

W. D. FORSYTH.
 REINFORCED CONCRETE CROSS TIE.
 APPLICATION FILED NOV. 25, 1910.

996,634.

Patented July 4, 1911.

2 SHEETS—SHEET 1.

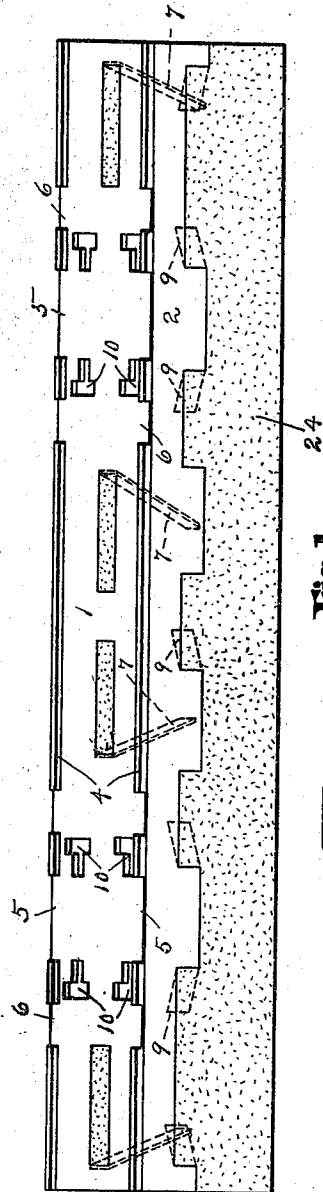


Fig. 1.

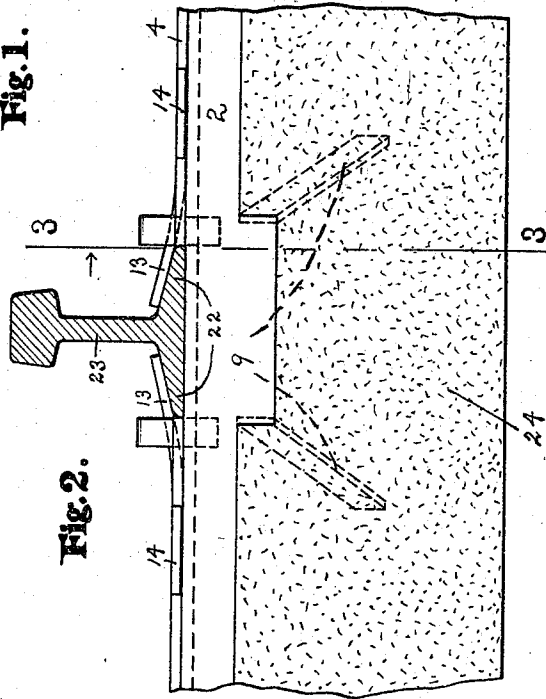


Fig. 2.

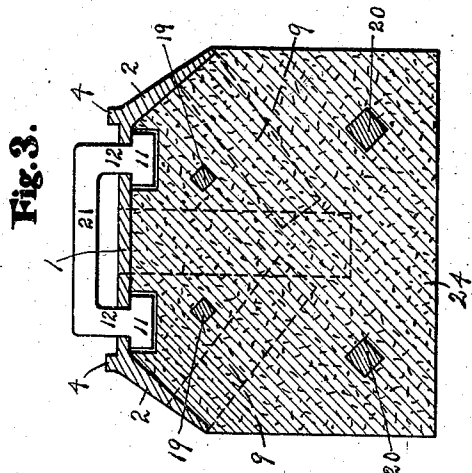


Fig. 3.

Inventor

Witnesses
 Albert A. Hofmann
 Elizabeth M. Brown.

William D. Forsyth.
 By Edward N. Pagelsen,
 Attorney

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2 SHEETS—SHEET 2.

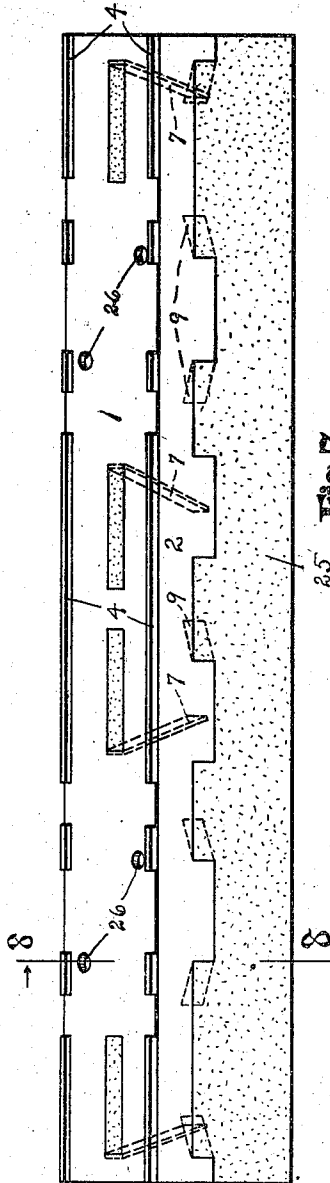


Fig. 7.

