

No. 810,876.

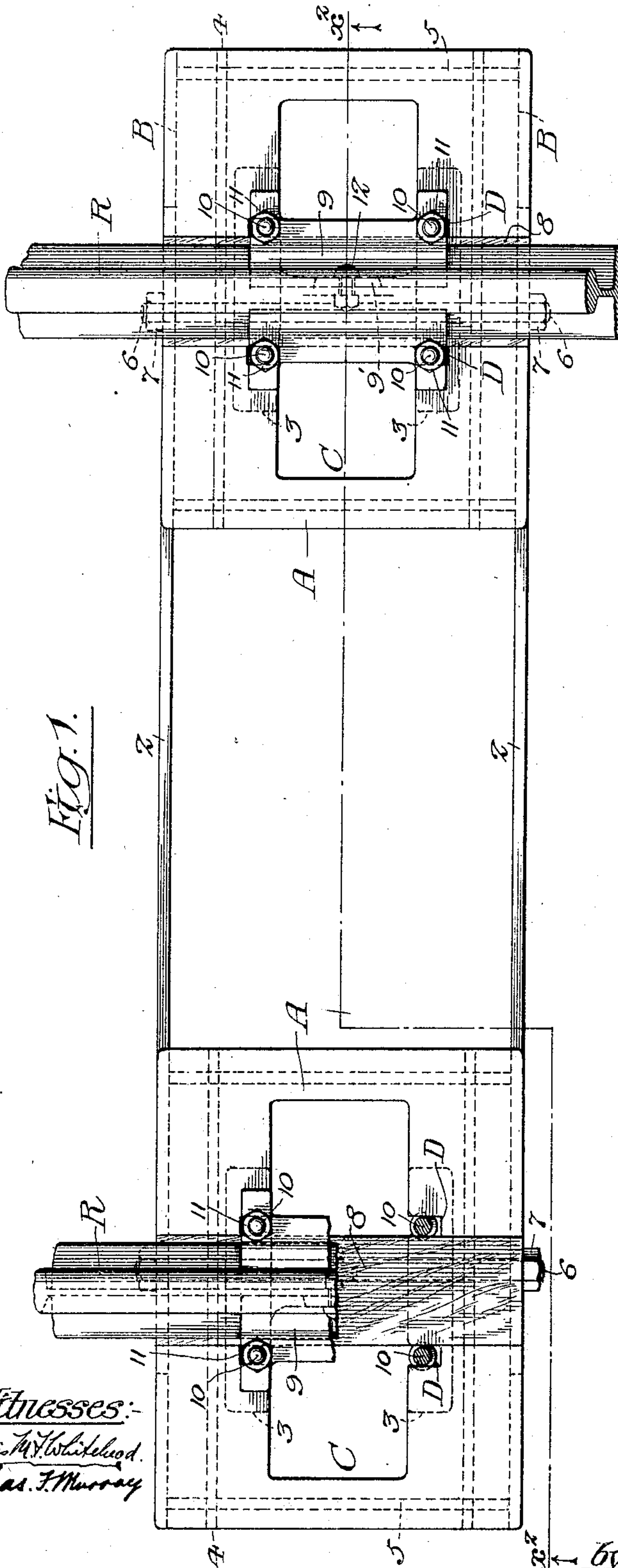
PATENTED JAN. 23, 1906.

E. MURRAY.  
RAILROAD TIE.

APPLICATION FILED JULY 6, 1905.

