

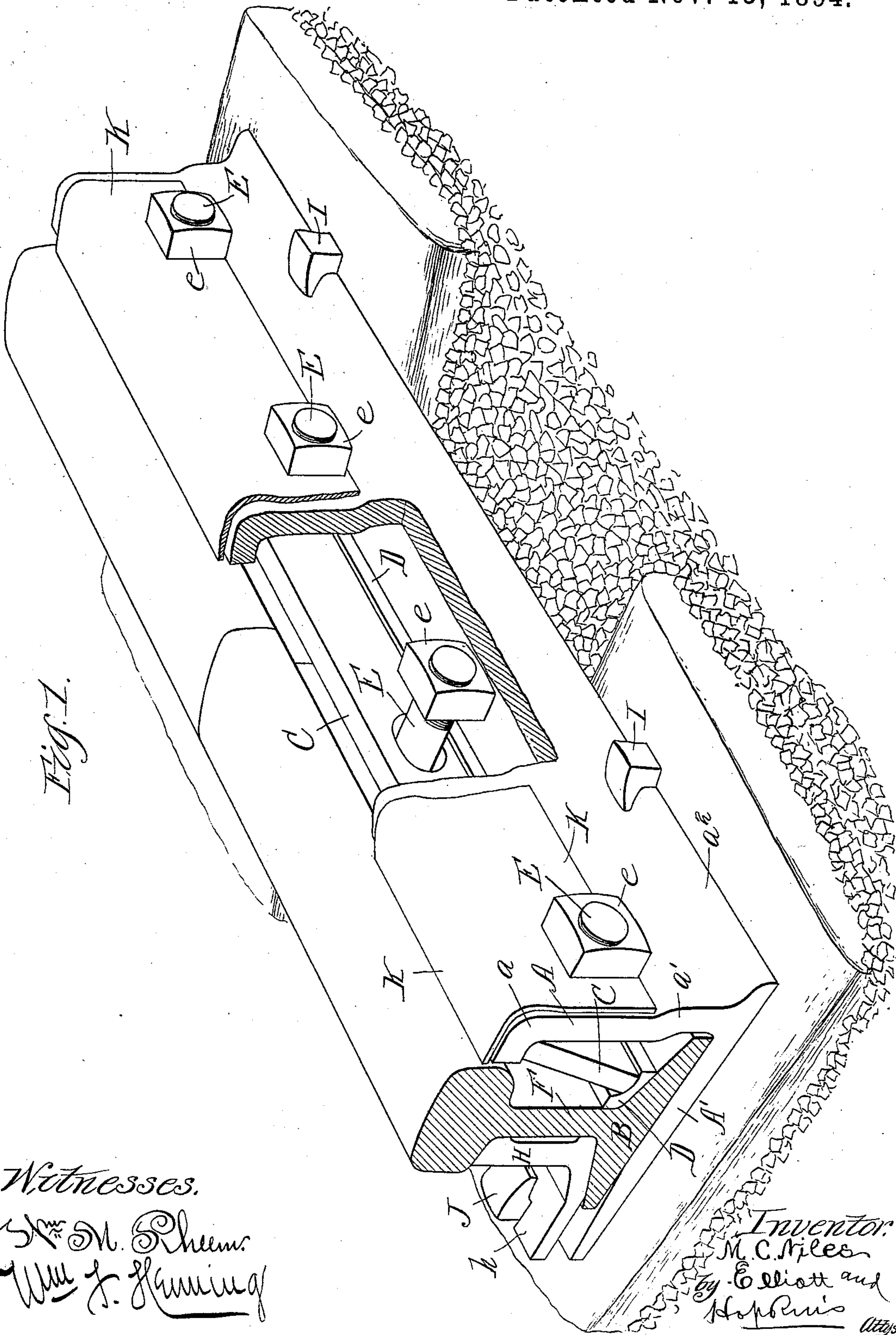
(No Model.)

M. C. NILES.
RAIL JOINT.

2 Sheets—Sheet 1.

No. 529,044.

Patented Nov. 13, 1894.



