts and the outer faces of the plates to form anchors for cement cappings, substantially as described.

7. As a new article of manufacture, a composite railway-tie comprising a metallic framework embedded in cement, and having anchors and adjusting devices and plastic cappings coacting with said anchors, substantially as described.

8. A composite railway-tie comprising a metallic framework embedded in plastic material and having adjusting means and anchoring devices at the ends, and supporting channel-plates resting upon the upper bar of the framework, substantially as described.

9. A composite railway-tie comprising a metallic framework consisting of upper and lower bars embedded in plastic material and having vertically-disposed bolts passing through said bars, the heads of which bolts are embedded in said material, rail-supporting plates resting upon said framework and through which said bolts pass, and rail-securing devices retained by said bolts, substantially as described.

10. A composite railway-tie comprising a metallic framework consisting of upper and lower bars having vertically-disposed bolts passing through said bars and connecting them together, rail-supporting plates resting upon said framework and through which said bolts pass, and rail-securing devices retained by said bolts, substantially as described.

In testimony whereof I affix my signature, in the presence of two witnesses, this 1st day of May, 1900.

CHARLES COPPAGE HARRELL.

Witnesses:

LUCIUS C. TOOLE,  
WILLIAM A. STERNE.