(No Model.)

B. WOLHAUPTER.

TIE PLATE.

No. 538,809. Patented May 7, 1895.

Fig. 2.

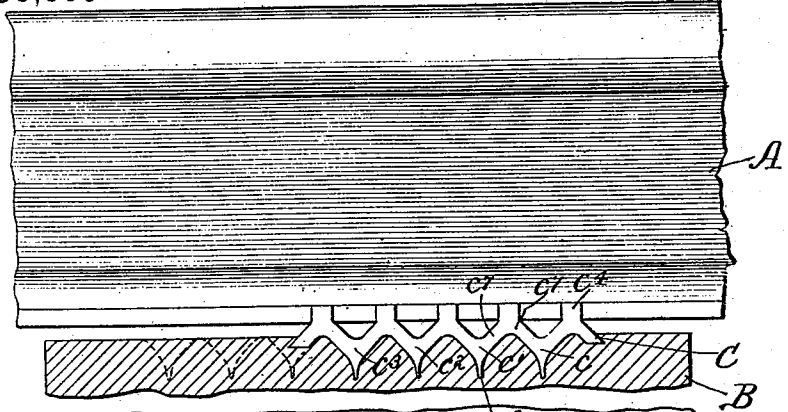


Fig. 1.

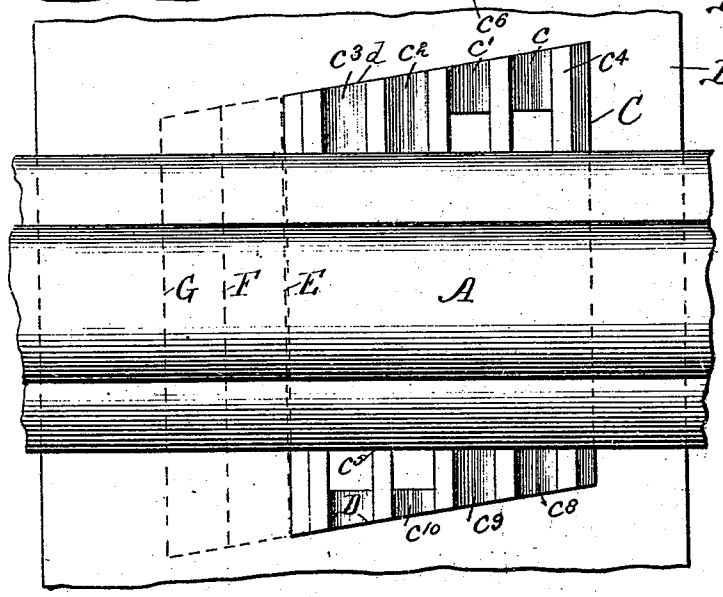
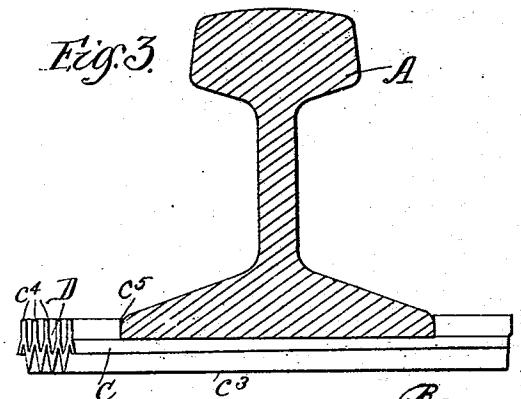


Fig. 3.



Witnesses.
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UNITED STATES PATENT OFFICE.

BENJAMIN WOLHAUPTER, OF MORGAN PARK, ILLINOIS.

TIE-PLATE.

SPECIFICATION forming part of Letters Patent No. 538,809, dated May 7, 1895.

Application filed March 13, 1895. Serial No. 541,521. (No model.)