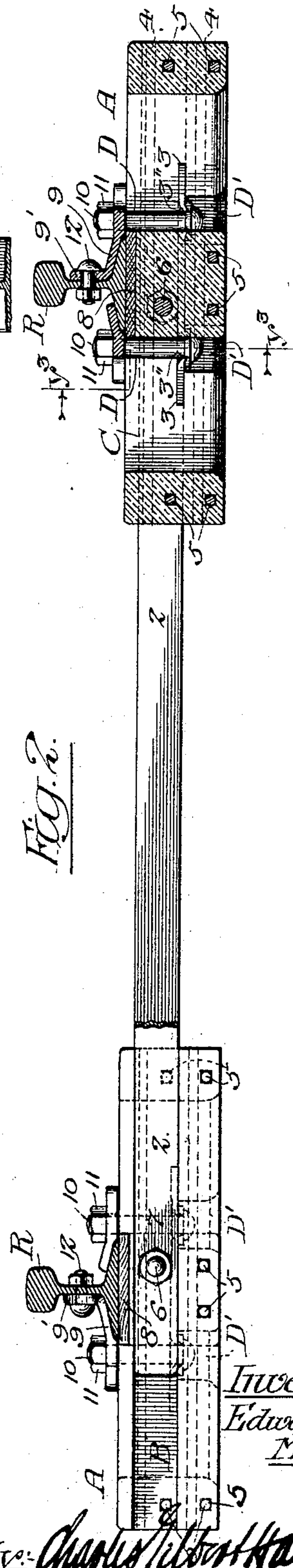
2 SHEETS—SHEET 1.

Fig. 1.



Witnesses:  
Louis M. Whitelock  
Chas. F. Murray

Fig. 2.



Inventor:  
Edward  
Murray

By: Charles F. Murray

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2 SHEETS—SHEET 2.

Fig. 3.

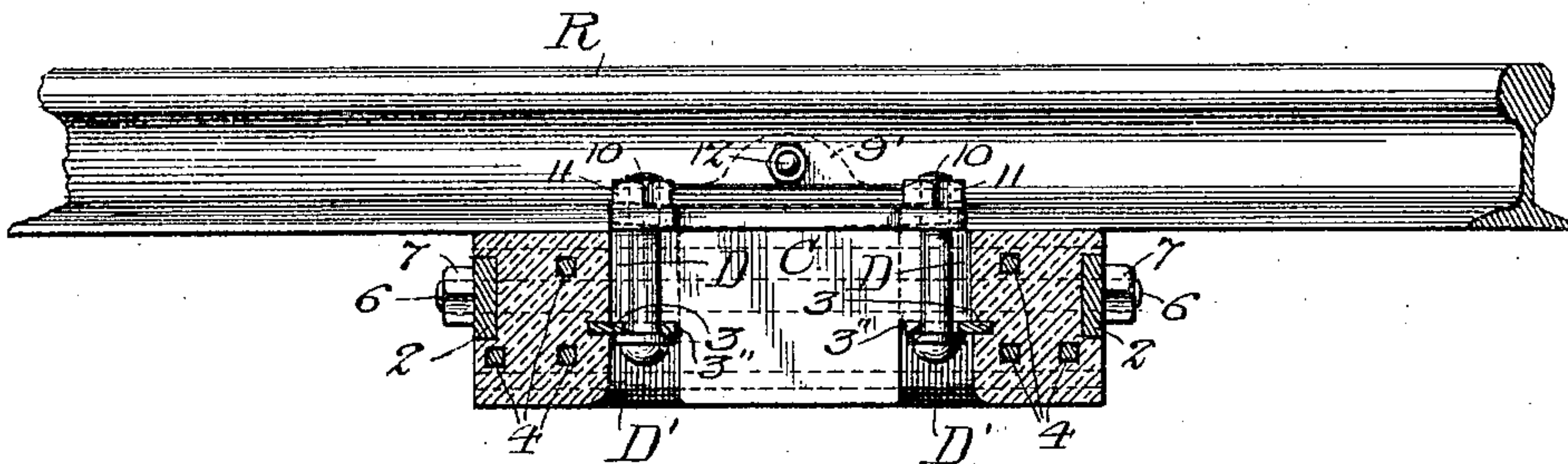


Fig. 4.

