

(No Model.)

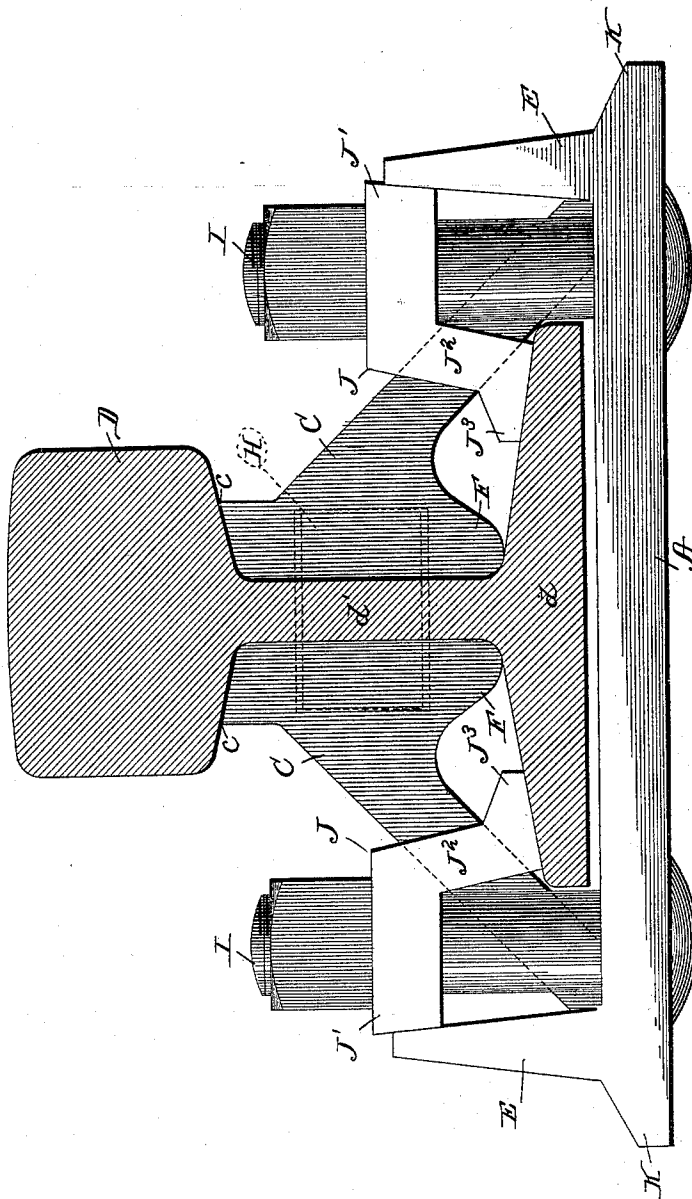
3 Sheets—Sheet 1.

M. C. NILES.
RAIL JOINT.

No. 509,581.

Patented Nov. 28, 1893.

Fig. 1.



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(No Model.)

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Fig. 2.

