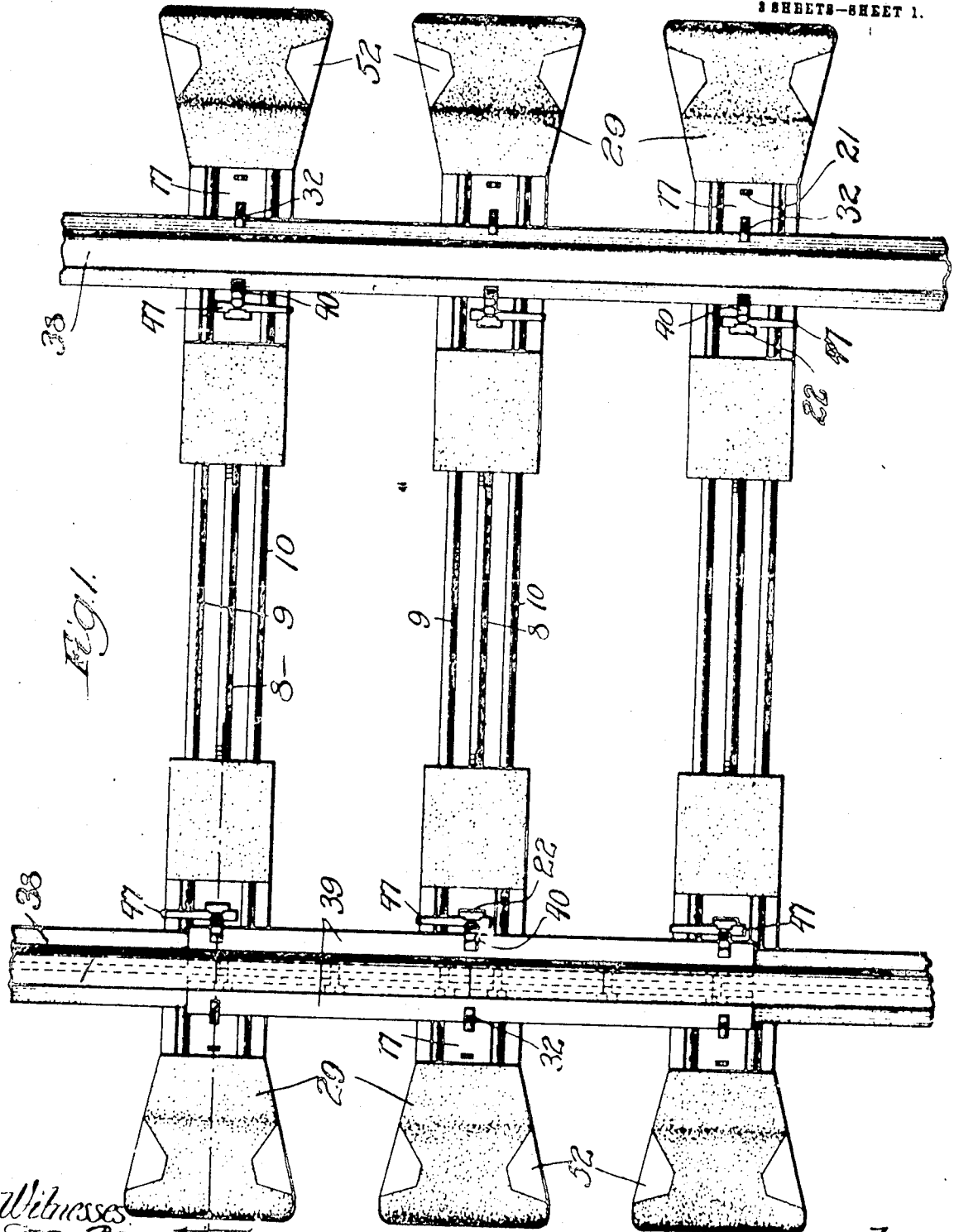


955,645.

O. R. HOLDEN.
REINFORCED CONCRETE TIE.
APPLICATION FILED MAY 14, 1909.

Patented Apr. 19, 1910.

3 SHEETS—SHEET 1.



Witnesses
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3 SHEETS—SHEET 2.

