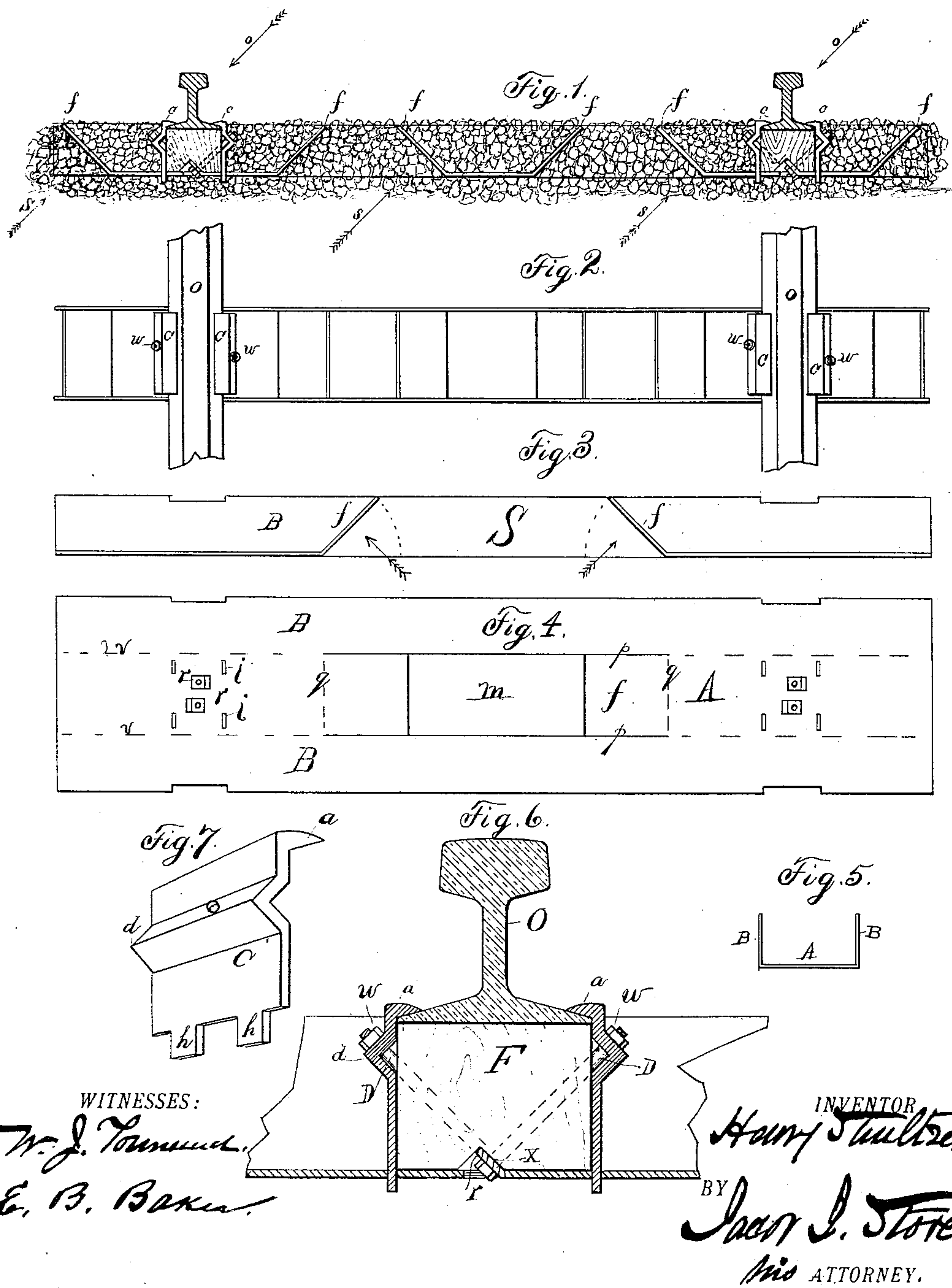


(No Model.)

H. SHULTZEN.  
RAILWAY METAL TIE.

No. 386,357.