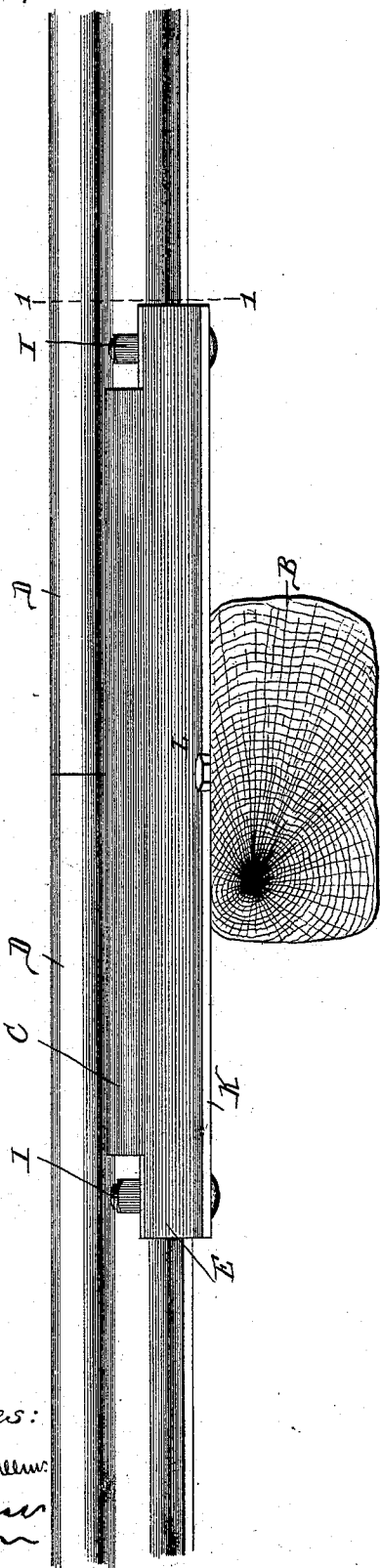
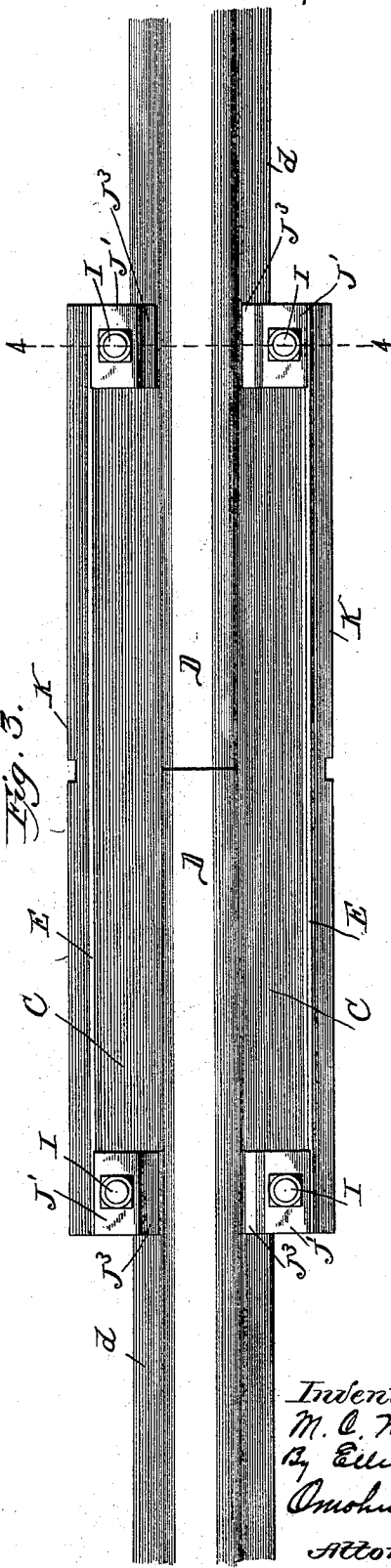


Fig. 3.



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(No Model.)

3 Sheets—Sheet 3.

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Fig. 5.

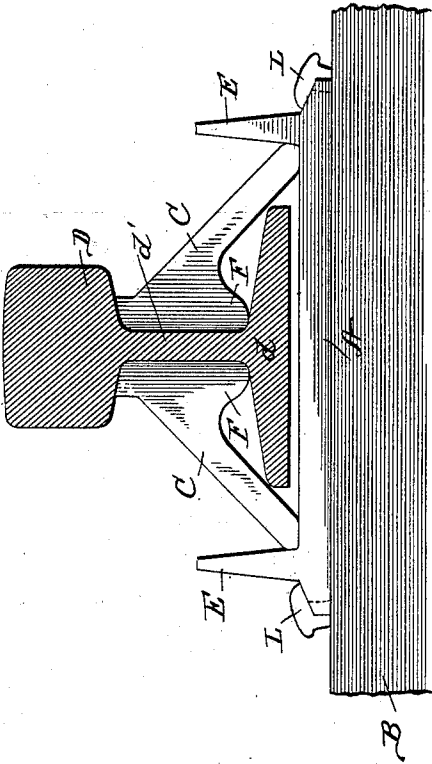


Fig. 4.

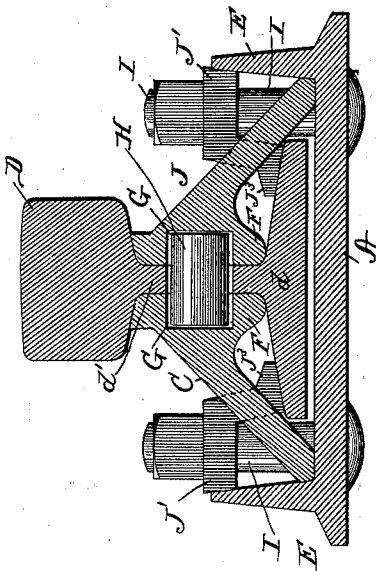


Fig. 6.

