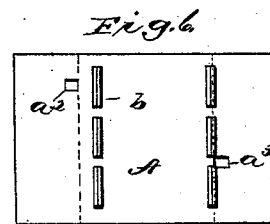
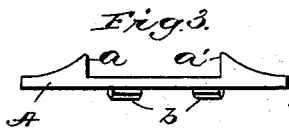
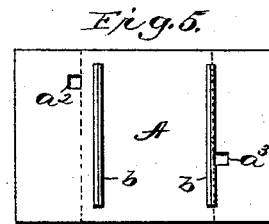
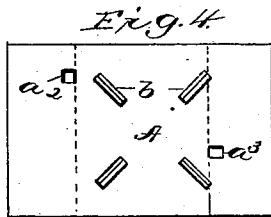
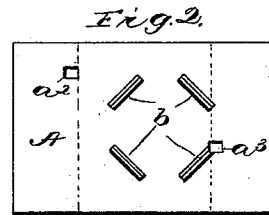
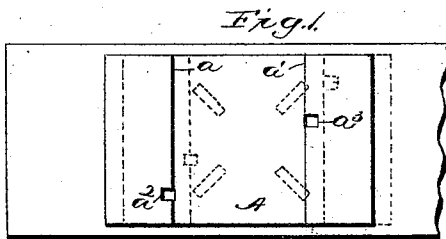


(No Model.)

R. MORRELL.
TIE OR WEAR PLATE.

No. 531,637.

Patented Jan. 1, 1895.



Witnesses:

J. M. Fowler
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Inventor:

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By Charles Shind
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UNITED STATES PATENT OFFICE.

ROBERT MORRELL, OF SUMMIT, NEW JERSEY, ASSIGNOR OF THREE-EIGHTHS TO CHARLES S. DAY, OF SAME PLACE, AND W. W. McCULLOM.

TIE OR WEAR PLATE.

SPECIFICATION forming part of Letters Patent No. 531,637, dated January 1, 1895.

Application filed April 3, 1894. Serial No. 506,211. (No model.)

To all whom it may concern:

Be it known that I, ROBERT MORRELL, of Summit, in the county of Union and State of New Jersey, have invented certain new and useful Improvements in Tie or Wear Plates; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, and to the letters of reference marked thereon.

This invention relates to improvements in that class of railway appliances known as wear or tie plates.

The principal objects of my present invention are first to provide an efficient means for firmly and securely confining the plate in position upon the surface of the tie with the least injury to the latter and without distorting the plate, and, second, to provide for lateral adjustment of the tie plate, to compensate for displacement occasioned by wear or defective seating, and avoiding excessive mutilation of the tie.

In the accompanying drawings, Figure 1 is a top plan view, Fig. 2 is a bottom plan view and Fig. 3 an edge view of a tie plate containing an embodiment of the invention. Figs. 4, 5 and 6 illustrate modifications.

Similar letters of reference in the several figures indicate the same parts.

The tie plate A is preferably provided upon its upper surface with two parallel shoulders or ribs a , a' (although one only is required under certain circumstances), between which the base of the rail is secured, and holes a^2 a^3 are provided on opposite sides for the insertion of the spikes.

In the preferred form illustrated in Figs. 1 to 3, the under face of the tie plate is furnished with four symmetrically disposed projections b which are driven into the surface of the tie until the plate makes contact therewith, and they serve to retain the tie plate in position and to resist motion in all directions in a horizontal plane.

The projections b are wedge shape in cross section the base or thicker portion of the wedge merging into the surface of the plate, and they are so disposed that their edges or cutting faces stand diagonally to the plate and to the grain of the wood. Moreover the

projections lie wholly within the margin of the plate.

A four fold advantage results from this arrangement. In the first place, the cavities formed by the projections are entirely covered and the entrance of water therein prevented. In the second place the cutting or penetrating edges cross the grain of the wood, and splitting of the tie is prevented. In the third place, the diagonal arrangement of the ribs results in strengthening the plate, forming braces on the under surface which resist any tendency of the plate to bend or curl; and in the fourth place, the diagonal arrangement provides a more secure support and resistance to motion either laterally or longitudinally of the tie.

In ordinary use tie plates are subjected to forces which tend to force them in two directions, the one laterally of the rail and longitudinally of the tie, developed most strongly on curves; and the other or creeping movement in the direction of the running train, that is laterally of the tie.