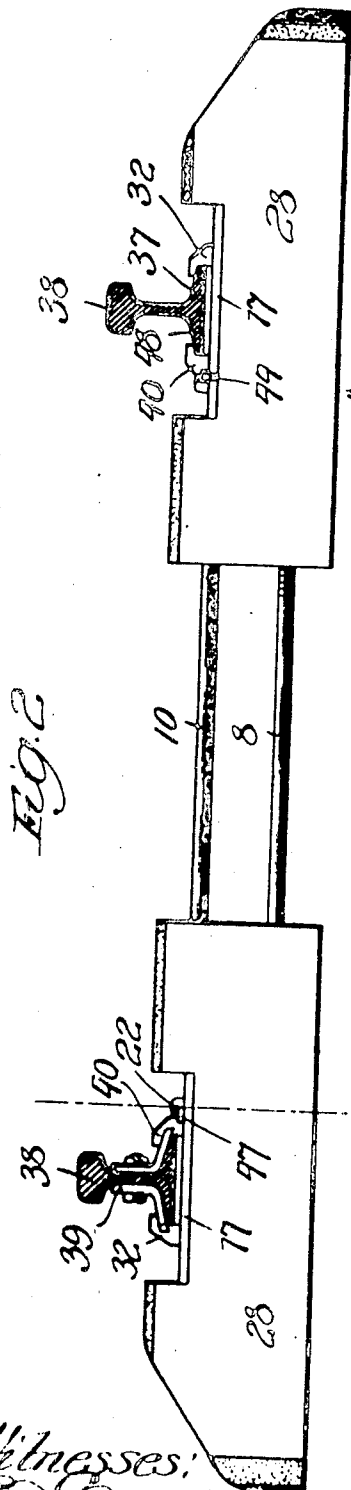


Fig. 2

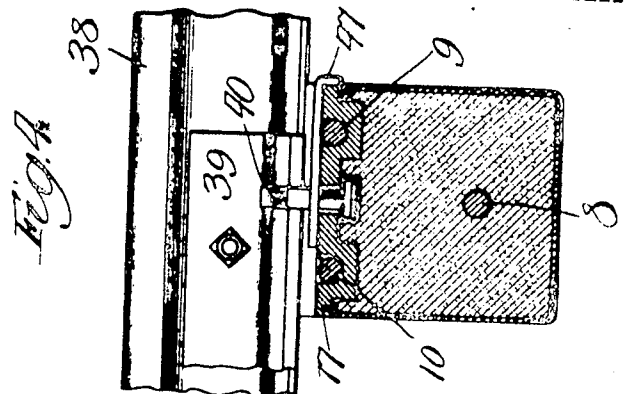


Fig. 4

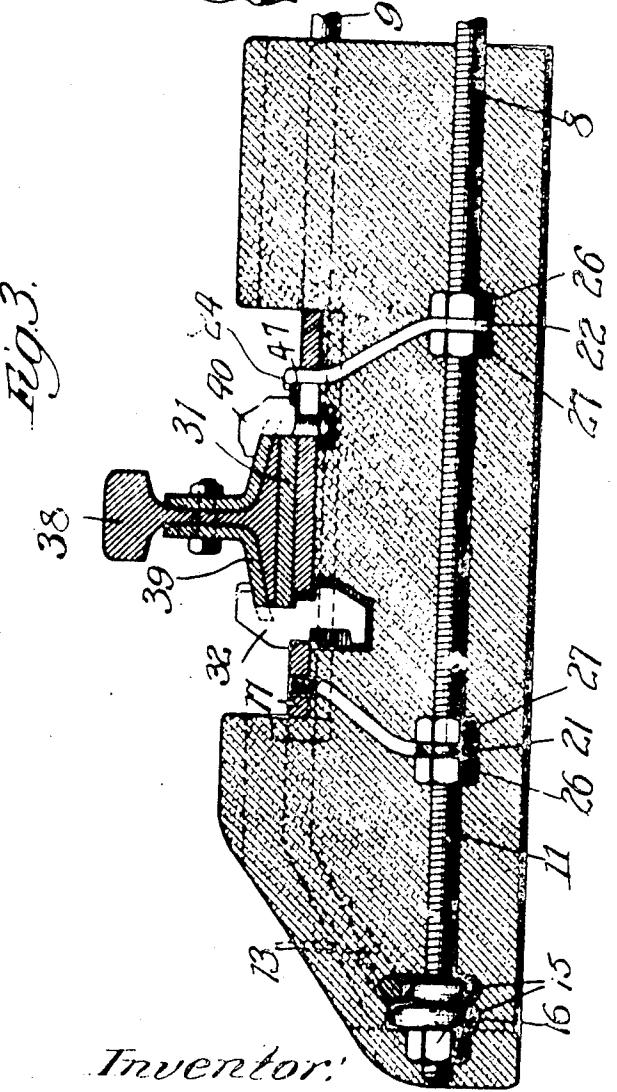


Fig. 3

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