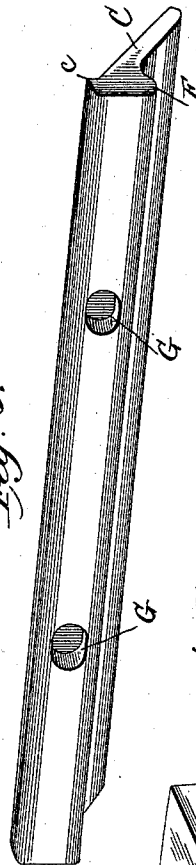
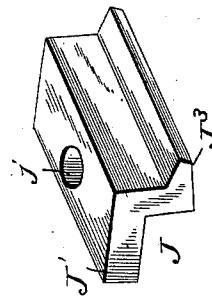


Fig. 7.



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UNITED STATES PATENT OFFICE.

MILTON C. NILES, OF OAK PARK, ILLINOIS.

RAIL-JOINT.

SPECIFICATION forming part of Letters Patent No. 509,581, dated November 28, 1893.

Application filed September 22, 1892. Serial No. 446,544. (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 full, clear, and exact specification.

My invention relates to improvements in rail joints, in which the rails are held against downward and lateral movement at their meeting ends, by means of inclined braces, taking their bearing directly under the heads of the rails, and serving to support the rails clear of the base-plate, thus constituting a self-tightening joint, and causing the sustaining resistance to be applied directly to the under sides of the heads of the rails, the point where it is most needed.

The primary object of my invention, is to support the rails clear of the base-plate directly from their heads, and to transmit the strain resulting from the downward or lateral pressure upon the rails, directly to the base-plate, and practically in line with its cross-section; and at the same time, make the brace-plates by which the rails are thus supported, serve to hold the rails against independent vertical movement.

A further object of my invention, is to make the brace-plates subserve the further important purpose of limiting the movement of the rails, resulting from expansion and contraction, without necessitating the puncturing of such plates.

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 attained, as fully explained with reference to accompanying drawings and more particularly pointed out in the claims.

In the said drawings, Figure 1, is an end view of my improved joint showing the rail in section, on the line 1, 1, Fig. 2. Fig. 2, is a side elevation of the same, on a smaller scale. Fig. 3, is a plan view thereof. Fig. 4, is a vertical transverse section, taken on the line 4—4, Fig. 3. Fig. 5, is a view similar to Fig. 1, with certain parts omitted, as will be hereinafter described. Fig. 6, is a detail perspective view of one of the brace-plates, and

Fig. 7, is a detail perspective view of one of the bearing blocks, hereinafter described.

Like signs of reference indicate like parts throughout the several views.

In carrying out my invention, I employ a preferably flat base-plate A, which may or may not be supported upon the cross-ties B, accordingly as it happens to project across one or more of them, or between them. This base-plate may be of any desired length, but usually, it is about twenty-eight inches long, and, consequently, it will ordinarily project across one or more ties, and this is preferable, because when so arranged the ties greatly add to the support of the base-plate.

On both sides of the rails, is arranged an inclined brace-plate C, which extends along each rail a considerable distance from the meeting ends of the rails, and whose upper edge, throughout its length, impinges the heads of the rails, directly against their under side. The lower edge of each of these brace-plates rests throughout its length directly upon the base-plate A, in the corner formed by such plate, and a stout upright flange E, rising therefrom, and preferably extending throughout the length thereof, so as to stiffen the base-plate and hold it from bending on a transverse axis. The lower edge of each of these brace-plates may be formed on an angle, which will correspond to the angle formed by the base-plate A, and its flange E, whereby it will seek its bearing at the lowest point possible against the flange E, and thus bring the strain resulting from pressure upon the rails, practically in line with the cross-section or transverse diameter of the base-plate, thereby reducing to a minimum the liability of the flanges E breaking or bending under the strain, and also making it impossible to depress the rails to any material extent, without pulling the base-plate asunder, against its tensile strain. To further the same end, I provide the lower edge of each brace-plate C, with its greatest bearing surface underneath, as shown, in order that it may have less vertical or upright bearing surface in contact with the flange E; and such flange is inclined outwardly on both sides, in order that the maximum strength at its base may be obtained with the minimum amount of metal.

The brace-plates proper, C, are preferably flat, or without bends or angles, in order that they may best resist the strain, and they are of such width as to support the rails slightly above the base-plate, as shown in the drawings. The under side of each brace-plate, however, is provided at its upper edge with a depending enlargement or extension F, which extends downwardly and rests upon or impinges the foot flanges *d* of the rails, preferably at a point near the webs, *d'*. These enlargements or extensions, F, preferably extend throughout the length of the brace-plates C, and thus serve the purpose of the ordinary fish plates, filling the space between the heads and flanges of the rails and holding the rails against independent vertical movement. It is to be noted, however, that vertical movement in a downward direction, is effectually resisted by the brace-plates C, the enlargements or extensions F being chiefly for the purpose of carrying both rails down together, should either be depressed, thus avoiding unevenness at the joint.