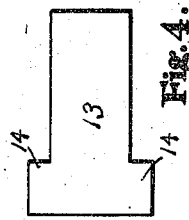


Fig. 4.

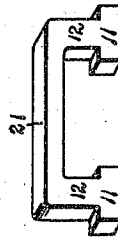


Fig. 5.

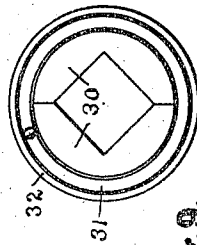


Fig. 9.

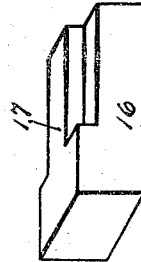


Fig. 6.

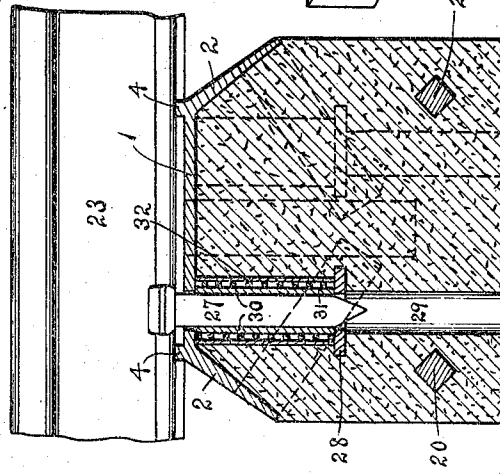


Fig. 8.

Inventor

Witnesses
 Albert A. Hofmann
 Elizabeth M. Brown.

William D. Forsyth.
 By Edward W. Pagelee, Attorney

UNITED STATES PATENT OFFICE.

WILLIAM D. FORSYTH, OF YOUNGSTOWN, OHIO.

REINFORCED-CONCRETE CROSS-TIE.

996,634.

Specification of Letters Patent. Patented July 4, 1911.

Application filed November 25, 1910. Serial No. 594,013.

To all whom it may concern:

Be it known that I, WILLIAM D. FORSYTH, a citizen of the United States, and a resident of Youngstown, in the county of Mahoning and State of Ohio, have invented a new and Improved Reinforced-Concrete Cross-Tie, of which the following is a specification.

This invention relates to railway cross-ties formed with a body of plastic material, such as concrete, properly reinforced and provided with rail-securing devices, and its object is to provide a cross-tie which shall have sufficient strength to resist the hammering from heavy trains, which shall have means for properly determining and preserving the gage of the track, and which shall have readily removable rail-retaining devices.

It further relates to improved rail-retaining devices especially adapted for reinforced-concrete cross-ties.

In the accompanying drawings, Figure 1 is a perspective view of a cross-tie embodying this invention. Fig. 2 is a side elevation of a section of the same on a larger scale. Fig. 3 is a cross section of the cross-tie on the line 3—3 of Fig. 2. Fig. 4 is a plan of a key for holding the rails in position. Fig. 5 is a perspective of the stirrup to engage the key. Fig. 6 is a perspective of a core. Fig. 7 is a perspective of the preferred form of cross-tie embodying this invention. Fig. 8 is a cross section on the line 8—8 of Fig. 7. Fig. 9 is a plan of a spike-retainer.

Similar reference characters refer to like parts throughout the several views.

The objection to the greater number of suggested reinforced cross-ties has been that the ties lacked proper means for holding down the rails and for predetermining the gage of the track, and that no proper provisions are made to transmit the blows from passing trains evenly to the entire body of the concrete.

The accompanying drawings illustrate two forms of reinforced concrete bodies, one having novel spike retaining devices embedded therein and the other provided with other novel rail retainers. Both forms of concrete bodies are shown supplied with a trough-shaped steel top provided with

gapped ridges to position the rails and with inwardly extending tongues to unite the tops to the concrete bodies.

The steel top of the cross-tie shown in Figs. 1, 2 and 3 is preferably in the form of a trough having a top-plate 1, inclined sides 2, ridges 4 having gaps 5 and 6, and inwardly extending tongues 7 and 9 sheared out of the top-plate 1 and inclined sides 2, respectively. The top-plate may be formed with T-shaped slots 10, in pairs, at opposite sides of the gaps 5, the larger portions of the slots being sufficiently large to admit the heads 11 of the stirrups shown in Fig. 5, the narrower portions of the slots closely fitting the stems 12. The distance between the stems 12 is sufficient to admit the resilient steel keys 13 having lateral extensions 14 adapted to fit in the gaps 6 in the ridges 4, when the keys are driven to rail-holding position. The cross-tie is formed in a proper mold by placing in the bottom thereof the steel top with the tongues 7 and 9 properly bent inward. To form the recesses to permit the movement of the heads 10 of the stirrups, cores 16, shown in Fig. 6, of some easily granulated material, may be positioned by placing the T-shaped tongues 17 into the slots 10. These cores may be formed by properly molding sand mixed with flour-paste and then baking. After the top and cores are in position, concrete 24 is rammed down against the metal around the tongues, and if desired, any proper longitudinal reinforcing rods 19 and 20 of any desired type may be embedded in the concrete. The resultant cross-tie will have a continuous tie-plate which will transmit the blows from the train to the entire upper part of the concrete body. As the tongues 7 and 9 insure a close union between the metal and concrete, the usual crumbling of the concrete under the rail will be avoided. The keys 13 are driven under the cross-bars 21 of the stirrups onto the inclined flanges 22 of the rails 23 and will bend slightly. When the lateral projections 14 of the keys reach the gaps 6 they will snap down into the same. The stiff keys hold the rails securely in the gaps 5. To remove the keys, wedges may be driven under their outer ends until they are free from the gaps

6 when they may be driven back out of the stirrups.

