

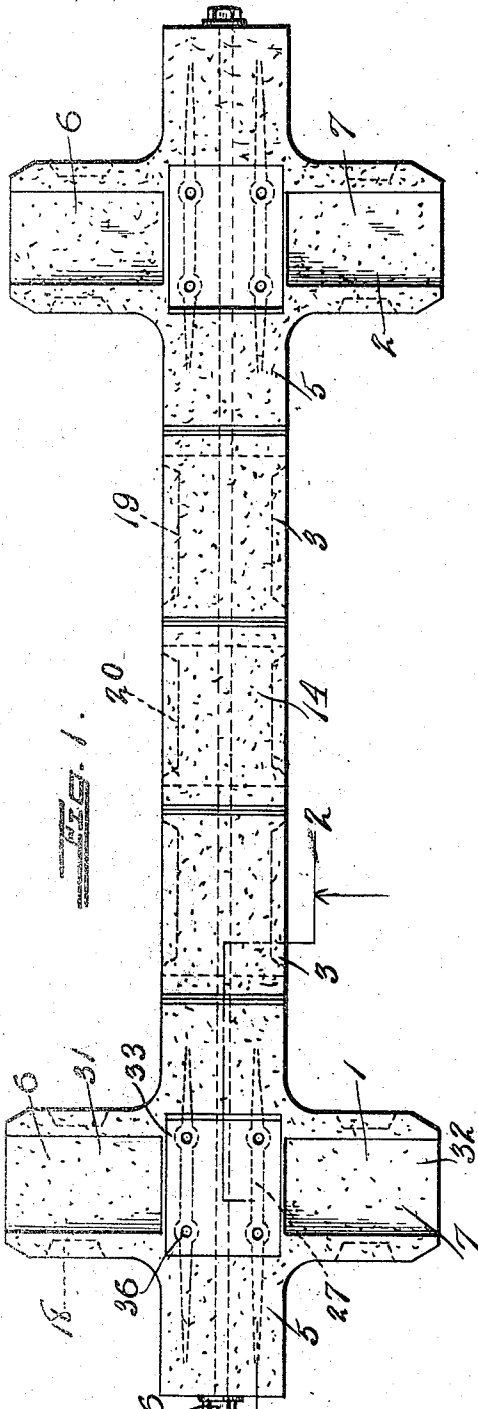
P. C. ICKES.
CONCRETE TIE.

APPLICATION FILED DEC. 3, 1914,

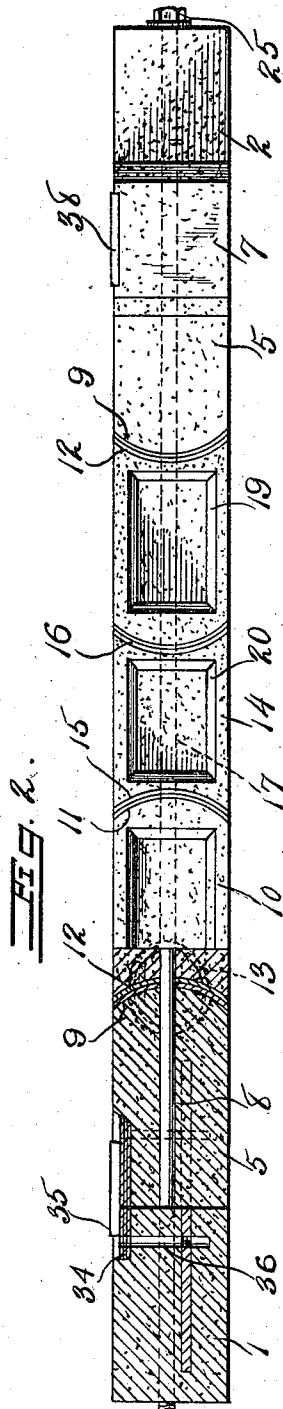
Patented Mar. 21, 1916.

2 SHEETS—SHEET 1.

1,176,366.