The upper edges of the brace-plates C and the lower edges of the extensions F, are so formed with relation to each other, and to the angle of inclination of the surface of the foot flange *d*, and the under side of the head D, that should any downward movement of the rails take place independently of the base-plate, causing the brace-plates C to turn on their upper edges, the increase in the distance between the point of bearing of the lower edge of the extension F, and the under surface of the head of the rail, will be compensated for by a wider portion of the upper edge of the plate C coming in contact with the heads of the rails. This is accomplished by inclining the upper edge of the plate C upwardly along the under side of the head of the rail, so that when the rails descend, causing the lower edge of the extension F to come outward, letting the upper edge of the plate C downward, the corner *c*, on the upper edge of the plate C, will accordingly move inward toward the rail, and thus compensate for the downward and outward movement of the lower edge of the extension F. This movement, however, is only a possible and not a probable contingency, for it is quite evident that if the brace-plate C on one side descends toward the horizontal, the brace-plate on the other side must make a similar movement, and as such a movement would bring the upper ends of the plates nearer together, it follows that the movement could not take place at all, without crushing the rails, or else pulling the base-plate A in two, neither of which could possibly result from the weight to which the rails are ordinarily subjected. These extensions or enlargements F, are utilized for the further purpose of limiting the movement of the rails resulting from expansion and contraction, and I accomplish this by providing each of the extensions or enlargements F, in its inner side or face, with a number of elongated sockets

G, into which fit short transverse lugs H, projecting through the ordinary bolt holes in the webs of the rails. The sockets are formed only partially through the brace-plates C, because when so formed, they do not materially weaken the brace-plates, and at the same time, they serve to hold the lugs in place without other attachments, and without danger of displacement, while effectually resisting the longitudinal movement of the rails.

I prefer to form the lugs H separate from the brace-plates, instead of making them integral therewith, because it is easier to produce the brace-plates with sockets than it would be to produce them with projecting lugs. These lugs H, are, of course, arranged on both sides of the inter-section of the rails, and if desired, they may be arranged at such distance apart as to prevent the upper edges of the rails from coming together, if, during the expansion of the rails, their ends are depressed under the weight of the rolling stock; for, if the edges of the rails do not touch at such time, the shearing off or chipping of their upper edges, resulting from the great pressure thereon thus produced, will be prevented.

Referring to Fig. 5, it will be seen that the brace-plates alone, when used in conjunction with the base-plate, will support the rails directly upon the base-plate from the under side of their heads, and the projections or enlargements F will act like the ordinary fish plates, in holding the rails against independent vertical displacement, the construction and arrangement being such as to be self-tightening under the weight of the rolling stock. In order, however, that the base-plate may be supported in the event there is no cross-tie arranged under it, and in order further, that the rails may be held down in position, I clamp the base-plate and the rails together, by means of a number of upright bolts I, passing through the base-plate at both sides of the flanges of the rails, and being provided with bearing blocks J, upon which the bolts take their bearing, and which in turn are supported upon the flanges of the rails. I prefer to arrange one of the bolts I, near each end of the base-plate, on each side, and to pass them through perforations *j*, formed in the horizontal portions J', of the bearing blocks J. Each of the bearing blocks J, is preferably provided with an upright portion, J², which is slightly inclined toward the rail and is provided at its lower end with an enlarged bearing toe J³, which serves to distribute the pressure throughout a greater area of the rail flange, while the incline of the portion J², brings the bearing toe nearer to the center of the rails, where the webs are better able to withstand the pressure.

The bearing blocks J are of such height that the outer ends of the horizontal portions J' will rest against the inner sides of the flanges E of the base-plate, and the outer ends of such portions J' being beveled or inclined,

to correspond to the inclination of the flange E, it will be seen that by tightening up the bolts I, the bearing blocks, while they are forced downward by the pressure of the bolts, will also be carried inward by the inclination or bevel of the flanges E; but, it will be understood, that both the downward and the inward movement of the bearing blocks is very slight, inasmuch as any inward movement of the bearing block produces a corresponding upward movement, by reason of the fact that the bearing toe thereon rests upon the inclined flange of the rail; and consequently, the inclinations of the flange of the rail and the flange E act in opposition to each other and lock the bearing block against material movement in any direction.

