(No Model.)

M. C. NILES.

RAIL JOINT.

No. 484,227. Patented Oct. 11, 1892.

Fig. 1.

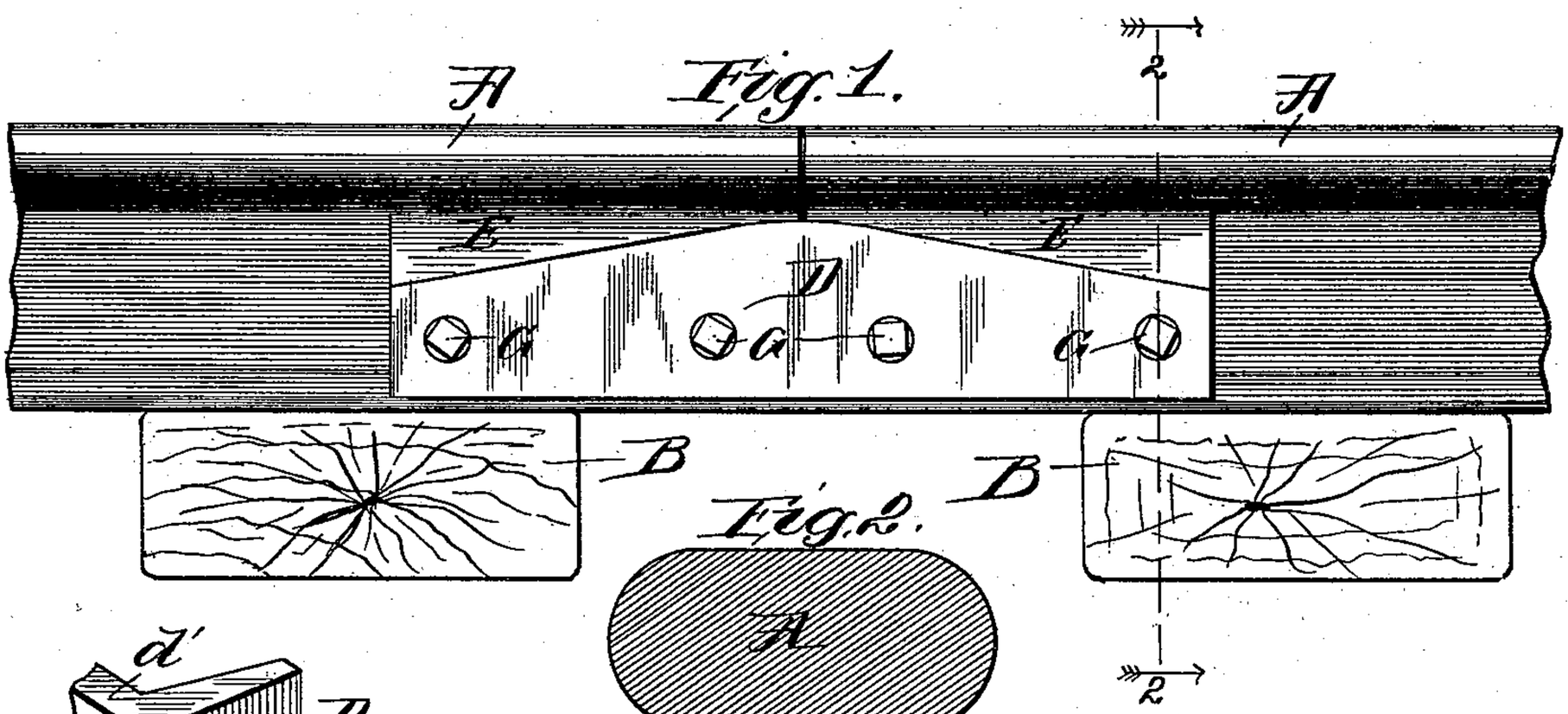


Fig. 2.

