No. 818,067. PATENTED APR. 17, 1906.

J. A. WILKINSON.

METALLIC TIE.

APPLICATION FILED JAN. 20, 1906.

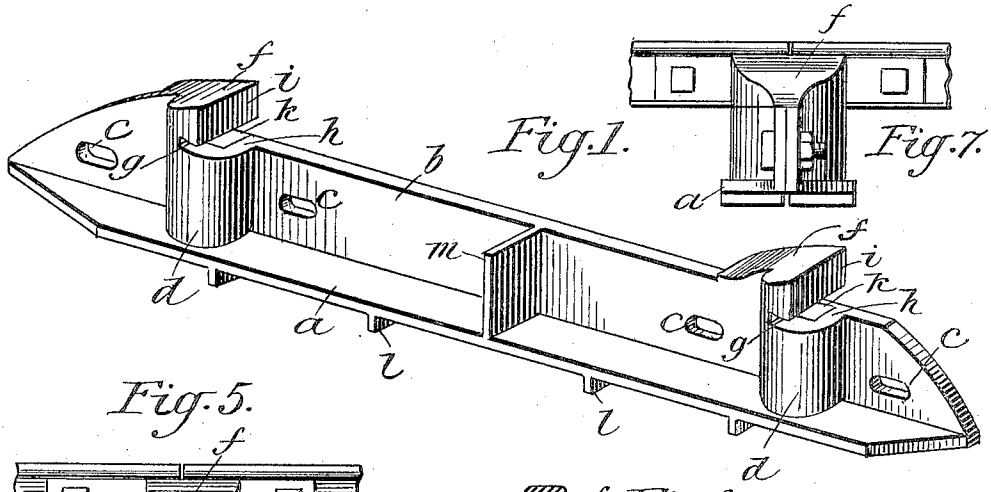
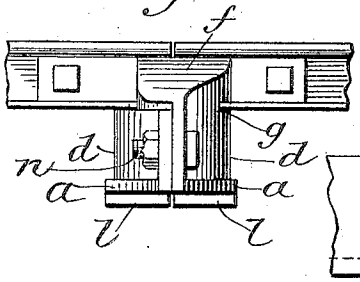


Fig. 1.

Fig. 7.

Fig. 5.



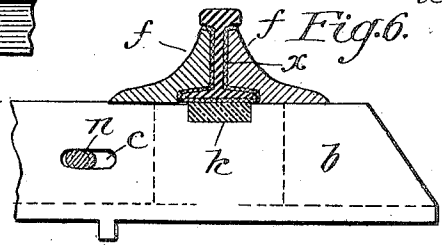


Fig. 6.

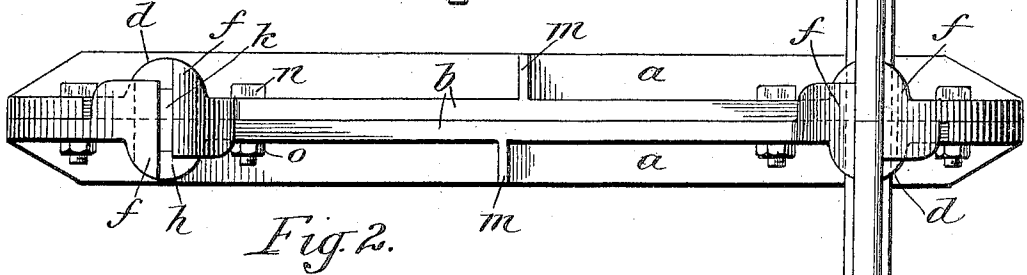


Fig. 2.

