J. E. FOOTE.

RAIL JOINT.

APPLICATION FILED OCT. 24, 1912.

1,068,880. Patented July 29, 1913.

Fig. 1.

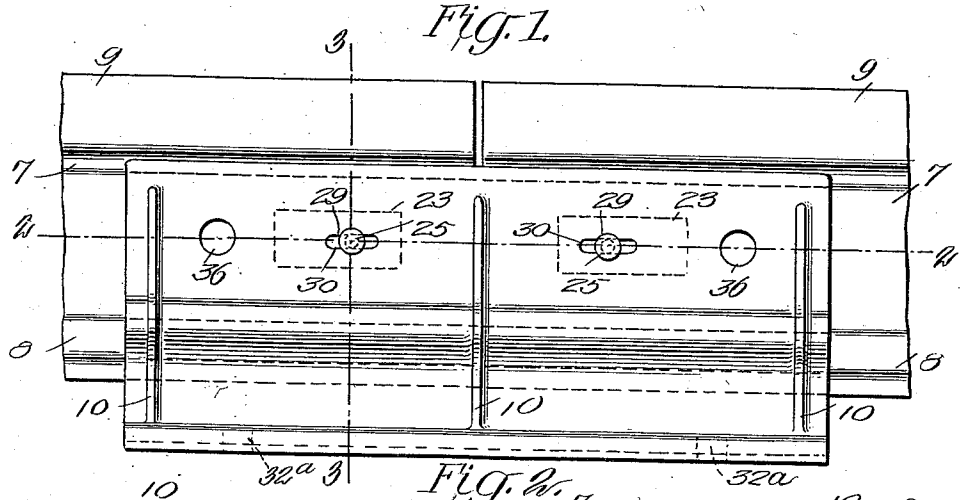


Fig. 2.

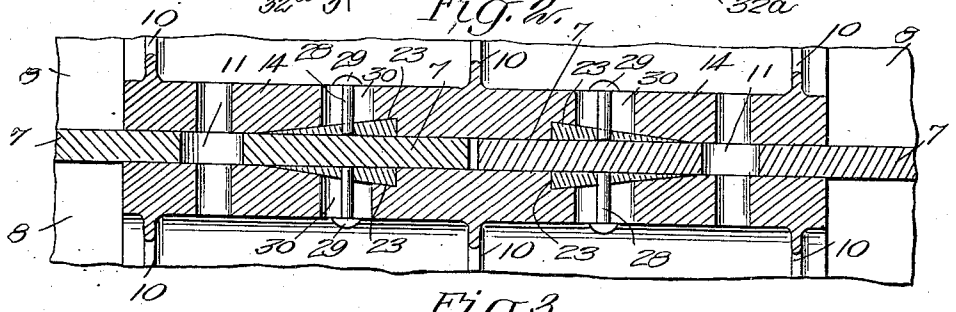


Fig. 3.

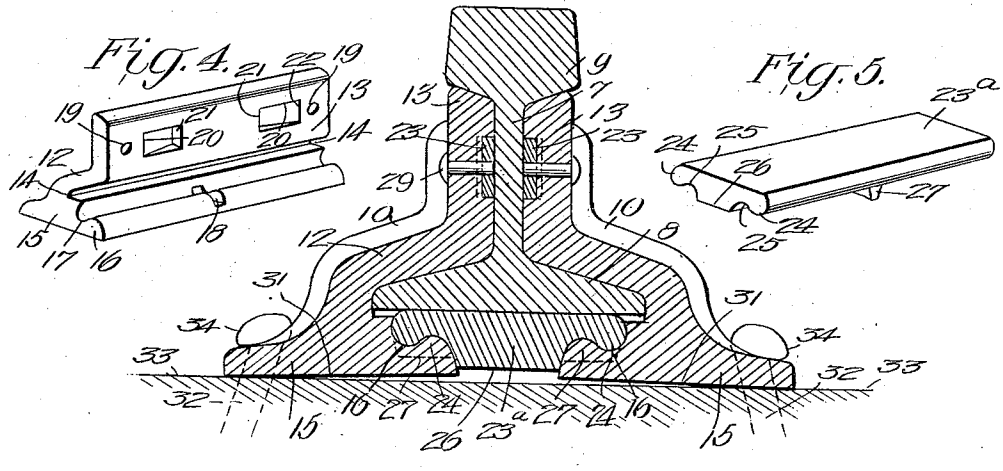
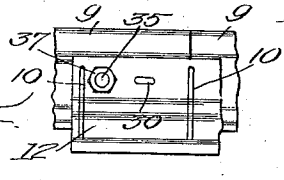


Fig. 4.