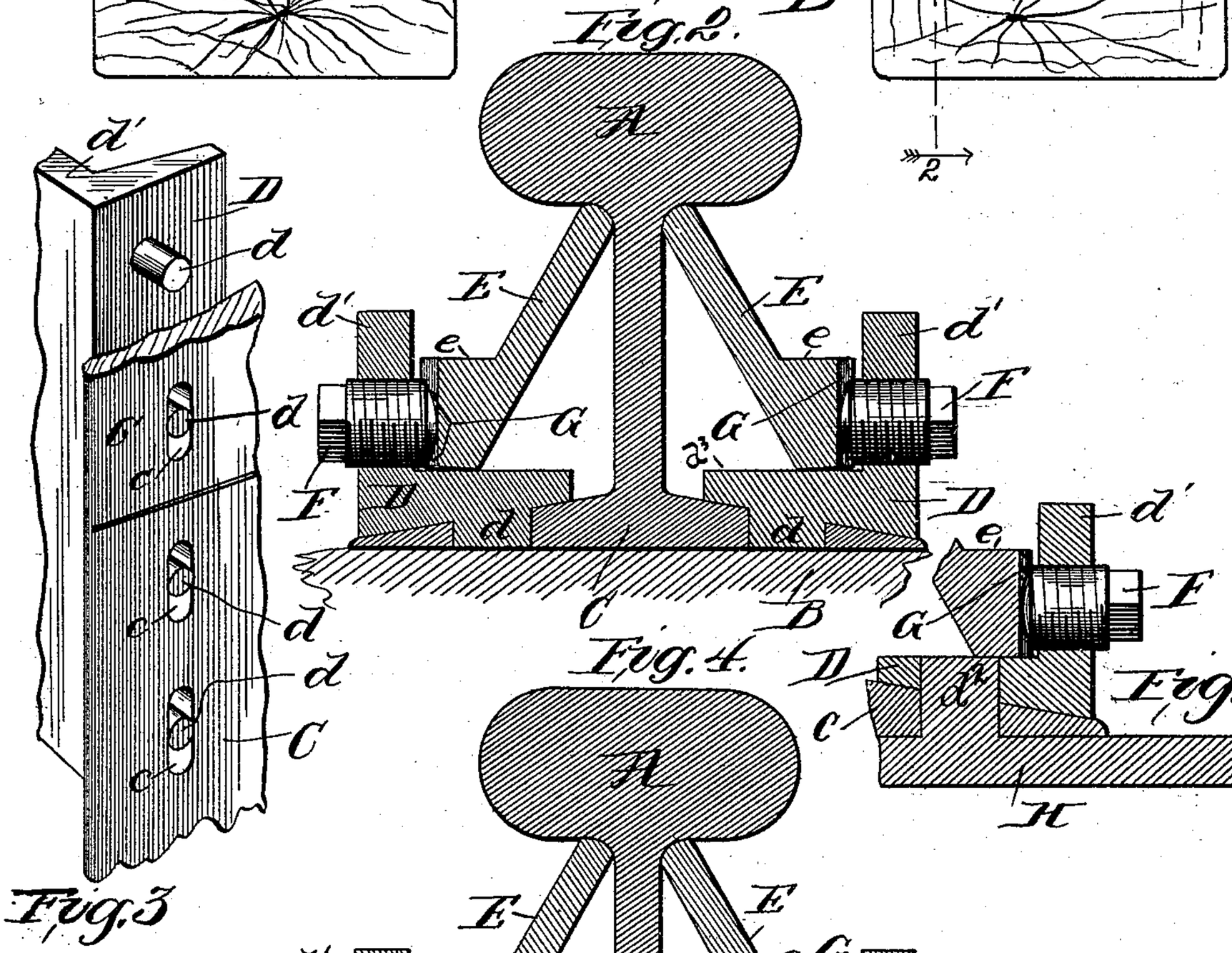
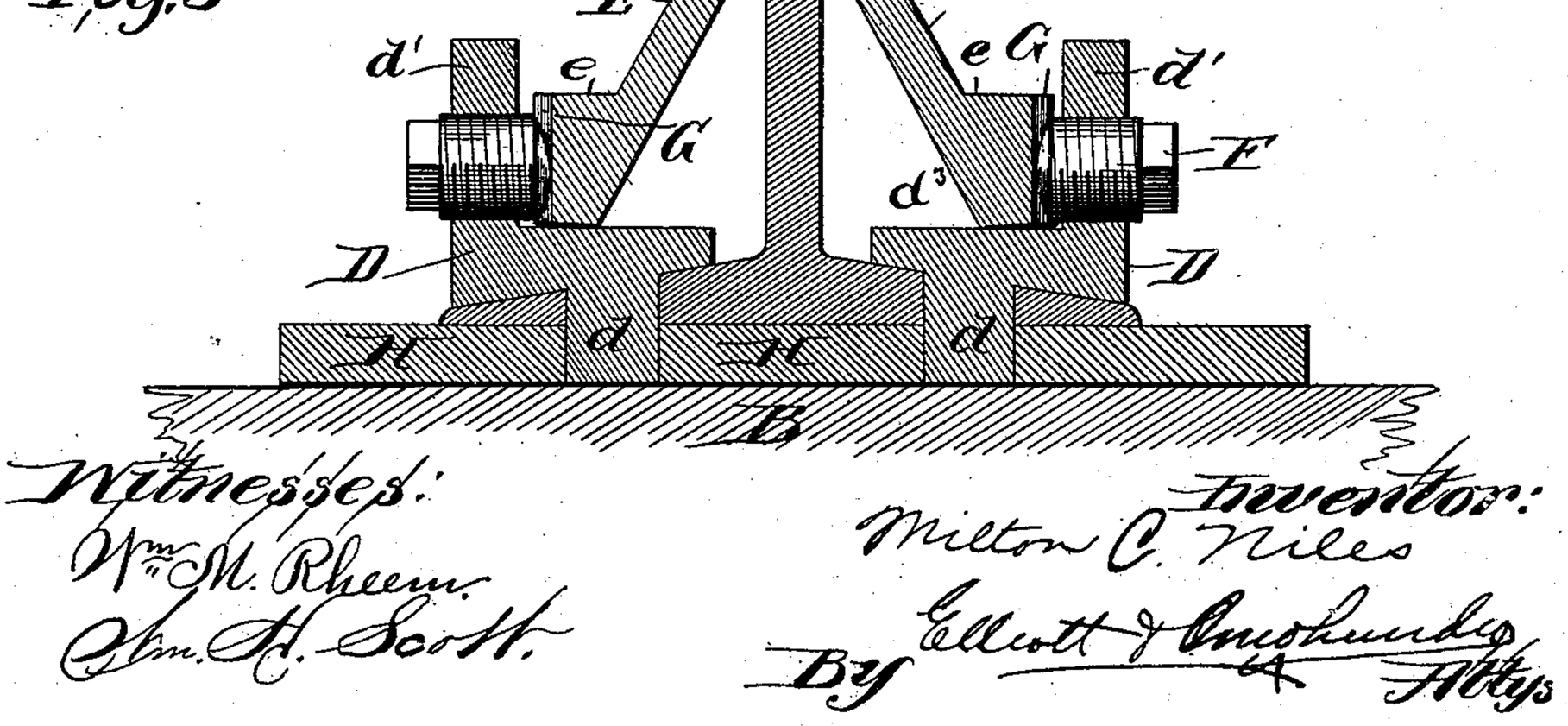