Witnesses
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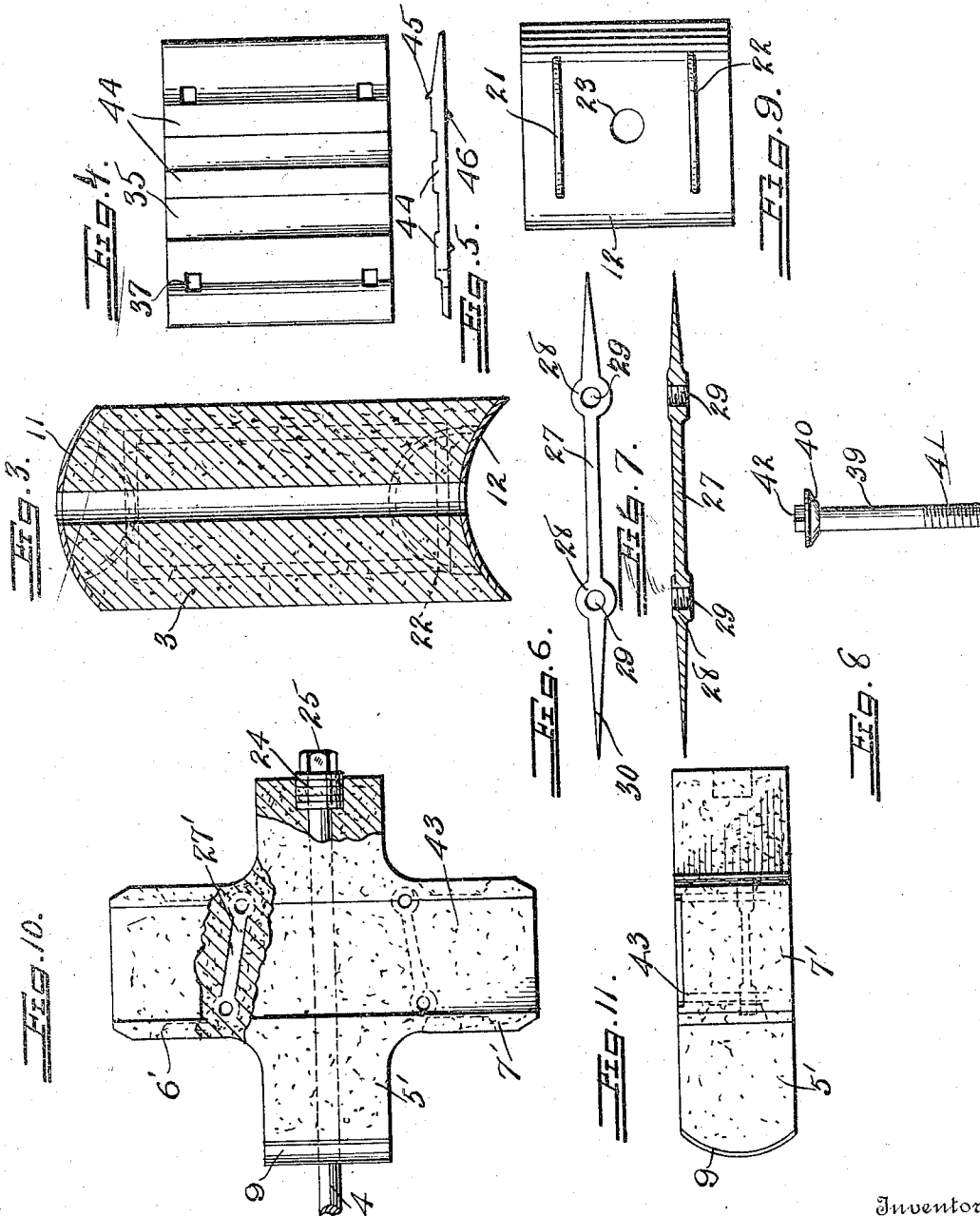
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UNITED STATES PATENT OFFICE.

PETER C. ICKES, OF CHANUTE, KANSAS.

CONCRETE TIE.

1,176,366.

Specification of Letters Patent.

Patented Mar. 21, 1916.

Application filed December 3, 1914. Serial No. 875,339.

To all whom it may concern:

Be it known that I, PETER C. ICKES, a citizen of the United States, residing at Chanute, in the county of Neosho and State of Kansas, have invented certain new and useful Improvements in Concrete Ties, of which the following is a specification.

An object of my invention is to construct a concrete tie comprising a plurality of sectional members connected together to form the complete tie and having a means of attachment arranged to permit disassembling of the parts thereby facilitating removal and renewal of the various sections.