Fig. 5.

Fig. 6.



WITNESSES

Samuel E. Wade.

Walton Harrison.

INVENTOR

JULIAN E. FOOTE

BY Munn & Co.

ATTORNEYS

COLUMBIA PLANOGRAPH CO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

JULIAN E. FOOTE, OF TOPEKA, KANSAS.

RAIL-JOINT.

1,068,880. Specification of Letters Patent. Patented July 29, 1913.

Application filed October 24, 1912. Serial No. 727,521.

To all whom it may concern:

Be it known that I, JULIAN E. FOOTE, a citizen of the United States, and a resident of Topeka, in the county of Shawnee and State of Kansas, have invented certain new and useful Improvements in Rail-Joints, of which the following is a specification.

My invention relates to rail joints and contemplates a number of improvements for the following purposes, to wit:—I, to enable contraction of the rail in the general direction of the length thereof to tighten the joint; II, to enable the weight of the rail and the downward pressure of spikes associated with the rail to tighten the joint; III, to provide efficient means for preventing the separation of various parts comprising the rail joint, and, generally to render the joint as far as practicable self-tightening; IV, to avoid the use of bolts and analogous fastening members except in instances where it may be desirable to use the same; V, to improve the general efficiency of the rail joint.

Reference is made to the accompanying drawings forming a part of this specification and in which like letters indicate like parts.

Figure 1 is a fragmentary side elevation showing the abutting ends of two rails as secured by my improved rail joints; Fig. 2 is a section on the line 2—2 of Fig. 1; Fig. 3 is a section on the line 3—3 of Fig. 1; Fig. 4 is a perspective of one of the angle plates; Fig. 5 is a perspective of the binding plate, used for preventing the spreading of the angle plates and for supporting the rail underneath; and, Fig. 6 is a fragmentary elevation showing a slightly different form of the device than that appearing in the other figures.

Rail webs are shown at 7, rail feet at 8, and rail heads at 9, each rail comprising, as usual, a head, a foot, and a web. Each rail is provided with holes extending through the web, the outermost or end holes being shown at 11. The angle plates are shown at 12 and are each provided with three strengthening ribs 10. Each angle plate is further provided with a flat portion 13 adapted to fit neatly against the webs 7 of the rails. Below the flat portion 13 and disposed upon the inside of each angle plate 12 is a groove 14. Each angle plate is provided with a base portion 15 partially bounding this groove and is further provided with a rounded portion 16 and with a groove 17, the surface of which is curved and constitutes a continuation of the surface of the rounded portion 16. The base 15 of each angle plate is further provided with a notch 18 for a purpose hereinafter stated. The flat portion 13 of each angle plate is provided with rivet holes 19 and with wedge-shaped openings 20. These wedge-shaped openings have their deepest portions 21 adjacent to each other, as indicated in Fig. 4, their shallowest portions 20 extending from the deep portions toward the adjacent respective ends of the plate. Wedges 23, made of metal and having proper form to mate the openings 20, are provided and disposed upon opposite sides of the rail web. A binding plate 23^a, provided with rounded portions 24 adapted to fit snugly into the grooves 17 of the angle plates, is employed for the purpose of preventing the angle plates from spreading. Each binding plate 23^a is provided with a groove 25, the surface of which is curved and forms a continuation of the adjacent rounded surface 24 so that the rounded portion 16 of the plate is adapted to fit neatly into the groove 25 of the binding plate. The binding plate is further provided with a thick portion 26 located between its two grooves 25. Mounted upon the lower face of the binding plate 23^a are tongues 27 which fit into the notches 18 of the angle plates. Carried by the wedges and extending laterally therefrom through the angle plates are rivets 28. These are for the purpose of holding the wedges 23 in position relatively to the angle plates. The rivets 28 extend through the rail web and are provided with heads 29 preferably formed by riveting, and these heads are slidable relatively to the angle plates 12. The angle plates are provided with slots 30 and the rivets 28 extend through these slots. The rivets and wedges 23 are so arranged that the wedges 23 move with the rivets in the event of slight displacement of the position of the rivets relatively to the angle plates. By this arrangement, whenever the rails expand or contract owing to changes in temperature, the rivets 28 are shifted slightly in relation to the angle plate, the slots 30 permitting of this movement. When the rails contract owing to their being subjected to a low temperature, the rivets 28 force the wedges 23 to move slightly toward the adjacent portions of the rails, and in doing this the inner faces of the wedges—that is the faces abutting against the rail web—are

forced hard against the rail web. As the wedges are distributed in pairs as indicated in Fig. 2, the pressure of one wedge balances the pressure of the other wedge of the same pair so that while the rail web is now gripped tightly between the two wedges of the pair there is no unbalanced pressure upon the web, such as would tend to displace it in a direction lateral to its length.