Fig. 4.

Fig. 5.



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UNITED STATES PATENT OFFICE.

MILTON C. NILES, OF OAK PARK, ILLINOIS.

RAIL-JOINT.

SPECIFICATION forming part of Letters Patent No. 484,227, dated October 11, 1892.

Application filed October 27, 1891. Serial No. 409,950. (No model.)

To all whom it may concern:

Be it known that I, MILTON C. NILES, a citizen of the United States, residing at Oak Park, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Rail-Joints, of which the following is a specification.

My invention relates to that class of joints employed at the meeting ends of the rails for binding the rails in alignment and preventing the downward springing or bending of their ends, especially where such ends come between two cross-ties, and at other points where there is no firm support beneath them.

The prime object of my invention is to provide a rail-joint which shall possess the maximum strength with a given weight of material.

A further object of my invention is to obviate the weakening of the rails caused by the formation of holes through the webs thereof for the passage of bolts, and at the same time to equalize the movement caused by the expansion and contraction of the rails.

With these ends in view my invention consists in certain features of novelty in the construction, combination, and arrangement of parts by which the said objects and certain other objects hereinafter described are accomplished, as fully explained, with reference to the accompanying drawings, and more particularly pointed out in the claims.

In the said drawings, Figure 1 is a side elevation of the meeting ends of two railway-rails having my improved joint applied thereto. Fig. 2 is a transverse sectional view thereof on a larger scale, taken on the line 2 2, Fig. 1. Fig. 3 is a perspective view of portions of the bottoms of the meeting ends of the rails, showing the manner of connecting thereto the abutment-plates, hereinafter described. Fig. 4 is a view similar to Fig. 2, showing the joint as adapted for use where the rails are supported upon metallic bearing-plates; and Fig. 5 is a sectional view partly broken away, illustrating a modification of the form shown in Fig. 4.

