

(No Model.)

2 Sheets—Sheet 1.

M. C. NILES.
RAIL JOINT.

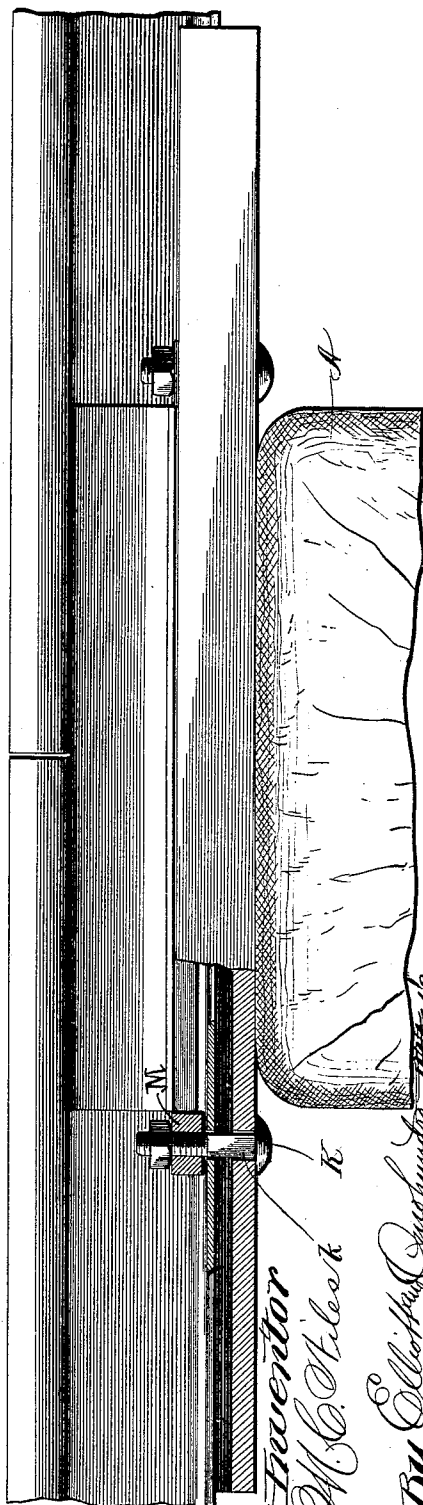
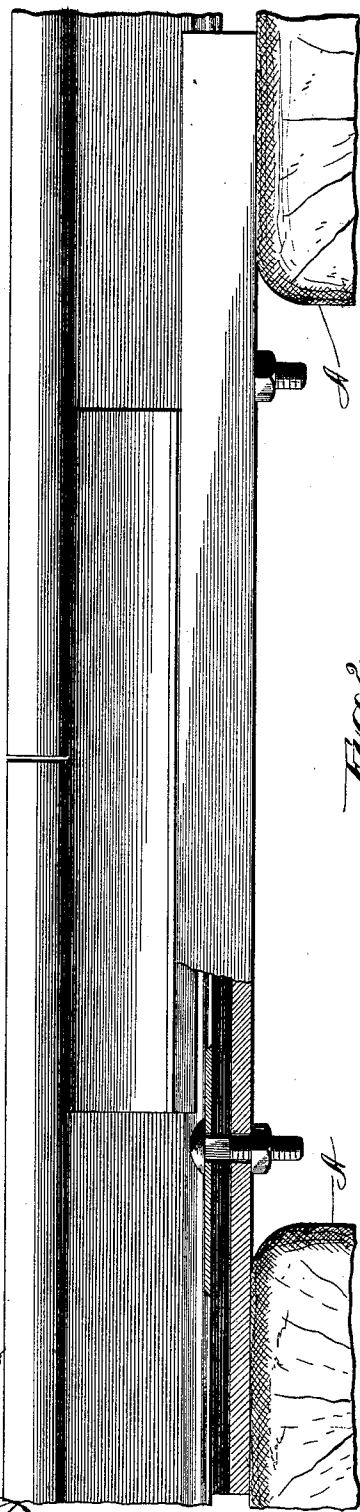
No. 480,506.

Patented Aug. 9, 1892.

Fig. 1.

Fig. 2.