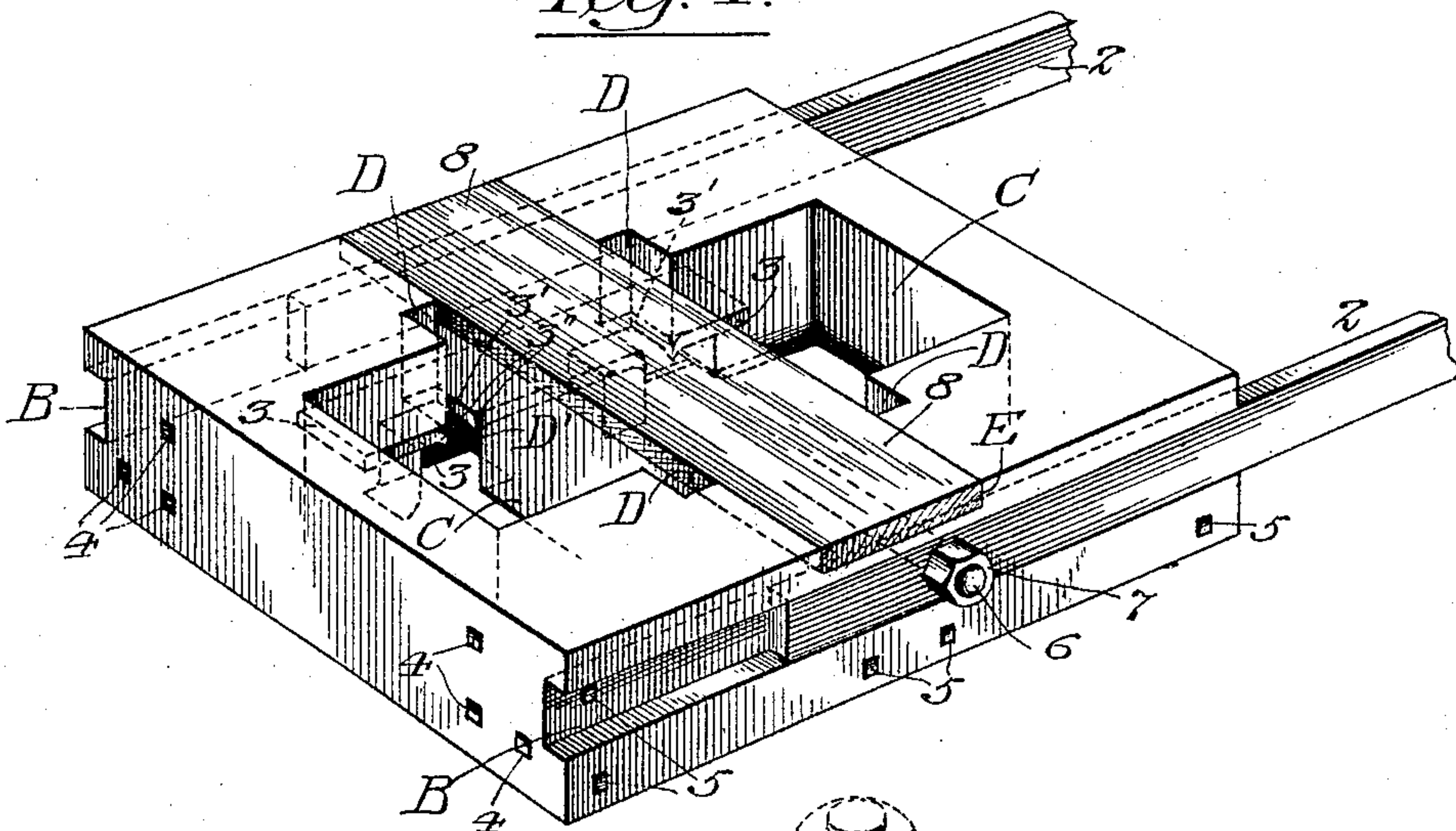