A further object is to so arrange the several sections and the means by which these sections are connected that a degree of flexible or elastic yielding is permitted under the load of a train, and jolts, jars and irregularities usually imparted directly to the supported body will be in a great measure obviated.

A still further object is to construct and arrange the parts of the tie in a manner that the strain and wear upon the tie structure is reduced to a minimum.

Yet another object is to provide a rail fastening means adapted to permit securement of a rail of standard form without alteration in any part thereof.

With other objects in view, which will be referred to, my invention consists in the peculiar combination and novel arrangement of parts, such as will be hereinafter more fully described in connection with the accompanying drawings and more particularly pointed out in the appended claims.

In the drawings:—Figure 1 is a view in top plan of the tie of my invention with the parts arranged in the operative relation. Fig. 2 is a view in side elevation of the tie with parts thereof in section on the line 2—2 of Fig. 1. Fig. 3 is a longitudinal vertical sectional view through one of the body members of the tie. Fig. 4 is a view in top plan of a form of tie plate adaptable for use with my improved tie. Fig. 5 is a view in end elevation of the tie plate disclosed in Fig. 4. Fig. 6 is a view in elevation of one of the reinforcing rods embedded in the structure of the tie and constructed to form a cooperating element of the rail-fastening means. Fig. 7 is a longitudinal sectional view through the disclosure in Fig. 6. Fig. 8 is a view in elevation of one of the stud

bolts used to secure the rail in the proper position upon the tie. Fig. 9 is a view in elevation taken from the rear face of one of the wear plates mounted on the end of the section of the tie. Fig. 10 is a view in top plan of one of the ends or rail-supporting sections of the tie with parts illustrated in section. Fig. 11 is a view in side elevation of the member disclosed in Fig. 10.

The tie of my invention in the preferred embodiment and in the form illustrated in Figs. 1 and 2 of the drawings comprises the end or rail-supporting members 1 and 2 having the body members 3 mounted therebetween to secure the proper spacing, and the entire structure then connected together by a stay bolt 4 or other suitable means.

The end or tie-receiving members 1 and 2 are made in duplicate and the body portions 5 of these members have the arms 6 and 7 formed to extend at right angles therefrom and to lie in line with the points at which the rail bears against this body portion to increase the extent of the seat or bearing for the rail. The body portion 5 of the end member has a bore 8 provided longitudinally and centrally therethrough and at the inner end of this body portion a wearing plate 9 is mounted, which wearing plate is made convex from the top face to the bottom face of the body portion as is better illustrated in Fig. 2.

A plurality of body or connecting sections 10 are made of a transverse dimension equal to the similar dimension of the body portion 5 of the end members and these body sections have on their one end the wearing plates 11 which are duplicates of the wearing plates 9 carried by the end sections, similar wearing plates but arranged in a concave relation as indicated at 12 being mounted upon the opposite ends of each of the body sections. The body sections are bored longitudinally at 13 and the bores are alined with the bore 8 of the end section, it being the intention that the concave wearing plate of the body sections 10 shall abut against the convex wearing plate of the end members 1 and 2 and that the stay bolt 4 shall hold these parts connected in the proper relation.

From the foregoing description, it will be seen that the body sections 10 which are fitted in the proper relation with respect to the end sections 1 and 2, present convex wearing plates at their inner ends and a

central section 14, in its transverse dimension corresponding to the similar measurement of the body sections 10 has the concave wearing plates 15 and 16 carried by the opposite ends thereof to have the convex wearing plate 11 of the body sections 10 received therein and this central section 14 also is provided with a longitudinal bore 17 formed coaxially with the bores 13 and 8 of the body and end sections.

The end sections, the body sections and central section of the tie are of concrete or other suitable plastic material and are molded or otherwise shaped to the desired form, the end sections being preferably provided with the hand holds 18 on the arms 6 and 7 to facilitate moving and setting thereof and it being preferable that the members 10 and 14 be paneled as at 19 and 20 on the sides to lessen the weight and decrease the amount of material used in these members. To facilitate more ready mounting of the wearing plates upon the ends of the several members or sections, it is preferable that these plates, as illustrated in connection with the wearing plates 12 illustrated in Fig. 9, be shaped to the desired faced outline either convex or concave, and that anchoring and reinforcing loops 21 and 22, the outline of which is better illustrated in Figs. 2 and 3, be secured by riveting or otherwise to the reverse faces of the wearing plates and that the anchoring members be embedded in the plastic material of the tie sections in the process of formation. Each of the wearing plates is provided with a central opening 23 which aligns with the longitudinal bore of the several sections and permits free passage of the stay bolt 4 there-through.

