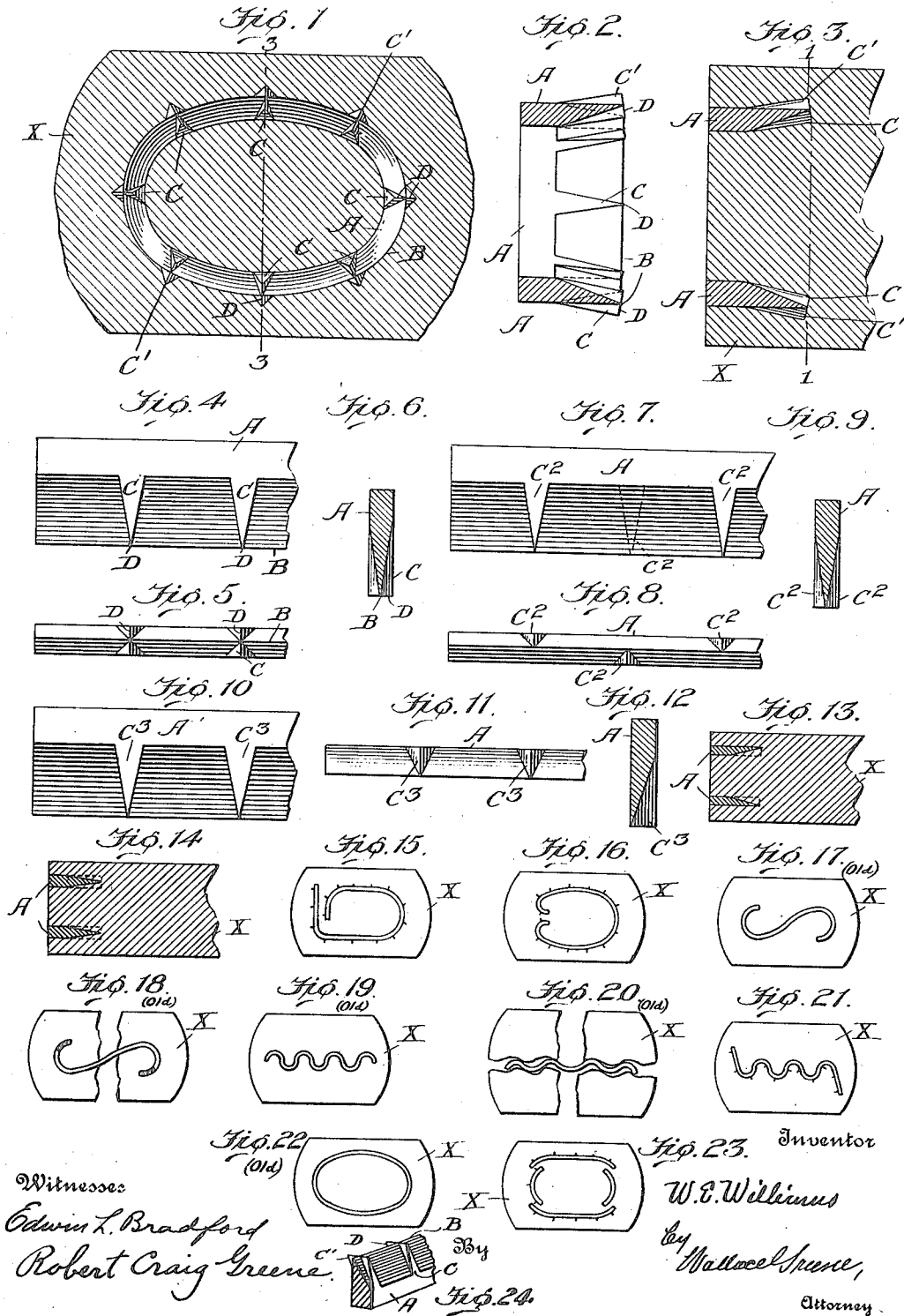


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 ANTISPLIT DEVICE FOR WOOD RAILWAY TIES.  
 APPLICATION FILED JAN. 22, 1915.

1,208,255.

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# UNITED STATES PATENT OFFICE.

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ANTISPLIT DEVICE FOR WOOD RAILWAY-TIES.

1,208,255.

Specification of Letters Patent.

