

(No Model.)

2 Sheets—Sheet 1.

M. C. NILES.
RAIL JOINT.

No. 407,301.

Patented July 16, 1889.

Fig. 1.

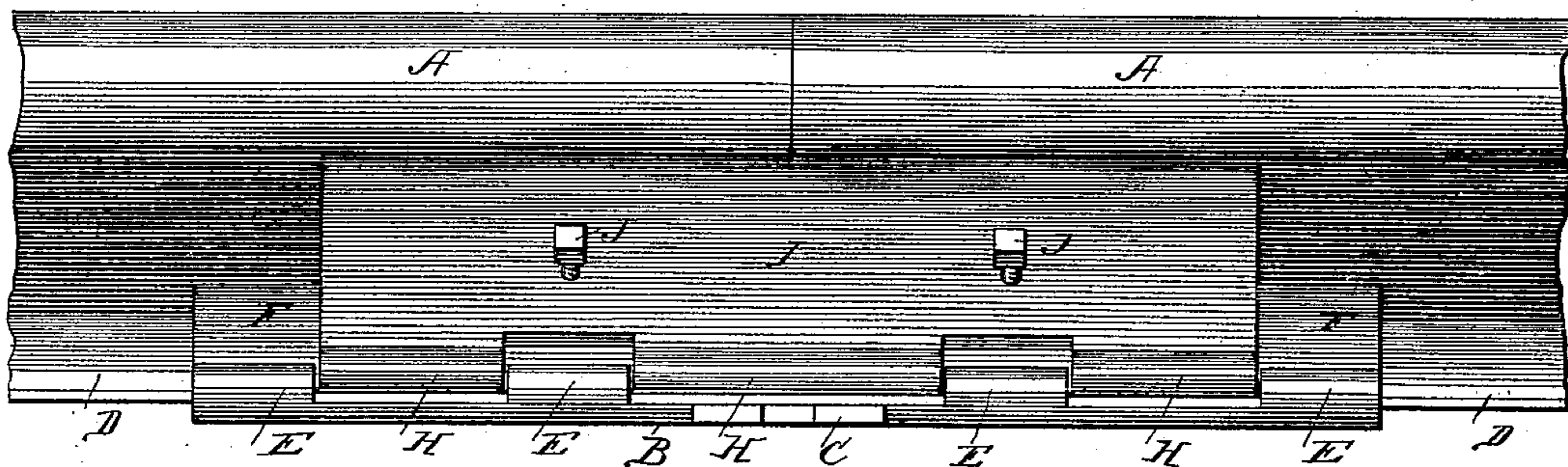


Fig. 2.