To all whom it may concern:

Be it known that I, BENJAMIN WOLHAUPTER, a subject of the Queen of Great Britain, residing at Morgan Park, county of Cook, State of Illinois, have invented a certain new and useful Improvement in Tie-Plates; and I 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 pertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

Heretofore in the use of railway tie plates two general styles of plates have been employed. The plates were first put into use without top flanges, that is, flanges on the top of the plate against which the rail flange could abut and the plate thereby be utilized to prevent the lateral movement of the rail and consequent widening of the gage; but in the use of these smooth top plates it was found that the constant thrusts of the rail laterally tended to shear the spike and the latter had to be frequently renewed. To relieve the spike and obviate this item of renewals the plate was provided with a top ridge or flange against which the rail flange could bear, the flanges on the under side of the plate which engaged the tie supposedly holding the plate against any movement along the tie and the plate thereby relieving the spikes from the shearing action of the rail caused by its lateral thrust; but in the use of these plates with top flanges it has been found that the lateral thrust of the rail has caused the flanges on the under side of the plate to break or compress the wood fibers and allow the plate to creep along the tie longitudinally thereof. When the plate has once moved it has been practically impossible to again hold the top flange against the rail flange after the rail has been returned to its original and proper position, since the under flanges have no wood to abut against, the result being that even with the top flange on the plate, the spike has had to take the thrust of the rail after the plate has been in use a short time thus rendering useless this top flange and soon shearing the spike.

My invention has for its object the production of a plate which while being provided with the top flange to receive the thrust of the rail is so constructed on its under side that after it has been moved by the lateral pressure of the rail it, together with the rail can be easily moved back to the proper position to maintain the gage, and be held in that position even more firmly than when originally laid.

The invention further contemplates a form of plate provided with top and under flanges which shall be extremely strong in its construction and effective in its designed use, and yet easily rolled or formed into shape as well as very light weight.

It consists in a combination of devices and appliances hereinafter described and claimed.

In the drawings, Figure 1 is a plan view of the rail and plate thereon and portion of the tie. Fig. 2 is a side elevation of the rail, showing an end elevation of the plate. Fig. 3 is a cross-section of the rail and side elevation of the plate.

In carrying out the invention A represents the track rail, B the tie, and C the tie plate. The plate is preferably, although not necessarily formed into the shape shown more particularly in Fig. 2, that is to say, what may be termed a trussed shape so that flanges are provided on both the under side as at c, c', c^2, c^3 and top sides as at c^4. On the top side a way c^5 for the rail or what may be termed the rail seat is provided. The flanges on the under side are preferably shaped with comparatively sharp edges c^6 so that they will readily enter and separate the grain of the tie. As will be seen when in position these under flanges extend parallel with the grain of the tie, the ends being substantially blunt or square and forming abutments to prevent so far as possible the plate from creeping along the tie. It will be observed that by this form of plate there is much less opportunity or chance of buckling than with the ordinary flat plate since each point where the rail rests upon the plate, is supported and trussed by metal which is more or less on edge instead of on its side, thereby forming for each resting point of the rail two girders c^7 joined at the apex by the top flanges c^4 where the rail rests. By the above construction also the wood between the flanges c, c', c^2, c^3 will, because of the sloping of the approaching sides of the flanges be compressed between the flanges, thereby greatly aiding in sustaining the weight put upon the plate, and also in excluding moisture from the wood under the plate. A form of plate such as I have just de-

scribed is also of material advantage in that I am enabled to make it much lighter in weight. In this construction of plate with the same amount of material as is ordinarily used in tie plates a much stronger plate is obtained. Heretofore it has been a commercial necessity in order to get the price of plates where they could be sold for use on the cheaper grade of ties, to reduce and diminish as far as possible the material and consequently the weight of the plate. The result has been that with the plate flat and thin it has buckled when the rail pressure has been brought on it thereby damaging the tie as well as rendering the plate useless as a bearing for the rail; but in my construction since the points where the rail rests are supported by metal more or less in upright position the plate is greatly strengthened without addition of weight. So also by a construction as above the top of the plate where the rail is seated comprises a series of flat portions with a series of depressions between, so that while there is abundant wearing surface between the rail and plate, there is space for sand, cinders, &c., to work out. Again, these depressions permit the draining off of water and moisture so that in cold weather the top of the plate particularly the space between the rail and plate is not covered with ice and the friction between the rail and plate thereby either lessened or obviated entirely.