The outer end of the body portion 5 of each of the end members 1 and 2 is recessed around the central bore provided there-through and a plurality of flexible washers 24 are mounted around the stay bolt 4 in the relation illustrated in Fig. 10, the head 25 of this bolt 4 bearing at the one end against the flexible washers and a nut 26 being provided to be received upon the screw-threaded end of the stay bolt to bear against the flexible washers at the opposite end of the tie and also permitting adjustment of the tension exerted to draw the wearing plates of the several sections together. It will be understood that a metal or other protective washer will be mounted around the stay bolt adjacent the head and counting of the nut thereon to bear against the flexible washers and relieve these flexible washers of wearing action and also it will be seen that the provision of the wearing plate and formation of the openings there-through in alignment with the longitudinal bores of the several sections of the tie will relieve all rubbing strain and wear between

the several sections and will prevent chipping or wear of the concrete or other plastic material around the stay-bolts.

In the preferred form of my invention, reinforcing rods 27, the detail structure of which is better illustrated in Figs. 6 and 7, are embedded in the body portion 5 of the end sections 1 and 2 to extend parallel to the longitudinal bore 8 thereof and these reinforcing rods or bars are broadened out or increased in their transverse extent at spaced-apart points as at 28, the portions 28 having bores 29 provided therethrough and the bores being screw threaded. It is preferable that the bores 29 be spaced apart a distance corresponding to the transverse dimension of the base flange of the rail to be secured upon the tie and the body of this member 27 terminating beyond the enlarged portion 28 at each end in the prong 30, it being the intention that these reinforcing rods or bars 27 be embedded in the end section as formed and extend substantially the entire length of the body portion 5 thereof.

The end sections of the tie, now referring more specially to the disclosure in Figs. 1 and 2, are grooved throughout the longitudinal extent of the arms 6 and 7 and transversely across the body portion in alignment so that the sockets 31 and 32 are formed in the arms 6 and 7, respectively, and the grooved portion or socket 33 in the body member 5 of the end section is made of a greater transverse extent and preferably of a dimension to receive and fit the ordinary tie plate. Also it is preferable that the socket or reduced portion 33 be of greater depth than the similar portions 31 and 32 of the arms 6 and 7. In use, the socket 33 will have a cushion block or pad 34 received therein, and in this connection I have found that a pad built up of several layers of roofing felt gives the desired resiliency to cushion shocks which would otherwise be transmitted to the concrete structure and that such a pad or block also has a greater period of life than the wooden block usually adopted in this connection. After the insertion of this cushion block within the socket 33, the tie plate 35 is fitted within the socket and to rest upon the cushion block 34, this cushion block and body of the tie having bores formed as at 36 to establish communication from the openings 37 of the tie plate to the screw-threaded bores or orifices 29 of the reinforcing bars 27. A packing material or block 38 is fitted within each of the sockets 31 and 32 of the arms 6 and 7, respectively, and is preferably made of a thickness that the top thereof is flush with the upper bearing face of the tie plate 35. Stud bolts 39 which have the heads thereof formed in a bearing flange are screw threaded at 41 at their lower end to fit the screw threads of the orifices 29 and a

squared portion 42 is formed as a part of the head to permit turning of the stud bolt with a wrench to cause the screw threads thereof to be fed into the orifices of the reinforcing rod 27 and draw the head 40 of the bolt down against the base flange of the rail after the rail has been placed in the proper relation upon the tie plates.

