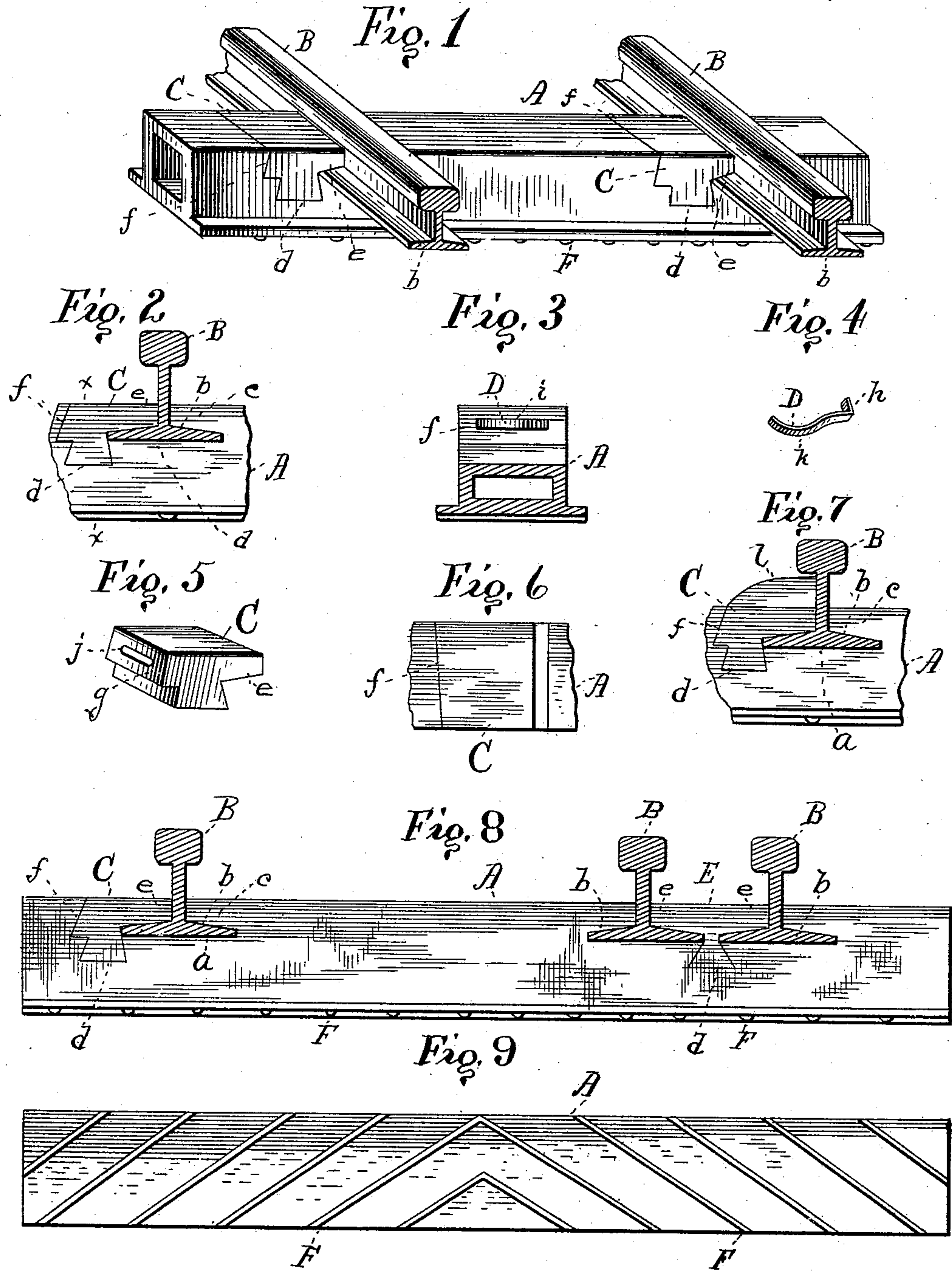


(No Model.)

C. E. STEINER.  
RAILWAY TIE.

No. 507,179.

Patented Oct. 24, 1893.



Witnesses

Howard P. Wilson  
Relle B. Smith

Inventor  
Charles E. Steiner  
By  
M. D. Peck  
Attorney



# UNITED STATES PATENT OFFICE.

CHARLES EDWARD STEINER, OF YORK, PENNSYLVANIA, ASSIGNOR OF ONE-HALF TO WINFIELD B. HILDEBRAND, OF SAME PLACE.

## RAILWAY-TIE.

SPECIFICATION forming part of Letters Patent No. 507,179, dated October 24, 1893.