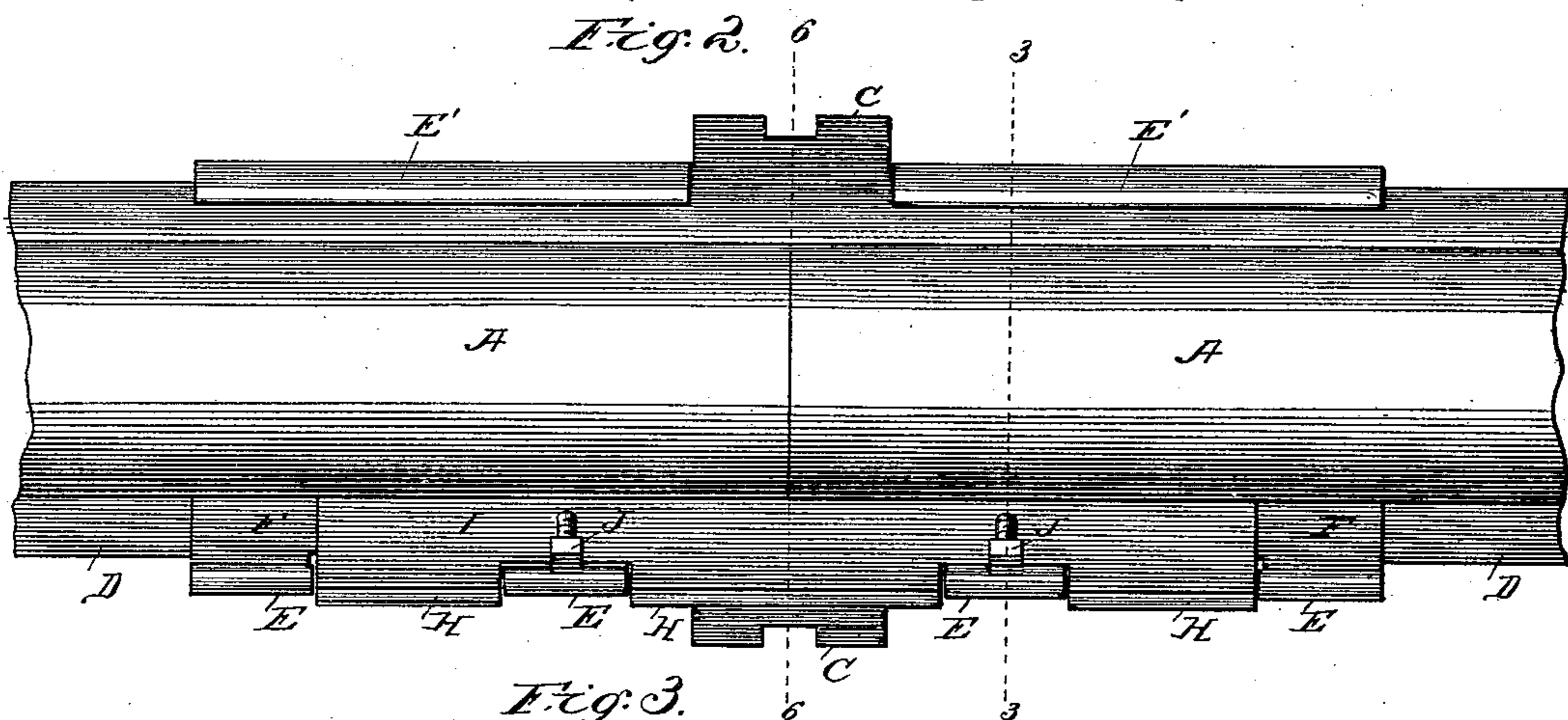


Fig. 3.