In the form of the device illustrated in Figs. 10 and 11, the end block is illustrated in a slightly varied adaptation, and in this form the body 5' has the arms 6' and 7' provided to extend laterally therefrom, the remaining part of the design and fastening means being identical with similar parts as hereinbefore described. It is the intention that this form of end section or block be provided where a joint is to be made between two rails and a fish-plate connection is used and to this end the arms 6' and 7' are grooved laterally throughout their entire extent and the body portion 5' has this same groove extended transversely thereacross. In use, a single cushion block or pad will be placed within the groove 43 to extend the entire length thereof and the rail joint with the fish plates attached will be mounted directly upon the cushion block, it being of course understood that the rail will be secured in the proper relation in the manner as hereinbefore described. With the adaptation as illustrated in Figs. 10 and 11, it is necessary that the reinforcing rods 27' be spaced at a greater distance apart than in the form of end sections as hereinbefore described and to permit the accomplishment of this purpose, the reinforcing rods 27' will have the spurs 30 omitted from the ends thereof and it is thus permitted that these bars 27' may be mounted within the arms 6' and 7', otherwise the reinforcing bars are identical with those as described in connection with the preferred form and fastening means is operable in a like manner.

In Figs. 4 and 5, a form of tie plate well adapted for use with my improved tie is illustrated and this structure comprises the plate 35 which has the longitudinal bearing ribs 44 provided on the upper face thereof, a fin 45 being mounted at a point adjacent the other sides of these bearing ribs 44 to provide lateral support for the outer edge of the base flange of the rail when mounted in the operative relation. Orifices 37 are provided through the plate 35, as has been hereinbefore described to receive the stud bolts 39 or other fastening means and if so desired, the spurs 46 may be provided on the underside of the plate 35 to engage with the pad or cushion as mounted in the tie and to prevent entirely shifting movement of the one member with respect to the other.

From the foregoing it will be seen that I have provided a tie structure composed of a plurality of independent sections which are

so connected as to avoid spreading or displacement of the rails and which at the same time permit a flexible or yielding cushion for the shocks transmitted thereto and to thus alleviate in a great measure shocks which otherwise would be transmitted to the vehicle traveling upon the rails. It will also be apparent that the provision of the wearing plates adapts the structure to be used under any climatic conditions as these wear plates have a sufficiently close bearing that freezing between these members is prevented. It will also be seen that the mounting of the tie plates in the relation as hereinbefore set forth provides a brace for this member against side displacement and that the rails may be rigidly secured with the end block and the desired flexibility of mounting will be accomplished to the cushion provided therebeneath and through the flexibility of mounting of the several sections of the tie.

While I have herein shown and described only specific forms of my invention, it will be understood that slight changes might be made in the form and arrangement of the several parts comprising the complete device without departing from the spirit and scope of my invention, and hence I do not wish to be limited thereto except for such limitations as the claims may import.

I claim:—

1. A tie comprising a plurality of sections to be mounted together, means to connect said members in a relation that a degree of flexible yielding is permitted under strain, and wear plates mounted upon each of said members to engage with like plates carried by other members and to decrease the friction through the yielding movement.

2. A tie comprising a plurality of sectional members to be mounted in abutting relation and provided with alined bores, means to be received through said alined bores to hold the sections in their proper abutting relation and to permit flexible yielding thereof, and wear plates mounted upon each of said members at the point of abutment to engage with like plates carried by other members to decrease the friction through the yielding movement.

3. A tie comprising a plurality of sectional members to be mounted in abutting relation and provided with coaxially alined bores, a stay-bolt received through the alined bores to secure the members in the proper abutting relation and to permit flexible yielding thereof, and wear plates carried by each of said sectional members to engage with similar plates carried by the remaining members at the point of abutment to relieve the friction in the yielding movement.

4. A tie comprising a plurality of sectional members to be mounted in abutting relation, and concave and convex wear plates

carried by said members at the points of abutment to be interfitted upon a proper mounting of said members.

5 5. A tie comprising a plurality of sectional members to be mounted in an abutting relation and provided with coaxially alined bores, means received through said alined bores to hold the members in the proper relation and to permit flexible yielding there-
10 of, and interfitted concave and convex wear plates mounted at the points of abutment of said sections to relieve the friction in the yielding movement thereof.

6. A tie comprising a plurality of sectional members to be mounted in abutting relation and provided with coaxially alined bores, a stay bolt received through said alined bores to hold the sectional members in the proper abutting relation, flexible
20 means received at the point of bearing of the bolt in its drawing tension to permit a flexible yield of the members at their point of abutment, and interfitted convex and concave wear plates mounted upon said sections at the points of abutment to relieve
25 the friction in the yielding movement.