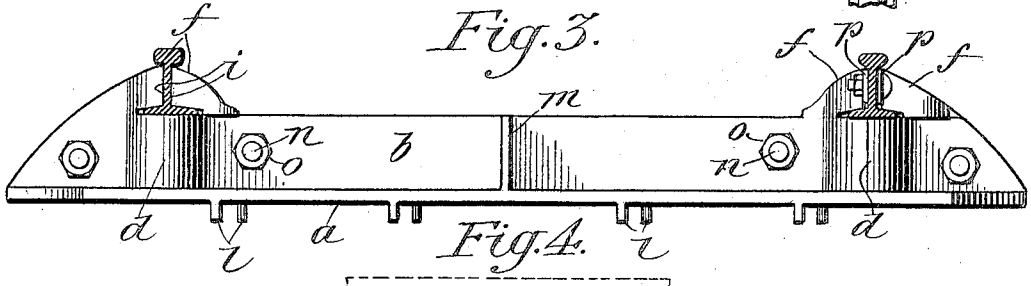
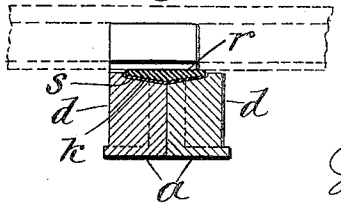


Fig. 3.

Fig. 4.



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UNITED STATES PATENT OFFICE.

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METALLIC TIE.

No. 818,067. Specification of Letters Patent. Patented April 17, 1906.

Application filed January 20, 1906. Serial No. 297,022.

To all whom it may concern:

Be it known that I, JOHN A. WILKINSON, a subject of the King of Great Britain, residing in the city of Washington, District of Columbia, have invented certain new and useful Improvements in Metallic Ties; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to metallic ties for railways, and more particularly to metallic ties which combine therewith as an integral structure rail fastening and clamping devices, and has for its object to provide a two-piece tie the sections of which are identical in all respects and when assembled constitute a simple and efficient tie adapted to firmly clamp the rails without the interposition of the usual spikes, chairs, clamps, and the like and which may be quickly applied to or removed from position by the ordinary skilled workman.

To this end the invention in one of its practical embodiments consists of a tie comprising two interchangeable reversible sections, preferably formed of cast, rolled, drop-forged, or pressed steel, each section having a bottom flange and a vertical web with a boss at each end and extending from the bottom flange to the top of the web and forming, with the mating boss on the adjacent section, a seat or support for the rail, a clamping-jaw at each end adjacent the corresponding boss, provided with an undercut shoulder to engage the top side of the rail-base, and a vertically and laterally extended face adapted to engage the rail-web substantially throughout the vertical extent of the latter and to present an overlapping engagement with the corresponding face on the coöperating jaw of the other section. Each section is also preferably provided with a series of transverse lugs or flanges on the under side of the lower flange to constitute line-holding means to prevent lateral slippage of the track, and, if desired, one or more lugs may be provided in the angle between the bottom flange and the web to assist in the line-holding function, particularly when rock ballast is employed. In order to prevent undue wear between the rail and its support on the tie and also to deaden the noise, there is provided a special type of cushion, preferably located in a recess formed in the top of the mating boss-sections, which cushion engages the under side of the rail-base and serves the additional purpose of more firmly gripping the rail when the tie-sections are assembled. The sections of the tie are removably secured together by means of bolts and nuts, the bolts being inserted through registering holes in the webs of the tie members, so that the two webs may be drawn into close engagement by setting up the nuts, and the two sections may be quickly released to remove one or both of them by removing the nuts and bolts.

In the accompanying drawings, Figure 1 is a perspective view of one of the tie-sections. Fig. 2 is a plan view of a complete tie, showing the mode of applying the same at a joint in one of the lines of rails. Fig. 3 is a side elevation of a tie, showing the rails in position. Fig. 4 is a transverse section through a tie at the rail-supporting boss, showing the mode of applying the cushion between the boss and the rail-bottom. Fig. 5 is an end view of a tie, illustrating the coöperation between the same and a line of rails at a joint. Fig. 6 is a longitudinal section through one end of a slightly-modified form of tie, showing the mode of insulating the rail from the tie. Fig. 7 is an end elevation of a tie, illustrating a modified form of clamping-jaw.

Referring to the drawings, it will be noted that each tie consists of two exactly similar sections, which when reversed with respect to each other constitute a girder-like structure which serves to clamp and support the rails without the use of any auxiliary devices—such as spikes, chairs, clamps, and the like—commonly employed in railway construction.