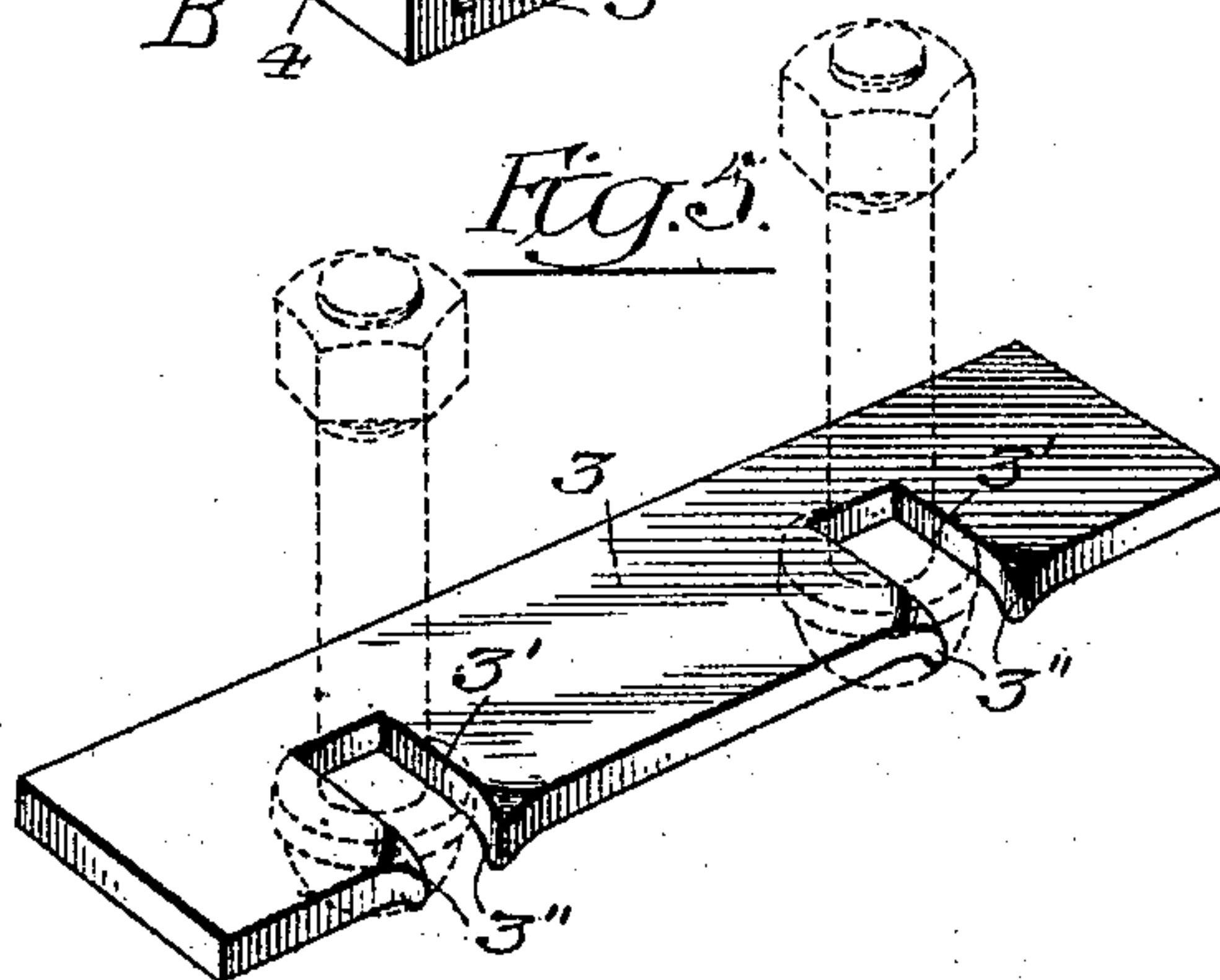