Patented July 17, 1888.





# UNITED STATES PATENT OFFICE.

HENRY SHULTZEN, OF ELIZABETH, NEW JERSEY, ASSIGNOR TO THE STANDARD METAL TIE AND CONSTRUCTION COMPANY, OF NEW JERSEY.

## RAILWAY METAL TIE.

SPECIFICATION forming part of Letters Patent No. 386,357, dated July 17, 1888.

Application filed February 21, 1888. Serial No. 264,753. (No model.)

*To all whom it may concern:*

Be it known that I, HENRY SHULTZEN, of Elizabeth, in the county of Union and State of New Jersey, have invented a new and useful Improvement in Railway Metal Ties, of which the following is a specification.

This invention relates to railway metal ties, and is designed as an improvement on the metal tie for which an application for Letters Patent of the United States, Serial No. 258,539, was filed by me on or about the 20th day of December, 1887.

The objects of this improvement are to prevent the tie from being moved endwise or sliding laterally to the line of the rails under the oblique pressure of trains on curves, and, further, to apply a new form of clip and a method or device for making the same operative.

Reference is to be had to the accompanying drawings, forming part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 represents a longitudinal vertical section through the center of the tie, showing the manner in which the bottom of the tie is cut and turned up to form the angle or lateral resisting-plates, and also showing the tie embedded in the ballast of the road-bed. Fig. 2 represents a top or plan view of the tie with rails in position without the road-bed. Fig. 3 represents a longitudinal vertical section through the center of a tie where the center only of the tie is cut away to form two of the lateral resisting-plates. Fig. 4 represents the shape into which the sheet metal is cut before it is bent up to form the tie shown in Fig. 3. Fig. 5 represents an end view of the tie after it is bent into form. Fig. 6 is an enlarged sectional elevation showing rail, block, and improved clip in position on the tie. Fig. 7 is a perspective view of the improved clip.

In the application for United States patent above referred to, a metal tie on which this is an improvement, its clips, bolts, and packing-blocks are fully illustrated and described; hence it seems unnecessary to re-describe them in this specification. I will therefore confine my description to those features which constitute my present invention.

The great difficulty to be overcome in metal ties where stone ballast is used is the lateral

slip—that is, the sliding sidewise of the rails and ties in the road-bed when the train strikes one of the rails with considerable force in approaching a curve. To obviate this difficulty, therefore, is chiefly the intention of my present invention.

Taking into consideration the weight of the train at the usual speed in approaching a curve, the direction of the force which tends to slide the tie is at an angle of about forty-five degrees, as indicated by the arrows *o o*, and the resisting-power of the road-bed must consequently be as the direction of the arrows *s s*. Thus I find that it is most effectual to have the resisting-plates *f* stand at an angle of about forty-five degrees to the plane of the road-bed, as illustrated in Figs. 1 and 3, for in this position the plates standing at right angles to the lateral train force and back by the road-ballast must necessarily raise the tie before any lateral movement can possibly take place, and as the weight of the train is directly opposed to this lifting of the tie it is thus effectually utilized to prevent the lateral movement.

The manner in which I construct my present improved tie is best illustrated in Figs. 3 and 4.

A flat plate or body, *A*, is cut in the shape illustrated in Fig. 4. A central or bottom piece, *m*, is then in some instances cut out and removed, as also indicated in Fig. 4, and the resisting-plates *f f* having their sides cut free from the body *A*, as shown by the lines *p p*, which leave them free to be bent up. After the plates *f f* are bent at the dotted lines *q q* to the desired angles, the sides *B B* are bent up at right angles to the bottom *A*, so as to form a channel-beam with a central bottom piece cut out and with an opening or pocket, as *S*, Fig. 3, open at top and bottom, having two sides formed by the sides of the beam and two by the resisting-plates. In some instances more than one of these open pockets *S* are formed in the tie, as shown in Fig. 1, and in such cases no bottom piece, *m*, need be cut and removed, but only a transverse cut or cuts be made in the bottom of the tie or tie-blank *A* before the tie is formed to separate the individual plates of each pair of resisting-plates. The ballast filled into these open pockets *S* forms, as indicated in Fig. 1, an in-



tegral portion of the road-bed itself; hence because of these pockets the ties can be anchored or fixed in place in the most simple and effective manner, becoming, in fact, combined with the road-bed. The number of resisting-plates required depends, of course, upon the condition or character of road-bed, and it must be understood that any number of plates can be formed in the same manner as above described, and that they may be inclined at any desired angle.