Witnesses
R. A. Quaker
W. H. Smith



Inventor
M. C. Niles
By *Clifford Quaker* *Att'y.*

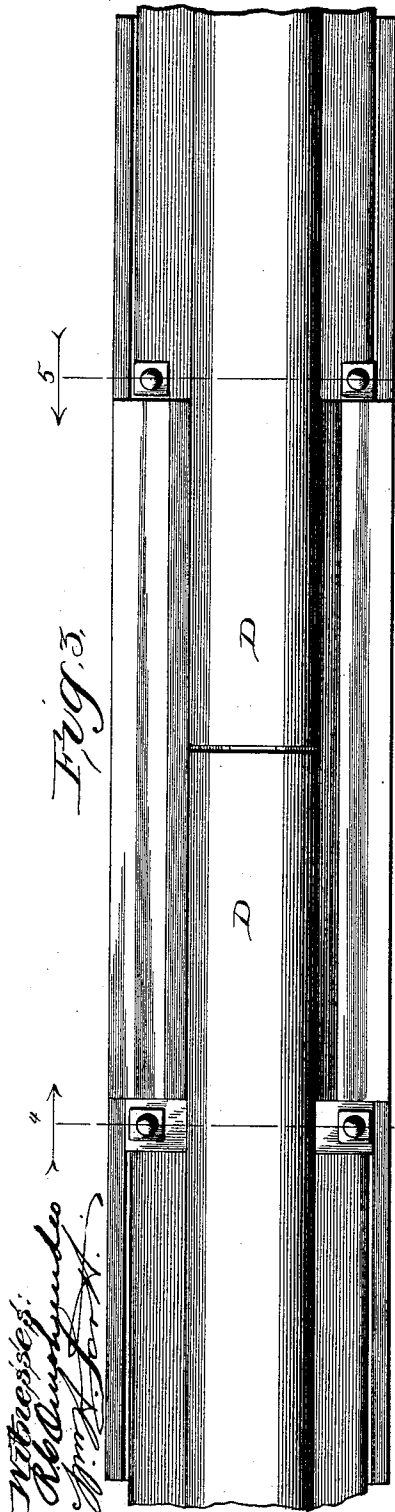
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2 Sheets—Sheet 2.

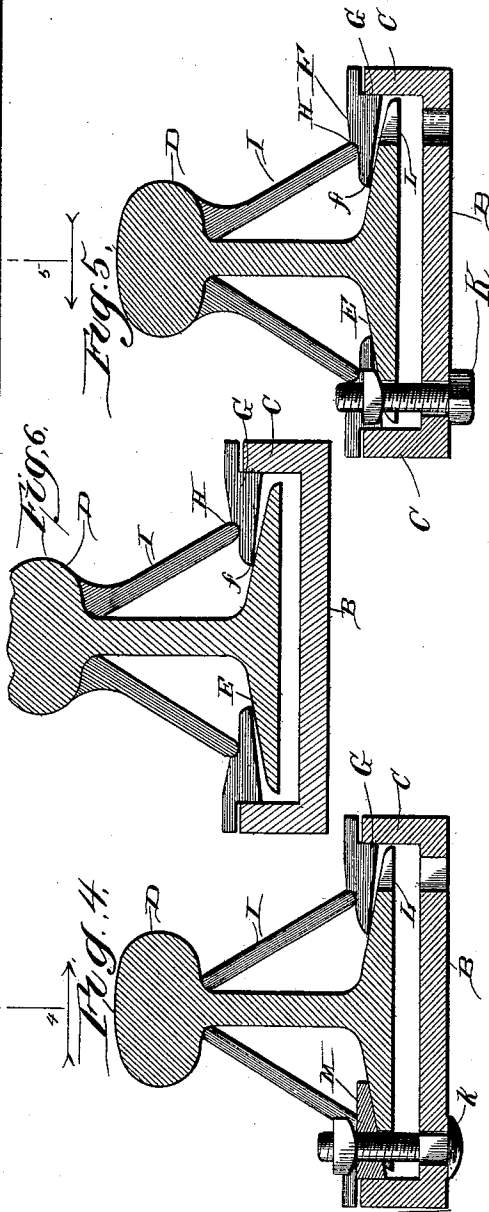
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RAIL JOINT.

No. 480,506.

