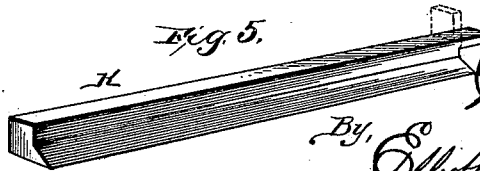
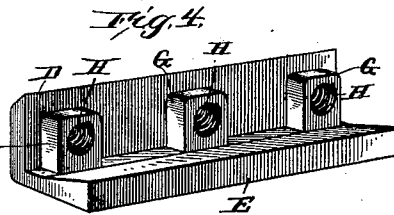
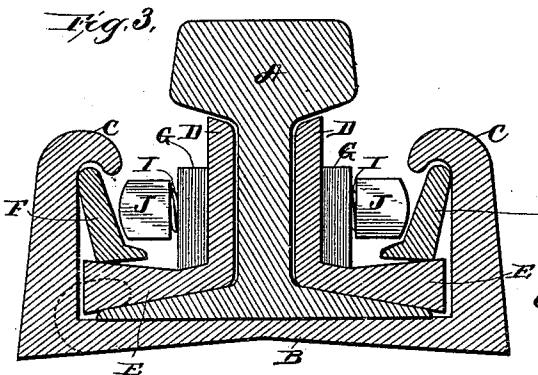
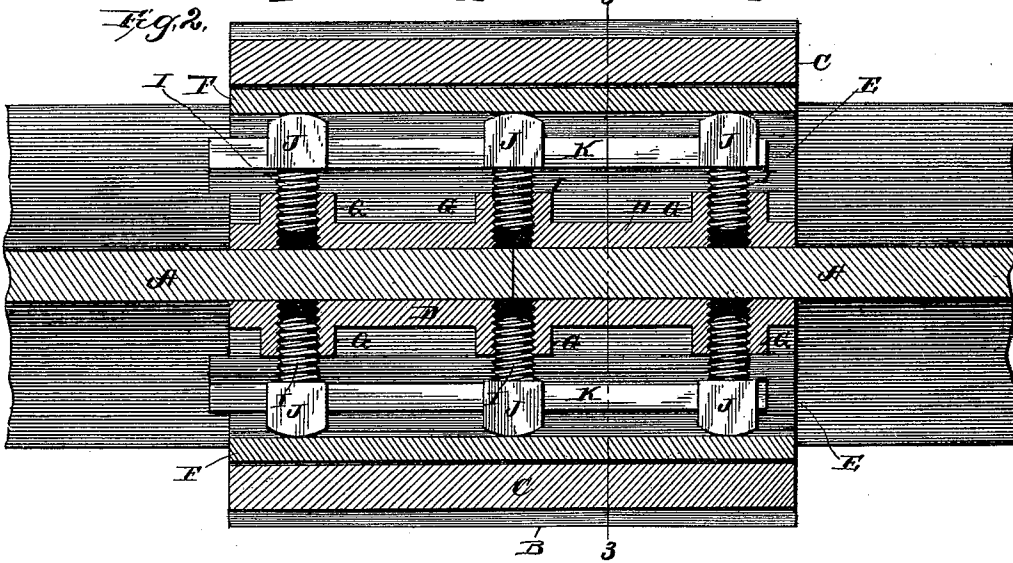
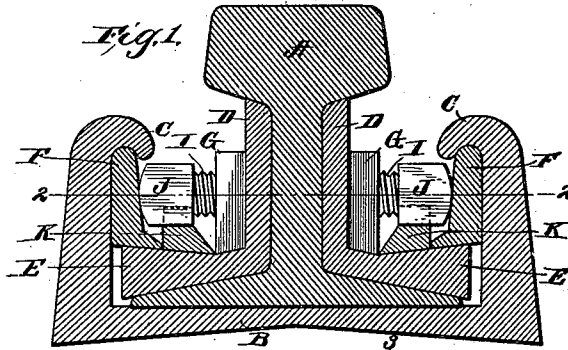


(No Model.)

M. C. NILES.
RAIL JOINT.

No. 464,696.

Patented Dec. 8, 1891.



Witnesses:

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UNITED STATES PATENT OFFICE.