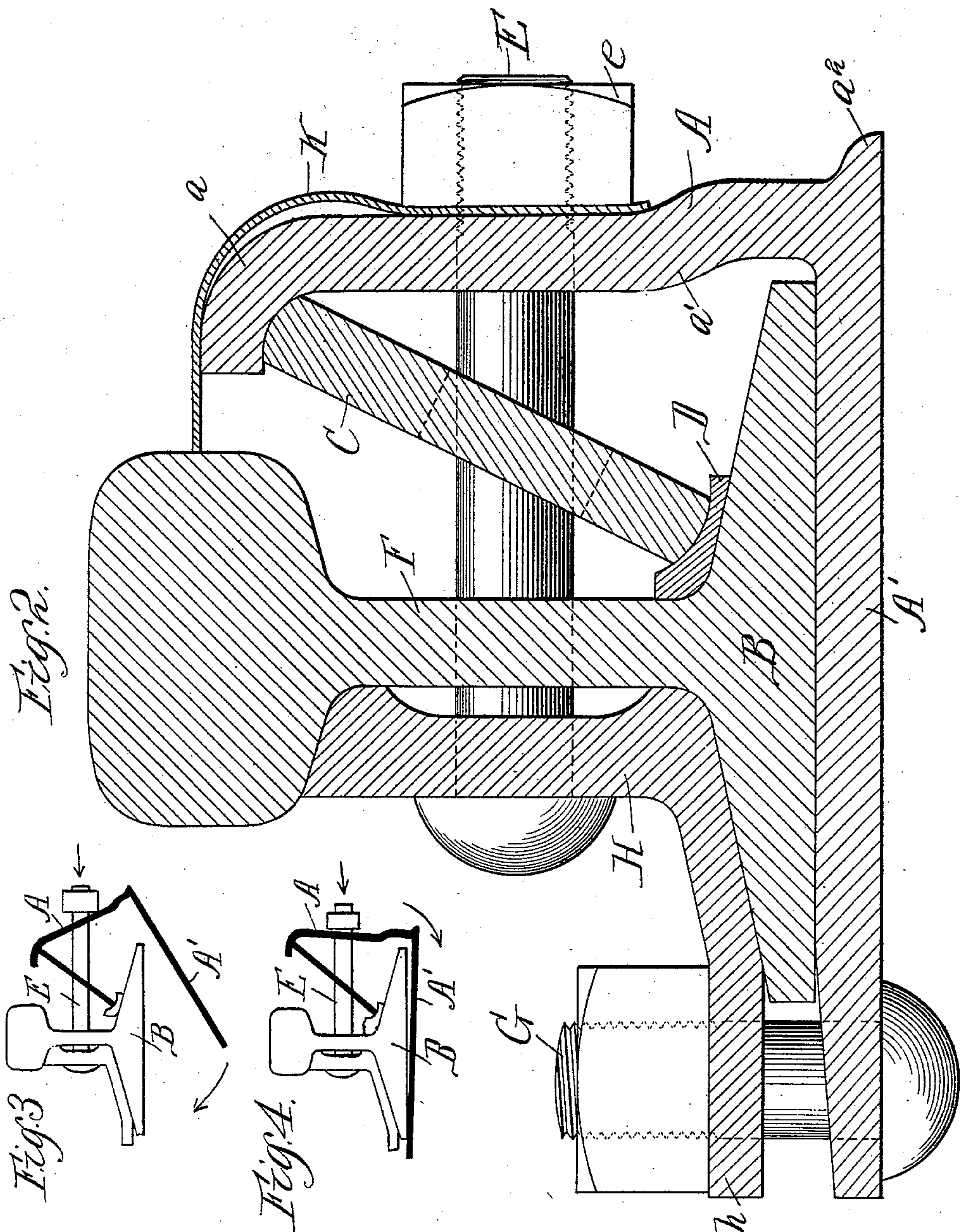
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2 Sheets—Sheet 2.

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UNITED STATES PATENT OFFICE.

MILTON C. NILES, OF OAK PARK, ILLINOIS.

RAIL-JOINT.

SPECIFICATION forming part of Letters Patent No. 529,044, dated November 13, 1894.

Application filed September 29, 1894. Serial No. 524,437. (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.

This invention relates to that class of rail joints in which the parts are bound to the rails by pressure obtained through leverage acting between a fixed part of the joint and the foot flanges of the rails, and it is designed more particularly as an improvement on the device of this character covered by United States Letters Patent No. 484,229, issued to me October 11, 1892.

The forms of rail joints in which a bed or base plate is employed are generally deemed preferable because of the great strength and firm foundation afforded by such plate; but it has always been a difficult problem to find adequate and simple means for binding such plate to the under side of the rail flanges with a sufficiently firm and constant pressure uniformly throughout, and to be able to insert such bed-plate from the side without the necessity of elevating the rail, regard being had to the difficulty of making complicated forms by drop forging or by rolling which are the only two practical methods of producing the parts. In my said prior invention the side lever plates took their bearing against the edges of the foot flange, each turning on such point as its fulcrum and rocking inward toward the rail on the inclined clamping plate; but the object of my present invention is to provide such lever plate with a complete bed or base-plate and cause such lever plate to assume its entire fulcrum upon the clamping plate and thus press the bed or base plate firmly against the under side of the rail flanges throughout their transverse extent.