The diagonal disposition of the holding ribs b is especially well calculated to resist movement of the plate in either direction, for whether the direction of motion be longitudinally or laterally of the tie it will be borne by the sides or extended faces of all the projections, two of said projections presenting converging walls between which the wood is compressed while the opposite or rear most projections present diverging surfaces.

Another advantage derived from this construction is the extended support which the elongated edges of the diagonally arranged projections give to the plate before and during the bedding operation. In applying the tie plates the usual practice is to first locate the plates properly under the rails and insert the spikes and drive them down so as to firmly grip the rail. After this the plates are subjected to the pressure of a passing train or weight by which the projections are forced into the tie until the plate takes a firm bearing thereon, when the spikes are finally driven home. During the preliminary placing of the plates the diagonal edges of the projections afford a broad and firm support so that when the pressure is applied they enter squarely

into the wood and are not liable to be displaced laterally. Moreover, owing to the diagonal arrangement they brace the plate and prevent its being bent or curled up when subjected to the great pressure employed in seating them.

Instead of arranging the wedge shaped projection on lines radiating from a center as shown in Figs. 1 to 3, they may with like effect be arranged as illustrated in Fig. 4.

The provision made for adjusting the tie plate laterally of the rail and longitudinally of the tie is designed more especially for use in connection with tie plates provided with double ribs on the upper surface.

These plates are employed mostly on curves when it is desired to more securely hold the rails from lateral movement in either direction. After the plates have been in use for some time, and subjected to the action of fast and heavy express trains, the socket formed by the projections become enlarged, owing to the great pressure to which the rails are subjected, resulting in a slight spreading of the rails. Again, it may sometimes happen in setting the tie plates that they will be forced slightly to one side as the projections penetrate the wood. After the plates have once been seated their position cannot conveniently be changed without injury to the tie, either by leaving unfilled cavities for the reception of water, or by so enlarging the cavities first formed as to destroy in a measure the holding capacity of the projecting ridges.

To provide for a limited adjustment of the tie plate, I arrange the projections, whether of the preferred variety shown in Figs. 1 to 4 or of other known forms, such for example as are illustrated in Figs. 5 and 6, symmetrically, that is to say, with the projection or projections on one side of the center corresponding in location and arrangement with that on the opposite side, but, instead of locating the projection equidistant from a line drawn longitudinally of the plate midway between the two ribs a a' , they are arranged at unequal distances therefrom, that is to say the projection or projections on one side are slightly nearer the median line than those on the other side, or what amounts to the same thing, the projections located on one side are slightly nearer the rib or shoulder a than are those on the other side to the rib or projection a' . Hence it may be said that the projections b are symmetrically and eccentrically arranged with respect to the ribs a , a' .

As a result of this construction it becomes possible to change the location of the ribs a a' relative to the tie by simply reversing the tie plate so that the projections which before occupied the sockets or depressions nearest the end of the tie will occupy the sockets or depressions formed by the corresponding projections on the side most remote from the end of the tie, thus shifting the position of the ribs a a' nearer to or farther from the end of the tie without occasioning further mutilation of the tie such as would result if the projections were shifted and re-seated in new sockets or depressions.

If the spike holes are symmetrically arranged also, the spikes may be made to occupy the same holes, but as this is not always desirable, especially where, by the enforced shifting of the tie plate, the sockets have been enlarged, I prefer to locate one spike hole nearer the end of the plate on one side than upon the other, so that, when the plate is reversed, the spikes can be driven into new wood instead of the old spike hole.

The dotted lines in Fig. 1 indicate the effect produced by reversing the plate.

In Figs. 4 and 5 the projections are shown arranged symmetrically on opposite sides of the median line but at unequal distances therefrom so that when the plate is reversed the ribs, indicated by the dotted lines, will be shifted in position.

Having thus described my invention, what I claim as new is—

1. A tie plate provided on its under surface with a series of separate holding plates or projections radially arranged beneath the central portion of the plate; substantially as described.

2. A tie plate provided on its upper face with a retaining rib or ribs and on its lower face with two or more symmetrically arranged projections eccentrically disposed with reference to the holding rib; substantially as described.

3. A tie plate provided with parallel holding ribs on its upper surface, symmetrically arranged projections on its lower face located eccentrically, and spike holes arranged at relatively different distances from opposite ends of the plate; substantially as described.

ROBERT MORRELL.

Witnesses:

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