Fig. 5.



Witnesses:-

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*Chas. F. Murray*

Inventor:-

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Attys:-



# UNITED STATES PATENT OFFICE.

EDWARD MURRAY, OF CHICAGO, ILLINOIS.

## RAILROAD-TIE.

No. 810,876.

Specification of Letters Patent.

Patented Jan. 23, 1906.

Application filed July 6, 1905. Serial No. 268,354.

*To all whom it may concern:*

Be it known that I, EDWARD MURRAY, a citizen of the United States, residing at Chicago, Cook county, Illinois, have invented a certain new, useful, and Improved Railroad-Tie, of which the following is a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to railroad-ties, and has particular reference to ties of the class known as "concrete" ties.

The objects of my invention are, first, to provide an improved railroad-tie in which artificial stone or concrete and metal shall be combined to form a comparatively light, strong, and durable railroad-tie; second, to provide an artificial or concrete tie of such simple construction that it may be made at a cost slightly in excess of the cost of a wooden tie of the best grade; third, to provide a concrete tie of such form and construction that it may be easily and effectually tamped, my purpose in this regard being to insure the solidity of the tie when placed in the road-bed; fourth, to provide a concrete or composite tie that shall determine the track-gage and which shall lend itself to employment with rails of different sizes without change in said gage; fifth, to provide in a concrete tie improved means for securing the rails thereto, a particular object of my invention being to not only firmly secure the rails upon the tie, but also prevent the creeping of the rails thereon; sixth, to provide a concrete tie that shall be composed of two principal separably-connected concrete parts that may be handled with ease when it is necessary to transport or to place the same; seventh, to provide a concrete tie composed of two concrete portions so connected that the parts shall be self-aligning, whereby the rails shall be relieved of lateral strains, to which they would otherwise be subjected; and, eighth, to provide a concrete tie which shall have a wooden or other non-metallic and non-mineral rail-seat that shall afford requisite resilience and minimize the effect of communicated rail-blows upon the tie when in position.

With these objects in view my invention consists in a railroad-tie substantially of the form and construction hereinafter shown and described, and particularly pointed out in the claims.

My invention will be more readily understood by reference to the accompanying

drawings, forming a part of this specification, and in which—

Figure 1 is a plan view of a railroad-tie embodying my invention. Fig. 2 is a vertical sectional view thereof on the line  $x^2 x^2$  of Fig. 1. Fig. 3 is a transverse vertical section on the line  $y^3 y^3$  of Fig. 2. Fig. 4 is a perspective view of one end of the tie with the rail and rail-fasteners removed, and Fig. 5 is an enlarged perspective view of one of the anchor-plates which I embed in the concrete to hold the rail-fastening bolts.

In the drawings the sectional views are taken upon the planes indicated by section-lines and viewed in the direction of respective arrows, and the reference letters and figures refer to similar parts throughout the several figures.

As shown in the drawings, my tie is made in two principal parts or blocks A A of concrete, connected by tie-bars 2 2. The blocks are identical in form and construction, and therefore interchangeable. A description of one will serve for both. The block A is composed of concrete of good quality and is preferably of somewhat greater length than width. In molding the block I provide it with edge grooves B B and with tamping-spaces C C. One of these spaces C is provided on each side of the middle or rail portion of the block, and the spaces extend through the top and bottom of the block. In addition to these grooves and recesses the block is, when being molded, provided with the vertical notches D D, somewhat enlarged at the bottom of the block, as shown at D'. These notches open into the spaces C C and are intended to accommodate the bolts by which the rail is secured to the tie. The intermediate portion of each notch D is traversed by a metal plate 3. I prefer to employ a single plate for each pair of notches, the plate extending longitudinally of the tie and transversely of the rail. This plate 3 is illustrated in dotted lines in Figs. 1, 2, and 4 and is shown in full lines in Figs. 3 and 5. As shown in the latter figure, the plate 3 has notches 3', corresponding to the notches or vertical grooves D in the concrete block. The corners of the plate at the openings of the notches 3' are bent downwardly to form the spurs 3'', that serve to retain the heads of the bolts, as hereinafter explained. As clearly appears in Fig. 3, the notches or recesses D' in the lower part of the tie, beneath the embedded plates 3, are of sufficient size to admit the bolt-heads.



In molding the concrete block I embed therein a number of longitudinal and also a number of transverse tie rods or bars 4 and 5, which greatly strengthen the block. These rods extend through the solid outer portions of the block surrounding the cavities or tamping-spaces C. In the solid middle portion of the block is a rod 6, having threaded ends to receive nuts 7. This rod is embedded or placed in the concrete, and its ends project through the sides of the block in position to receive the tie-rods 2 2. These tie-rods are placed in the grooves B B of the block, and when secured upon the rods 6 of the two blocks they fix or determine the distance between the blocks A A, and thus fix the rail track-gage. The rods 6 6 are accurately positioned in the concrete block by use of suitable molds, and the holes in the tie-rods 2 are of standard distance between centers, so that all parts of my ties are interchangeable. By recessing the ends of the tie-bars in the sides of the blocks A A, I gain the advantage of the vertical strength of the tie-bars to prevent tilting of the blocks A A. It will be noted that each block A is provided with a transverse groove or recess E in its top, the same crossing the solid transverse or middle portion of the block. This groove corresponds to the position of the rail upon the tie-block and is filled by a strip or sheet 8 of wood or other non-metallic material possessing sufficient resilience to relieve the concrete tie from the jar imparted to the rail by a passing train. The rail R rests upon the wooden strip 8 and is secured to the tie-beams by metal clips or plates 9 and bolts 10. The bolts 10 are placed in the recesses D before the spaces C are filled with earth. The heads of the bolts are dropped into the notches in the embedded plates 3. The rail having been positioned upon the tie, the plates 9 are then placed upon the upper ends of the bolts 10 and are followed by the nuts 11. The plates 9 have their inner edges recessed or bent to fit the base of the rail, and when the nuts 11 are tightened upon the bolts the rail will be firmly locked upon the tie. It may here be noted that when the bolts are drawn tight by means of the nuts the bolt-heads will be tightened against the undersides of the embedded plate 3 and lateral movement of the bolts in the notches of said plates will be prevented by the depending points 3'' on said plate. This is the case even when the nuts have become loosened sufficiently to attract the attention of the trackman, and all danger of accidental disconnection of the bolts from the ties is therefore avoided. I prefer to employ rail-plates of two different kinds, both serving to secure the rail against vertical movement and both also serving to prevent the creeping of the rail upon the tie. In one, usually upon the inner side of the rail, the plate 9 is slightly curved at the time it is