The preferred embodiment of this invention is shown in Figs. 7, 8 and 9. The top is again formed by the plate 1, sides 2 and ridges 4, and the tongues 7 and 9 again extend into the concrete body 25. The top-plate is formed with any desired number of holes 26 to admit the spikes or bolts 27 which may have any desired cross section. Molded in the concrete are the plates 28 having proper apertures to permit the shank of a spike that has lost its head to be driven through, for which purpose the body of concrete also has the passages 29. Between these plates 28 and the top-plate 1 are the two-part sleeves 30, preferably cylindrical, with bores to fit the spikes 27. These sleeves may be formed from properly rolled steel bars. Surrounding the sleeves 30 are coil-springs 31 which tend to hold the two parts together. These springs are within sleeves or tubes 32 of indurated fiber, straw-board, veneering, or other compressible material. The concrete 25 is rammed around the tongues 7 and 9, around the sleeves 32 and around any proper reinforcing rods 20 in the usual manner, any desired means being employed to form the passages 29 and to position the two-part sleeves 30. When a rail lies in the notches 5, spikes 27 may be driven down into the retainers where they will be firmly and securely held by the friction caused by the grip of the springs. The fiber sleeves prevent the soft concrete from flowing in between the coils of the springs which would prevent any expansion of the springs. Solid sleeves are commercially impractical as the ordinary sheared spikes and cast sleeves cannot be produced with sufficient accuracy. But by the use of these springs provision is made for considerable variation in the sizes of the spikes and bore of the sleeves. If a spike head should break off the spike can be driven down through the passage 29. The plates 28 prevent the sleeves 30 from being driven down into the passages 29 and also hold the sleeves tight against the top plates 1 and thus prevent tipping of the rails.

Many other changes in the details of construction may be made by those skilled in the art without departing from the spirit of my invention.

Having now described my improvements, what I claim as my invention and desire to secure by Letters Patent is:—

1. In a reinforced cross-tie, the combination of a body of concrete and a metal top for the same comprising a flat top-plate having ridges along its edges and inclined sides, said top-plate and sides having tongues integral therewith extending into

the concrete to hold the top and the concrete together, said ridges having gaps to receive the rails, said top-plate having apertures to receive rail-securing devices.

2. In a reinforced cross-tie, the combination of a body of plastic material and a trough-shaped metal top for the same, said top being sheared to form tongues which extend into the concrete and also having apertures to receive rail-securing devices, and having a longitudinal ridge formed with gaps to receive the rails and predetermine the gage of the track.

3. In a reinforced cross-tie, the combination of a body of plastic material, a metal trough-shaped top for the same provided with tongues extending into the plastic material and with holes to admit spikes, and spike-holding devices molded into the body of plastic material below said holes, each comprising a split-sleeve and a spring surrounding the sleeve.

4. In a reinforced cross-tie, the combination of a body of plastic material, a metal trough-shaped top for the same provided with integral inwardly extending tongues and with holes for spikes, said metal top extending the entire length of the plastic material, and spike-holding devices molded into the body of plastic material below said holes in the metal top, each comprising a split-sleeve, a coil spring surrounding the sleeve, a fiber tube surrounding the spring, and a plate at the lower end of each spike-holding device to support the same.

5. In a reinforced cross-tie, the combination of a body of concrete, a metal plate extending along the top of the same and provided with holes for spikes, and spike-retaining devices molded in the concrete below said holes comprising split-sleeves having proper bores to receive the spikes, and resilient means to grip the sleeves onto the spikes.

6. In a reinforced cross-tie, the combination of a body of concrete, a metal plate extending along the top of the same and provided with holes for spikes, and spike-retaining devices molded in the concrete below said holes comprising split-sleeves having proper bores to receive the spikes, resilient means to grip the sleeves onto the spikes, and means to prevent the concrete from contacting with said resilient means.

7. In a reinforced concrete cross-tie, the combination of a body of concrete, a metal plate extending along the top of the same and provided with holes for spikes and with tongues extending into the concrete, and spike-retaining devices molded in the concrete below said holes comprising split-sleeves having proper bores to receive the spikes, coil-springs surrounding the split-

sleeves to cause the same to grip the spikes, means to prevent the wet concrete from flowing around the windings of the springs, and a supporting plate under each spike-
5 retaining device, said concrete body having vertical passages communicating with the bores of said split-sleeves.

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

WILLIAM D. FORSYTH.

Witnesses:

JAMES F. CALLAHAN,
M. E. THOMAS.