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 object and certain other objects hereinafter described are attained, all 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 perspective view of my improved rail joint, a por-

tion of the side lever plate being broken away and the rail being shown in transverse section. Fig. 2. is an enlarged transverse sectional view thereof, and Figs. 3 and 4 are diagrammatic views on a smaller scale showing the principle of the operation of my improved joint.

In my present invention instead of employing two side lever plates as in my prior device, I employ a side lever plate A on one side only of the rails and instead of being provided with simply a short hook engaging under the rail flanges, it is made integrally with an extensive base or bed plate A' extending substantially across the rail flanges B and forming a firm bed for the latter. The side lever plate A is provided along its upper edge on its inner side with a flange or lip *a* as in my prior invention, but such flange is preferably rounded on its under side substantially as shown, to form a working surface for the inclined clamping plate C whose upper edge is of complementary form so that during the working together of these parts they will always have a firm bearing, and but the minimum amount of wear be entailed.

The lower edge of the clamping plate C instead of being supported directly upon the rail flange as in my prior invention, is seated upon a seat D whose upper surface may be curved in cross section for the reception of the edge of the clamping plate which is likewise curved in a complementary direction, the seat D preferably extending substantially throughout the length of the clamping plate C. The advantages of this seat are two-fold: First, it, in conjunction with the curvature of the clamping plate constitutes a firm and uniform bearing for such plate at all times throughout the oscillation of the latter; and, second, it may be constructed of hardened steel and serve to avoid the possibility of the sharp edges of the rails at their intersection laminating or cutting the edge of the clamping plate. This feature of the invention cannot be too fully appreciated when it is remembered that should the clamping plate fail to bear firmly upon the rail flanges at their juncture, the pressure of the rolling stock upon one rail would cause it to sink below the end of the succeeding one and thus present an obstruction for the wheels to strike

against, a result which is at once damaging to the rolling stock and rails to say nothing of the comfort of the passengers, and the cause of a waste of power required to keep up speed over a track thus obstructed. With the described steel seat however both rails if they go down at all at their inter-section, they go down together; and a still further advantage of such seat is that it holds the base or lower edge of the clamping plate nearer the vertical part of the lever plate, whereby the clamping plate is nearer the perpendicular and consequently more powerful as a lever when the side lever plate is forced inward toward the rails. To the same end also the upper side of the side lever plate is off-set at a' toward the rails so that its flange a may project farther over the rail flanges without bringing the side lever plate against such rail flanges, it being essential to the operation of my present invention (unlike my said prior one) to maintain at all times a sufficient space between the edge of the rail flanges and the vertical part of the side lever plate, to permit the latter to swing toward the rails at its base or to move bodily in that direction and not simply rock upon the edge of the rail flanges when the bolts E are tightened up. If however the seat D should be omitted, the base of the clamping plate C would be lodged in the corner or angle formed by the rail webs F and foot flanges G; for it will be observed that unlike my former invention the clamping plate C is depended upon for not only constituting one member of the compound lever of which the lever plate A is the other member, but for holding the rails against independent lateral play, and more especially for preventing the upright part of the side lever plate from coming against the rail flanges and thereby precluding the further inward movement of the lower edge of the side lever plate and consequently the upward movement of the opposite edge or the base plate A'. This is the important point of distinction between my present and prior invention, for in my prior invention the inward movement of the upper edges of the side lever plates induced by the pressure of the bolts E causes the extremities of the hooks or flanges 2 on such plates to swing downward, whereas in my present invention it is obvious as illustrated diagrammatically in Figs. 3 and 4, that so long as the lower edge of the side lever plate A is out of contact with the edges of the rail flanges, leaving the lever plate to fulcrum entirely upon the clamping plate C. The initial pressure of the bolts E against the lever plate will induce the lower edge of the latter to swing inward or toward the rails and consequently the free edge of the base plate A' to swing upward against the under side of the rail flanges; thus causing the free or left hand edge of the base plate to grip the rail flanges before its opposite does. As the pressure of the bolts E continues however, and the upward movement of the base plate A' is re-

