

No. 763,538.

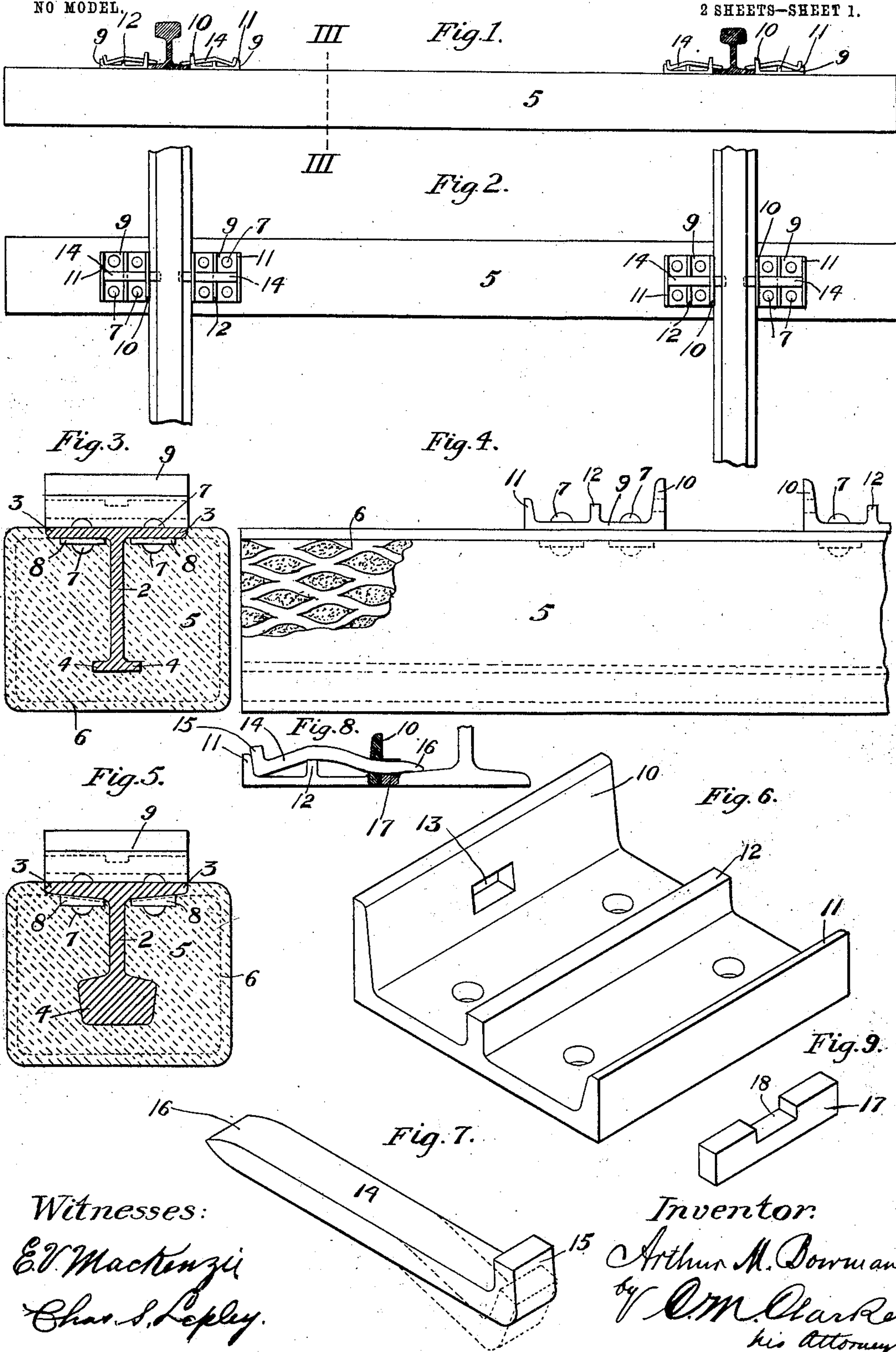
PATENTED JUNE 28, 1904.

A. M. BOWMAN.
RAILWAY TIE.

APPLICATION FILED APR. 14, 1902.

NO MODEL.

2 SHEETS—SHEET 1.



Witnesses:

E. V. Mackenzie
Chas. S. Lopley.

Inventor:

Arthur M. Bowman
by C. M. Clarke
his Attorney.

