April 27, 1943. P. T. BLACK 2,317,435

TIE PLATE AND SPIKE ASSEMBLY

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Fig. 1.

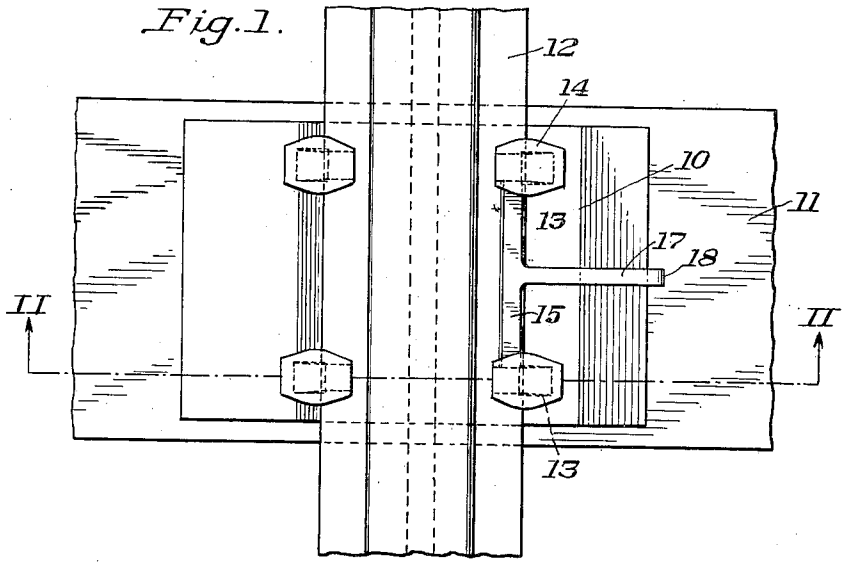


Fig. 3.

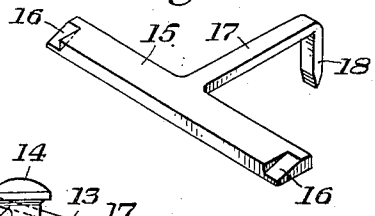


Fig. 2.

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Fig. 4.

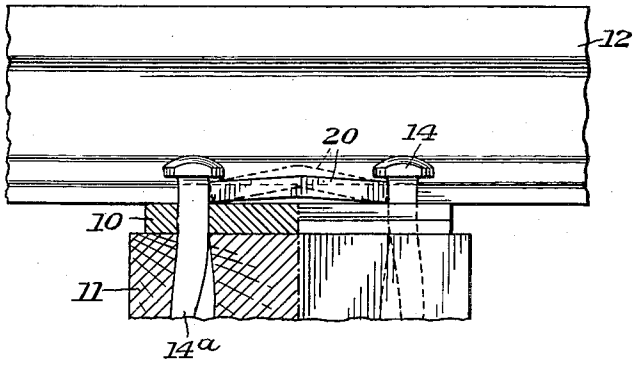


Fig. 5.

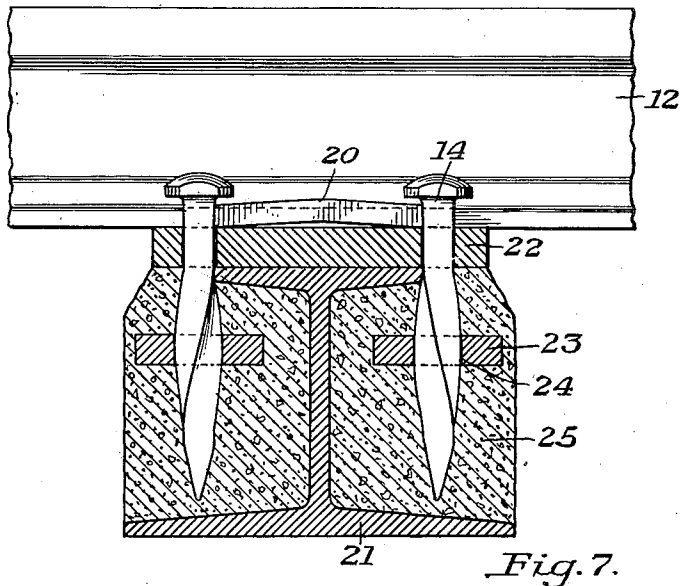


Fig. 7.