Each tie-section comprises a horizontal flange *a* and a vertical web *b*, which are preferably rounded or beveled at their respective ends. Near each end of the tie-section there is provided a boss *d*, extending from the bottom flange *a* to substantially the same height as the web *b*. These bosses *d* constitute an integral part of the web and flange and may be formed therewith in any desired manner—such, for example, as by swaging or pressing if the section is formed by rolling or stamping, or in case the section is formed as a casting by casting the web, flange, and bosses as an integral structure.

Near each end of each tie-section there is provided a rail-clamping jaw *f*, which con-

sists of an extension of the flange *b*, which is enlarged laterally and vertically to form a shoulder *g*, overhanging the top of the boss member *d*, and a vertical face *i*, the depth of which is substantially the same as that of the rail-web, so as to engage the web substantially from the rail-base to the rail-head. Each clamping-jaw *f* is extended laterally beyond the web *b* on the side of the tie-section opposite the boss *d* in order to afford a large engaging surface with the web of the rail and also to cause the coöperating faces *i* on the mating tie-sections to overlap each other to provide an extended vise-like engagement between the rail and the clamping-jaws.

Each of the tie-sections is provided with a series of general oval-shaped holes *c*, which may be punched or otherwise worked through the webs *b*, which holes are so related that when the two sections of the ties are reversed with respect to each other—viz., with their webs *b* brought back to back—the respective holes *c* will be brought into registry when the vertical faces *i* of the clamping-jaws *f* firmly engage opposite faces of the rail-webs. The object in making the holes *c* oval or elongated is to permit the necessary longitudinal adjustment of the tie-sections relatively to each other, so that the jaws *f* may be accurately spaced to accommodate the varying thicknsss of the rail-webs, the addition of fish-plates at the rail-joints, or of insulation between the rail and the tie. To insure the ready tightening of the bolts *n* in the final operation of setting the tie-sections, each of said bolts is preferably provided with an oval-shaped enlargement just under the head, which engages the hole *c* and prevents the bolt turning when the butt is being turned up or released.

To prevent the ties from moving or slipping laterally on the road-bed, which would disturb the alinement, there is formed upon the bottom flanges *a* of each rail-section a series of transverse lugs or projections *l*, which embed themselves in the dirt or rock ballast of the road-bed and substantially anchor the tie. Whenever it is found desirable, one or more flanges or lugs *m* may be formed in the angle between the web *b* and the flange *a* to materially assist the lugs *l* in the line-holding operation. These lugs, together with the bosses *d*, are quite effective to prevent lateral slippage of the ties and consequent disturbance of the alinement of the track, particularly when the road-bed is provided with rock ballast, as the ballast will bed in between the lugs and hold the tie firmly in position.

In order to reduce the wear between the rail and the tie and to deaden the noise and vibration which would occur if the steel surfaces of the rail and tie were permitted to remain in contact, there is provided a special form of cushion, located in the top of the bosses *d* and engaging the under surface of the rail-bottom. This cushion consists, preferably, of a piece of lead, Babbitt metal, fibroid, oak, or other suitable material generally rectangular in plan view and triangular in longitudinal cross-section, so as to fit snugly within a generally wedge-shaped depression, formed in the top of the rail-supporting bosses *d*. The upper face of this cushion projects slightly above the top surface of the boss and, should it become worn, may be readily brought to proper position under the rail by slipping a thin shim or section of metal between the cushion and its seat in the top of the bosses *d*. As this cushion is slightly larger than the recess in which it lies, it will be observed that when the two sections of the tie are brought together the wedging action between the cushion and its seat will cause the cushion to firmly engage the bottom of the rail, so that the rail will ride fairly on the cushion and the inclined top sides of the rail-base will be firmly gripped by the shoulders *g* of the clamping-jaws *f*.

