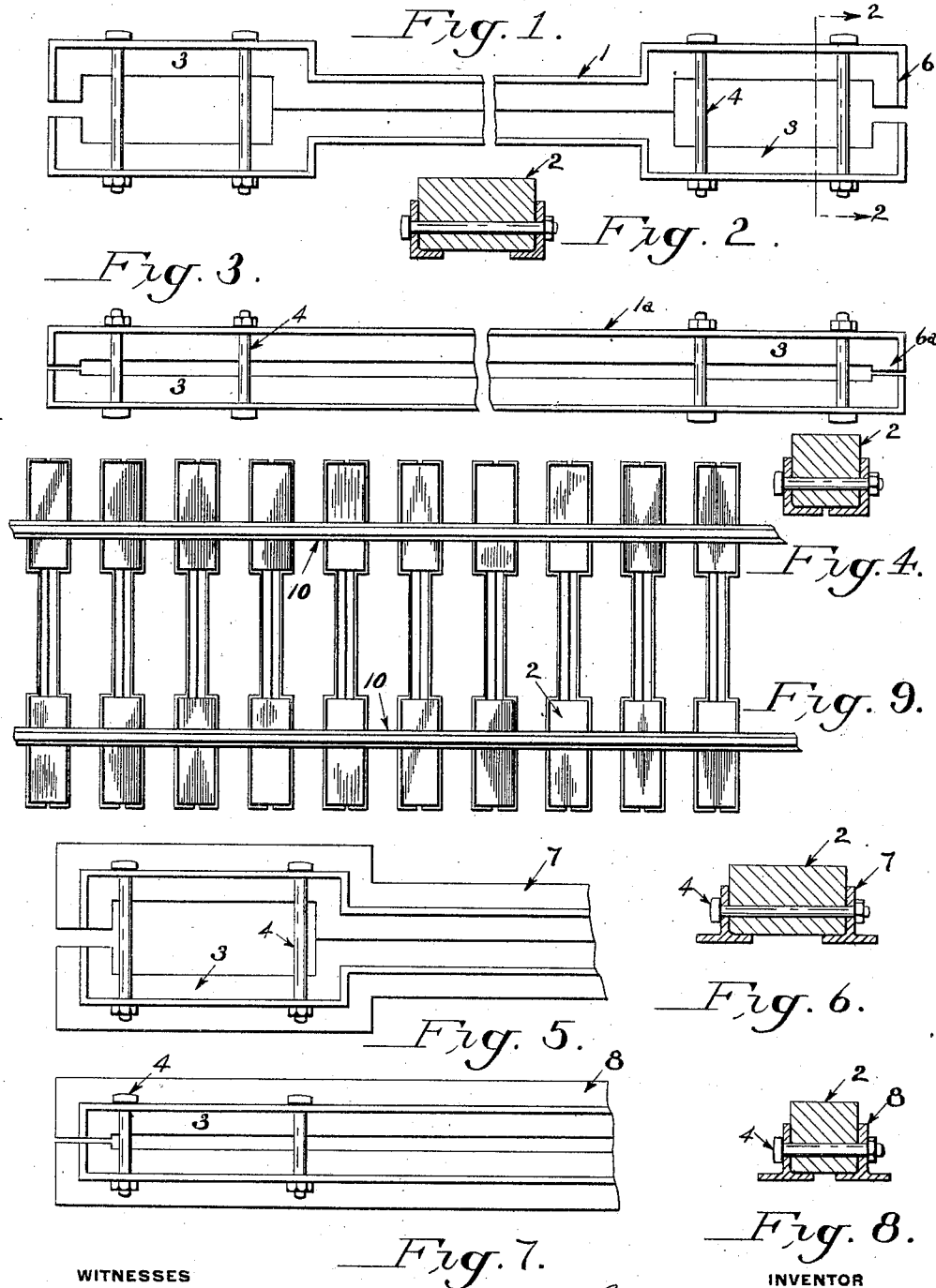


R. BAGGALEY.
METAL RAILWAY CROSS TIE.
APPLICATION FILED DEC. 27, 1911.

1,046,939.

Patented Dec. 10, 1912.

2 SHEETS-SHEET 1.



WITNESSES

Wm. C. Seifriz.
E. L. Hyde

INVENTOR

Ralph Baggageley,
By Fred W. Winter
Attorney

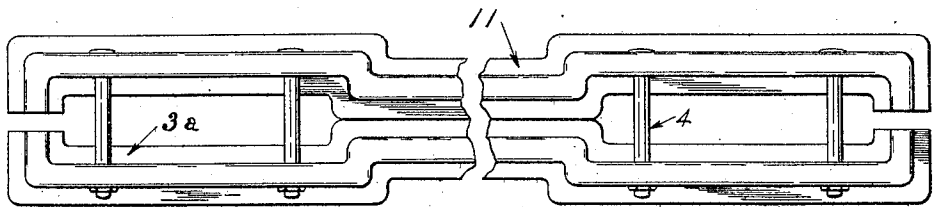


Fig. 10.