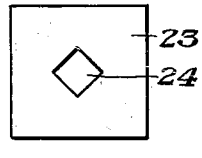
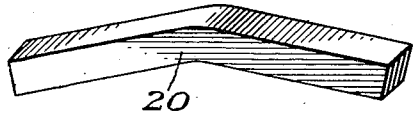


Fig. 6.



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TIE PLATE AND SPIKE ASSEMBLY

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Application March 8, 1941, Serial No. 382,353

5 Claims. (Cl. 238—366)

This invention relates to rail-securing means and, in particular, to a spike and tie-plate assembly characterized by a holding power greater than that of conventional spikes and tie-plates as now utilized in securing railroad rails on supporting cross-ties.

Conventional railroad spikes, when properly installed, satisfactorily secure railroad rails to supporting cross-ties under most service conditions. Where the service is unusually severe, however, such as on tracks traversed by high-speed passenger trains or numerous heavily loaded freight trains, there is a tendency for the spikes to be partially withdrawn as a result of the repeated heavy impact and rebound resulting from the passage of successive car wheels over each tie. Under such types of service, the maintenance of the track in safe operating condition presents a difficult problem.

I have invented a novel form of rail-securing means exhibiting a holding power considerably greater than that of the conventional railroad spike, which can be manufactured and installed practically as easily and cheaply as the latter. In a preferred embodiment, the invention comprises a tie-plate having a pair of non-circular holes adjacent the edge of one of the rail flanges, and a pair of spikes having shanks shaped to fit snugly in said holes and twisted in opposite directions. The remaining element of the assembly comprises means for preventing "unscrewing" or turning of the spikes after installation. The invention provides a spike having a holding power approaching that of a screw spike yet retaining the ease of installation characteristic of the conventional driven spike.

A modified form of the invention is adapted for use with steel cross-ties.

The invention may be readily understood by reference to the following detailed description and the accompanying drawings illustrating the preferred embodiment and the modification above mentioned. In the drawings

Figure 1 is a partial plan view of a rail secured to a cross-tie by my invention;

Figure 2 is a sectional view taken substantially along the plane of line II—II of Figure 1;

Figure 3 is a perspective view of a detail;

Figure 4 is a view showing the rail in elevation and the tie and tie-plate partly in section, with a modified form of spike-locking means;

Figure 5 is a view similar to Figure 4 showing the application of the invention to steel ties;

Figure 6 is a perspective view of a detail; and

Figure 7 is a plan view of a further detail.

Referring now in detail to the drawings and, for the present, to Figures 1 through 3, a tie-plate 10 is disposed on a cross-tie 11 and supports a track rail 12. The tie-plate 10 has a pair of holes 13 therethrough spaced along the edge of one or both flanges of the rail. The holes are non-circular and preferably rectangular or substantially square as shown and are dimensioned to receive snugly the shanks of spikes 14. The spikes 14 are of conventional design except that the shanks have a partial twist 14a therein, e. g., a 90° twist. Only the intermediate portion of the shank is twisted, the upper and lower ends thereof being undeformed. It will be apparent, however, that in the case of a 90° twist in the shank, the sharp bottom edge of the spike, instead of being parallel to the rail will be normal thereto.

In driving the spike 14, its sharp end is inserted through the hole 13 with the head of the spike extending parallel to the rail 12, in the case of a spike having a shank twisted 90°. The spike is then driven in the usual manner. As it penetrates the tie, the snug fit between the spike shank and the walls of the hole in the tie-plate causes the spike to turn bodily about its longitudinal axis through an angle of 90°, resulting in the spike head being turned toward the rail when finally driven so as to engage the rail flange in the normal manner, as illustrated in the drawings. The rotation of the spike about its longitudinal axis as it is driven deforms the fibers of the tie and thereby greatly increases the holding power of the spike.

The spikes driven into the same tie on one side of the rail have their shanks twisted oppositely, i. e., the shank of one spike having a right-hand twist and the shank of the other having a left-hand twist. The spikes are so placed, furthermore, that any withdrawal thereof tends to cause the overhanging portion of the head to turn toward the other spike. I am thus able to prevent "unscrewing" or withdrawal of the spikes by a spacer bar or strut 15 extending between the two spikes entering a single tie on the same side of the rail, the bar engaging under the overhanging portion of the heads of the spikes. As shown in the drawings, the bar 15 lies on the rail flange and has its ends recessed as at 16 to fit under the heads of the spikes. The bar 15 has a tail portion 17, the end of which is turned down as at 18 and provided with a wedge point whereby it may be driven into the tie, as shown in Figures 1 and 2, to secure the spacer bar permanently in place.