Application filed August 30, 1892. Serial No. 444,545. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES EDWARD STEINER, a citizen of the United States, residing at York, in the county of York and State of Pennsylvania, have invented certain new and useful Improvements in Railway-Ties; and I do hereby 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 appertains to make and use the same, reference being had to the accompanying drawings, which form part of this specification.

This invention relates to an improvement in metallic ties for railways, and has for its object to produce a tie having mechanism that will hold the rails firmly and securely in place without the use of spikes that are usually employed, said mechanism being so constructed and arranged as not to be affected by the jar and vibration incident to the passage of a train over the track, or by the expansion and contraction of the rails due to changes in temperature, whereby spreading of the rails and the consequent liability to accidents is avoided.

A further object is to produce a metallic tie having a locking wedge of such construction that it will admit of being driven only a predetermined distance, whereby the locking spring used in conjunction with the wedge, will be caused properly to perform the function for which it is designed, and also to produce a locking wedge of a construction that will brace and strengthen the web of the rail at the point of connection between the said tie and rail, and also to provide a tie having its base portion so constructed that the tie will remain firmly seated on the bed when a train is passing over the track; and the invention consists in the novel construction and combination of parts hereinafter fully described and more particularly pointed out in the claims.

In the accompanying drawings, like letters of reference indicate corresponding parts.

Figure 1. is a perspective view of my improved tie as it appears when in use. Fig. 2. is a front elevation, partly in section, showing more particularly the contour of the locking

wedge. Fig. 3. is a transverse section, taken on the line X—X of Fig. 2, with the locking wedge removed, showing the locking spring in its seat. Fig. 4. is a perspective detail view of the locking spring. Fig. 5 is a perspective detail view of the locking wedge showing also the seat for the locking spring. Fig. 6. is a top plan view of a portion of the tie, showing more particularly the wedge like shape of the top of the locking key. Fig. 7. is a front elevation, partly in section, showing the locking wedge provided with a rib for bracing the web of the rail. Fig. 8. is a side elevation, showing the contour of the locking wedge to be used on a guard rail. Fig. 9. is a bottom plan view of the tie, showing a plurality of ribs or flanges thereon to prevent lateral movement of the tie on its bed.

In the drawings, A. designates the tie, which is shown in this instance as a tubular structure, and preferably rectangular in cross section, though it may be made in any other desired form. At a point near each end of the tie is cast, or otherwise formed, a recess or seat *a*, in which fits the base *b*, of the rail B. one half of the base being braced and held firmly in place by means of an overhanging flange or projection *c*, formed by the said recess. To one side of each of the recesses *a*, is formed a dovetail recess or seat *d*, which is of greater depth than the recess *a*, and forms a seat for a locking wedge C. which serves to hold the rail securely in place. This wedge is provided with an arm or projection *e*, designed to bear upon the base and the web of the rail, the under side of the projection being inclined upward, as clearly shown in Fig. 5, in order to conform to the inclination of the base of the rail, and thus form a close contact therewith when the wedge is driven to place.

In order to prevent the locking wedge C. from being driven such a distance within the recess as to allow it to project beyond the side of the tie, the upper inner face of the wall *f*, above and on the outer side of the said recess is arranged at an angle to the rail, and forms in conjunction therewith an approximately wedge-shaped recess, and the outer face *g*, of the wedge is cut at an angle to its inner or



web bearing face, as clearly shown in a top view in Fig. 6. By this construction the key or wedge can only be driven a predetermined distance, as the contour of the recess in which it works will, in a manner that will be perfectly obvious, prevent undue or undesirable lateral play or movement.

In order to prevent the key or wedge C. from working loose when driven to its seat, a locking spring D. is employed. This spring is made in the form of a compound curve and has a toe *h*, at right angles thereto at one end for holding it in proper position. As seen in Fig. 3. the face of wall *f*, above and on the outer side of the recess *d*, is provided with a transverse recess *i*, in which is seated the spring D. and by reference to Fig. 5, it will be seen that wedge C. is provided with a recess *j*.

The operation of the spring is as follows: The rail having been placed on the tie, the spring is seated in the recess *i*, and the key or wedge is inserted in the recess *d*, and driven to its seat. As the key is entering the recess *d*, it forces the spring D. back into the recess *i*, but as soon as the recess *j* of the wedge registers with the recess *i*, the curved portion *k*, of the spring slips into the recess in the key and thus holds it securely in place as against displacement from the jar and vibration of the rails, or from expansion and contraction of the different parts of the structure. When it is desired to remove the key or wedge, it is only necessary to apply percussive force to the side opposite that struck when seating it when the spring D. will be again forced back into recess *i*, and the key or wedge may then be removed. It is to be understood that if desired, the spring may be seated in the key instead of in the tie; but for obvious reasons the spring in the tie is preferred.