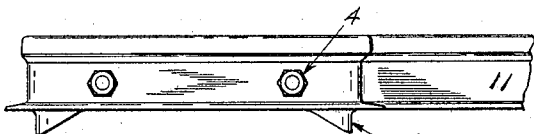


Fig. 11.

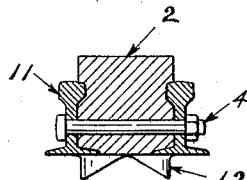


Fig. 12.

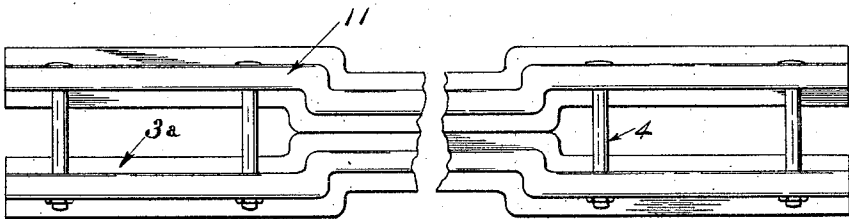
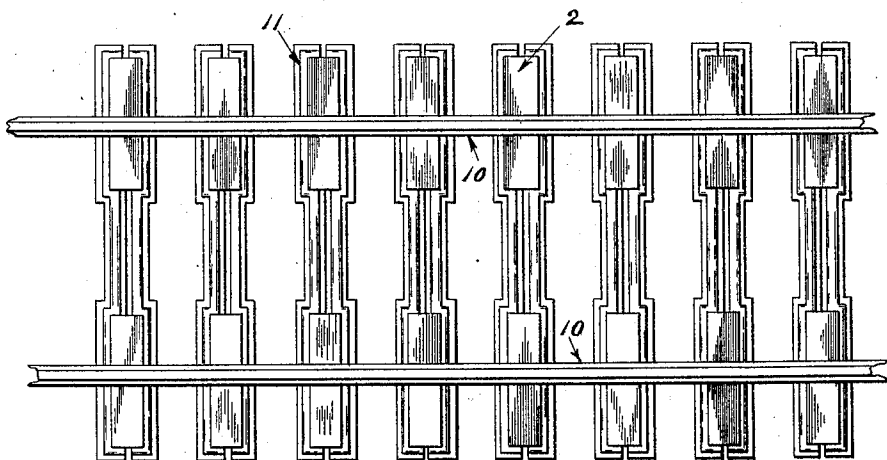


Fig. 13.



WITNESSES

Chas. E. Seifing.
 E. L. Hyde.

INVENTOR

Fig. 14. Ralph Baggageley,
 By Frank W. Hunter
 Attorney

UNITED STATES PATENT OFFICE.

RALPH BAGGALEY, OF PITTSBURGH, PENNSYLVANIA.

METAL RAILWAY CROSS-TIE.

1,046,939.

Specification of Letters Patent.

Patented Dec. 10, 1912.

Application filed December 27, 1911. Serial No. 668,022.

To all whom it may concern:

Be it known that I, RALPH BAGGALEY, a resident of Pittsburgh, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Metal Railway Cross-Ties, of which the following is a specification.

This invention relates to metallic railway ties and its object is to provide a tie which is substantially permanent, which provides a good anchorage in the ballast to prevent endwise movement under the shock of heavy and rapidly moving trains on curves, which has the rails supported on resilient shock absorbing insulating blocks to protect the road bed and the tie from the shock of the train and also adapt a road bed constructed with such ties to modern signaling systems, and one which can be constructed at a reasonable cost from practically waste materials.

The invention comprises a tie constructed and arranged as hereinafter described and claimed.

Numerous attempts have been made to provide more permanent cross ties for railroads than the wooden ties which are universally used, on account of the increasing scarcity and increasing cost, with decreasing quality, of wooden ties. Such attempts have, however, not been successful, and metallic ties have not been used permanently except on a few freight roads, and are not now being used on roads on which fast passenger service is maintained and on which signaling systems must be used as an essential to safety. The ideal condition would be to provide a permanent road bed, or at least one that could remain undisturbed for many years. This ideal has, however, not so far been realized in practice.