Figure 4 illustrates a modified form of spacer bar **20** which is shown in its initial form in Figure 6. As there illustrated, it comprises a bent bar adapted to be laid on the tie-plate **10** adjacent the edge of the rail flange with its ends almost engaging the undeformed portions of the spike shanks immediately adjacent the heads. The bar **20** may conveniently be deformed from the condition shown in dotted lines in Figure 4 to the condition shown in solid lines by a sledge hammer blow. This deformation causes the ends of the bar to engage firmly against the sides of the spike shanks, whereby they are effectively prevented from turning toward each other.

Figure 5 illustrates a modification of the invention adapted for use with a steel tie **21**. Tie-plates **22** disposed on the tie **21** support the rail **12** and are similar to the tie-plate **10**. The spike holes through the tie-plate **22**, however, must be positioned beyond the edges of the upper flanges of the tie **21**. The spikes **14**, when used with steel ties, are provided with washers **23** having holes **24** therein shaped to fit snugly the shanks of the spikes. The spikes and washers are embedded in masses of concrete **25** placed between the bottom flanges of the tie and the tie-plate.

In the installation of my rail-securing means with steel ties, as illustrated in Figure 5, the rails are laid on the tie-plates properly positioned on the ties and the spikes are inserted through the holes in the tie-plates. As they are lowered, they turn through a 90 degree angle so that the overhanging portions of the heads engage the rail flange in the same manner as illustrated in Figures 1 and 2. The washers **23** are slipped on the depending shanks of the spikes and the concrete masses **25** are then put in place, embedding the shanks of the spikes and the washers **23**. The spacer bars **20** are then placed in the manner already explained. When the concrete masses **25** set, they become firmly bonded to the washers and spike shanks, thus providing a strong anchorage for the rail. The spikes cannot be withdrawn without turning in the washers **23** and the embedding masses of concrete. Such turning of the spikes, however, is prevented by the bars **20**.

It will be apparent from the foregoing description and explanation that the invention provides a novel form of rail anchorage having important advantages over the conventional spike and tie-plate assembly. Tests show that my rail anchorage is characterized by considerably greater holding power than ordinary spikes. It is adaptable, furthermore, to steel as well as wooden ties, as fully explained above. The cost of my anchorage is not substantially greater than that of ordinary spikes and tie-plates. While I have illustrated and described but a preferred embodiment of the invention with a modification, it will be understood that changes in the details and arrangement of the elements thereof may be made without departing from the spirit of the invention or the scope of the appended claims.

I claim:

1. Rail-securing means comprising a tie-plate adapted to support a rail on a cross-tie, said plate having square holes therethrough adjacent the edge of at least one flange of the rail, a pair of spikes inserted through said holes, respectively, and embedded in said tie, the shanks of said spikes being square in section, dimensioned to fit snugly in said holes, and twisted in opposite directions, and a strut extending between and engaging the adjacent faces of the shanks of said spikes for preventing "unscrewing" thereof.

2. Rail-securing means comprising a tie-plate adapted to support a rail on a cross-tie, said plate having square holes therethrough adjacent the edge of at least one flange of the rail, a pair of spikes inserted through said holes, respectively, and embedded in said tie, the shanks of said spikes being square in section, dimensioned to fit snugly in said holes, and twisted in opposite directions, and a spacer bar engaging the adjacent faces of the spikes and effective to prevent them from turning in the direction necessary for their withdrawal.

3. Rail-securing means comprising a tie-plate adapted to support a rail on a cross-tie, said plate having square holes therethrough adjacent the edge of at least one flange of the rail, a pair of spikes inserted through said holes, respectively, and embedded in said tie, the shanks of said spikes being square in section, dimensioned to fit snugly in said holes, and twisted in opposite directions, and a spacer bar extending between and engaging the adjacent faces of the shanks of the spikes effective to prevent either from turning toward the other.

4. Rail-securing means as defined by claim 2, characterized by said spacer bar lying on the rail flange and engaging the spike heads.

5. Rail-securing means as defined by claim 2, characterized by said spacer bar lying on said tie-plate and engaging the shanks of said spikes.

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