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*To all whom it may concern:*

Be it known that I, WILLIAM E. WILLIAMS, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Antisplit Devices for Wood Railway-Ties, of which the following is a specification, reference being had therein to the accompanying drawing.

The object of this invention is to provide improved means for preventing the deterioration of railway ties through checking or splitting at the ends.

In the accompanying drawings, Figure 1 is a section on the line 1—1, Fig. 3, showing a tie provided with one embodiment of my invention. Fig. 2 is a diametrical section of a ring shown in Fig. 1, a position which its sharp edge has before the completion of the ring being shown in dotted lines. Fig. 3 is a section on the line 3—3, Fig. 1. Figs. 4, 5, 6, are, respectively, a side view, an edge view, and a cross section of a bar differing slightly from the constituent ring bar seen in Figs. 1, 2, 3. Figs. 7, 8, 9 are views similar to Figs. 4, 5, 6, respectively, but showing a slight modification. Figs. 10, 11, 12, are views strictly analogous to Figs. 4, 5, 6, but showing a further modification. Fig. 13 is a view similar to Fig. 3 showing a ring in use and made of a bar like that shown in Figs. 10, 11, 12. Fig. 14 is a section like Fig. 13 but showing the ring as made from the bar of Figs. 4, 5, 6. Fig. 15 is an end view of a tie provided with a sort of discontinuous ring binder. Fig. 16 is a view similar to Fig. 15 but showing a different discontinuous ring. Fig. 17 is a like view showing a binder of the old S form instead of ring form. Fig. 18 shows the tie of Fig. 17 forcibly split, the binder having slipped in its seat as it will when of the usual smooth form. Fig. 19 shows similarly a common sinuous binder in a tie end. Fig. 20 shows the same tie forcibly split transversely to the binder and again split by the wedging action of the wavy bar when it is compelled to slip longitudinally. Fig. 21 is a view similar to Fig. 19 but showing the bar with its end portions extended obliquely nearly to the lateral surface of the tie. Fig. 22 shows in end view a tie provided with an endless oval ring which may illustrate a common widely used binder having its constituent bar externally smooth. Fig. 23 is a like view of a tie pro-

vided with four binder bars so placed as to overlap and to inclose a central portion of the tie end, this portion corresponding to the part inclosed by the endless ring of Fig. 2. Fig. 24 is a perspective view showing a portion of a ring similar to the ring of Figs. 1, 2, 3.

It is common to drive into the end of a tie any of many forms of smooth binders having one sharp margin which facilitates entrance into the wood. Among the forms are those having the general forms shown in the drawings, and since all have serious defects in use, extensive and systematic experiments have been made to determine fully the character of such defects, with a view to correcting them. The binder of S form when made of the usual smooth bar acts as indicated in Fig. 18 when the tie X is forcibly split. The crack usually begins at the surface on opposite sides of the tie and opens widely before any great strain is borne by the binder bar, but when such strain occurs the bar slips longitudinally in its seat, at the same time changing its curvature. The serpentine form of Figs. 19, 21 acts similarly, and in this case the longitudinal slipping tends even more strongly than in the case of the S form to split the tie parallel to the binder by a wedge-like action.

The faults of the common endless ring form of Fig. 22, wherein the constituent bar is smooth, are that it is difficult to drive properly and that under tie-splitting force it breaks at its weakest point and then slips longitudinally in the manner already mentioned; and this form having slight resistance to slipping is therefore the more likely to break at some weak point. In driving discontinuous forms, blows beginning at one end are progressively advanced toward the other end, but in the closed ring forms this is not feasible and in practice one person holds a plate over the binder, keeping the binder as nearly as may be in the desired position on the tie end, while another person strikes the plate over the central portion of the binder, driving all parts simultaneously by very heavy blows.

The various evils are avoided by making the binder such that, whatever its shape as a whole, a short segment will offer such resistance to slipping that the bar will break before appreciable slipping occurs and at the same time any material injury to the

wood by wedging action or otherwise is avoided. These results are obtained by making the binder bar, whatever the outline of the binder as a whole, with lateral projections or lugs on one or both of its broad faces, the lugs being of such form as to present shoulders transverse to the corresponding part of the bar, to engage large portions of the tie wood and make slipping impossible.