The angle plates 12 are provided with inclined faces 31 which, when the parts are in position as indicated in Fig. 3, rest upon the cross ties 33 at the outer edges only of the base plates. This causes the weight of the rail to assist in forcing the flat portions 13 of the angle plates against the rail web, as will be seen from Fig. 3. I provide spikes 32 having heads 34 and extending through holes 32ª in the angle plates for the purpose of holding the angle plates in position. The pressure of the spikes upon the angle plates tends to increase the pressure of the flat portions 13 against opposite faces of the rail webs. The spikes 32 diverge at their lower ends, as will be seen from Fig. 3. This virtually increases the strength of the spikes for the reason that the strain upon them is shifted slightly toward the general longitudinal axes of the spikes.

The operation of the mechanism shown in Figs. 1 to 5 inclusive, is as follows:—The parts being assembled and arranged as indicated, the weight of the rails, the pressure of the spikes 32 and the inclination of the flat surfaces 31 all contribute to a common end, to wit: to force the flat portions 13 of the angle plates directly against the adjacent faces of the rail web. The tongues 27 which fit into the notches 18 as above described prevent any longitudinal or endwise movement of the binding plate 23ª relative to the angle plates 12 and in so doing prevent displacement of the angle plates. Suppose now that owing to changes in temperature of the atmosphere the rails 7 contract and their adjacent ends are as a consequence drawn slightly apart, the wedges 23 are, by virtue of the rivets extending through them and through the rail webs, drawn or pulled in the direction toward which the wedges are pointing. This movement of the wedges forces them tightly against oppositely disposed portions of the rail webs—the net result being that the rail joint as a whole is tightened considerably and this tightening takes place just when it is most needed; that is to say, when the ends of the rails are widest apart. The weight of the rails holds the binding plate 23ª in proper position relatively to the angle plates. The rounded portions 16 of the binding plate are unable to leave the grooves 17 of the angle plates, and similarly the rounded portions 16 of the angle plates are unable to withdraw from the grooves 25 of the binding plate. The parts are thus effectively locked together and the locking is rendered more secure by the weight of the rails and the pressure of the spikes.

As will be noted from the foregoing description, no bolts, in the sense of rail bolts, and no nuts associated with such bolts, are employed. Practically, the entire construction is made up of large parts easily handled, and where small parts are employed, they are located so as to be protected and for the most part inaccessible. The rail joint is self-tightening, in the sense that the various movable parts are automatically caused to tighten the parts with which they are associated.

In some instances it may be desirable to employ bolts, as indicated in Fig. 6. The bolts are shown at 35 and the angle plates are provided with bolt holes 36 through which the bolts 35 extend. The rails are provided, as usual, with bolt holes of the kind shown at 11, those disclosed in this instance being the end holes. The bolts are held in position by aid of nuts 37 substantially in the usual manner. Where the bolts 35 and the nuts 37 are employed, however, the wedges 23 and rivets 28 for the same are discarded.

I do not limit myself to the particular construction shown, the scope of my invention being commensurate with my claims.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is as follows:—

1. A device of the character described comprising a pair of angle plates having portions for engaging a rail web and further provided with openings, wedges located within said openings, and means controllable by changes in the length of the rail for moving said wedges within said openings.

2. A device of the character described, comprising angle plates for fitting against opposite surfaces of a rail, said angle plates being provided with openings, and wedges located within said openings and secured to said rail for the purpose of enabling changes in the length of said rail to shift the said wedges relatively to said angle plates.

3. A device of the character described, comprising a pair of angle plates, a rail provided with a portion extending between said angle plates, wedges carried by said rail and movable relatively to said angle plates when said rail changes in length depending upon the temperature, rivets carried by said rail and extending through said wedges for the purpose of guiding said wedges.

4. A rail joint comprising a rail, an angle plate for engaging the same and means controllable by changes in the length of said rail, due to changes in temperature, for tightening said rail relatively to said angle plate.

5. A device of the character described comprising a pair of angle plates, a rail disposed between said angle plates, and mechanism connected with said angle plates and with said rail and controllable by changes in length of said rail, due to changes in temperature, for controlling the degree of pressure exerted by said angle plates against said rail.

JULIAN E. FOOTE.

Witnesses:
EDW. T. HEARICK,
Mrs. C. S. NEWMAN.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."