sisted by the rails, the edge of such base plate adjacent to the lever plate A also comes into firm contact with the under side of the rail flanges, thus firmly gripping the rail flanges throughout their transverse extent without the necessity of bolts or other tightening devices on the opposite side, although bolts such as shown at G having their nuts bearing upon the lateral flange of an ordinary fish-plate H, may be employed if desired for the sake of greater security. It is also evident that while this swinging upward movement of the bed plate A' is taking place, the rocking of the clamping plate C toward the rails is also producing an upward strain on the lever plate A which is communicated to the base plate A' and the seat D, which latter bears downward upon the rails for holding them against vertical movement while at the same time offering sufficient resistance in a horizontal direction to prevent lateral play. This principle of operation of my improved joint is evident from the diagrammatic illustrations, Figs. 3 and 4. Let it be assumed that when the parts are first put together they are in the position shown in Fig. 3 with the base plate A' hanging at an angle to the under surface of the foot flanges of the rails. By tightening up the bolts E it will be seen that the lower edge of the lever plate A will be carried inward toward the rail flanges while the free edge of the base plate A' will swing upward against the rail flanges at their opposite sides as shown in Fig. 4. In practice the base plate A' will of course bear at this time against the under side of the rail flanges throughout their transverse extent, but the pressure nevertheless will commence at the free side of the base plate A' and any further tightening of the bolts E will tend to increase that pressure so long as the opposite side of the rail flange is not in contact with the base plate, or so long as the lower edge of the lever plate A is out of contact with the rail flanges and can continue inward by virtue of the elasticity of the parts A A' at their juncture; and when the plate is given a bodily inward movement or strain, the upper pressure of the base plate A' will be uniform throughout.

The lever plate A with its base plate A' and the clamping plate C and seat D may be of sufficient length to project over two of the ties as shown in Fig. 1 and the lower edge of the lever plate A may be provided with a flange a^2 for the engagement of spike-heads I, the whole joint being held against longitudinal movement by spikes J engaging in notches formed on an extension h of the fish-plate H, the bolts E being passed through such fish-plate as well as the clamping-plate C.

If it should be desired to close the opening between the rails and the edge of the flange a for preventing the admission of stones and dirt to the interior of the joint, a spring plate or shield K may be secured over such opening by means of the bolts E. The upper edge

of this plate K is turned over horizontally so as to rest against the rails while its lower edge is pierced by the bolts E and held in place by the nuts e thereon. The plate K is so formed that its upper overhanging edge will be slightly longer than the distance between the outer face of the plate A and the edge of the rail so that when the parts are screwed up, the edge of the plate K will produce a constant pressure against the rails and thus provide for continuous contact notwithstanding the adjustment of the parts of the joint.

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 an upright side lever plate having a base plate passing under the rails, a clamping plate having abutment against said lever plate and against the rails and holding said lever plate at a distance from the rail flanges, and means for moving the lower edge of said lever plate inward or toward the rails, substantially as set forth.

2. In a rail joint, the combination with the rails, of a side lever plate provided with an over-hanging flange or lip and having a base plate projecting under the rails, an inclined clamping plate taking its abutment under said over-hanging lip or flange and being lodged upon the foot flanges and held against movement toward the rails by the rail webs, said clamping plate serving to hold the lower edge of the lever plate normally away from the flanges of the rails, and means for moving the said lever plate inward or toward the rails, substantially as set forth.

3. In a rail joint, the combination with the rails, of a side lever plate having a base plate extending under the rails, a clamping plate abutting against said side lever plate, a seat resting upon the rail flanges and supporting said clamping plate, the said lever plate being normally out of contact with the rails, and means for moving said lever plate toward the rails, substantially as set forth.

4. In a rail joint, the combination with the

rails, of a side lever plate having a base plate extending under the rails, a seat lodged at the juncture of the rail webs and flanges and having a curved surface, the clamping plate abutting against said lever plate and having a curved edge resting upon said seat, and means for moving said lever plate inward or toward the rails, substantially as set forth.

5. In a rail joint, the combination with the rails, of a side lever plate having a flange at its upper edge provided with a curved surface, and a base plate at its lower edge projecting under the rails, a seat resting upon the rail flanges and against the rail webs and having a curved surface, an inclined clamping plate having its edges curved and resting respectively against the curved surfaces of said flange and seat, and means for drawing said lever plate toward the rails, substantially as set forth.

6. In a rail joint, the combination with the rails, of a side lever plate having a base plate projecting under the rails, an inclined clamping plate abutting against said lever plate and having its lower edge supported upon the foot flanges of the rails and held against inward movement toward the rails, said clamping plate holding the lower edge of the lever plate normally away from the rail flanges, a fish plate arranged on the opposite side of the rails, the bolts G passing through said base plate and supported by said fish plate, and bolts passing through said fish plate, the rails and lever plate for drawing the lever plate toward the rails, substantially as set forth.

7. In a rail joint, the combination with the rails, the transverse bolts E, an upright plate through which said bolts pass and means co-acting therewith for clamping the rails, of a spring plate secured by said bolts E and having its upper edge bent over said first plate and resting against the rails, substantially as and for the purpose set forth.

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