A marked advantage of a tie of the character hereinbefore described lies in the fact that it is capable of use in temporarily repairing a broken rail, for when the tie is slipped into position under the break in the rail and the clamping-jaws *f* of the two tie-sections are brought into engagement with the rail the web ends of the broken section are held, as in a vise, without the interposition of tie-plates or other auxiliary holding means. The peculiar construction of the clamping-jaws also renders this tie of great economy and utility in reinforcing the rail-joints. By reference to Figs. 2, 3, and 5 it will be noted that the tie may be positioned exactly under the rail-joint, so that the ends of the rail are firmly supported. The vertical faces *i* of the clamping-jaws firmly embrace opposite sides of the rail-web and hold the abutting ends of the rail in accurate alinement. If it is desired to use fish-plates at the joint, these plates may be interposed between the jaws *f*, and it will be noted that it is necessary to secure the plates to the joint by only two bolts, located outside of and beyond the ends of the jaws *f*. As the vertical faces *i* of the jaws engage the sides of the rail-web for a considerable distance on each side of the joint and for substantially the entire depth of the web, it is impossible that any relative movement of the rail ends can occur, so that the tendency of the rails to lip is entirely obviated. Moreover, this extensive vertical and lateral engagement between the rail-web and the vertical faces of the clamping-jaws absolutely prevents any tipping or canting action of the rails, such as frequently occurs when the latter are held with spikes, bolts, or other independently-removable holding devices.

It will be observed that in constructing a

given class or size of tie in accordance with this invention every tie-section is interchangeable with every other tie-section and that the simple act of assembling the respective ties in position on the road-bed not only accurately establishes the gage of the road, but immediately clamps the rails in such position that there can be no side slippage, no canting of the rails, and no lipping of the joints. Furthermore, when it is desired to remove a given tie or a section of a tie it is only necessary to loosen the bolts which secure the sections together and remove one or both sections by drawing the same laterally from under the rails in order to free the clamping-jaws from engagement with the rails.

In addition to the advantages enumerated it will be apparent that ties of this character may be employed as integral parts of a bridge structure, serving as the cross-girders.

When metallic ties are employed on roads employing the rails as electrical conductors—as, for example, in block-signaling systems and the like—it is necessary to insulate the rails from the tie to preserve the continuity of the rails as a conducting medium and to prevent grounding the circuits. As heretofore practiced, this insulation of the rails involved the interposition of insulating-shims, washers, or the like between the clamps, bolts, or other holding devices and the rails and also to insert sections of insulation between the rails and ties. Under such conditions it is very difficult and expensive to maintain an efficient or satisfactory insulation; but with the construction of tie hereinbefore described a highly efficient insulation may be established between the rails and the ties at very small cost and without the employment of skilled labor or special appliances. To effect this insulation of the rails, I conveniently employ a relatively thin sheet of fibroid or other suitable insulating material, which is applied to the rail as a sheath or envelop embracing the rail-base and web sides throughout the extent of the engagement of those portions of the rail with the tie. Such an arrangement of insulation is illustrated in Fig. 6, in which *x* indicates a sheet of fibroid or like insulating material, that is bent around the rail-section so as to interpose a non-conducting surface or sheaf between the tie and rail at every point. This sheet of insulation *x* may, if desired, consist of a simple rectangular section of thin fibroid or the like, which is readily bendable into proper shape to conform generally to the cross-section of the rail base and web and which when the jaws *f* of the tie-sections are set up to clamp the rail will be clamped firmly in position and can only be displaced or removed by releasing the tie-sections. It will be noted that this mode of insulating the rails is not only exceptionally efficient electrically considered, but is most economical in that it wholly obviates the use of auxiliary attaching means or the provision of special forms of washers, shims, or liners which have to be applied with exceeding care.

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

1. A metal tie, comprising two similar angle-sections having mating rail-supporting bosses at each end, and integral rail-clamping members overhanging the respective bosses.

2. A metal tie, comprising two similar L-sections having mating rail-supporting bosses at each end, and integral clamping members overhanging the respective bosses.