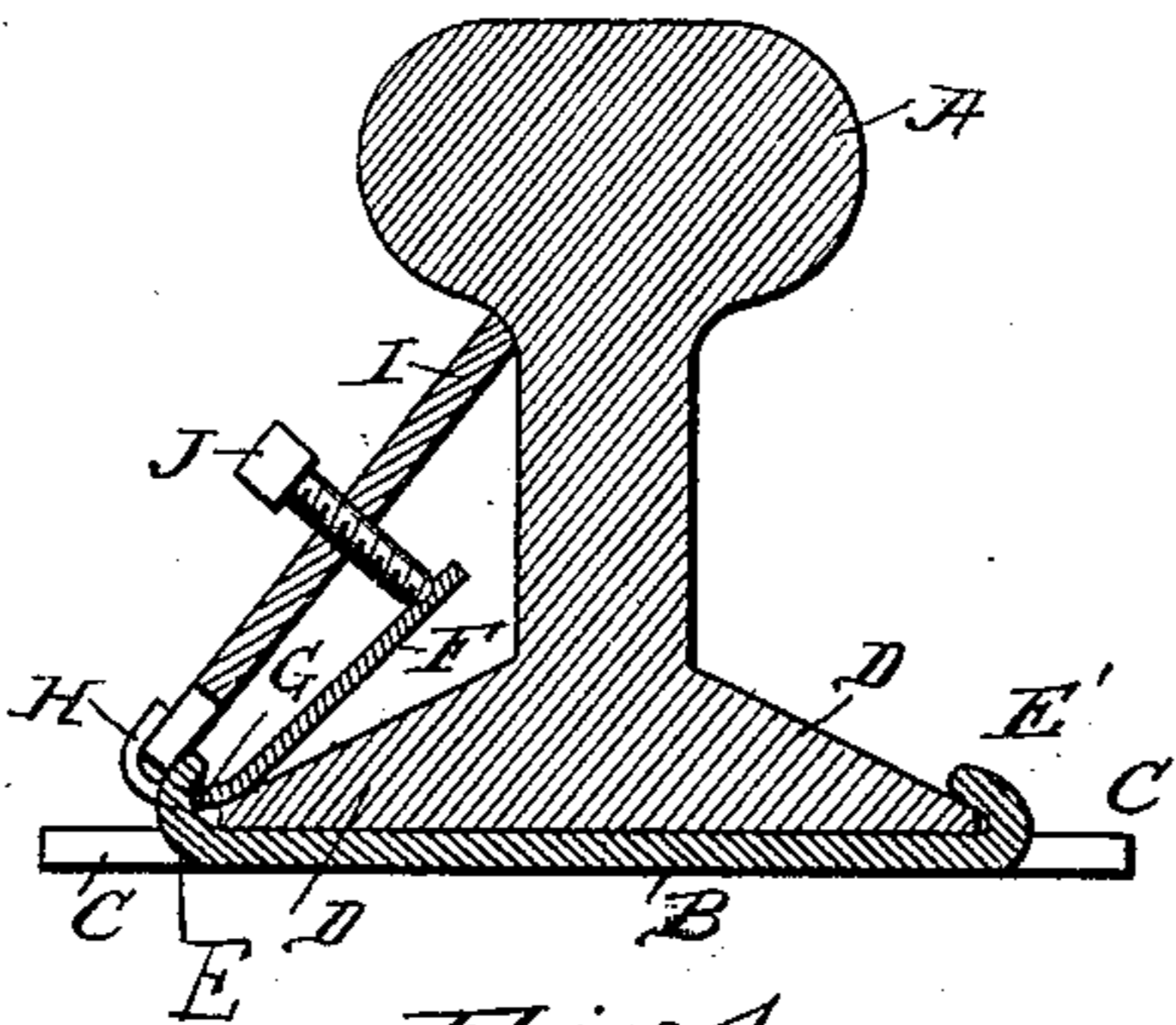
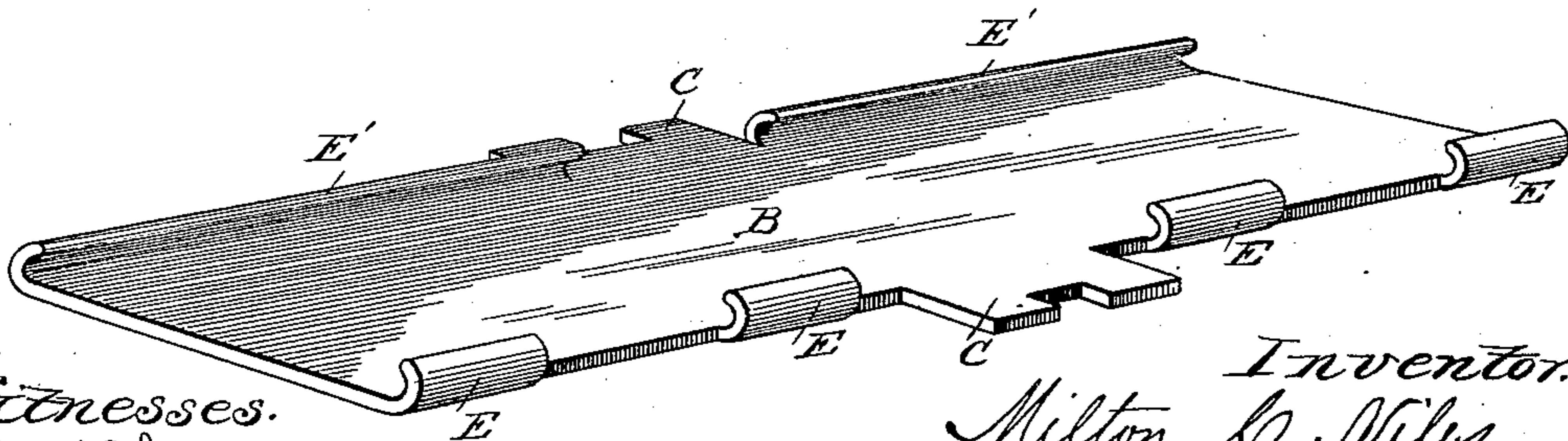


Fig. 4.



Witnesses.