Most metallic railway ties do not meet the necessary conditions for the reason that the rails bear directly on the metal tie so that the shock of rapidly moving heavy traffic breaks down the metallic tie and also transmits the shock to the underlying ballast, reducing the latter to powder and rendering it worthless. Such direct contact of the rails with the metal ties also destroys the insulation of the rails and unfits them to be used as parts of the circuit of modern signaling systems. Attempts have been made to secure such installation by interposing fibrous material between the rail and the tie, but tests have shown that the constant shocks of heavy traffic entirely destroy such

fibrous material and render it worthless. Furthermore, ordinary metallic ties possess no skin friction and cannot be sufficiently anchored in the road bed to prevent movement thereof laterally of the road bed on curves under the impact of rapidly moving heavy trains. One test of metallic ties of I-beam section on a prominent railroad with a heavy passenger train running at high speed around a moderate curve moved the rails and ties sidewise a distance of five inches, which immediately condemned those ties for such purpose.

The foregoing objections to metallic ties have led to the practically universal retention in the United States of wooden ties, notwithstanding their increasing cost and decreasing quality and the difficulty of obtaining them. The wooden ties possess more nearly all the essentials of a proper tie than do metallic ties, that is to say, they have the necessary resilient qualities, the necessary skin friction in the ballast and the necessary insulating properties. They, however, are not permanent, rotting out quickly, so that constant cost of taking out defective ties and replacing the same goes on. It has been estimated that the cost of taking out a defective tie and replacing it with a new tie equals the cost of the tie itself. In addition to this the ballast underneath the tie is disturbed each time, so that it requires constant tamping to get a sufficiently solid foundation for the ties.

The object of the present invention is to supply the urgent need of a more permanent cross tie, and so that a comparatively permanent road bed can be constructed and at a cost which is not prohibitive, and which embodies all of the desirable features of the wooden tie and eliminates its undesirable features.

In the accompanying drawings Figure 1 is a plan view of one form of tie constructed according to my invention, the wooden blocks being omitted; Fig. 2 is a cross section, on the line 2—2, Fig. 1, showing the wooden block in position; Figs. 3 and 4 are, respectively, plan view and cross section views showing a modification; Figs. 5 and 6 are respectively plan view and cross section showing the form of tie of Figs. 1 and 2 formed of T bars instead of angle bars; Figs. 7 and 8 are respectively plan view and cross section showing the form of tie of Figs. 3 and 4 constructed of T sections in-

stead of angle bars; Fig. 9 is a plan view of a road bed constructed with form of tie shown in Fig. 1; Figs. 10, 11 and 12 are respectively plan view, side elevation and cross section of a tie such as shown in Figs. 1 and 2 formed from worn-out railroad rails without re-rolling; Fig. 13 is a plan view showing a modification of the latter; and Fig. 14 shows a road bed constructed with the form of tie shown in Fig. 10.

In the formation of my improved tie it is preferred to use worn-out railroad rails which have but little value on account of their low cost at the steel works where they can be used for scrap and the generally high cost of transporting the same to such steel works. Where suitable steel works for re-rolling the rails are accessible at not too high cost it is preferred to re-work the rails by slitting and re-rolling and forming therefrom either angle, L or T shapes in cross section and utilize these for the formation of the tie. Figs. 1 to 4 show a tie formed from such re-rolled angle shapes, and Figs. 5 to 8 show a tie formed from re-rolled T shapes. In localities, however, so far removed from steel mills where the rails can be re-rolled that the cost of transportation would be excessive, it is preferred to form the rails directly into ties without re-rolling, which can be done in practically any railroad shop, which must have the necessary forges and fuel for heating, and an ordinary bending machine such as a bulldozer. The forms of ties shown in Figs. 10 to 14 are constructed from such rails without re-rolling.

In Figs. 1 and 2 the tie is formed from two angle or L shaped members 1, placed with the horizontal lugs or flanges projecting toward each other and sufficiently spaced apart at the ends to receive between the vertical members thereof a resilient shock absorbing insulating block 2 which rests upon the bottom flanges 3 and is secured in place by bolts 4. To increase the anchorage of the tie in the ballast it is preferred to offset the angle bars as shown in the drawings, that is, by spreading their end portions apart to the desired width to receive the block 2 therebetween, while at the central portions the two angle bars are substantially in contact forming a narrow central portion. This has the further advantage that such narrow central portion will practically prevent the track man from tamping the ballast so tightly thereunder as to cause what is known as "center binding," in which the tie rocks upon the high central ballast. It is preferred to bend the extreme ends inwardly as at 6 to form abutments to receive the outward thrust against the blocks 2. Such intumed end portions, however, are not absolutely essential.

Figs. 3 and 4 show a similar form of tie also formed from angle bars, but not having

the narrow central portion as in Fig. 1, the angle bars 1^a in this case being substantially straight from end to end but preferably having their end portions bent inwardly or toward each other, as at 6^a. The wooden blocks and manner of securing the same are the same in this form as in Figs. 1 and 2.

Fig. 5 shows a form of tie exactly similar to Fig. 1 except that it is formed from T bars 7 instead of angle shapes, and Figs. 7 and 8 show the same construction of tie as in Figs. 3 and 4 except that T shapes 8 are substituted for the angle bars. These forms will be understood without further description.