MILTON C. NILES, OF CHICAGO, ILLINOIS.

RAIL-JOINT.

SPECIFICATION forming part of Letters Patent No. 464,696, dated December 8, 1891.

Application filed November 4, 1890. Serial No. 370,278. (No model.)

To all whom it may concern:

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

This invention relates to improvements in that class of rail-joints in which the chair is bound to the rails by a pressure obtained through leverage or through the employment of a wedge. In all prior forms of such devices, so far as I am aware, the screw-bolts employed for operating the lever or wedge have had a bearing working through either the rails or the chair, or both, and frequently through other members comprised in the joint, thereby not only materially increasing the cost and complexity of the joint, but also reducing the strength of the same to an injurious degree.

The prime object of this invention is to dispense with the employment of bolts passing through either the rail or chair, and at the same time promote the rigidity of the joint.

Another object is to have the joint of such character that by the employment of laterally or horizontally operating pressure-screws a direct vertical pressure is obtained, firmly binding the chair to the rail against vertical movement, and to have the same operation produce a lateral pressure in opposite directions, which, combining with the vertical pressure, produces the most advantageous disposition of power derived from a single source for imparting to the joint the maximum degree of rigidity. These objects are attained by the devices illustrated in the accompanying drawings, in which—

Figure 1 represents a transverse vertical section through a rail-joint embodying my invention, taken on the line 3 3 of Fig. 2; Fig. 2, a horizontal section taken on the line 2 2 of Fig. 1; Fig. 3, a view similar to Fig. 1, but showing the position of the parts before being tightened; Fig. 4, a detail perspective view of the combined brace and wedge plate, and Fig. 5 a detail perspective view of a lock for the pressure-bolts.

Similar letters of reference indicate the same parts in the several figures of the drawings.

Referring by letter to the accompanying drawings, A indicates the rails, and B the chair or base-plate, having the general contour of double "L" or channel iron in cross-section and provided along the upper edges thereof with overhanging lips C, extending the length of the chair at each side of the rails.

Fitting into the angle formed by the web and flanges of the rails, at each side thereof, is a brace-plate D, that portion of which resting upon the rail-flanges thickened, so as to form a wedge E, which has its greatest elevation at the outer edge, inclining toward the rail-web and forming a seat for a binding-plate F, interposed between said wedges and the overhanging lips C on the shaft. These combined brace and wedge plates are also provided on their vertical portions—that is, the portion opposing the web of the rails—with bosses G, having screw-threaded perforations H therein, in which work screw-pressure bolts I, horizontally disposed, the heads J of which bear against and actuate the clamping-plates F, causing them to rise upwardly and outwardly upon the wedges, pressing with their upper edges against the under side of the overhanging lips on the chair until the latter is bound firmly against the rail. It will thus be seen that the pressure-screws are braced and gain a bearing against the web of the rail through the medium of the combined brace and wedge plates and that, while their operation and line of movement is horizontal through the instrumentality of the clamping-plates, which they actuate, this lateral or horizontal pressure is converted into a direct vertical pressure upon the chair, which gives latter a truss-like support upon the rails, for any vertical strain whatever upon the chair is immediately transferred to the rails, from which the pressure must come, thus equalizing and distributing the strain, and hence it is obvious that no vertical movement of the rails relative to the joint can take place; but by the peculiar disposition of the members of the joint it becomes practically a part of the rail, the same as if formed integrally therewith, and cannot move independently of the rail.

To prevent the accidental loosening of the pressure-bolts, due to the jarring of the rail

or any other cause, any suitable form of lock device may be employed—such, for instance, as the wedge-shaped lock-bar K, interposed between the wedge-plate and bolt-head, which
 5 tapers sufficiently toward one end to permit its being inserted under all of the bolt-heads at one side of the rail, with its smaller end projecting beyond the end bolt, so as to be
 10 turned up behind the bolt, as illustrated by dotted lines in Fig. 5, and thus prevent the slipping or unseating of the lock-bar. Obviously the lock-bar, instead of being wedge-shaped or tapering, may be shouldered at one
 15 end and upturned at the other, or upturned at both ends, or in fact arranged in any other suitable manner, so long as it or some equivalent device serves to prevent the reverse rotation of the pressure-bolts and the consequent loosening of the joint.

