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by Frank P. Wentworth
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UNITED STATES PATENT OFFICE.

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TO MICHAEL E. LYNCH AND ONE-THIRD TO MICHAEL HARRINGTON, OF BLOOM-
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RAILWAY-TIE.

994,453.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, WILLIAM FULLARD, a citizen of the United States, residing at North Plainfield, in the county of Somerset and State of New Jersey, have invented certain new and useful Improvements in Railway-Ties, of which the following is a specification, reference being had therein to the accompanying drawings, which form a part thereof.

My invention relates to railway ties and more particularly to a type of tie embodying therein a metal base.

The main object of the invention is to provide a railway tie wherein the portion thereof embedded in the ballast will be of metal so as to prolong the life of the tie by avoiding decay or destruction by worms or insects and yet will present a relatively immovable wooden portion to which the rails may be spiked thus preserving that resiliency in the support for the rail which is desirable in railway practice.

A further object is to provide a railway tie of the character above referred to wherein the wooden rail-supporting portion will be capable of adjustment independently of the metallic portion of the tie, while being incapable of displacement due to the weight of passing trains or the vibration resulting from such trains.

A still further object is to provide a tie having a metallic sheathing and wooden supporting blocks therein, which will be capable of being raised or lowered in its entirety by tamping the ballast thereunder or removing it therefrom, in the usual manner, and wherein the wooden truck supporting blocks may be adjusted without removing the tie from the road bed.

A still further object is to provide a metallic railway tie provided with cushioning blocks adapted to support the rail, the metallic portion of the tie being continuous and integral, and so constructed as to engage the foot of each rail and prevent the spreading of the rails.

A still further object is to provide a tie which when originally assembled, will possess all of the characteristics of an ordinary wooden tie, all of the parts thereof being capable of being locked together so as to prevent displacement both during transportation and after being laid.

A still further object is to provide a metallic tie provided with wooden rail supports having relatively smaller dimensions, whereby, after wear upon the wooden supports has made them unsuitable for use, they may be replaced without disturbing the metallic portion of the tie and at small cost compared to the cost of the ordinary wooden tie as now almost universally used. And a still further object is to provide a railway tie in combination with a fish plate which combination will serve to not only support the rail upon renewable wooden supports in a metallic base, but will prevent the creeping of the rails and thus relieve the spikes attaching the rails to the cushioning wooden rail supports from the strains incidental to such creeping.

My invention consists primarily in a railway tie comprising a base of channel metal extending transversely of the rails, and rail supports consisting of independent wooden blocks adjacent to the opposite ends of said base and seated within said channel; and in such other novel features of construction and combination of parts as are hereinafter set forth and described, and more particularly pointed out in the claim hereto appended.

Referring to the drawings:—Figure 1 is a side view of a tie embodying my invention, the channel base being broken away adjacent to the ends, this view showing a joint in one rail; Fig. 2 is a perspective view of one tie with only one supporting block shown; Fig. 3 is an end view of adjacent ties at a joint in the rail, showing the manner of applying the fish plate, and, Fig. 4 is a perspective view of the fish plate alone.

Like letters refer to like parts throughout the several views.

In the embodiment of my invention shown in the drawings, *a b* indicates the two rails of a track which are the ordinary type used in the United States, having a foot *c* and a head *d*.

At *e e* I have shown adjacent ties which ties are identical in their construction so as to make it necessary to describe only one of them. This tie consists of a metallic base *f* of a length greater than the gage of the track, and is made of channel stock of sufficient thickness to withstand the ordinary conditions of use, while insuring economy of production. Extending from the bottom of

this channel, toward the middle and the ends thereof respectively, are a plurality of drain holes f' , and the sides of the base are cut downwardly as shown at f^2 , at the point corresponding with the location of the rails, the width of this cut corresponding with the width of the foot c of the rails, which arrangement will cause the said rail foot to engage the sides of said openings and thus fix them at the proper gage as predetermined by the accurate production of the channel stock forming the tie base, an arrangement which will insure greater accuracy than can be secured by the method now ordinarily employed, and with greater rapidity. The base f thus serves to withstand the deteriorating influences of contact with the road bed and at the same time serves to accurately line up the track and prevent the spreading of the rails. A metallic tie, however, has many disadvantages, such as its subject to fracture under heavy load, its lack of resiliency, and its acoustic properties as well as the expense and inconvenience due to the great weight of the tie. A channel tie such as I have described, would have the further advantage that if the side of the channel were relied upon to sustain the weight of the train as well as the rails, they would rapidly break down and thus be impracticable. To obviate these difficulties I provide adjacent to each pair of cut away portions f^2 a cushioning block upon which the rails are seated, and spiked. This cushion block projects above the bottom of the openings f^2 thus permitting a considerable wear upon the cushion before it is necessary to raise the same. These cushioning rail supports being seated within the channel as described are incapable of displacement longitudinally of the track and are held against lateral displacement by the engagement of the foot c of the rail with the sides of the openings f^2 . To prevent a vertical movement of this support, I provide spike openings f^3 in the side of the channel base f by means of which spikes may be driven into the said rail supports to secure said supports firmly in their position in said base.

The foot of the rail rests upon the cushioning rail supports, and thus presents in the tie all of the advantages of the ordinary wooden tie as to resiliency, diminution of sound and the attachment of the rail. The employment of the spikes i passing through the side opening f^3 permits the use of rail supporting blocks of about a foot in length, thus reducing the volume of wood entering into the tie, and thus permitting the use of timber for the manufacture of the tie, which heretofore has been impossible. The said blocks may be of any desired suitable kind of wood, and may be treated in any desired manner to prevent their destruction by climatic conditions or insects, the size of the

cushion supporting blocks reducing the cost per tie of such treatment.