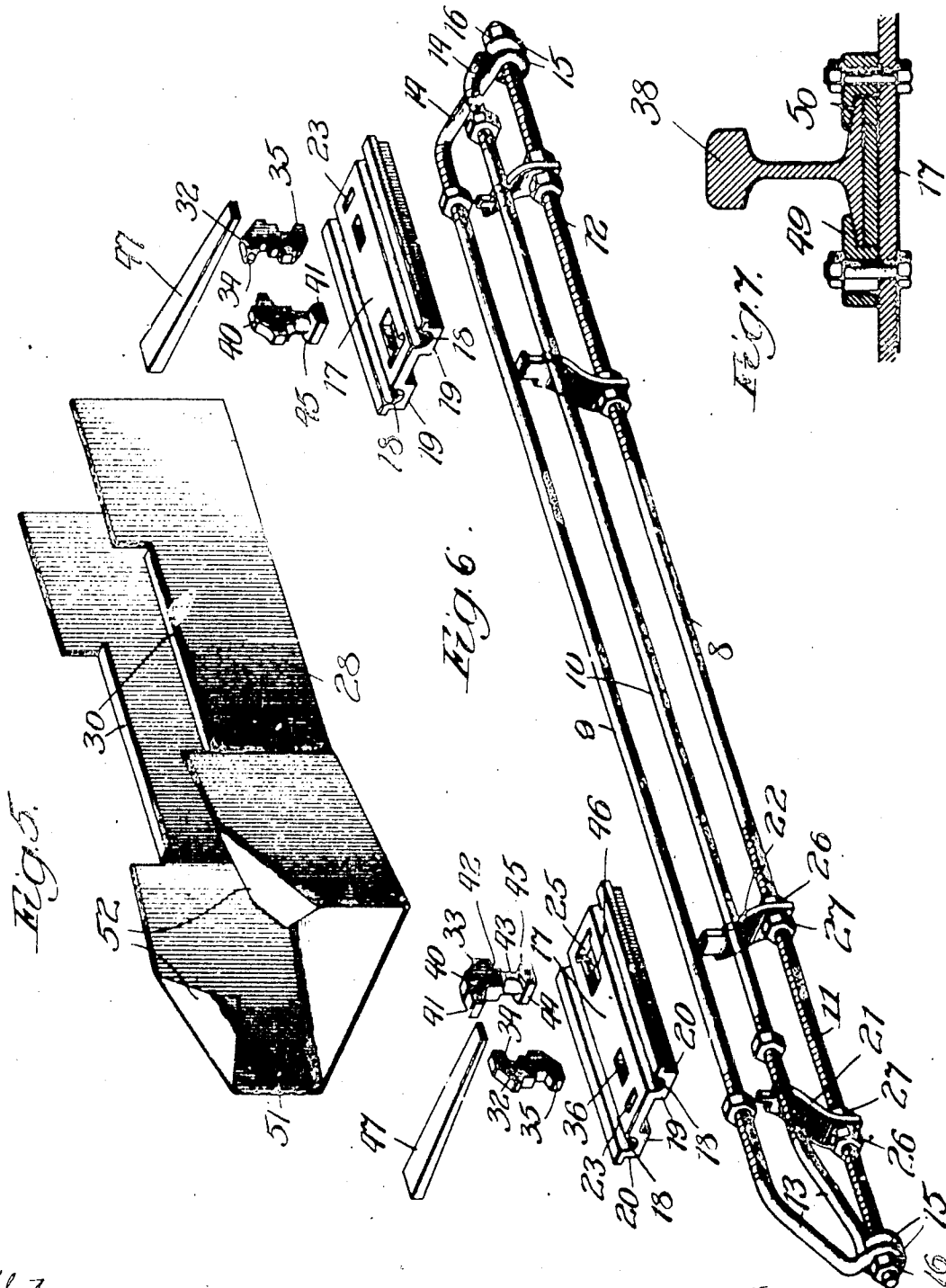
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UNITED STATES PATENT OFFICE.

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REINFORCED-CONCRETE TIE.

955,645.