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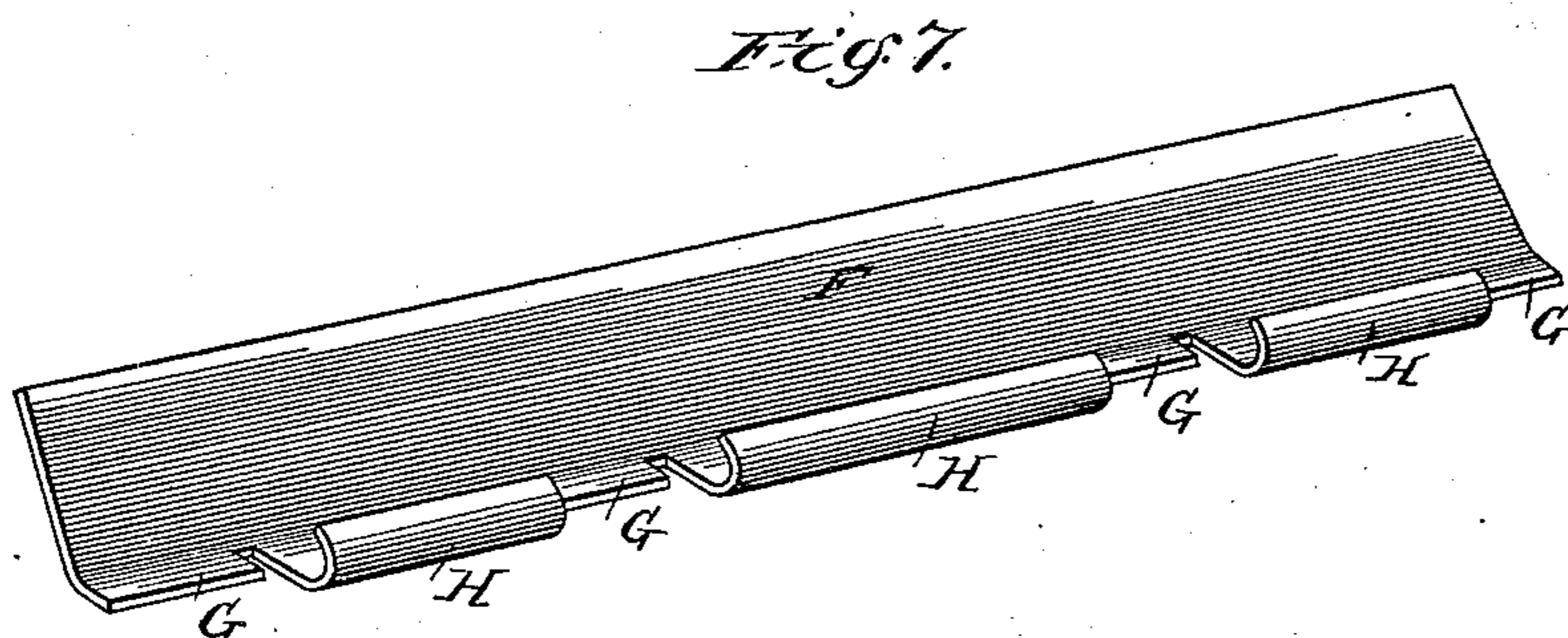