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Witnesses:
Abraham Quinlan
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UNITED STATES PATENT OFFICE.

MILTON C. NILES, OF OAK PARK, ILLINOIS.

RAIL-JOINT.

SPECIFICATION forming part of Letters Patent No. 480,506, dated August 9, 1892.

Application filed August 28, 1891. Serial No. 403,945. (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.

The prime object of my invention is to support the rail entirely from the head thereof and not upon the foot-flange, as heretofore, and to so construct and arrange the parts as to produce an upward supporting resistance or pressure which will increase in direct ratio with any increase in the degree of downward pressure brought upon the rail.

A further object of my invention is to provide the rail with a more or less elastic support which will at the same time resist any lateral thrust caused by the wheel-flanges or otherwise.

With these ends in view my invention consists in certain features of novelty hereinafter fully described in connection with the accompanying drawings and particularly pointed out in the claims.

In the said drawings, Figure 1 is a side elevation, partly in section, showing my improved joint connecting the ends of two rails and spanning and resting upon two cross-ties. Fig. 2 is a similar view showing the joint extending across and resting upon a single tie. Fig. 3 is a plan view of the form shown in Figs. 1 and 2, the ties being omitted. Fig. 4 is a transverse sectional view taken on the line 4 4, Fig. 3, looking in the direction of the arrow, the bolt and beveled leveling-washer on one side being omitted for the purpose of showing the parts in the rear. Fig. 5 is a transverse sectional view taken on the line 3 3, Fig. 3, looking in the direction of the arrow, also having the bolt on one side omitted; and Fig. 6 is a view similar to Figs 4 and 5, all the bolts being omitted.

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

A A are the ordinary cross-ties, upon which rests a base-plate B, having vertical upturned side flanges C. The rail D is of ordinary construction and has its foot-flange E located between the vertical flanges C of the base-plate

and being nearly equal in width to the distance between such flanges.

Resting upon the flanges C are levers F, which are made in the form of elongated plates, as clearly shown in Figs. 1 and 3, having longitudinal shoulders G at their outer ends on their lower sides, resting against the vertical sides of the flanges C, in order to resist lateral pressure, and with longitudinal shoulders H extending throughout their length for the purpose of forming seats or footings for upright inclined supporting-plates I. As clearly shown in Figs. 4, 5, and 6, these supporting-plates I impinge against the under side of the rail-head at the junction of the head and the web of the rail, so that downward pressure on the rail will be borne by the plates I and transmitted directly to the levers F at a point on each between its fixed end and point of fulcrum. Such pressure will of course also cause the inner ends of said levers to have a tendency to move downward; but inasmuch as such levers have a rest or fulcrum at their inner ends or edges *f* upon the foot-flange of the rail and are supported against a downward movement at their outer edges or ends by means of the flange C it follows that supporting or brace plates I cannot descend as fast as the rail, and hence the greater the downward pressure on the rail the greater will be the resistance of the supporting or brace plates I against the under side of the rail-head. In other words, the rail cannot move downward without also forcing the brace-plates I either downward or outward an equal distance. The plate I cannot move downward the same distance that the rail would travel if it should move, because each of said plates rests at an intermediate point on a lever whose greatest range of motion cannot exceed the movement of the rail, and such plates cannot move outward because they are held by the flanges C. It is obvious, therefore, that since the upward resistance is always equal to the downward pressure there can be no downward movement of the rail at all, excepting that which might be permitted by the elasticity of the parts, which is desirable rather than otherwise. It will now be seen that the rail is not given a rigid unyielding support as with other

joints, but is supported clear of the base-plate through the more or less elastic medium of the flanges C and levers F, and inasmuch as the joint tightens automatically under the pressure on the rail it stands to reason that the degree of elasticity of the joint will increase and decrease with the fluctuations of such pressure.