20 In practice the pressure-bolts when at the extreme of their inward adjustment are intended to just extend through the combined brace and wedge plate, but not project beyond the inner face thereof, so that when the
 25 members of the joint are put together there is sufficient play for the free movement and easy assemblage of the members, as illustrated in Fig. 3; but when the pressure-bolts are unscrewed or partially withdrawn
 30 from their bearings in the combined brace and wedge plates the clamping-plates are forced outwardly, riding the inclines or wedges until they bear against the sides of the chair, the upper edges thereof during this operation
 35 having pressed against the overhanging lips of the chair until the maximum degree of tightness is reached in all directions at the time of the lateral impingement of the clamping-plates against the chair; but while
 40 this should be the operation when the parts are properly made and proportioned it is obvious that a slight increase in the height of the clamping-plates will cause the maximum tightness to be reached before the clamping-plates bear against the sides of the chair;
 45 but such a variation would be immaterial and would not affect the rigidity of the joint, and, as a matter of fact, substantially the same result would be produced, though not in so
 50 satisfactory a manner, by dispensing with the wedge and having the upper surface of what is now the wedge-plate horizontal or even less than horizontal, and force the clamping-plate outwardly by the pressure-bolts in the same
 55 manner as at present, but reaching the maximum degree of tightness before the clamping attains a vertical position; nor is it absolutely essential to the successful operation of my invention that the double set of pressure-bolts, brace, wedge, and clamping plates be employed, one at each side of the rails, as shown, for, as illustrated by the dotted lines at the left in Fig. 3, one set of these devices
 65 may be dispensed with and the chair be provided with an overhanging lip directly en-

gaging the rail-flange instead of indirectly engaging the rail, as is the case when these devices are employed; but the double set is preferred because of the perfect equalization of the strain upon the joint attained by their use. 70

In conclusion I may state that the essential elements of my invention are the chair provided with an overhanging lip or lips, and the clamp-plate engaging said lip and directly or indirectly supported upon the rail-flange, and,
 75 so far as relates to the broad idea of my invention, any means for operating the clamping-plate in substantially the manner described are contemplated by the claims, for it will be obvious to any one skilled in the art
 80 to which my invention appertains that with these elements many different means may be employed to effectually tighten the joints.

Having described my invention, what I claim, and desire to secure by Letters Patent, 85 is—

1. In a rail-joint, the combination, with the chair provided with an overhanging lip at one or both sides thereof, of a wedge resting upon the rail-flange, a clamping-plate extending between said wedge and lip, and means for operating said plate, substantially as described. 90

2. In a rail-joint, the combination, with the chair provided with an overhanging lip at one or both sides thereof, of a clamping-plate extending between said lip and the rail-flange, and pressure-bolts working in screw-threaded sockets and having end bearings against the rail and clamping-plates, respectively, substantially as described. 100

3. In a rail-joint, the combination, with the chair provided with an overhanging lip at one or both sides thereof and a combined brace and wedge plate at one or both sides
 105 of the rail, of a clamping-plate extending between the wedge and the lip on the chair, and pressure-bolts working in screw-threaded sockets in the brace-plate and having their heads bearing against the clamping-plate, substantially as described. 110

4. In a rail-joint, the combination, with the chair engaging the rails at one side thereof and provided with an overhanging lip at the opposite side thereof, of a combined brace
 115 and wedge plate bearing upon the rail, a clamping-plate interposed between said plate and the lip on the chair, and pressure-bolts working in the brace-plate and bearing against the clamping-plate, substantially as described. 120

5. In a rail-joint, the combination, with the chair provided with overhanging lips at each side thereof and the combined brace and wedge plates at each side of the rails, of
 125 clamping-plates interposed between the wedges and the lips on the chair, and pressure-bolts working in the brace-plates and bearing against the clamping-plates, substantially as described. 130

6. In a rail-joint, the combination, with the chair provided with an overhanging lip at one or both sides thereof, of a clamping-plate extending between said lip and the rail-flange,
5 of pressure-bolts working in screw-threaded sockets and having end bearings against the rail and clamping-plates, respectively, and a lock device for said plates, substantially as described.

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Witnesses:

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