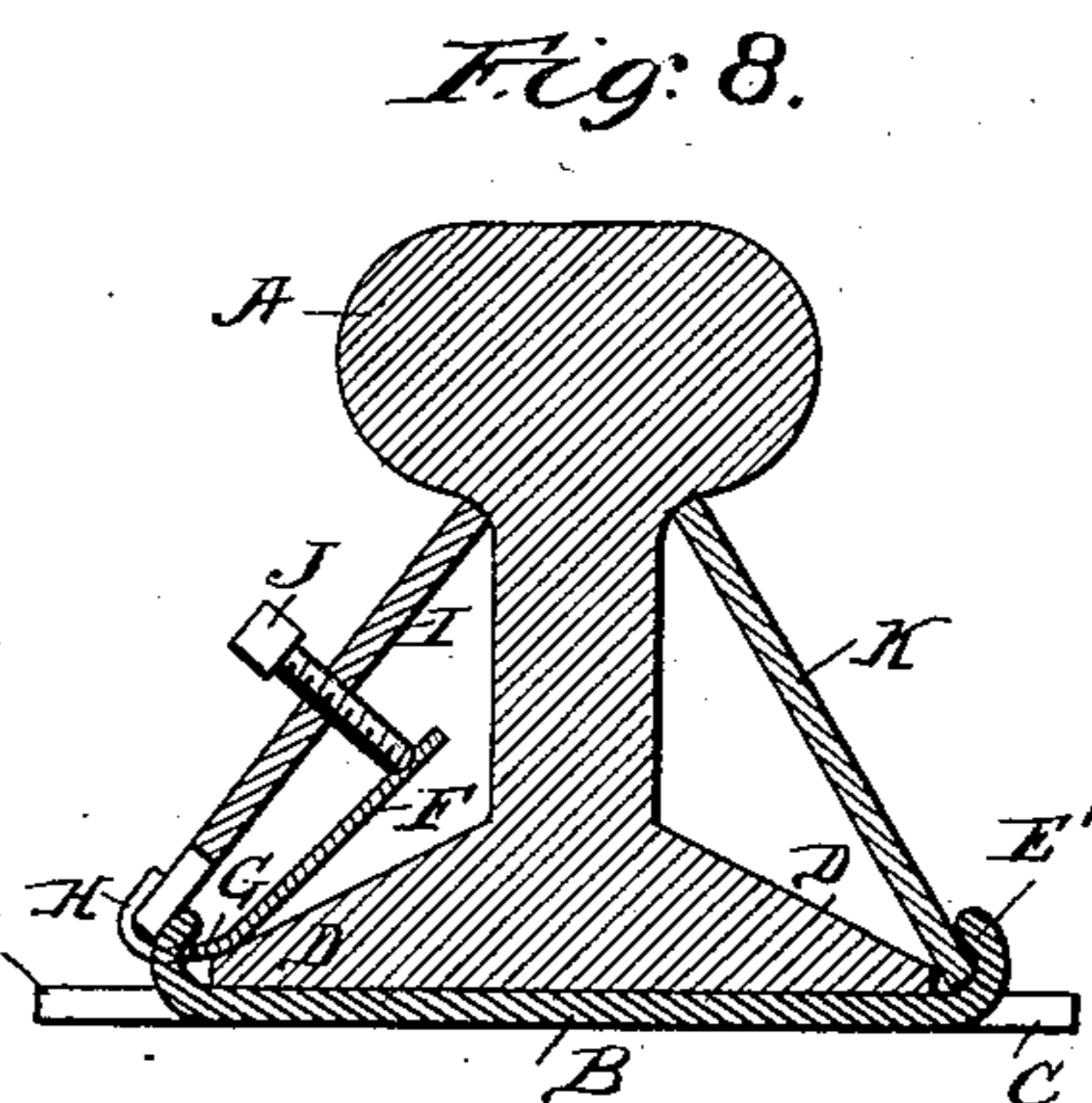