Specification of Letters Patent. Patented Apr. 19, 1910.

Application filed May 14, 1909. Serial No. 496,001.

To all whom it may concern:

Be it known that I, CHARLES R. HOLDEN, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Reinforced-Concrete Ties, of which the following is a specification.

My object, generally stated, is to provide an improved construction of concrete tie, which shall be economical to manufacture, simple of construction, and highly useful in accomplishing the purposes of constructions of this type.

Specifically stated, my objects are to provide a construction of tie which shall afford the resiliency desired, without sacrificing rigidity of structure; to provide a form of reinforcing member which, in itself, shall be collapsible into compact condition, thereby facilitating its transportation to the place of installation, and which, when incased in concrete to form the strengthening means for the tie, shall serve very effectually as a reinforcement for the concrete; and to provide improved means for supporting the rail on the tie and on the reinforcing member.

In the accompanying drawings, in which I have illustrated the preferred embodiment of my invention—Figure 1 is a plan view of a section of track formed with ties constructed in accordance with my invention. Fig. 2 is a view in side elevation of one of the similar ties illustrated in Fig. 1, the rails being shown in section. Fig. 3 is an enlarged sectional view of one end of one of the three similar ties illustrated in Fig. 1, the section being taken as indicated at the line 3 on Fig. 1 and viewed in the direction of the arrow. Fig. 4 is an enlarged section taken at the line 4 on Fig. 2 and viewed in the direction of the arrow. Fig. 5 is a perspective view of one of two similar molds preferably employed in connection with each tie for forming its concrete heads. Fig. 6 is a perspective view of the reinforcing member for the tie, plates cooperating with this reinforcing member, and means for securing the rails to the plates, these parts being shown in disassembled but related condition; and Fig. 7, a sectional view of one of the plates with a rail fastened thereon by another form of fastening means.

The reinforcing member, or frame, for the concrete, in its preferred embodiment, is formed of three rods 8, 9 and 10 extending

generally in parallel relation to each other, the rod 8 being screw-threaded at its opposite ends as represented at 11 and 12. The opposite ends of each of the rods 9 and 10 are deflected as indicated at 13 and 14, their extremities terminating in eyes 15 which surround the ends of the rod 8 as represented, nuts 16 screwing upon the opposite ends of the rod 8 and bearing against the eyes 15, preferably with sufficient force to slightly spring the rods 9 and 10 between their ends away from the rod 8, thus affording a rigid reinforcing frame possessing truss qualities. The pivotal connection of the rods 9 and 10 with the rod 8 afforded by the provision of the eyes 15, enables the frame to be collapsed and folded into condition for ease of shipment.

The position the rods occupy with relation to each other when the rods 9 and 10 are turned at their pivotal connections with the rod 8 for extending them to the position they occupy in use, is that represented in Fig. 6, in which position they cooperate near their opposite ends with metal plates 17, each of which contains parallel grooves 18 on its upper surface for receiving the rods 9 and 10, as illustrated in Fig. 4, these plates preferably being so formed as to afford longitudinally extending ribs 19 on their bottom surfaces presenting shoulders 20. At each end portion of the reinforcing members are braces 21 and 22, each of which is adjustable on the rod 8. The upper ends of the braces 21 extend into apertures 23 in the plates 17 near one end thereof, and the upper ends of the braces 22, which are formed with undercut portions 24 opening toward the ends of the reinforcing frame, extend through openings 25 in the plates toward their opposite ends. These braces, which are provided for the purpose of affording rigidity to the structure and abutments for wedge keys, as hereinafter described, in assembling the plates with the reinforcing frame, are adjusted upon the rod 8 to a position in which they rigidly bind against this rod and forcibly bear against the walls of the openings in the plates into which they extend, in which position they may be held as by nuts 26 and 27 screwing on the rod 8.

In forming a tie in accordance with the preferred embodiment of my invention, I employ two molds 28 formed of sheet metal,

each of which is designed to receive the concrete for forming one of the two heads 29 of the tie. Each mold has portions of the metal forming its opposed upper edge portions bent inwardly to form seats 30. It will be understood that preliminary to the molding of the concrete for forming the heads, the reinforcing frame with the plates 17 connected thereto as described, is positioned in the opposed molds to extend into the latter at its opposite ends, as clearly illustrated in Fig. 1, to cause the plates 17 to rest upon the seats 30 and the ends of the rods forming the reinforcing frame to extend close to the ends of the molds, this frame, by reason of the seating of its rods 9 and 10 in the grooves 18 in the plates 17, being maintained in suspended condition in the molds. The concrete for forming the heads 29 may then be filled into the molds to incase the end-portions of the frame and the braces 21 and 22, and preferably extend over the edges of the plates as represented. The plates 17 thus exposed at the upper surface of the tie form supports for wooden shims 31, upon which latter it is designed that the rails be seated cross-wise of, the heads 29, and fastened to the plates in any desirable way.