With a joint constructed according to my invention it is unnecessary for the support of the rail to employ mechanism other than that above described; but for the purpose of holding the base-plate B up into position and to prevent accidental displacement of the parts when there is no pressure upon the rail I prefer to pass a bolt K through the base-plate near each corner thereof and through slots or openings L in the edges of the rail-flange. At such places where the bolts would come between the two ties the slots L in the rail-flange may be prismatic in form and the bolts provided with square or prismatic portions k fitting therein, the threaded ends of the bolts passing through circular openings in the base-plate and having a tap or nut on the under side of the latter, as shown in Fig. 1; or, if desired, the lower end of the bolt may be provided with a prismatic head for the application of a wrench, in which case the bolt-holes in both the base-plate and the foot-flange may be rounded; but the tap on the upper end of the bolt should be of sufficient size to prevent its rotation without striking against the side of the flange C when the bolt is turned, as shown in Fig. 5; but where the bolt-heads rest on a tie or other support I prefer to arrange them as shown in Figs. 2 and 4. In this instance the flattened head of the bolt is arranged underneath the base-plate, and the bolt is secured against rotation by its prismatic portion k , which fits in a prismatic bolt-hole in the base-plate, the upper end of the bolt being provided with a tap or nut, between which and the foot-flange of the rail is located a leveling-washer M, whose under side is inclined or beveled, as shown, and rests upon the said foot-flange, thus forming a square seat for the tap. If desired, the bolts may be provided with spring-washers to prevent rattling.

While I have been thus particular to describe various forms of bolts as adapted for specific uses, yet it is to be understood that I do not limit myself to any particular form of bolt or attachment, for attachments of any kind are not essential to the operation of my device and the same may be entirely omitted therefrom without departing from the spirit of my invention or modifying its operation. Having described my invention, what I claim, and desire to secure by Letters Patent, is—

1. A rail-joint having a lever supported on the rail at one end and having a fixed support at its other end, and a separate brace between the rail and said lever, substantially as set forth.

2. In a rail-joint, the combination of a lever having a fixed support at one end and fulcrumed upon the rail at its other end, and a brace arranged between the head of the rail and said lever between its said fixed end and point of fulcrum, substantially as set forth.

3. In a rail-joint, the combination, with the base-plate, of a lever supported on said base-plate at one end and fulcrumed on the foot-flange of the rail at its other end, and an inclined support engaging the rail and impinging said lever between its fixed end and point of fulcrum, substantially as set forth.

4. In a rail-joint, the combination of the base-plate, a lever having a shoulder engaging said plate at one end and being fulcrumed upon the rail at its other end, and a support engaging the rail and resting upon said lever between said shoulder and said point of fulcrum, substantially as set forth.

5. In a rail-joint, the combination, with a base-plate, of a lever having a fixed support at one end and a separate brace resting upon said lever between its ends and supporting the rail at a distance above said base-plate, substantially as set forth.

6. In a rail-joint, the combination of levers each having a fixed support at one end and resting upon the rail at the other end, said levers having shoulders, and brace-plates engaging said shoulders and the rail, substantially as set forth.

7. In a rail-joint, the combination of levers each having a shoulder on its under side at its outer end, the base-plate having flanges with which said shoulders engage, the rail arranged between the said flanges and supporting the inner ends of said levers, said levers having shoulders on their upper sides, and brace-plates engaging the shoulders on the upper sides of said levers and impinging the rail, substantially as set forth.

8. In a rail-joint, the combination, with the base-plate having side flanges, of levers having shoulders engaging said flanges and resting upon the foot-flange of the rail, and inclined brace-plates impinging said levers near their inner ends and engaging with the rail, substantially as set forth.

9. In a rail-joint, the combination, with the base-plate, of levers having fixed supports at their outer ends and resting upon the rail at their inner ends, and inclined brace-plates abutting against said levers and against the under side of the rail-head and being separate from said levers, substantially as set forth.

10. In a rail-joint, the combination, with the base-plate, of levers having fixed supports on said base-plate and resting upon the rail, supports between said levers and the rail, and bolts passing through a portion of the rail and the base-plate, substantially as set forth.

11. In a rail-joint, the combination of the levers having fixed supports at their outer ends and being fulcrumed upon the rail at their inner ends, and brace-plates impinging said levers between their fixed supports and

their fulcrums and supporting the rail, substantially as set forth.

12. In a rail-joint, the combination, with the base-plate, of levers having fixed supports on said base-plate and resting upon the rail, brace-plates supporting the rail upon said levers, bolts passing through the base-plate

and foot-flange of the rail, and leveling-washers on said bolts, substantially as set forth.

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Witnesses:

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