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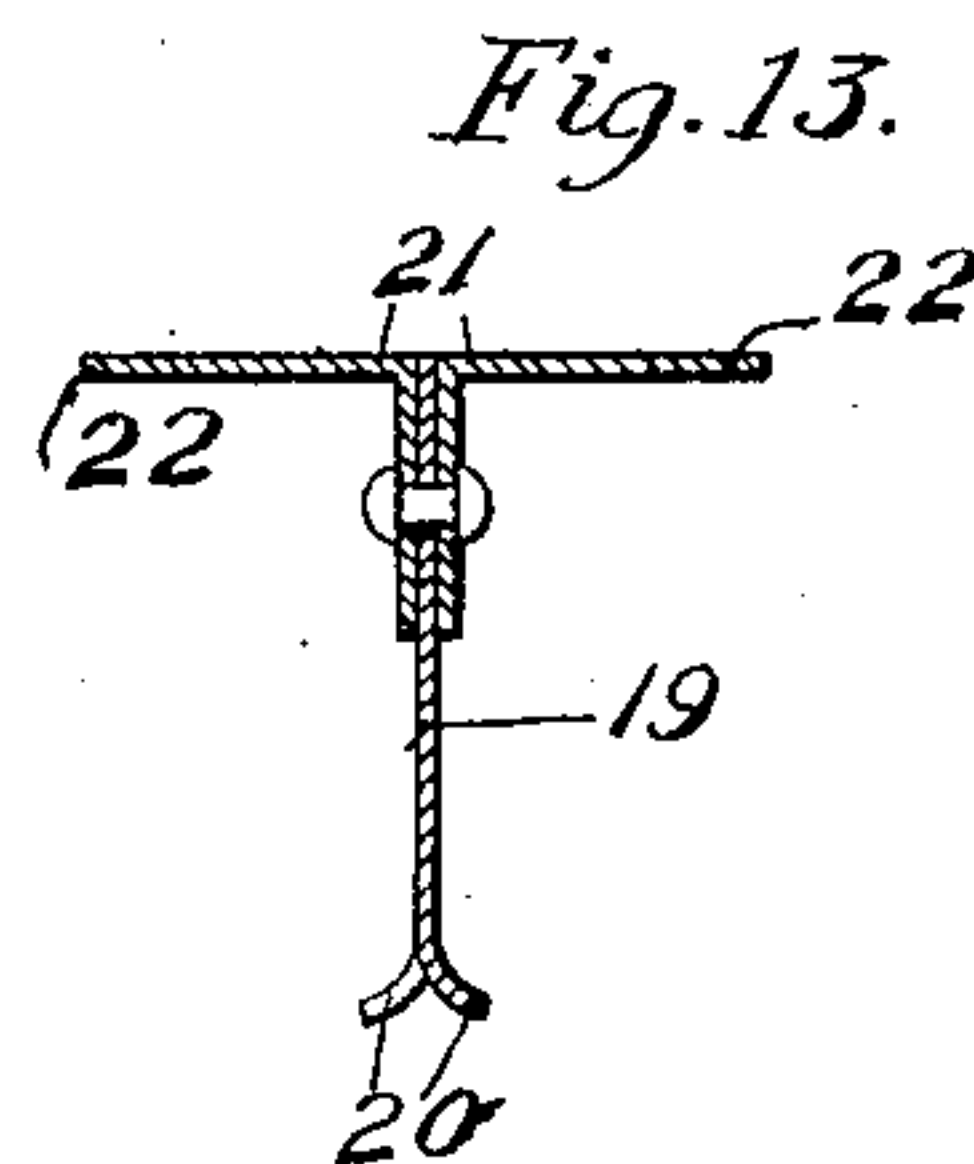
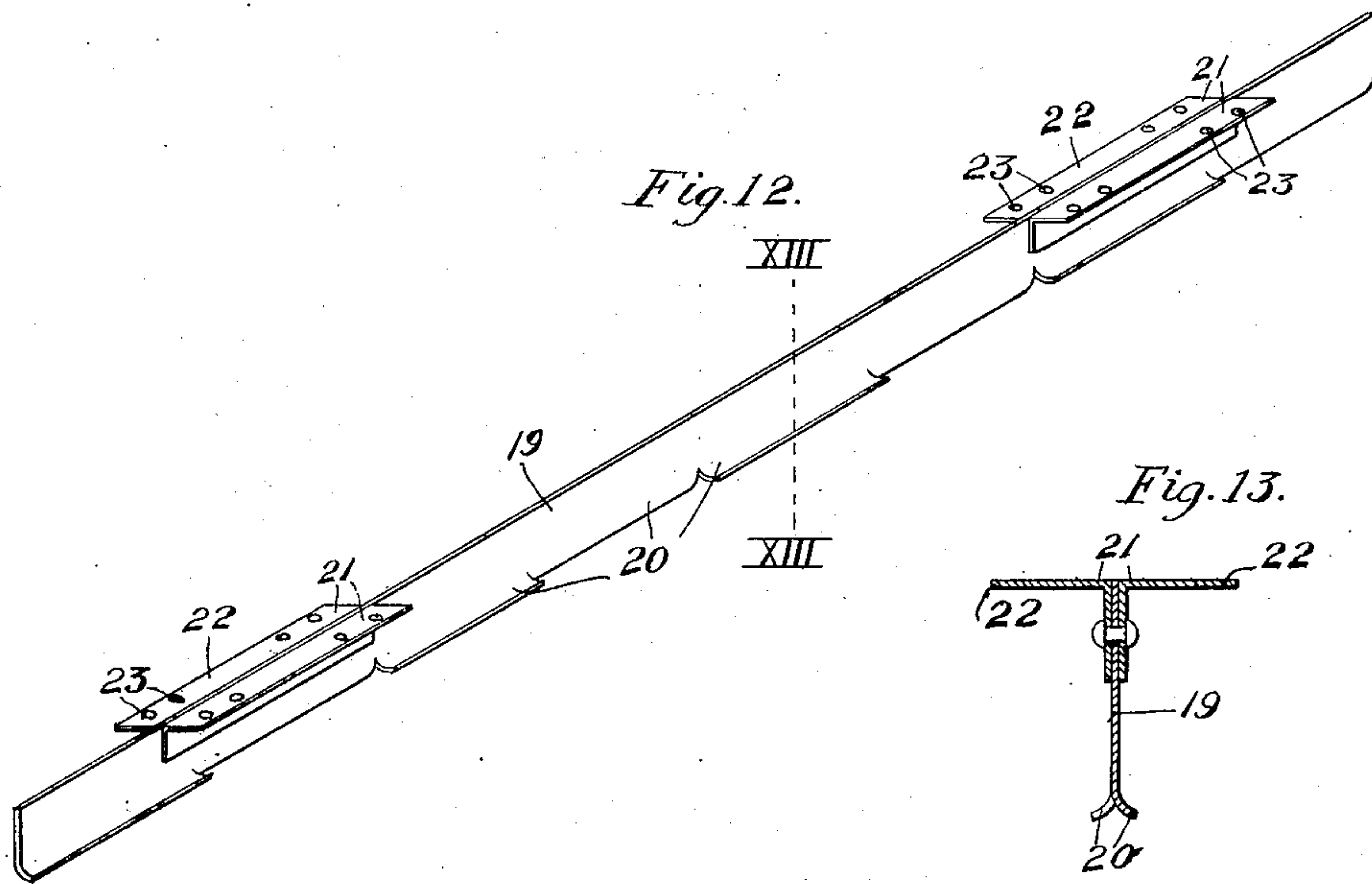