made, (see dotted lines, Fig. 3,) and its under side is also roughened. This curved plate when drawn down by the nuts on bolts 10 operates to clamp the rail and also serves to lock the nuts upon the bolts. The device operates as an anticreeper and is particularly efficient in this regard because the plate 9, with the two plates 3 and the two bolts, comprises a parallel-motion device wherein the longitudinal movement of the rail-plate 9 tends to shorten the distance between said plate and the plates 3, and hence more firmly clamps the plate 9 upon the rail. In the case of the rail-plate upon the outer side of the rail I provide same with a vertical lug or flange 9', that extends into engagement with the web of the rail and is secured thereto by one or more bolts 12. The bolt-opening in the flange 9' is preferably elongated vertically to permit the horizontal portion of the plate to rest upon the rail-base. The bolt 12 serves to prevent longitudinal movement of the rail upon the tie. The dimensions of the block A are such that the bolts 10 upon the two sides of the rail are separated sufficiently to admit a rail of maximum size, and the rail-plates 9 are made to correspond to the rails with which they are used. In other words, bolts 10 being definitely positioned the plates 9 determine the distance between the rails upon opposite ends of the tie. I prefer to have the rod 6 with its axis in the plane of the gage-line and the holes in the tie-rods 2 bored to exactly correspond with the track-gage. By so doing I adapt my ties to the universal gage without respect to the different sizes of rails that may be employed thereon. When placing my ties in the track, the same are tamped around the outer edges of the block A in the usual manner and are then additionally tamped upon the inside through the tamping-spaces C, which are of sufficient size to admit the tools with which tamping is done.

As it is obvious that numerous modifications of my invention will readily suggest themselves to one skilled in the art, I do not confine the invention to the specific constructions herein shown and described.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. A concrete railroad-tie provided with tamping-spaces in its end portions, substantially as described.

2. A concrete railroad-tie comprising suitably-connected concrete blocks or rail-supporting portions, each provided with two vertical holes or tamping-spaces, substantially as described.

3. A concrete railroad-tie having rail-seats upon its ends and provided with tamping-spaces upon opposite sides of each said rail-seat, substantially as described.

4. A concrete railroad-tie comprising con-



crete blocks and means for securing the rails thereon, in combination with parallel tie-rods that connect said blocks, substantially as described.

5 5. A concrete railroad-tie comprising concrete blocks provided with means for securing the rails thereto and each provided with side grooves or recesses, in combination with parallel tie-rods having their ends detach-  
10 ably secured in said side grooves, substantially as described.

6. A railroad-tie comprising blocks composed of concrete and metallic reinforcing parts embedded therein, in combination with  
15 transverse anchor bars or rods in said blocks and parallel tie-rods having their ends secured upon said anchor-rods, substantially as described.

7. A railroad-tie comprising two concrete  
20 blocks, each containing a transverse anchor-rod located in the plane of the rail-gage line, in combination with parallel tie-rods secured upon the ends of said anchor-rods, and determining the track-gage, substantially as de-  
25 scribed.