My improved clip C, which is designed to be wide enough to reach across the tie between its sides, has its jaw *a* formed nearly at right angles to its body, as best shown in Figs. 1, 6, and 7, and the inferior face of the jaw is fashioned to conform with the slope or bevel of the upper face of a rail-base, as indicated.

On the back of the clip, at an angle of about forty-five degrees to its vertical portion and about one-third of its length below the jaw, is formed a shoulder, *d*, which may be made to extend entirely across the clip, as shown, or only partly across, so as to form a boss for a bolt to pass through.

On the lower edge of the clip and an integral portion thereof are straight fingers *h*, which are designed to be inserted into corresponding openings, *i*, made in the bottom of the tie, in order to hold the clip lower edge in place. It will be seen that when in position the inner face of the clip lies close against the packing-block F and edge of the base of the rail O, thereby excluding the elements which otherwise might get between it and the block and cause deterioration of one or both. In order to retain a pair of these clips in place and make them perform their especial functions of holding the rail O firmly down on the block F and holding the block immovably in position, burrs or washers *r* are partly cut at opposite points from the bottom of the tie and turned up at an angle of about forty-five degrees, with faces parallel to those of the clip-shoulders *d*, as shown best in Fig. 6, to bear against the bottom of the block, which is cut away for this purpose, as shown at X, Fig. 6. Bolts D are then passed up from opposite points through these washer *r* and diagonally through the block and out through the clip shoulders or bosses, and on their ends nuts *w* are turned down with the effect of causing the opposite clips to draw down and secure the rail O immovably on its seat. When these ties are set beneath rail-joints, the clips will take the place of fish-plates.

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

1. A railway metal tie constructed of channel-beam iron having resisting or anchor plates bent at angles opposed to the direction of the disturbing lateral force of a train up from the tie-bottom, to form within the tie sloping ends of an open pocket, of which the sides of the tie are the vertical sides, substantially as herein shown and described.

2. A railway metal tie constructed, substantially as herein shown and described, with an open pocket diminishing in area from the bottom upward and having two sides vertical and two sides sloping inward toward each other from the bottom, as and for the purpose described.

3. A railway metal tie constructed from a form, as shown in Fig. 4, the sides B B being bent upward on the longitudinal dotted lines *v v* at right angles to the bottom, and with resisting-plates *f f*, bent upward on the transverse dotted lines *q q*, substantially as shown and described, whereby when the tie is laid in position said resisting-plates will, when backed by the road-ballast, offer resistance to the lateral disturbing force of the moving train, as set forth.

4. In a railway metal tie, the combination, with holding-bolts passed diagonally through the clips, of burrs or washers struck from the tie-bottom and forming an integral part thereof, and bent upward at right angles to the direction of said bolts, substantially as shown and described.

5. In a railway metal tie constructed of channel-beam iron, as a means for holding a rail to the tie, a clip with jaw formed nearly at a right angle to its body, with boss or shoulder formed on its back at an angle to its vertical portion, and with straight fingers prolonged from its lower edge, substantially as and for the purposes set forth.

6. The combination, with a railway metal tie constructed substantially as herein shown and described, of blocks F, set in the channel of the tie, clip C, arranged on opposite sides of said blocks, and bolts D, provided with nuts, passed diagonally from opposite directions through the tie-bottom, the blocks, and the clips, substantially as and for the purpose set forth.

In testimony that I claim the foregoing improvement in railway metal ties, as above described, I have hereunto set my hand this 11th day of February, 1888.

HENRY SHULTZEN.

Witnesses:

SAMUEL KILPATRICK,  
E. A. PEEBLES.