I will now describe the second feature of the invention, viz., the ability to adjust the plate to take up any widening of the gage due to the lateral movement of the plate and rail. The ends of the engaging flanges on the under side of the plate are regularly stepped or cut on a diagonal line as compared with the rail flange. It is of course obvious that the ends of the flanges might be cut on this diagonal line or the entire end of the plate cut in this way. In my present drawings I have shown the latter construction, the entire end of the plate being sheared diagonally as at D.

The operation is as follows: The plate is of course originally engaged to the tie in such a location as that the rail will be in proper position to form the proper gage of track. Each of the flanges c to c^3 will displace enough of the fiber to allow them to enter the face of the tie. After the plate has been in use some time the lateral pressure of the rail will move the plate to a greater or less extent along the length of the tie and the ends d of each flange c to c^3 will compress the fiber in advance of it. Now if the plate is removed there will be a series of indentations or perforations in the face of the tie made by the flanges c to c^3 and these indentations or perforations will be stepped or on a diagonal line. The plate is now replaced on the tie with the edge E moved to a position shown by dotted lines F. This will bring each flange c to c^3 into the indentation or perforation originally occupied by the flange next adjacent with the exception of the flange c^3 nearest the edge E, this flange making a new indentation for itself. Now if the end d of each flange c to c^3 is brought to a bearing against the end of the indentation made by the next preceding flange and the ends of these flanges are on a diagonal line as compared to the rail flange, the plate will be found to have moved lengthwise of the tie a distance equal to the difference between the length of each plate flange measured from its end to the rail flange. Now as will be seen this movement of the plate lengthwise of the tie will force the rail laterally a corresponding distance, thus restoring the desired gage of the track. If one shifting of the plate is not sufficient to take up the abnormal width of the gage, or if after the plate has been shifted, it again gives way to sufficiently widen the gage the edge E can be shifted to the position shown by dotted lines G.

It will be seen by the above description that I have described only one end of the plate as having the flanges stepped or on a diagonal line. In practice, however, both ends could and probably would be beveled or stepped and as I will presently explain this will give an opportunity to reverse the plate end for end and obtain additional adjustments. It is obvious that after the second adjustment the flange c' will occupy the space originally occupied by the flange c^3. Now by reversing the plate end for end, the end c^3 of the flange c would be in the indentation originally occupied by the flange c^3. Therefore by making the distance between the rail flange and the end c^3 one step greater than the distance from the rail flange to the end c' an additional adjustment is gained when the plate is reversed and by making the ends c^9, c^{10} respectively a step longer than the preceding flange two more adjustments are gained. It will thus be seen that after the plate is laid it can be shifted twice, then turned end for end (an adjustment being gained by the turning) and then shifted twice, making in all five adjustments. It is obvious, however, that the number of adjustments can be greatly increased if desired, only being limited by the width of the tie.

A material advantage in thus employing the indentations for another flange after they have once been made by a preceding flange, is that every time the plate shifts, by virtue of the pressure of the rail laterally, it compresses the fibers in advance of it so that by the time the plate has been adjusted once or twice it takes much more pressure and a much longer time for the rail to shift it more.

Another feature of the invention is the provision of the pairs of spike holes in diagonal corners. This is for the purpose of permitting the spike to be driven into the old spike hole in the tie after the plate has been adjusted, thus obviating the necessity of driving a new hole in the tie every time the plate is adjusted, and thus spoiling the tie.