In the drawings, wherein like signs of reference refer to like parts throughout the several views, A indicates the rails, which are supported upon the cross-ties B in any well-known and usual manner, and which rails are of the ordinary construction, with the exception that at their ends or other points where it is desired to provide them with one of my improved joints the foot-flange C of each is provided on both sides of the web with a number of sockets or perforations *c*, in which fit, respectively, a corresponding number of lugs *d*, formed on or otherwise secured to and depending from the under side of overlying abutment-plates D. The plates D are arranged on either side of the web, upon the top of the foot-flange, and are provided along their outer edges with upright abutment-flanges *d'*. The lugs *d*, as shown in Fig. 4, are arranged at intervals throughout the length of the abutment-plates and are suited in number and size to the degree of strain brought against the abutment-plates by the pressure on the rail through the medium of the members which are presently to be explained.

As more clearly shown in Figs. 2 and 4, upon each of the horizontal surfaces d^3 of these abutment-plates D abuts the lower end or edge of a brace or supporting plate E, whose upper edge or end abuts against the under side of the rail-head in the corner or angle formed by the junction of the head with the web; or, if desired, it may impinge the head or the web at any other point above the level of the abutment-plates, the construction and arrangement shown being preferred, however, for the sake of greater simplicity and strength.

The brace-plates E are designed to support the heads of the rails and prevent any downward-bending movement thereof under the pressure of the passing train, and to this end the said plates are of sufficient length to bridge the point of juncture between the ends of the rails and extend a considerable distance along each rail, as shown in Fig. 1. The brace-plates are of greater vertical or upright extent than the distance between the abutment-plates and the under side of the rail-head or other points provided for the abutment of the upper edges of such brace-plates, so that in placing the brace-plates between the rail-head and the abutment-plates it is necessary to incline them outwardly or diverge their lower ends, as shown, in such a manner that pressure applied to them between their lower ends and the abutment-flanges *d'* will cause such brace-plates to wedge tightly between the rail-

head and the abutment-plates D, thus affording a firm support for the meeting ends of the rails and at the same time holding the abutment-plates firmly against the foot-flange with their engaging-lugs *d* in place. This inward pressure against the brace-plates may be supplied by means of any suitable wedging devices co-operating with the abutment-flanges *d'*. As a convenient and preferable form of device for this purpose I have shown the abutment-flanges provided with short set screws or bolts F, arranged laterally in the abutment-flanges and adapted to impinge the lower edges of the brace plates in a transverse direction for forcing their said lower edges along the horizontal bearing-surfaces d^3 toward the rails, and thus tightening the joint in the manner described. These set-bolts are preferably located as near to the lower portions of the abutment-plates D as possible, so as to cause the strain produced against the flanges *d'* to be brought as far as practicable transversely of the lugs *d* and at the same time lessen the strain at the base of the flanges *d'*.

In the drawings I have represented each of the abutment flanges as being provided with four of these set-bolts disposed in a manner most advantageous for resisting the strain to which the brace-plates might be subjected, preferably one near each end and one on either side of and in close proximity to the junction of the rails; but it will, of course, be understood that the number of these bolts and their disposition relative to each other and to the length of the brace-plates may be modified at pleasure without departing from my invention.

The abutment-flanges *d'* may be of any shape best adapted for strength in resisting the lateral thrust of the set-bolts and for reinforcing the lower portion of the abutment-plates D. A durable and economical form is that which I have shown, which consists of a flange having an increased depth at its mid-length, where the greatest strain is felt. The lower edge of each of the brace-plates is preferably provided with an enlargement or boss *e*, whose outer side is upright or vertical when in position, so as to afford a better bearing-surface for the ends of the set-bolts.

In order that the rails may come and go without damaging the joint in expanding and contracting under the influence of varying temperatures, I make the perforations *c* in the foot-flange of the rail of elongated form, as shown in Fig. 3, and in order that the brace-plates E may not be permitted to creep out of place from the same causes they may be provided with any suitable stops arranged on any anchored or fixed portion, such as the rail itself, the abutment-plates D, or even the cross-ties; but as a preferred manner of accomplishing this I provide the bosses *e* with countersinks or sockets G, in which the ends of the set-bolts F engage, and thus preclude longitudinal slipping of the plates E relatively to the abutment-plates D, while the said brace-plates are at the same time held up to their work.

Where my improved joint is used on rails which are supported on metallic bearing-plates, as H, spiked to the cross-ties, I may increase the efficiency of the joint and greatly lessen the liability of fracturing the foot-flange of the rail by providing the said bearing-plate H with perforations or sockets registering with the perforations *c* and extending the lugs *d* down into them, as shown in Fig. 4, thus at the same time increasing the strength of the lugs *d* and holding the plates H in place without the necessity of the spikes usually employed for the latter purpose. It is of course obvious that if the abutment-flanges *d'* were made integral with the foot-flange of the rail or otherwise rigidly secured thereto, so as not to depend on the pressure of the brace-plates for holding them in place, the said brace-plates might rest at their lower edges upon the foot-flange itself, and hence it would not involve a departure from the spirit of my invention to so modify the construction which I have shown.