In laying a rail it is not always possible to accurately level up the road bed or the ties, or to preserve this level; and to meet this condition, I make each rail supporting block independently adjustable as to height, by constructing it of two cooperating wedge-shaped members g g' , the cooperating faces of said sections extending laterally of the rail, and both sections being confined at the sides, by the sides of the channel base f , the aggregate height of both of said blocks being necessarily less than the height of the sides of said base to permit the projection of the foot c of the rails through the angular cut away portions f^2 of the sides of said base. The side openings f^3 are at least two in number, one being provided for each portion g g' of the cushioning rail support, thus permitting the locking of both of said sections to the base.

It will be observed that the cushioning rail supports form practically a portion of a structure having all of the characteristics of an integral tie, and in addition thereto the anti-rail-spreading features and the adjustability independently of the road bed, thus permitting the take up of any wear which may occur upon the rail supporting cushions, or the leveling of the track by the ordinary method of tamping or the operation of the wedge sections g g' without the necessity for taking up the tie, thus preserving all of the desirable characteristics of the tie necessary for the convenience of the section gang.

At each end of the sides of the channel base f I provide openings f^4 in which picks or other implements may be inserted for the purpose of adjusting the tie laterally.

The rails may be attached to the blocks g g' in the ordinary manner and this attachment irrespective of the accuracy in placing the spikes will insure an absolute alinement of the rails and guard against their spreading. It will not however, prevent the longitudinal creeping of the rails which is taken care of by the fish plates. To utilize my tie in guarding against such creeping, I provide a special form of fish plate having especial adaptability with my tie and having no adaptability in other connections, said fish plate being composed of the ordinary angle side webs h and feet h' , adapted to project into adjacent ties and engage the sides thereof, being attached to the adjoining ends of the rails by bolts in the usual manner and the rail supporting blocks in adjacent ties by spikes. It will thus be observed that the ties themselves take up all the longitudinal strains resulting in a tendency of the rails to creep. The web h between the feet h' spans the space between adjacent ties. If desired, a groove h^2 may

be formed in the inner face of the flanges h for the purpose of forming a channel for the electrical bond wires.

The operation of my tie is substantially as follows:—In laying the ties, the road bed is prepared in the usual manner and the ties trued up as the rail is placed, the foot c of the rails being seated within the openings f^2 of succeeding ties, thus insuring absolute 10 alinement of the rails and frequent reinforcement preventing the spreading thereof. The rails and the ties in first laying, are leveled up by tamping, the cushion supporting blocks g g' being in new ties of uniform pre- 15 determined heights and secured in place by means of spikes i passing through the side openings f^3 . The blocks g g' support the rails so as to hold the bottom of the foot c thereof free of the metallic base f . When 20 the rails have been properly trued and leveled up they are spiked in place in the usual manner, the spikes entering both portions g g' and supplementing the action of the spikes i in preventing a loss of level through 25 the relative movement of the wedge-shaped portions g g' . The fish plates are attached at the rail joints in the usual manner, it being necessary to exactly space the adjacent rails with which the feet h' of said plates co- 30 operate.

If it becomes necessary for a section gang to level up any particular tie this may be done by tamping in the usual manner or if wear has occurred upon the upper rail supporting block g the rail spikes indicated at 35 j and the spikes i may be removed and said portions g g' driven toward each other so as to raise said block only, the various spikes being replaced when the rail has been properly leveled. It will be observed that this 40 readjustment of the supporting block may be accomplished without displacing the base f , the parts being readily accessible to a section gang by merely removing a portion of 45 the ballast adjacent to each or either end of the tie, thus minimizing the labor required of a section gang in effecting repairs.

A tie of this character may be used with any character of ballast, is practically as 50 noiseless as the ordinary wooden tie and possesses all of the characteristics of resili-

ency inherent to a wooden tie, while having greater durability and requiring less cost of transportation when it is necessary to renew the rail supporting cushion. Furthermore, 55 these cushions will possess greater durability than the ordinary ties. The lower portion thereof g^1 , is protected from the action of the ground by the sheathing afforded by the metallic channel base f , and when the other 60 section g becomes so worn across the portion thereof on each side of the middle, to an extent to preclude a further use of this portion as a rail seat, the position of the portions g g' may be reversed thus giving to 65 each portion two or three times the life of the ordinary tie by reason of this reversibility and the presence of the protecting sheathing.

It is not my intention to limit the inven- 70 tion to the precise details of construction shown in the accompanying drawings, it being apparent that such showing is merely a matter of design and may be varied to meet the special requirements of any par- 75 ticular condition of use.

Having described the invention, what I claim as new, and desire to have protected by Letters Patent, is:—

A railway tie comprising a base of channel 80 metal adapted to extend transversely of the track, a cushioning rail support consisting of independent wooden blocks adjacent to the opposite ends of said base and seated within said channel, each said block con- 85 sisting of a plurality of superposed cooperating wedges, and removable means locking each of said blocks in position relative to said base and each other, the sides of said channel base adjacent to each of said 90 blocks being cut away vertically at the top for a depth sufficient to cause the rail to rest solely upon said block and to engage the sides of said cut away portion.

In witness whereof I have hereunto af- 95 fixed my signature, this 9th day of March, 1910, in the presence of two witnesses.

WILLIAM FULLARD.

Witnesses:

MICHAEL E. LYNCH,
P. FRANK SONNEK.