It is obvious that the construction just described is susceptible of many changes, and

the prime object of the invention still be attained. For instance, the under flanges might be divided, or instead of flanges they might be merely projections and the plate instead of having its end beveled might be square, and the under flanges alone be stepped; or but a single end of the plate need be stepped; or the flanges having one or more of their ends stepped might be applied to a flat plate or to the numerous other constructions of plates now on the market.

In all of the above named variations the principle employed is the same and each would embody the essential idea of my invention which consists in providing a plate on its under side with a series of stepped flanges or projections, that is to say, flanges or projections arranged on a diagonal line with respect to the rail flange.

What I claim is—

1. The combination with the rail and tie of the tie plate provided with a series of stepped tie engaging flanges or projections on the under side, each arranged to fit into the perforation made by the flange or projection next adjacent, whereby when the plate is shifted transversely of the tie it is also shifted longitudinally thereof, substantially as described.

2. The combination with the rail and tie of the tie plate provided on its under side with a series of engaging flanges, adapted to enter the tie at least one end of said plate and flanges being cut on a diagonal line with relation to the rail flange, substantially as described.

3. The combination with the rail and tie, of the tie plate provided on its under side with one or more engaging flanges, adapted to enter the tie extending parallel with the grain of the tie, the opposite ends of said flange or flanges being different distances from the vertical plane of the rail, substantially as described.

4. The combination with the rail and tie of the tie plate provided on its under side with a series of tie engaging flanges or projections, adapted to enter the tie the ends of the flanges or projections at one end of the plate being a greater aggregate distance from the rail flange than the ends of the flanges at the other end of the plate, substantially as described.

5. The combination with the rail and tie of the tie plate provided on its under side with a series of engaging flanges or projections, adapted to enter the tie the ends of which are with respect to each other a variable distance from the vertical plane of the rail flange, the ends of the flanges or projections at one end of the plate aggregating a greater distance from the rail flange than those at the other end of the plate, substantially as described.

6. The combination with the rail and the tie of the tie plate provided on its under side with a series of flanges adapted to enter the tie and at least a portion of which project beyond the vertical plane of each edge of the rail flange, the series of flanges on one side of the vertical plane of the rail flange being longer than those on the other side, substantially as described.

7. The combination with the rail and tie of the tie plate, provided on its under side with a series of flanges adapted to enter the tie and at least a portion of which projects beyond the vertical plane of each edge of the rail flange, at least one end of each flange being arranged on a diagonal line with respect to the rail flange, the series of flanges on one side of the rail flange being longer than the series on the other side, substantially as described.

8. A railway tie plate formed on the under side with devices more or less sharpened adapted to penetrate and engage the tie, and on its upper side with a series of flanges on which the rail rests, substantially as described.

9. A railway tie plate formed with flanges on the under side for entering and engaging the tie parallel with the grain thereof and having on the upper side depressions parallel with and vertically above the flanges on the under side, substantially as described.

10. A railway tie plate the body of which is formed into a series of arches, the lower edges of said arches being provided with tie-entering and engaging devices or flanges, substantially as described.

11. A railway tie plate the body of which is formed into a series of arches the lower edges of which are provided with tie-entering and engaging flanges, and the upper side of the plate having a series of depressions vertically above said engaging flanges, substantially as described.

12. A railway tie plate provided on its under side with tie engaging flanges more or less sharpened extending parallel with the grain of the tie, and with spike holes extending through said flanges, substantially as described.

13. A tie plate provided with at least four spike holes arranged in pairs in diagonal corners of the plate, substantially as described.

14. The combination with the rail and the tie of the plate having on its under side one or more holding flanges or projections adapted to enter and perforate the tie, and at least one or more additional flanges or projections on the plate, the latter being a different distance from the vertical plane of the rail and on a plane parallel with the length of the tie, different from the first named flange or projection whereby when the position of the plate is changed so that the second flange enters the perforations originally occupied by the first, the plate has been shifted along the length of the tie, substantially as described.

In testimony whereof I sign this specification in the presence of two witnesses.

BENJAMIN WOLHAUPTER.

Witnesses:
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FLORENCE EMBREY.