3. A metal tie, comprising two similar sections having mating rail-supporting bosses at each end, and integral rail-clamping members adapted to engage the top of the rail-base and also to engage the web of the rail from the base to the rail-head.

4. A metal tie, comprising two similar sections having mating rail-supporting bosses at each end, and integral rail-clamping jaw members, each of said members having a shoulder to engage the rail-base and a vertical face engaging the web of the rail from the base to the rail-head.

5. A metal tie, comprising two similar sections having mating rail-supporting bosses at each end, and integral rail-clamping jaw members, each of said members having a shoulder to engage the rail-base and a vertical face engaging the web of the rail from the base to the rail-head, the jaw members at the respective ends of the assembled tie overlapping each other laterally.

6. A metal tie, comprising two similar L-sections adapted to be secured together back to back, and means for holding them in such adjusted position, each section having one-half of a rail-supporting boss at each end, and a rail-clamping jaw overlying the boss members.

7. A metal tie, comprising two similar L-sections adapted to be secured together back to back, and means for holding them in such adjusted position, each section having one-half of a rail-supporting boss at each end, and rail-clamping jaws overlying the boss members, said jaws having an undercut shoulder to engage the rail base, and a vertical face to engage the rail-web from the base to the head.

8. A metal tie, comprising two similar and removably-connected L-sections placed back to back, mating rail-supporting bosses formed integrally with each of said sections, and rail-clamping jaws also formed integrally with said sections, each jaw having an undercut shoulder to engage the rail-base, and a

vertical face to engage the rail-web, the vertical faces of the adjacent clamping-jaws overlapping each other laterally.

9. A metal tie, comprising two similar sections having mating rail-supporting bosses at each end, integral rail-clamping members overhanging the respective bosses, and transverse ribs on the sections to preserve the alinement of the rails.

10. A metal tie, having rail-supporting bosses and rail-clamping jaws at each end, and removable cushions located in recesses in the tops of the rail-supporting bosses.

11. A metal tie, having rail-supporting bosses and rail-clamping jaws at each end, and removable wedge-shaped cushions located in recesses in the tops of the rail-supporting bosses.

12. An interchangeable section for metal ties, comprising as an integral structure a horizontal flange, a vertical web, a boss at each end to support the rail, and a clamping-jaw at each end overhanging the corresponding boss and having a vertical face to engage the rail web substantially throughout the vertical extent of the latter.

13. An interchangeable section for metal ties, comprising as an integral structure a horizontal flange, a vertical web, a boss at each end to support the rail, and a clamping-jaw at each end having an undercut shoulder above the corresponding boss and a vertical face of substantially the same depth as the rail-web.

14. An interchangeable section for metal ties, comprising as an integral structure a horizontal flange, a vertical web, a boss at each end to support the rail, and a clamping-jaw at each end having an undercut shoulder above the corresponding boss and a vertical face of substantially the same depth as the rail-web, said vertical face being laterally extended to overlap the corresponding face of a mating section.

15. An interchangeable section for metal ties, comprising as an integral structure a horizontal bottom flange, a vertical web, a boss at each end between the web and flange to form a rail-support, a clamping-jaw at each end having an undercut shoulder above the corresponding boss to engage the rail-base, and a vertical face of substantially the same depth as the rail-web, and transverse holding-ribs.

16. A metal tie comprising two similar interchangeable sections, having coöperating rail-clamping members, each member having a vertical face to engage the rail-web throughout the vertical extent thereof, mating rail-supporting bosses at the ends of each section having registering recesses in the tops thereof, and a removable cushion in the registering recesses at each end.

17. A metal tie, comprising two similar angle-sections having mating rail-supporting bosses at each end, the boss members at the respective ends having registering recesses in their upper faces, and removable cushions in said recesses.

18. A metal tie, comprising two similar L-sections having mating rail-supporting bosses at each end, provided with registering recesses in their upper faces, and wedge-shaped cushions in the mating recesses at the respective ends of the tie.

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

JOHN A. WILKINSON.

Witnesses:
CHAS. J. O'NEILL,
GEO. W. REA.