The form of means for fastening the rails to the plates which I prefer to employ are those illustrated in detail in Fig. 6. These means comprise a removable and replaceable abutment clip 32 for one side of a rail, designed to engage with its supporting plate in a manner to resist strains exerted against it, and a second clip 33 for the other side of the rail adapted to be forced into close and rigid engagement with the rail as by wedging means hereinafter referred to. The abutment clips 32 are of general S-shape affording oppositely extending undercut lugs 34 and 35 with the surfaces of the opposed edge-portions of these clips arranged in stepped relation as represented, whereby when the clip is inserted into an opening 36 in the plate 17 adjacent to the opening 23 and rests at one of its undercut lugs upon the flange of a rail, as for instance the flange 37 of the rail 38, or upon the flange of a fish-plate such as that represented at 39, it will interlock with the top and bottom surfaces of this plate, as represented of the clip illustrated in Fig. 3. Portions of the abutment clips 32 are thus caused to extend below the plates 17 into an opening in the concrete, which may be formed in the process of molding the heads 29, or thereafter in any other suitable way. The clips 33 are each formed with a head 40 affording a rail-flange-engaging shoulder 41, a shouldered portion 42, a round shank portion 43, and a cross-bar 44 at its lower end formed with a rounded upper surface as indicated at 45, these clips being adapted to be inserted

into openings 46 in the plates 17 and therein turned to cause the cross-bars to extend transversely of the plates. The clips 33 are bodily movable longitudinally of the plates in the openings 46 as through the medium of wedge-bars 47 engaging with the shouldered portions 42 of these clips and the undercut portions 24 of the braces 22, to cause the flanges 41 to be moved toward the rail and turned down and against those flanges of the rail, such as the flanges 48, which oppose the flanges 37. The arrangement of the stepped surfaces on the edges of the clips 32 adjacent to their lugs 34 and 35 is such as to permit of adjustment of the rails upon the plates longitudinally of the tie, this being accomplished by inverting the clips in the openings 36.

It will be noted that where the fish-plates for connecting together abutting rails, span the ties, the rail-securing clips on the ties thus spanned overlap the flanges of the fish-plates which, in turn, rest upon the flanges of the abutting rails, thus the clips engaging with the fish-plates need differ from the clips adapted to engage directly with the flanges of the rails in size only, to cause their rail-flange-engaging shoulders to project a sufficient distance above the plates, the principle of operation of these clips being identical.

While I have shown and described a particular form of means for securing the rails to the plates 17, I do not wish to be understood as limiting my invention to the employment of such means, as any other suitable form of rail-fasteners may be employed without departing from the spirit of my invention. Thus, for example, the fastening means may be in the form of clips 49 and 50 bolted to the plates 17 to engage with the opposite flanges of the rail as clearly illustrated in Fig. 7.

The form of mold which I prefer to employ for forming the concrete heads 29 have their outer end-portions flaring, as represented at 51, with inwardly extending flanges 52 along their upper edge-portions, the latter serving to reinforce the concrete, and the flaring portion of the mold affording to the molded concrete heads widened ends which present a broad bearing surface of the heads on the ballast of the roadbed, at those points where resistance to downwardly directed strains is most needed. It will be understood that the use of a mold of the character described is not indispensable to the forming of a tie embodying my improvements, though it is highly desirable to employ such a mold.

By connecting the heads 29 through the medium of a reinforcing frame formed of the rods 8, 9 and 10, a degree of flexibility is afforded to the tie which closely approximates that of the wooden tie.