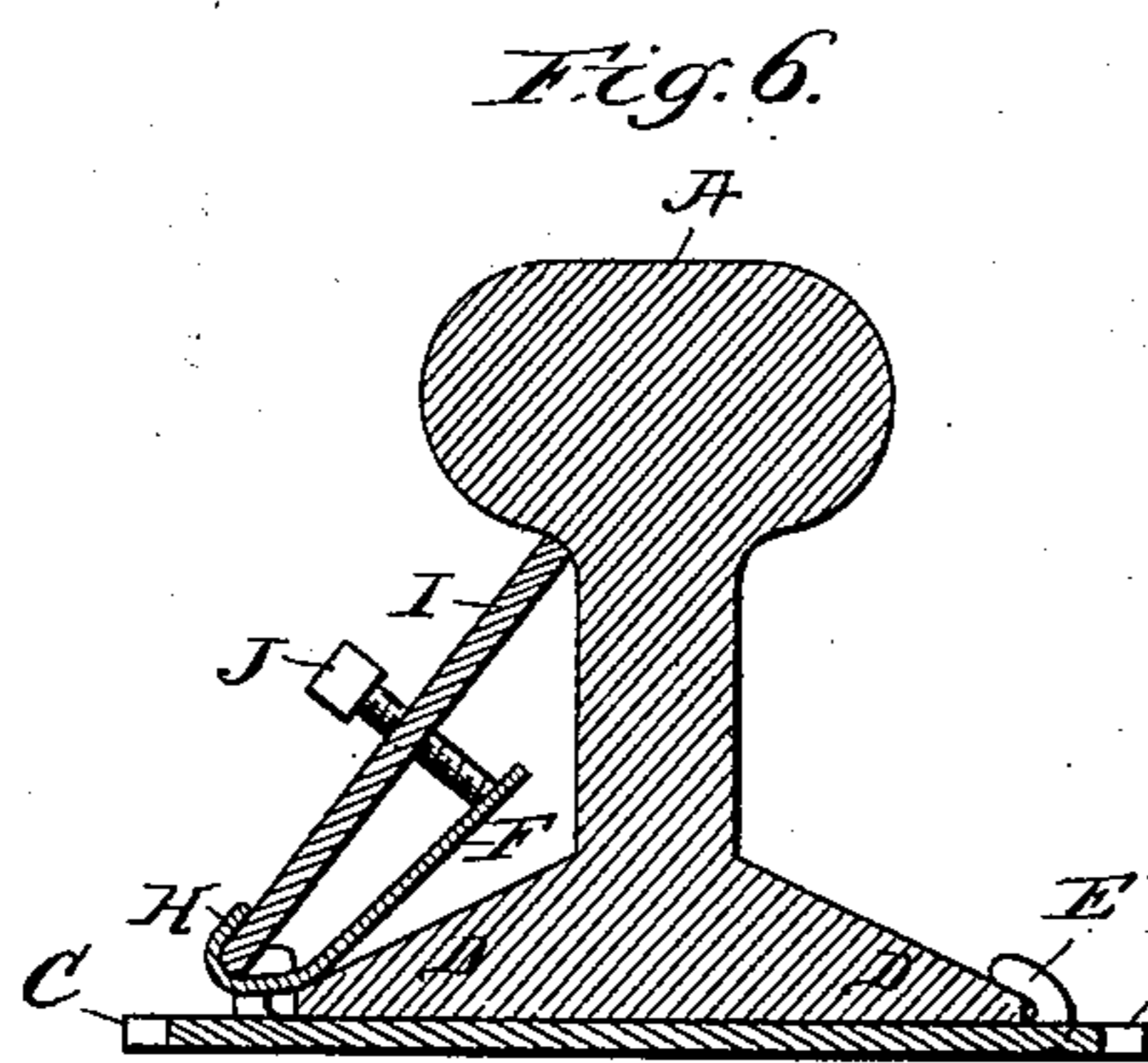
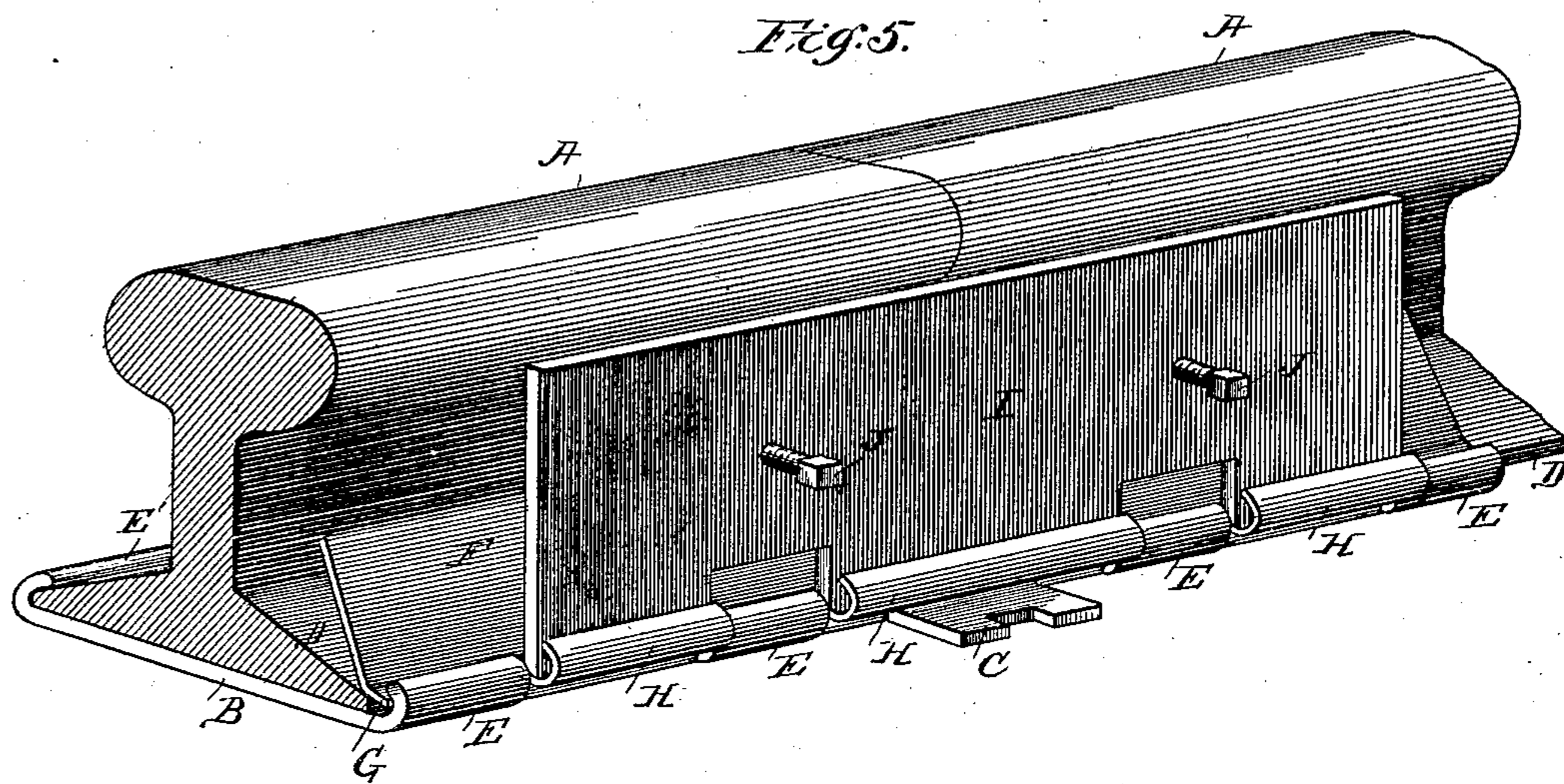
(No Model.)