In the form shown in Fig. 5, which is best adapted for use where the said bearing-plates H are employed, the abutment-plates D, instead of being provided with lugs, as before explained with reference to Figs. 1 and 4, are provided with sockets or perforations which register with the perforations *c* in the foot-flanges of the rail, and the plate H, instead of being provided with perforations for the admission of the lugs *d*, are provided with upwardly-projecting lugs d^2, preferably formed integrally therewith, which project upward through the registering perforations in the foot-flanges and abutment-plates D. In some respects this construction is superior to the form shown in Fig. 4, inasmuch as the plates D are easier rolled without the lugs *d*. It will be understood that in each instance the lugs *d* are provided as improved substitutes for ordinary bolts or rivets, which might be passed through the foot-flange of the rail for securing the abutment-plates D in place.

Having described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a rail-joint, the combination, with the rails, of abutment-plates having flanges supported upon the rails, brace-plates resting upon said abutment-plates for holding said abutment-plates in place and supporting the rails, and devices abutting against said abutment-flanges and being adapted to slide said brace-plates along said abutment-plates toward the rails, substantially as described.

2. In a rail-joint, the combination, with the rails, of brace-plates for supporting said rails, abutment-flanges held in place by the pressure of said brace-plates, and set-bolts engaging in said abutment-flanges and impinging said brace-plates, substantially as described.

3. In a rail-joint, the combination, with the

rails, of brace-plates for supporting said rails abutment-plates secured against outward or transverse movement on the rails and upon which the lower edges of said brace-plates rest, and set-bolts carried by said abutment-plates and adapted to impinge said brace-plates and slide the same on said abutment-plates toward the rails, substantially as described.

4. In a rail-joint, the combination, with the rails having perforations in their foot-flanges, of overlying abutment-plates resting flat upon said foot-flanges and having depending lugs engaging in said perforations for preventing said abutment-plates from slipping off and means for supporting the rails upon said abutment-plates, substantially as described.

5. In a rail-joint, the combination, with the rails having sockets, of brace-plates for supporting said rails, abutment-plates upon which the lower ends of said brace-plates rest, having lugs engaging in said sockets, and means for impinging the said brace-plates for facing the latter toward the rail, substantially as described.

6. In a rail-joint, the combination, with the rails having sockets in their foot-flanges, of brace-plates, abutment-plates upon which the lower ends of said brace-plates rest, having lugs engaging in said sockets and abutment-flanges, and set-bolts engaging in said abutment-flanges and impinging said brace-plates, substantially as described.

7. In a rail-joint, the combination, with the rails, of brace-plates for supporting said rails, having upright bearing-surfaces at their lower edges, abutment-flanges secured to the rails, and set-bolts engaging between each of said upright bearing-surfaces and said abutment-flanges, substantially as described.

8. In a rail-joint, the combination, with the rails, of brace-plates for supporting said rails, having cavities or sockets at their lower edges, overlying abutment-plates having flanges secured to the flanges of the rails and supporting said brace-plates, and set-bolts threaded in said flanges and engaging in the said sockets in the brace-plates, substantially as described.

9. In a rail-joint, the combination, with the rails having elongated perforations in their foot-flanges, of brace-plates for supporting said rails, overlying abutment-plates upon which said brace-plates rest, supported on the foot-flanges of the rails and having depending lugs engaging in said perforations, and abutment-flanges having set-bolts impinging said brace-plates, substantially as described.

10. In a rail-joint, the combination, with the rails having their foot-flanges provided with perforations and the rail-bearing plate H, provided with registering perforations or sockets, of brace-plates for supporting the rails, abutment-plates upon which said brace-plates rest, having depending lugs passing through said perforations in the foot-flanges into the perforations in the plate H and being provided with abutment-flanges d', and means for imparting inward pressure to the brace-plates, substantially as described.

11. In a rail-joint, the combination, with the rails, of abutment-plates resting upon the rails and being provided with substantially-horizontal surfaces d^3, brace-plates depending under the heads of the rails and resting upon said surfaces d^3, and means for forcing said brace-plates across said surfaces d^3 toward the rails, substantially as set forth.

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