The bearing blocks J, need be of sufficient length only to serve as firm bearing surfaces for the bolts I, and the brace-plates C may be of just sufficient length to extend between the bearing blocks, at each end of the joint; thus, the lugs H, will transmit their pressure induced by the expansion and contraction of the rails, to the bearing blocks J, through the medium of the brace-plates C, and the bearing blocks J, being securely held to the base-plate by means of the bolts I, the base-plate itself, may be provided at its outer edges with projecting flanges K, in which notches may be formed for the passage of spikes L, for securing the base-plate to the ties, in the ordinary manner, and thereby limiting the creeping movement of the rails, as a whole. With a joint thus constructed, it will be seen that even though there should be no tie or ties under the base-plate, the latter will be firmly supported upon the foot flanges of the rails, by means of the bearing blocks and upright bolts; and inasmuch as these bearing blocks are located at a considerable distance from the inter-section of the rails, it will be understood, that any downward movement of the rails at their inter-section, would be transmitted to such blocks through the medium of the long base-plate, which acting as a lever of the third order, would produce comparatively but slight pressure upon the rail flanges, where they are impinged by the bearing blocks.

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

1. In a rail joint, the combination with the rails, of brace plates bearing under the heads of the rails, and a base plate upon which said brace plates rest, adjustably supported on the rails independently of said brace plates, substantially as set forth.

2. In a rail-joint, the combination with rails having bolt-holes in the webs thereof, of brace-plates held against said rails and each having two sockets in its inner face, one on each side of the intersection of the rails, and short lugs arranged in said holes in the rails, and engaging in the sockets in, and passing partially through, said brace-plates and being held in place thereby, substantially as set forth.

3. In a rail joint, the combination with the rails having holes therein, and a base-plate, of inclined brace-plates for supporting the rails, and lugs engaging in said holes in the rails and being held in place by said brace-plates, substantially as set forth.

4. In a rail joint, the combination with the rails having bolt holes in the webs thereof, of a base-plate, brace-plates supporting the rails upon said base-plate and having elongated sockets in their inner faces, and lugs passing through the rails and engaging in said sockets, substantially as set forth.

5. In a rail joint, the combination with the rails having bolt holes in the webs thereof, of a base-plate, brace-plates supporting the rails upon said base-plate, and short lugs arranged in said holes in the webs of the rails and passing partially through said brace-plates and being held in place thereby, substantially as set forth.

6. In a rail joint, the combination with the rails having holes in the webs thereof, of a base-plate having flanges, inclined brace-plates engaging between the heads of the rails and said flanges and having depending enlargements impinging the foot flanges of the rails and being provided with elongated sockets, and lugs passing through the webs of the rails and engaging in said sockets, the ends of said lugs being completely inclosed by the said brace-plates, substantially as set forth.

7. In a rail joint, the combination with the rails, of a base-plate having upright flanges, brace-plates resting directly upon said base-plate against said flanges and supporting the rails, and means for supporting said base-plate upon the foot flanges of the rails, independently of said brace plates substantially as set forth.

8. In a rail joint, the combination with the rails, of a base-plate having upright flanges, straight brace-plates resting directly upon said base-plate against said flanges, and impinging the heads of the rails, and having enlargements impinging the foot flanges of the rails, and upright bolts arranged at the edges of the rails and adapted to support the base-plate upon the foot flanges thereof, independently of said brace plates substantially as set forth.

9. In a rail joint, the combination with the rails, of a base-plate having upright flanges at both sides thereof, brace-plates resting directly upon said base-plate against said upright flanges and bearing under the heads of the rails on both sides, bearing blocks resting upon the foot flanges of the rails and bearing against said upright flanges of the base-plate, and bolts passing through said bearing blocks and base-plate, substantially as set forth.

10. In a rail joint, the combination with the rails, of a base-plate having upright beveled flanges, brace-plates bearing under the heads of the rails and resting upon said base-plate against said flanges, bearing blocks supported

upon the foot flanges of the rails and resting against said beveled flanges, and bolts for drawing the base-plate and said bearing blocks toward each other, substantially as set forth.

11. In a rail joint, the combination with the rails, of a straight, flat base-plate having upright flanges at both sides thereof, oppositely inclined brace-plates resting directly upon said base-plate against the lower edges of said flanges, and supporting the rails clear of the base-plate between their upper edges,

and having depending enlargements impinging the foot flanges of the rails, lugs for limiting longitudinal movement of the rails, held in place by said brace-plates, bearing blocks resting upon the foot flanges of the rails and against said flanges of the base-plate, and bolts for supporting the base-plate upon said bearing blocks, substantially as set forth.

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