7. A tie comprising end sections, body sections to be mounted adjacent said end sections, a central section to be mounted between said body sections and maintain the proper spaced relation of the end sections, means to hold the several sections in an abutting relation and to permit flexible yielding thereof, and concave and convex
35 wear plates mounted upon the abutting end of said sections to relieve the friction in the yielding movement.

8. A tie comprising end sections consisting of a body portion having arms extending laterally therefrom, a curved wear plate mounted upon the inner end of the body portion of each of said sections, a body section provided to be mounted in abutting relation with respect to the inner end of the
45 body portion of each of said end sections, a curved wear plate mounted upon the abutting end of each of said body sections to fit the wear plates of the end sections, and a central section received between said
50 body sections to maintain the end sections in the proper spaced relation.

9. A tie comprising end sections consisting of a body portion having arms extending laterally therefrom, a curved wear plate
55 mounted upon the inner end of the body portion of each of said sections, a body section provided to be mounted in abutting relation with respect to the inner end of the body portion of each of said end sections,
60 a curved wear plate mounted upon the abutting end of each of said body sections to fit the wear plates of the end sections, a central section received between said body sections to maintain the end sections in the
65 proper spaced relation, wear plates received

between said central section and body sections, and means to connect the several sections in a proper relation and to permit flexible yielding thereof against the wear plates.

10. A tie comprising end sections consisting of a body portion having arms extending laterally therefrom, a socket formed in each of said end members of a transverse dimension to have the ordinary tie plate fitted therein, a cushion fitted within said
75 socket upon which the tie plate is placed, sockets formed within the arms of said end sections on either side of the body portions, cushion blocks fitted within said sockets, means by which a rail-securing means is received and held, and body sections to be received between said end sections to hold the same in the proper spaced relation to maintain the gage of track rails carried by the
85 end sections.

11. A tie comprising end sections consisting of a body portion having arms extending laterally therefrom, a socket formed in each of said end members of a transverse dimension to have the ordinary tie plate fitted therein, a cushion fitted within said socket upon which the tie plate is placed, sockets formed within the arms of said end sections on either side of the body portions, cushion blocks fitted within said sockets, means by which a rail-securing means is received and held, body sections received between the end sections, and means to hold said end and body sections in a proper connected relation and to permit flexible yielding thereof.

12. A tie comprising end sections consisting of a body portion having arms extending laterally therefrom, a socket formed in each of said end members of a transverse dimension to have the ordinary tie plate fitted therein, a cushion fitted within said socket upon which the tie plate is placed, a socket formed within the arms of said end sections on either side of the body portions, cushion blocks fitted within said sockets, means by which a rail-receiving means is received and held, body members to be received between said end sections, said body
115 members and end sections provided with coaxially alined bores, and a stay bolt received through said bores to connect the several sections in the proper relation and to permit flexible yielding thereof.

13. A tie comprising end sections consisting of a body portion having arms extending laterally therefrom, a socket formed in each of said end members of a transverse dimension to have the ordinary tie plate fitted therein, a cushion fitted within said socket upon which the tie plate is placed, a socket formed within the arms of said end sections on either side of the body portions, cushion blocks fitted within said sockets,
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means by which a rail-receiving means is received and held, body members to be received between said end sections, said body members and end sections provided with co-axially alined bores, a stay bolt received through said bores to connect the several sections in the proper relation and to permit flexible yielding thereof, and wear plates received between the abutting ends of the adjacent sections to lessen the friction in the yielding movement.

14. A tie comprising end sections consisting of a body portion having arms extending laterally therefrom, a socket formed in each of said end members of a transverse dimension to have the ordinary tie plate fitted therein, a cushion fitted within said socket upon which the tie plate is placed, a socket formed within the arms of said end sections on either side of the body portions,

cushion blocks fitted within said sockets, means by which a rail-receiving means is received and held, body members to be received between said end sections, said body members and end sections provided with co-axially alined bores, a stay bolt received through said bores to connect the several sections in the proper relation and to permit flexible yielding thereof, and concave and convex interfitting wear plates carried by the abutting end of the sections making up the tie to relieve friction between these parts in the yielding movement.

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

PETER C. ICKES.

Witnesses:

WILLIAM SEARS,
LAURA M. WARD.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."