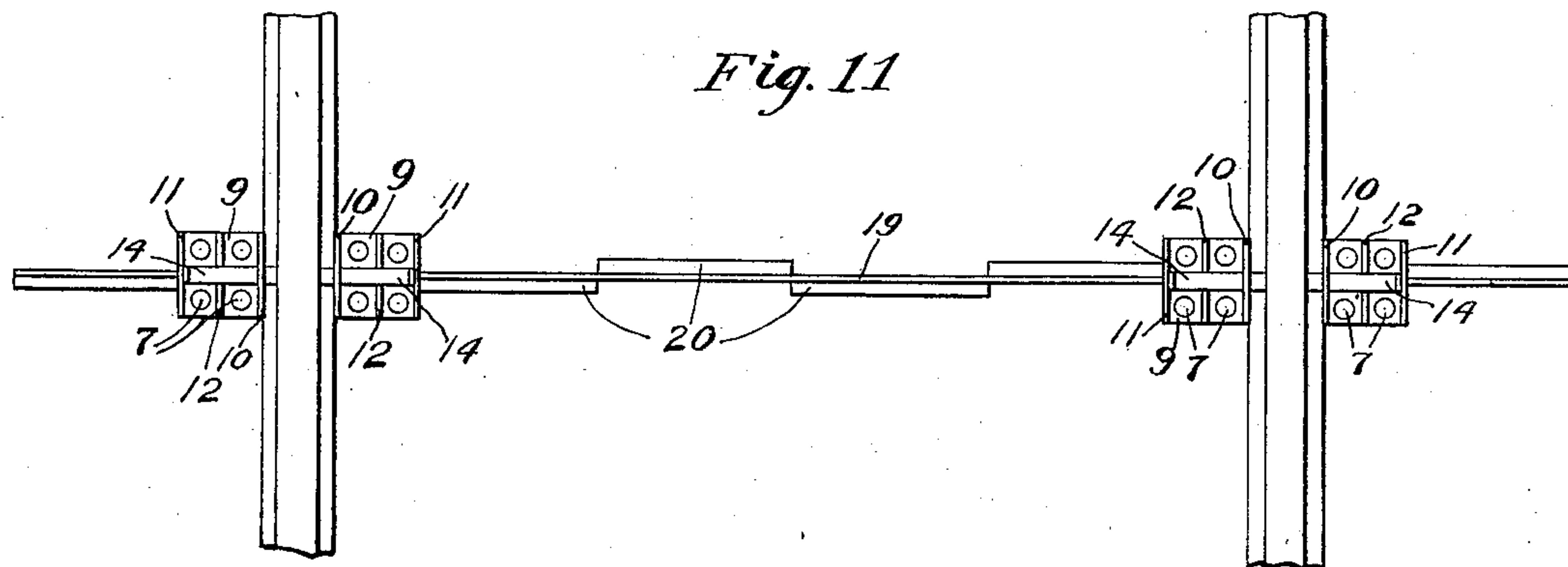
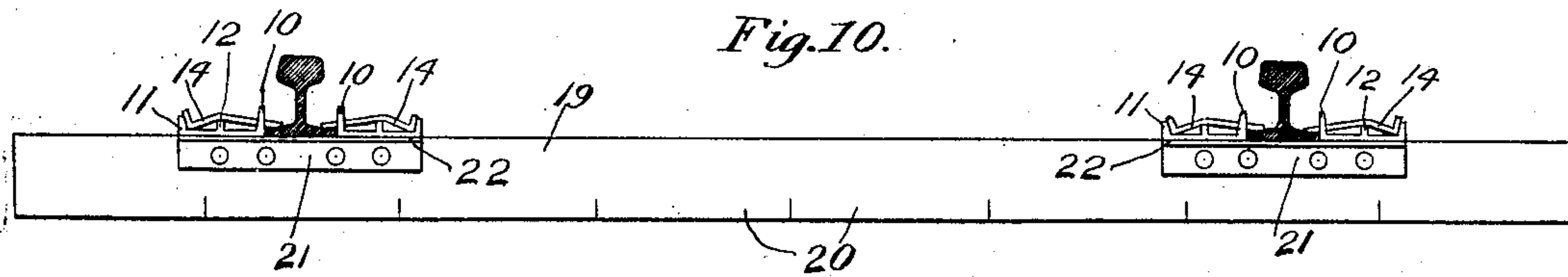
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NO MODEL.