2 Sheets—Sheet 2.

M. C. NILES.
RAIL JOINT.

No. 407,301.

Patented July 16, 1889.



Witnesses.

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UNITED STATES PATENT OFFICE.

MILTON C. NILES, OF CHICAGO, ILLINOIS.

RAIL-JOINT.

SPECIFICATION forming part of Letters Patent No. 407,301, dated July 16, 1889.

Application filed October 29, 1888. Serial No. 289,441. (No model.)

To all whom it may concern:

Be it known that I, MILTON C. NILES, a citizen of the United States, residing in Chicago, 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.

This invention relates to improvements in rail-joints in which the binding force of clamping-plates fulcrumed on the rail is solely depended on for gripping and joining the opposing ends of adjacent rails, in place of the old form of fish-plates, which were secured to the rails by bolts passing through both the plate and rails, but is especially designed as an improvement upon the invention set forth in United States Letters Patent No. 387,314, granted me on or about August 7, A. D. 1888. In that patent the clamping-plates were connected with the chair or base-plate by hinge-like joints on their outer edges, near which they were also fulcrumed upon the flange of the rails, the inner ends thereof being depressed by bolts passing through the rails and bearing upon but not otherwise engaging the plates, thereby causing these plates at their fulcruming-point to exert a gripping force upon the rails, effectually joining them together against lateral or vertical displacement.

The prime object of this invention is to dispense with the employment of bolts passing through the rail, and at the same time obtain a gripping force upon the rails through the medium of clamping-plates fulcrumed thereon.

Another object of my invention is to directly support the top or oval part of the opposing ends of the rails against lateral movement relative to each other, when a lateral pressure—such as that exerted by the flange of the car-wheels—is brought to bear upon the rails, thereby relieving the rails of torsional strain and at the same time furnish a means for depressing the clamping-plates of the joint, so as to firmly grip the same without employment of bolts passing through or otherwise engaging the rails.

A further object is to have a joint of such a character that the presence of a weight or any cause tending to jar or separate the parts—such as the passing train—serves to materially

increase the gripping or binding force of the joint.

A still further object is to have the devices for operating the clamping-plates of such a character and so arranged that the force exerted by the elasticity of these plates is transmitted to every member of the joint.

These objects are attained by the devices illustrated in the accompanying drawings, in which—

Figure 1 represents a side elevation of a rail-joint embodying my invention; Fig. 2, a plan view thereof; Fig. 3, a transverse section on the line 3 3 of Fig. 2; Fig. 4, a detail perspective view of the base-plate of the chair of the joint; Fig. 5, a perspective view of the joint with the parts thrown back out of the operative position; Fig. 6, a central vertical section through the joint, taken on the line 6 6 of Fig. 2; Fig. 7, a detail perspective view of the clamping-plate; and Fig. 8, a transverse vertical section similar to Fig. 3, showing a modified form of construction.

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 base-plate or chair provided with lateral flanges C for convenience of attachment to the cross-ties to prevent “creeping” of the joint and having its side edges beyond the flange D of the rail upturned at intervals along one side, but continuously along the opposite side, forming overhanging hooks E E', respectively, under the latter of which is inserted the edge of the rail-flange, thereby preventing a lateral movement of the chair, except such slight movement as occurs in tightening up the joint, as hereinafter described. Upon the opposite side of the rail is located a clamping-plate F, fulcruming on the flange of the rail, near the outer edge thereof, and provided along its lower edge at intervals with lips G, corresponding in number and location with the hooks E upon the chair, projecting under and engaging these hooks, so as to poise the plate upon its fulcruming-point. This plate is also provided along its lower edge with a series of upturned hooks H, projecting between and beyond the hooks E upon the chair, into which sets the