8. A railroad-tie comprising suitably-reinforced concrete blocks, each containing side grooves and each provided with a transverse anchor-rod, in combination with parallel tie-  
30 rods having their ends secured upon the ends of said anchor-rods within the side grooves of said blocks, substantially as described.

9. A railroad-tie comprising suitably-reinforced concrete blocks, each containing side  
35 grooves and each provided with a transverse anchor-rod, in combination with parallel tie-bars, having their ends secured upon the ends of said anchor-rods, within the side grooves of said blocks, said parallel bars having anchor-rod holes corresponding to the standard  
40 track-gage, substantially as described.

10. A concrete railroad-tie comprising suitably-reinforced concrete blocks provided with side grooves or recesses, in combination  
45 with parallel tie-rods having their ends secured in said grooves, substantially as described.

11. A railroad-tie comprising suitably-reinforced concrete blocks, each provided with  
50 a transverse horizontal anchor-rod having its end extending through the sides of the block, in combination with tie-rods having holes in their ends to fit upon the projecting ends of said anchor-rods, and means for se-  
55 curing said tie-rods thereon, substantially as described.

12. A concrete railroad-tie having tamping-spaces in its end portions and provided with horizontal anchor-plates embedded in  
60 said end portions in combination with bolts extending upwardly from said plates and a rail-securing plate upon each pair of said bolts.

13. A railroad-tie provided with vertical  
65 recesses upon each side of the rail-seat, in

combination with bolts extending upwardly through said recesses, and of less diameter than said recesses, nuts upon the upper ends of said bolts, and a rail-clamping plate extending between the bolts at one side of the  
70 rail-seat and held by the nuts thereon, substantially as described.

14. An anticreeping device comprising parallel bolts and means for anchoring the lower ends thereof upon a railroad-tie, in  
75 combination with a plate to engage a rail-base and connecting the upper ends of said bolts, substantially as described.

15. An anticreeping device comprising parallel bolts and means for anchoring the  
80 lower ends thereof upon a railroad-tie, in combination with a normally curved spring-plate to engage a rail-base and connecting the upper ends of said bolts, substantially as described.  
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16. An anticreeping device of the class described, comprising parallel bolts and means for anchoring the lower ends thereof upon a railroad-tie, in combination with a plate connecting the upper ends of said bolts and pro-  
90 vided with a vertical rail-web-engaging lug, having a bolt-hole, substantially as described.

17. A railroad-tie comprising suitably-connected concrete blocks provided with  
95 tamping-spaces and containing, embedded, horizontal anchor-plates, in combination with bolts, having their ends extending through said anchor-plates, nuts upon said bolts above the tops of said blocks, and hori-  
100 zontal plates connecting the pairs of bolts upon opposite sides of the rail-seat portions of said blocks, substantially as described.

18. A railroad-tie comprising suitably-connected concrete blocks provided with  
105 tamping-spaces and containing, embedded, horizontal anchor-plates, in combination with bolts, having their ends extending through said anchor-plates, nuts upon said bolts above the tops of said blocks and hori-  
110 zontal plates connecting the pairs of bolts upon opposite sides of the rail-seat portions of each of said blocks, one of said plates being normally curved and the other having a vertical lug to be attached to the web of a rail,  
115 substantially as described.

19. A concrete railroad-tie having horizontal anchor-plates embedded in its end portions and provided with vertical recesses opening above and below said plates, there  
120 being also tamping-spaces in said tie communicating with said recesses, rail-fastening bolts arranged in said recesses and engaged with said plates, said plates being provided with bolt-receiving notches and de-  
125 pending bolt holding lugs, substantially as described.

20. A bolt-anchoring device, for concrete railroad-ties, comprising a notched plate having its corners bent downwardly at the  
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openings of its notches, as and for the purpose specified.

21. A railroad-tie comprising suitably-connected concrete blocks each provided  
5 with a resilient rail-seat, two tamping-holes, bolt-recesses and embedded metallic anchor and reinforcing parts, substantially as described.

In testimony whereof I have hereunto set my hand, this 28th day of June, 1905, at Chicago, Illinois, in the presence of two subscribing witnesses.

EDWARD MURRAY.

Witnesses:

CHARLES GILBERT HAWLEY,  
CHAS. F. MURRAY.