

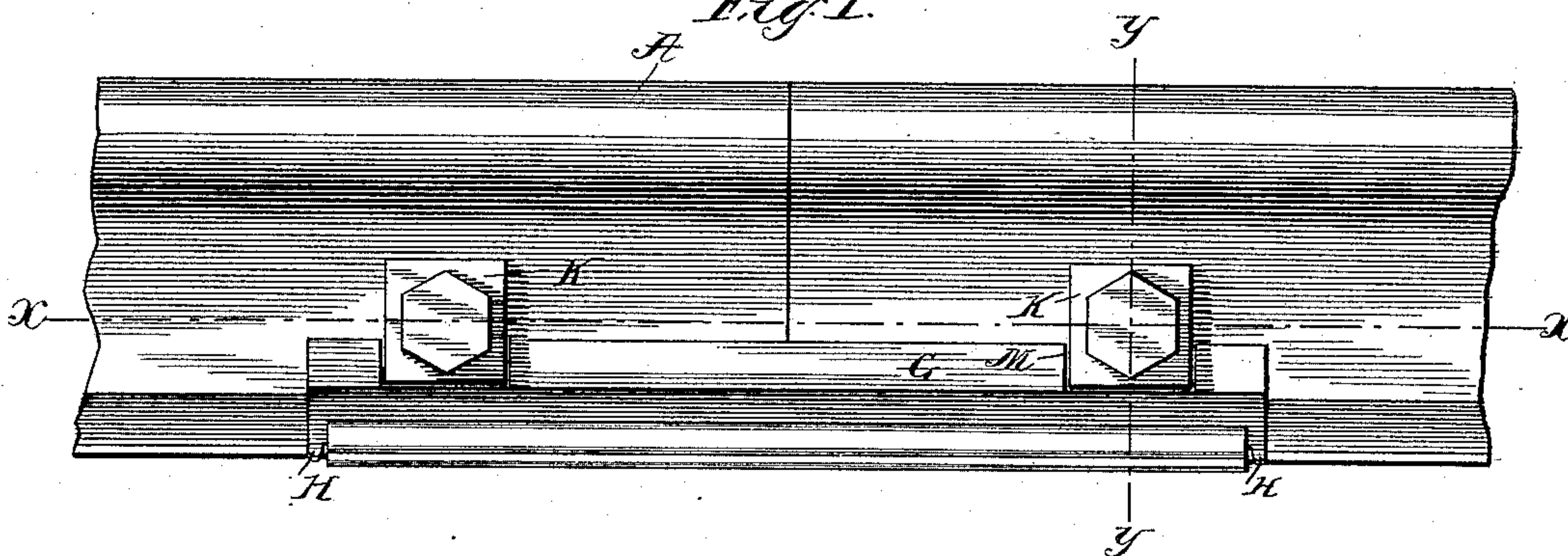
M. C. NILES.

RAIL JOINT.

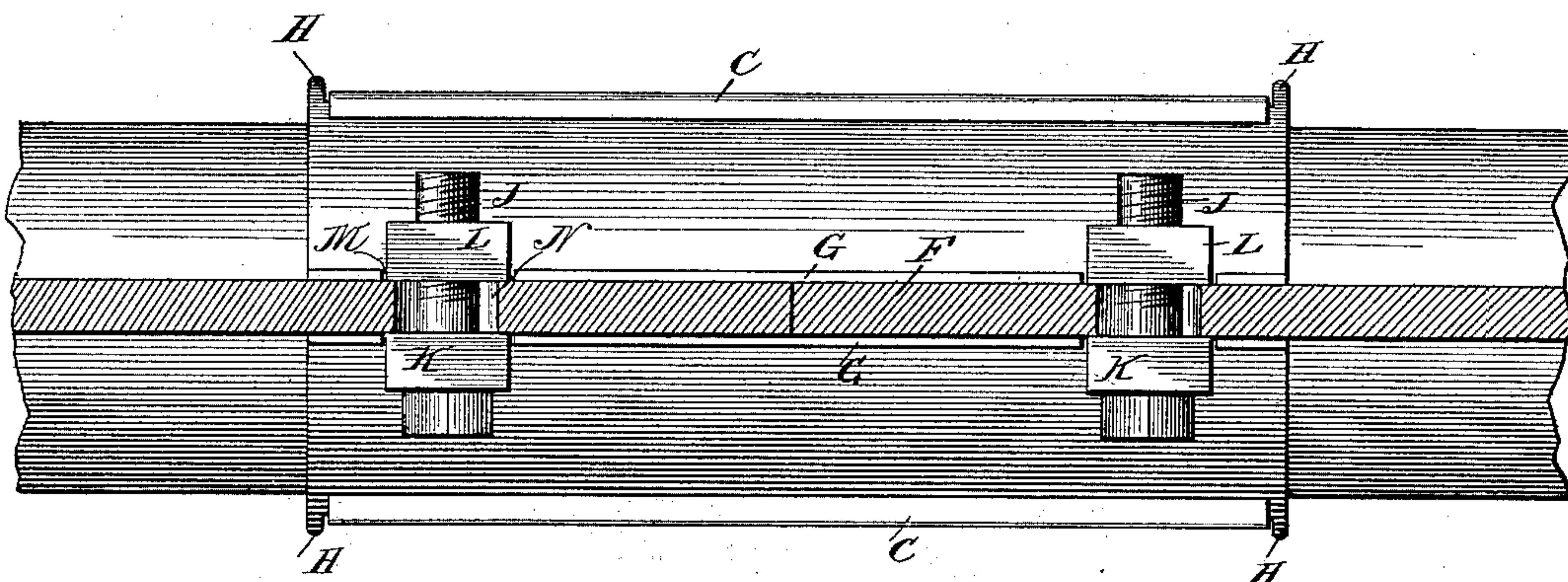
No. 387,314.