2 SHEETS—SHEET 2.



Witnesses:

Ella V. Mackenzie
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UNITED STATES PATENT OFFICE.

ARTHUR M. BOWMAN, OF AVALON, PENNSYLVANIA, ASSIGNOR OF ONE-HALF TO CHARLES M. CLARKE, OF PITTSBURG, PENNSYLVANIA.

RAILWAY-TIE.

SPECIFICATION forming part of Letters Patent No. 763,538, dated June 28, 1904.

Application filed April 14, 1902. Serial No. 102,766. (No model.)

To all whom it may concern:

Be it known that I, ARTHUR M. BOWMAN, a citizen of the United States, residing at Avalon, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Railway-Ties, of which the following is a specification, reference being had therein to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a view in front elevation of my improved cross-tie, showing the rails in position thereon. Fig. 2 is a plan view of one of the ties with portions of each rail attached. Fig. 3 is a vertical cross-sectional view, taken on the line III III of Fig. 1, on an enlarged scale. Fig. 4 is a partial side elevation of the tie, a portion of the cement having been removed. Fig. 5 is a cross-sectional view similar to Fig. 3, but showing a modified construction employing an inverted-T rail as the principal element. Fig. 6 is a perspective detail view of one of the rail-flange-securing plates. Fig. 7 is a similar detail view of the securing-key, the bent-down position being shown in dotted lines. Fig. 8 is a detail view showing the application of a filling device or plate. Fig. 9 is a detail perspective view of said filling-plate. Figs. 10 and 11 are views similar to Figs. 1 and 2, but showing a modified construction of the structural member. Fig. 12 is a perspective view of such modified form of structural member. Fig. 13 is a cross-sectional view on the line XIII XIII of Fig. 12.