In some instances it is desirable to brace the web of the rail, as in the case where sharp curves occur in the track, and in order to accomplish this result, the key or wedge C. is provided with a rib or flange *l*, which bears against the web, as clearly shown in Fig. 7, and if desired may be made to rest against the under side of the tread of the rail. With the exception of the rib, the key shown in Fig. 7, is of the same general construction as that shown in Figs. 1, 2, and 3.

In Fig. 8, there is shown a double locking key or wedge E. which has two projections *e*, adapted to bear upon the base of two rails when arranged in close proximity to each other, as in the case of a guard rail, and operates in the same manner as a single key or wedge. In using the key in this form however, the dovetailed recess or seat *d*, in the tie is made wedge shaped or broader on the bottom at one end than at the other, and the dovetailed portion of the key fitted therein to prevent it from passing beyond the edge of the tie when inserted, in lieu of making the inner face of the wall *f*, tapering as illus-

trated in Fig. 6, and a recess is made in the seat *d*, for retaining the spring D, which is seated in a recess in the under side of the dovetailed portion that rests in the seat *d*, for retaining the key when it is in position, in place of using the spring in the side of recess *f*, as shown in Figs. 3 and 5. It is also obvious that the locking key used for the guard rail, may be provided with a rib for bracing the web of the rail as shown in Fig. 7, for an ordinary single rail.

The means for preventing the tie from shifting on its bed, consists in a plurality of ribs or flanges F. on the base side of the tie. These ribs or flanges are integral with the tie, and are by preference arranged diagonally thereon, as shown, although any other preferred form of arrangement may be adopted. The function of the ribs is to sink into the road bed and thus form a number of retaining points to cause the tie to remain firmly seated at all times.

From the foregoing description the advantages of this form of metallic tie will be apparent. It will be seen that no rails or spikes are necessary to hold the rails in place, and that by constructing the top of the locking key, wedge-shaped, and by making the recess in the tie dove-tailed, the key or wedge will be caused to bear firmly against the rail and thus clamp it in place. Also that the wedge cannot be driven in a greater distance than is necessary, and that by the employment of the locking spring, the key or wedge will be held securely in place against accidental displacement; and also by providing the base of the tie with ribs or flanges, it will be caused to keep its position on the road bed.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent of the United States, is—

1. A metal tie for railways having a recess for the reception of the rail, and a dove-tail recess adjacent thereto and below the base of the rail, a supplemental recess above said lower recess having a wall on its outer side, its upper edge being at an angle to the rail, in combination with a dove-tailed locking key having its top wedge shaped to engage the angular wall of said supplemental recess, thereby preventing said key from being forced beyond a determined point, and holding it in position, as set forth.

2. A metallic tie having a recess for the reception of the rail and a dove-tail recess adjacent thereto having a transverse seat formed in its wall and opening into the recess, in combination with a locking key having a transverse seat registering with the seat in the wall opening into the dove-tailed recess, and a locking spring adapted to engage the two seats and hold the key in its fixed position, as set forth.

3. A metallic tie having a recess for the reception of the rail and a dove-tail recess adjacent thereto having one of its walls arranged at an angle to the rail and provided



with a transverse seat, in combination with a locking key having one side of its top arranged at an angle to correspond with the angular wall of the recess and provided with  
5 a transverse seat adapted to register with the seat in the wall of the recess, and a locking spring engaging the two seats to hold the said key in place, as set forth.  
4. A metal tie having a recess for the rail  
10 and a dove-tailed recess adjacent thereto and below the base of the rail, a supplemental recess above said lower recess having a wall on its outer side, its upper edge being at an angle to the rail, in combination with a locking  
15 key engaging the dove-tailed recess, the upper side of the key being wedge shaped to engage the upper wall of the recess and having

an upwardly extending rib bearing upon the base and supporting the rail from the tread to the base, as set forth. 20

5. A metallic tie having a recess for the reception of the rail and a dove-tail recess adjacent thereto having its upper portion wedge-shaped, in combination with a locking key having its top face made to conform to the  
25 shape of the recess, and a locking spring interposed between the wall of the recess and the key, as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

CHARLES EDWARD STEINER.

Witnesses:

JOHN V. BECK,  
DENIS CRIMINS.