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

1. A reinforcing member for ties of concrete formed of a plurality of sections pivotally connected together to adapt them to be folded into compact condition. 5
2. A reinforcing member for ties of concrete formed of a plurality of sections pivotally connected together near their ends to adapt them to be folded into compact condition. 10
3. A reinforcing member for ties of concrete formed of a plurality of rods, certain ones of which have deflected end-portions, said rods being pivotally connected with each other near their ends, for the purpose set forth. 15
4. A reinforcing member for ties of concrete formed of a plurality of rods, certain ones of which have deflected end-portions, terminating in eyes, said rods having pivotal connection with each other at said eyes, for the purpose set forth. 20
5. A reinforcing member for ties of concrete formed of a plurality of rods, certain ones of which have deflected end-portions provided with eyes engaging with the other of said rods and affording pivotal connections therewith, and means for holding the rods under tension, for the purpose set forth. 25
6. A reinforcing member for ties of concrete formed of a plurality of rods, one of which is screw-threaded at one end and provided at its opposite end with a stop, the others of said rods being formed with deflected end-portions surrounding the ends of said screw-threaded rod, and a nut screwing on the threaded end of said last referred-to rod and against the adjacent ends of said deflected rods, for the purpose set forth. 30
7. A reinforcing member for ties of concrete formed of a plurality of rods, one of which is screw-threaded at its opposite ends and the others of said rods being formed with deflected end-portions surrounding the opposite ends of said screw-threaded rod, and nuts screwing upon the ends of said screw-threaded rod and bearing against the ends of the deflected rods, for the purpose set forth. 35
8. A tie formed of two separated heads of concrete with a reinforcing member therefor embedded at its ends in said heads and spanning the space between them, the reinforcing member being formed of a plurality of rods, certain ones of which have deflected end-portions, the rods being directly connected together at their ends, for the purpose set forth. 40
9. A tie of concrete formed with a reinforcing member composed of rods, extending longitudinally of the tie, and plates on the tie near its opposite ends with portions of the rods extending across the upper surfaces of the plates. 45
10. A tie of concrete formed with a reinforcing member composed of rods, and plates on the tie near its opposite ends containing grooves in their upper surfaces, with portions of the rods extending across the surfaces of the plates. 50
11. A tie of concrete formed with a reinforcing member composed of rods, plates on the tie near its opposite ends, and braces carried by said member and engaging with said plates, for the purpose set forth. 55
12. A tie of concrete formed with a reinforcing member composed of rods, plates containing apertures on the tie, and braces carried by said member and extending into said apertures, for the purpose set forth. 60
13. A tie of concrete formed with a reinforcing member composed of rods, plates containing apertures on the tie, braces carried by said member and extending into the apertures in the plates, and means for placing the braces under tension, for the purpose set forth. 65
14. A tie of concrete formed with a reinforcing member composed of rods, one of which is screw-threaded toward its opposite ends, and the others of which are connected with said screw-threaded rod, plates on said tie near its opposite ends, braces connected with said last referred-to rod operatively engaging with said plates, and nuts screwing on said screw-threaded rod against the braces, for the purpose set forth. 70
15. A tie formed of two separate heads of concrete with a reinforcing member embedded therein and formed of rods extending longitudinally of the tie, one of which rods is located in the lower portion of the heads and is screw-threaded at its end-portions, the others of said rods being located in the upper portions of the heads and having their ends deflected and terminating in eyes at which they have pivotal connection with the lowermost rod of said member, nuts on the screw-threaded rod bearing against said eyes, plates operatively connected with the upper rods of said frame, and braces connected with the lower rod and operatively engaging said plates, for the purpose set forth. 75
16. The combination with a pair of rails, of a tie of concrete formed with a reinforcing member extending longitudinally of the tie and composed of rods, plates upon which said rails are supported located toward opposite ends of the tie, portions of said rods extending across the plates between the latter and the rails, and means operatively engaging with the plates and rails for securing the latter to the plates with said rods thereby clamped between the plates and the rails. 80
17. A tie formed of concrete with a reinforcing member embedded therein formed of upper and lower rods some of which have deflected ends at which the rods are connected. 85

5 nected together, the upper rods being disposed in the same, or approximately the same, horizontal position, and rail-seating plates engaging with the upper ones of said rods and holding the latter in spaced relation.

10 18. A tie formed with a reinforcing member composed of upper and lower rods with the upper ones of the rods disposed in the same, or substantially the same, horizontal plane, plates located at opposite ends of the

tie and provided with grooves extending longitudinally thereof and engaging with said upper rods, and means for fastening rails to said plates and maintaining said plates in position and the rods spaced apart, 15 for the purpose set forth.

CHARLES R. HOLDEN.

In presence of--

RALPH A. SCHAEFER,
JOHN WILSON.