When the binder is a closed or endless ring, I prefer to make it as shown in Figs. 1, 2, 3 where A represents a broad uniformly thick portion of a ring made from a flat bar similar to that shown in Figs. 4, 5, 6. The bar may be primarily beveled on opposite faces to form a cutting edge B, and may have at short intervals lateral lugs C which are beveled equally on each side to form transverse cutting edges D, all as shown in Figs. 4, 5, 6. This bar is deformed by having its beveled portion pressed to one side, from the position suggested by dotted lines in Fig. 2 to the position indicated by full lines, where the entire outer face of the bar has no bevel while the inner face has an incline extending from one face to the other of the bar as a whole. This deforming locates the lugs as in Figs. 1, 2, 3, 24, the outer ones C' lying wholly outside the body of the ring. Obviously in this form the wood within the ring is highly compressed, the faces of the lugs are nearly perpendicular to the line of direction of the corresponding portions of the binder bar, and in driving there is very little tendency to split off the wood outside the ring. The binder bar of Figs. 4, 5, 6 may be used without deforming, as shown in Fig. 14, but in this case the compression of the wood is less and the tendency to split off the wood outside the ring is much greater.

Figs. 7, 8, 9 illustrate alternately offsetting the lugs C<sup>2</sup> on opposite faces of the binder bar.

In Figs. 10, 11, 12 one entire face of the binder is without projections, the bevel and the lugs C<sup>3</sup> being all upon the one face. When this bar is bent or made into ring form and inserted in a tie, as in Fig. 13, it has many of the advantages of the binder of Figs. 1, 2, 3, but it lacks the external lugs.

Bars such as set forth may be cut to desired length and used to form binders suitable for almost any possible conditions, several different forms being shown in Figs. 15 to 21, and 23.

The forms of Figs. 17, 19, 22, when made without lateral projections are usual forms, and when so made they have the faults suggested by Figs. 18 and 20 and hereinbefore mentioned.

Figs. 15, 21, show binders having long laterally projecting ends and when these forms are used with ties already checked it is

usually possible to place them so that they will prevent further splitting, even when a corner threatens to split off.

The forms of Figs. 15, 16, 23 have most of the advantages of the endless ring forms, yet they cost slightly less and may be progressively driven as above suggested. The form of Fig. 23 would have little or no practical value if made of smooth bars, but when made of my shouldered bars it is highly effective; and it may be noted that its parts may be varied in relative positions according to the form of the particular tie and any developed tendency to splitting.

What I claim is:

1. An anti-split device for railway ties consisting of a flat metal strip in curvilinear form having on one face a series of lateral projections with abrupt shoulders adapted to resist equally longitudinal slipping in either direction when the strip has been driven in wood, one face of the strip being straight in cross section and the opposite face being beveled to meet the face first mentioned at one edge of the strip.
2. An anti-split device for railway ties consisting of a flat strip in curvilinear form beveled on one broad face to meet the opposite non-beveled face at the margin of the strip forming a sharp edge and provided on one face with transverse projections having abrupt shoulders adapted to resist equally longitudinal slipping in either direction when driven in wood, said projections terminating in sharp edges near the edge first mentioned.
3. An anti-split device for railway ties consisting of a flat metal strip in curvilinear form beveled on one broad face to meet the other broad face at one margin of the strip and provided on each face with transverse projections terminating in sharp edges near the intersection of the two faces, each of said projections extending outward from the adjacent portion of the strip to a distance approximately equal to half the thickness of the strip.
4. An anti-split device for railway ties consisting of a pliable flat metal strip having one marginal portion of uniform thickness, the strip being beveled on one face to form a cutting edge at the margin of the non-beveled opposite face and both faces being provided with transverse projections each merging at one end in one face of said marginal portion and having a cutting edge, at its opposite end, approximately equal in length to one half the thickness of the strip.
5. An anti-split device for railway ties composed of a metal strip adapted to be driven into the end of a tie and provided with lateral projections having abrupt shoulders transverse to the general line of direction of the corresponding portion of the strip, the said strip being formed to embrace the

central portion of the tie end and with its own end portions overlapping each other.

5 6. An anti-split device for the ends of railway ties composed of a metal strip adapted to be driven into the wood, said strip having a driving face and an opposite cutting edge and provided with lateral enlargements adapted to increase resistance to longitudinal slipping; the said strip being

curved in outline and embracing portions of 10 the wood and having overlapped end portions.

In testimony whereof I affix my signature in presence of a witness.

WILLIAM ERASTUS WILLIAMS.

Witness:

JAMES L. CRAWFORD.