My invention relates to improvements in railway ties or sleepers; and it consists of a metallic framework or base provided with rail seats or bearings on its upper surface consisting of lateral guide and securing plates adapted to provide means for the insertion of securing-keys, together with concrete or other material incorporated with the metallic construction in the manner hereinafter described and as illustrated in the drawings.

Referring to the drawings, the main longitudinal member of the tie consists of a rolled

section 2, having a central web, upper lateral flanges 3, adapted to provide a broad flat bearing-surface for the rail-flanges, and provided around its lower edge with lateral projections or flanges 4.

For the purpose of providing a sufficient cross-sectional body and of giving weight, stability, and bearing-surface to the tie the entire lower portion and surfaces are surrounded by and embedded in an enveloping body 5, of concrete or cement, and for the purpose of more securely retaining the concrete or cement and of connecting it with the metal member 2 of the tie I employ a surrounding wall or sheath 6, of expanded metal, woven-wire netting, or other similar flexible open or perforated material, with which the concrete or cement may be incorporated and with which it will form a strong self-containing bond. In the manufacture of the tie the retaining-wall 6 provides a surrounding sheath and envelops the lower portion of the member 2 from end to end. It is first placed in position and is preferably connected with the flange 3 on each side by rivets 7, passing through the flanges and the inner edges of the expanded metal or wire-netting, such rivets preferably being employed with washers 8 to more securely hold the parts together. The washers 8 may be single or may be strips of metal through which the rivets pass at intervals, and either construction is suitable for the purpose in view. It will also be understood that bolts may be substituted for the rivets if desired. If desired, the expanded metal or wire-netting may be simply laid around the longitudinal member and incorporated with the cement body portion without being connected to the flanges 3 by the rivets or, in fact, to any portion of the metallic member 2, as the cement body portion will firmly and securely hold it in position, the perforated sheath permitting free passage and circulation, diffusion, and distribution of the cement. When hardened, these two elements will then be firmly incorporated with the member 2 without the necessity of any other holding means. After the sur-

rounding expanded metal or wire-netting is placed in position the entire inner cavity, as well as the surrounding space outside, is filled with concrete or cement, which is then allowed to harden, and in this manner the longitudinal metal member 2, the perforated surrounding metal envelop 6, and the body portion of cement are firmly and rigidly incorporated together and with each other, and a tie of considerable weight and great rigidity is the result.

At suitable locations to correspond to the gage of the track the plates 9 are secured upon the upper surface of the flanges 3, as shown, by rivets 7, which pass through the flanges and through the perforated metal in the manner already described and securely hold the plate in position, although it will be understood that these plates may be held by independent rivets or bolts, as desired. The plates are provided with a flange 10 on one side, adapted to provide a suitable bearing for the edge of the rail-flange, while at the opposite side of the plate is the flange 11, preferably of less height, adapted to provide a seat or backing for the head of the retaining-key, while intermediate of the flanges is an upwardly-extending rib 12 for the purpose of providing an intermediate bearing for the securing-key. The flange 10 is provided with an opening 13, preferably rectangular in form, through which the securing-key 14 is inserted. Such securing-key (shown in detail in Fig. 7) is formed of a flat bar or other suitable shape, which may have a turned-up end or lip 15, or may be left plain, as desired, and an entering and bearing point 16, which is preferably tapered or beveled to facilitate its entering through the opening 13 and assist in its engagement with the upper side of the rail-flange. The ties having been located in position and properly leveled by tamping and the rails having been laid in place between the flanges 10 of the plates 9, the keys 14 are then driven in until the points 16 tightly bear upon the upper side of the rail-flanges, in which operation the point will be slightly bent up owing, to the force exerted, and will thus wedge the rail-flange into binding contact with the upper surface of the tie. In this manner the key is driven in until the head 15 is flush with the inner face of the flange 11, when it is driven down by a hammer or other suitable tool until it becomes seated against the inner surface of such flange 11, in which position it is secured against dislodgment and cannot become displaced or lost except by prying up the outer end, when it may be removed. The middle rib 12 by its bearing against the key will assist in forcing the point down and holding it against the rail-flange. If for any reason the flanges of the rail do not entirely fill the space between the flanges

10 10—as, for instance, where a narrower rail is used in a tie designed for a wider one—the space is filled by a filler-plate or backing 17, preferably provided with a notch 18 for the insertion of the key, as clearly shown in Figs. 8 and 9.