lower edge of a brace-plate I, the upper edge of which bears in the crotch of the rail, beneath the top, at the conjunction thereof with the web of the rail, and thus acts as a direct
 5 brace for the top of the rail against any pressure, such as that exerted by the car-wheel flange, tending to spread the rails—that is, to move or twist them laterally. Through this plate at intervals screw bolts J, the ends
 10 of which bear upon the clamping-plate F, near the upper edge thereof, so as to depress the same, causing the plate to swing upon its fulcrum on the rail and thereby effectually bind all the parts of the joint together. It
 15 will be observed that the gripping force exerted upon this clamping-plate is in effect equalized—that is to say, equally distributed between all the parts thereof—for when first depressed and brought into action it has a
 20 tendency to cause the chair to move laterally until the continuous hooks E on the inside edge thereof bear against the flange of the rail, thereby preventing a further movement of the chair, after which the chair itself is held tightly in place against the under
 25 side of the rail by the elastic force of the clamping-plate, produced by a further depression of the end of the inner free edge thereof, until sufficient tension is obtained to effectually bind or join the rails together;
 30 and simultaneously with this action the hooks on the clamping-plate, being independent of the lips thereof, force the brace-plate I tightly up against the rail with increasing power as
 35 the clamping-plate is actuated, thus equalizing the strain upon all the parts of the joint, each and every one of which is dependent for its gripping force upon the force exerted by the fulcrumed clamping-plate. By means of
 40 these devices I am enabled to dispense with the employment of bolts passing through or in any manner engaging the rails, in addition to which the bolts employed for actuating the clamping-plates are under such powerful
 45 pressure at all times, when in their operative position, as to be effectually locked against accidental displacement or jarring out of place from the effects of passing trains; and in addition thereto it will be observed
 50 that whenever the joint is subjected to the weight of a passing train the tendency of such weight is to cause the parts of the joint to bind all the tighter on the rail, increasing in force in proportion to the force to which
 55 they are subjected.

It will of course be understood that the brace-plate lies upon the outside of the rails, both for convenience of manipulation and particularly for the purpose of acting as a
 60 direct support for the opposing ends of the rails against the lateral movement relative to each other due to the pressure exerted by the flanges of the car-wheels, which of course always come upon the inside of the rails, which
 65 pressure, as is well known in practice, frequently results in great loss of life, and the support furnished to the top of the rail by

this plate is of especial importance in that it frequently opposes the twisting or torsion of the rails due to such lateral strain, thereby
 70 materially relieving the joint, as a whole, of this peculiar and detrimental strain, which is frequently the direct cause of the derailment of the cars where the rails are supported at their flanges only.

In Fig. 8 I have shown a modified construction, in which a second brace-plate K is employed upon the inside of the rail opposing the brace-plate I, and confined between the under side of the top of the rail and the up-
 80 turned edge or hook E on the base-plate, which plate may be employed for further equalizing the pressure of the joint as a whole, but is not essential to the perfect operation of the device, being merely employed
 85 for greater rigidity of the joint by having the tops of the rails confined between the opposing pressure of the two base-plates.

In conclusion, I would state that in the operation of inserting the brace-plate I and
 90 clamping-plate in their operative positions, at which time the chair is beneath the joint in the rail, the said plates are laid against and substantially parallel with each other, in order that the upper end of the brace-plate
 95 may be freely inserted under the top of the rail, which would otherwise be an extremely difficult operation.

Having described my invention, what I claim, and desire to secure by Letters Patent, 100 is—

1. In a rail-joint, the rails, the chair, and a clamping-plate connected with said chair at the side edge thereof and fulcrumed upon the rail-flange, in combination with the brace-
 105 plate confined between said clamping-plate and the under side of the rail-top, and means for operating said plate, substantially as described.

2. In a rail-joint, the rails, the chair, and a
 110 clamping-plate connected with said chair at the side edge thereof and fulcrumed upon the rail-flange, in combination with the brace-plate confined between said clamping-plate and the under side of the rail-top, and bolts
 115 working through said brace-plate for bearing upon and depressing the inner free edge of said clamping-plate, substantially as described.

3. In a rail-joint, the rails, the chair provided with upturned side edges, constituting
 120 hooks, under one of which one edge of the rail-flange is inserted, in combination with a clamping-plate fulcrumed on the rails, the outer edge of which engages the other up-
 125 turned edge of the chair, and means for operating said clamping-plate, whereby, when the inner free end thereof is depressed, the hook of the chair on the opposite side of the rail will be caused to bind tightly against the
 130 flange thereof, substantially as described.

4. In a rail-joint, the chair, the upturned side edges thereof, under which the flange of the rail is inserted, a clamping-plate fulcrum-

ing upon the rail-flange at the opposite side, and a connection between said plate and the chair, in combination with the brace-plate confined between the outer edge of said clamping-plate and the under side of the rail-top, and bolts working through said brace-plate for depressing the inner free edge of the clamping-plate, substantially as described.

5
10 5. In a rail-joint, the rail, the chair upturned along one side edge, under which the flange of the rail is inserted, and a series of hooks on the opposite side edge thereof, in combination with a clamping-plate fulcrumed upon

the flange of the rail, the outer edge of which engages the hooks on the chair, and a series 15 of upturned portions alternating with the hooks on the chair, a brace-plate confined between said upturned portions and the under side of the rail-flange, and bolts working through said brace-plate bearing upon and 20 depressing the inner free end of the clamping-plate, substantially as described.

MILTON C. NILES.

Witnesses:

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A. M. BENNETT.