Fig. 9 shows a permanent road bed constructed of ties such as shown in Fig. 1, with the rails 10 secured to the wooden blocks 2 by spikes, in the usual way.

Figs. 10, 11 and 12 show a tie similar to that of Figs. 1 and 2, with the substitution of standard forms of rails 11 for the angle bars. This, however, also shows the depression of the inner flanges 3^a at the sharp bends, as at 12, to stand substantially vertical and form spoons extending down in the ballast and forming an additional anchorage. Such depression of the flanges at the bends may also take place in ties formed of angle bars, as in Fig. 5. In bending the flange shape the horizontal flange on the inside of the curve necessarily tends to buckle and by directing such buckling downwardly these additional anchors or spoons are readily formed.

Fig. 13 illustrates a tie similar to that shown in Fig. 10 except that the end portions are not bent inwardly. Fig. 14 shows a road bed constructed with ties such as shown in Fig. 10.

By utilizing worn-out rails the metallic portions of the ties can be constructed at an economical cost, and particularly on those railroads which are located long distances from steel mills so that worn-out rails have little value to such railroads. With such roads the worn-out rails form a source of supply from which to gradually reconstruct the present road beds, with wooden ties which must be replaced every five years, into road beds which are practically permanent. The steel itself may, if desired, be protected against oxidation by a suitable paint or preservative. The resilient shock absorbing insulating blocks 2 can also be formed from the solid centers of discarded and condemned cross ties or from other waste timber such as timbers from trestles, bridges, buildings, worn-out cross ties and the like, all of which are usually burned to get rid of them. It is also preferred that such wooden blocks be treated with a suitable preservative to protect them against decay. They will, however, in time wear out due to cross cutting with spikes in chang-

ing the rails, as is necessary from time to time. The blocks, however, can be replaced when worn out by new ones without disturbing the position of the tie in the ballast, and particularly without disturbing the solid bed of ballast directly underneath the tie.

The ties constructed as before described have all of the desirable qualities of wooden ties, that is to say, they are sufficiently resilient to protect the road bed and the body of the tie from the shock of fast moving heavy trains, possess the necessary insulating qualities for the application of modern signaling systems to the track, and also have the necessary anchorage in the ballast to prevent endwise movement in the ballast on curves under the impact of fast moving trains, and at the same time are sufficiently durable to form a substantially permanent road bed and one in which the solid bed of ballast underneath the ties does not need to be disturbed at frequent intervals, as at present. The central portion of the tie is also so narrow that it is practically impossible for careless track men to tamp the ballast thereunder so hard as to produce center-binding and rocking of the tie on its center.

When the rails are used without re-rolling the wooden blocks must be shaped to conform thereto, as shown in Fig. 12, but this can be cheaply done by merely passing them endwise through a suitable wood working machine, such as a molding machine, with cutters or knives suitably formed so as to produce the desired shape.

The tie as a whole can be very economically constructed and on account of its permanent character is much cheaper than wooden ties at the present price and forms a superior road bed.

What I claim is:

1. A metallic railway tie comprising two wrought metal bars lying side by side and having substantial portions thereof parallel and other portions bodily bent or offset laterally to provide anchorage in the ballast against lateral end movement, resilient insulating blocks in said offset portions and

resting thereupon and means for securing said blocks in place and securing the two bars together.

2. A railway tie comprising a pair of wrought metal members located side by side and provided with bottom flanges, and having their end portions bodily bent away from each other to provide lateral off-sets adapted to be seated in the ballast, resilient insulating blocks resting upon the bottom flanges and located between said bars, and fastening means extending through said bars and said blocks to secure them together.

3. A railway tie comprising a pair of wrought metal members provided with bottom flanges and lying side by side with their middle portions closely adjacent, the end portions of said members being spread apart, wooden blocks between the end portions of said members and resting upon the bottom flanges thereof, and fastening means passing through said blocks and said members.

4. A railway tie comprising a pair of wrought metal members provided with bottom flanges and lying side by side, said metal members being bent laterally to provide offsets for anchoring the same in the ballast, and each being of substantially the same cross section from end to end, resilient insulating blocks resting on said flanges, and means for securing said members together.

5. A railway tie comprising a pair of metal members provided with bottom flanges and upper enlargements or heads and lying side by side, said members being offset laterally to provide anchorage in the ballast, resilient insulating blocks between said members and fitting the same and resting upon the bottom flanges thereof, and means for securing said members and blocks together, said enlargements engaging said blocks and preventing displacement thereof from said tie.

In testimony whereof, I have hereunto set my hand.

RALPH BAGGALEY.

Witnesses:

F. W. WINTER,
E. L. HYDE.