While I have shown the outer surfaces of the body portion of the tie as being smooth, it will be readily understood that such surfaces may be roughened or corrugated in any suitable manner, thus facilitating the holding action of the ballast in which the tie is laid.

The flanged plates, as will be understood, may be rolled in continuous lengths and cut off in sections of suitable length and secured to the ties in the manner described.

In the figures of Sheet 2 of the drawings I have shown a modified construction of the central longitudinal member wherein the vertical web is formed of a continuous metallic sheet or plate 19 for substantially the full length of the tie, the lower edge of which plate is partially divided vertically and the partially-severed portions 20, preferably of short equal lengths, are alternately turned outwardly at each side, providing a holding means for the cement covering and equivalent to the flanges 4 of the integral member 2. To the upper edge of the plate at each side and in positions with respect to its length corresponding to the positions of the plates 9 as determined by the gage of the track is secured the laterally-extending flanged angle member 21 by rivets, bolts, or other means. The lateral flanges 22 of such angle member are provided with holes 23, by which the plates may be secured in position, as already described, and as thus constructed the longitudinal member provides a strong, stiff, and practicable support for the rails, while being well adapted to the application of the surrounding cement-retaining sheath of perforated metal.

As thus constructed my improved tie is very strong and serviceable, very economical in construction, and will stand the rough usage to which ties are subjected, while it is practically indestructible and not subject to deterioration by the weather. The metal core is protected from heat or cold, while the concrete and embedded fabric stiffen it against buckling.

The invention may be readily utilized as a post, column, beam, girder, or any other building or structural element, its adaptation as a tie being but one of various obvious utilizations wherein a metal core is surrounded by a body of concrete with which is incorporated a strengthening-fabric.

The advantages of the invention will be appreciated by all those familiar with the use of this class of devices, and while various changes or modifications may be made in its design, proportions, or other details by the skilled

mechanic all such changes are considered to be as within the scope of the invention as expressed in the following claims.

Having described my invention, what I claim is—

1. In a tie the combination of a longitudinal metallic member constituting a main foundation member, a surrounding body portion of cement or the like embracing said foundation member, and a perforated metallic sheath incorporated with and surrounding the said body portion, and adapted to confine and protect it, substantially as set forth.

2. A tie consisting of a longitudinal structural member, a surrounding body portion of cement or the like, and holding means therefor consisting of a perforated metallic sheath incorporated with the cement and secured to the structural member, substantially as set forth.

3. A tie consisting of a longitudinal structural member, a surrounding body portion of cement or the like, holding means therefor consisting of a perforated metallic sheath secured to the structural member and incorporated with the cement, and means secured to the upper face of the tie for engagement with the rails.

4. A tie consisting of a flanged longitudinal structural member, a surrounding body portion of cement or the like, holding means therefor consisting of a perforated metallic sheath incorporated with the cement and attached to the flanges of the structural member, and holding devices secured to the upper side of the structural member and adapted to engage the flanges of the rail, substantially as set forth.

5. A tie consisting of a longitudinal structural member, a surrounding body portion of cement or the like, holding means therefor consisting of a perforated metallic sheath se-

cured to the structural member and incorporated with the cement, and flanged plates secured to the upper side of the structural member provided with locking-keys adapted to engage the flanges of the rails.

6. A tie consisting of a longitudinal rolled structural metallic member having upper and lower flanges, a surrounding sheath of perforated metal secured to the upper flanges on each side, a surrounding body portion of cement or the like incorporated with the structural member and flanged plates secured upon the upper side of the longitudinal member, provided with locking-keys adapted to engage the rail-flanges.

7. A tie consisting of a longitudinal rolled structural metallic member having upper and lower flanges, a surrounding sheath of perforated metal secured to the upper flange on each side, a surrounding body portion of cement or the like incorporated with the structural member and the sheath, and plates secured upon the upper side of the longitudinal member provided with lateral flanges at each side and intermediate ribs, and securing-keys adapted to be inserted through one of the flanges to engage the rail-flange and to be bent down to engage the other flange of the plate.

8. In combination with a metallic tie, a plate having upwardly-extending flanges at each side and an intermediate upwardly-extending rib, and a securing-key adapted to be inserted in an opening in one of the flanges and to be bent down into engagement with the other.

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

ARTHUR M. BOWMAN.

Witnesses:

JAS. J. McAFEE,
C. M. CLARKE.