Patented Aug. 7, 1888.

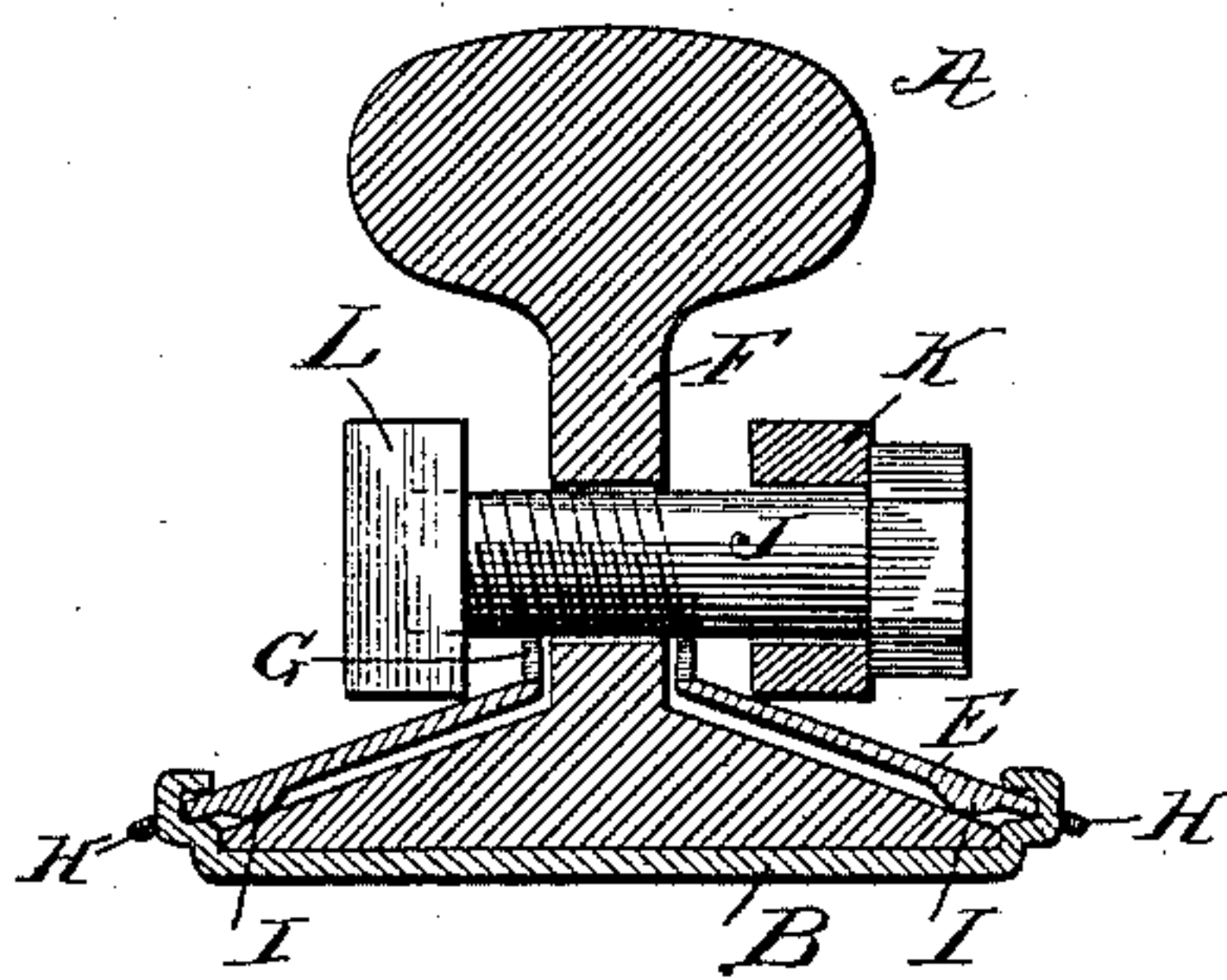
*Fig. 1.*



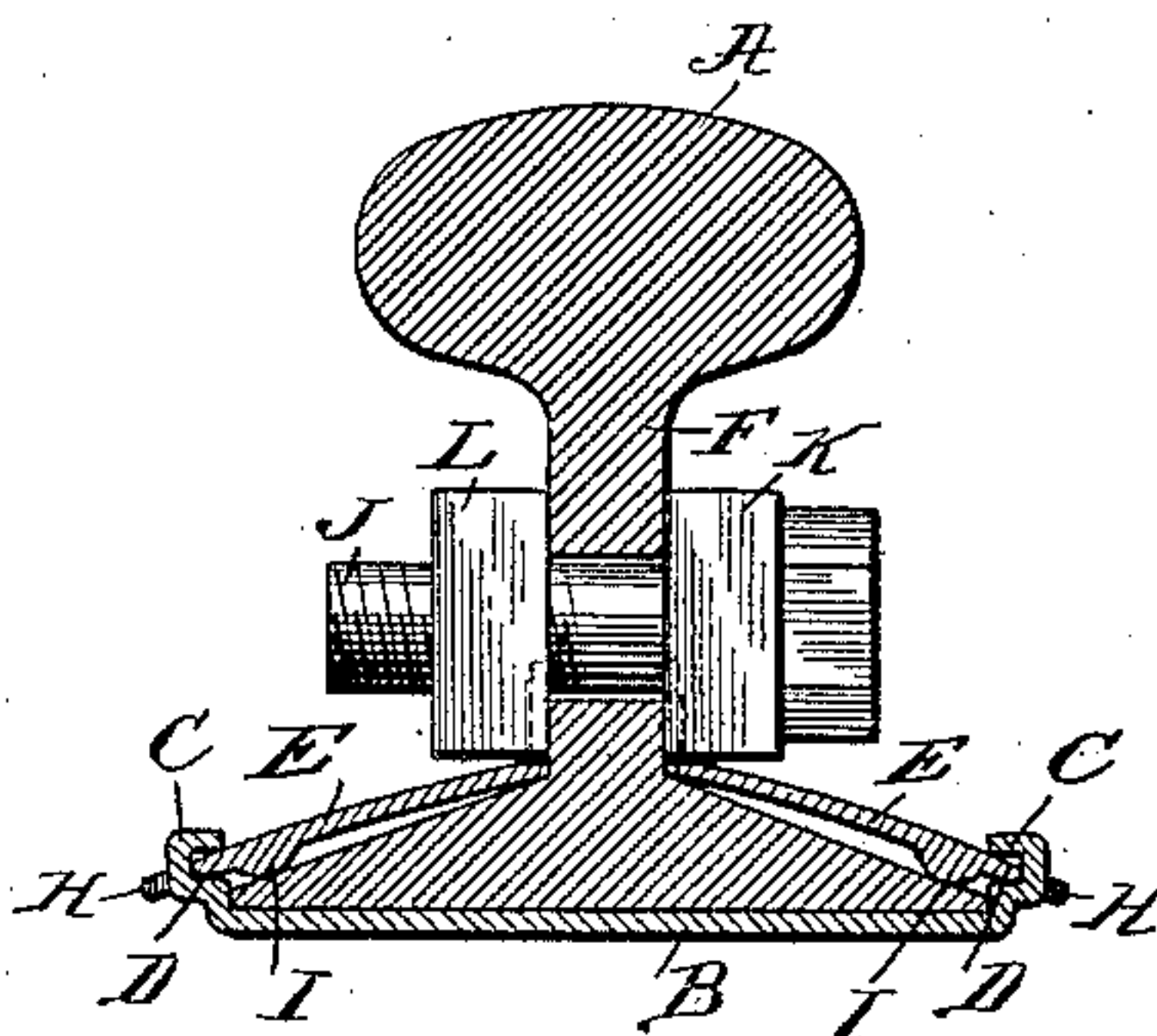
*Fig. 2.*



*Fig. 3.*



*Fig. 4.*



Witnesses.

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Fig. 5.

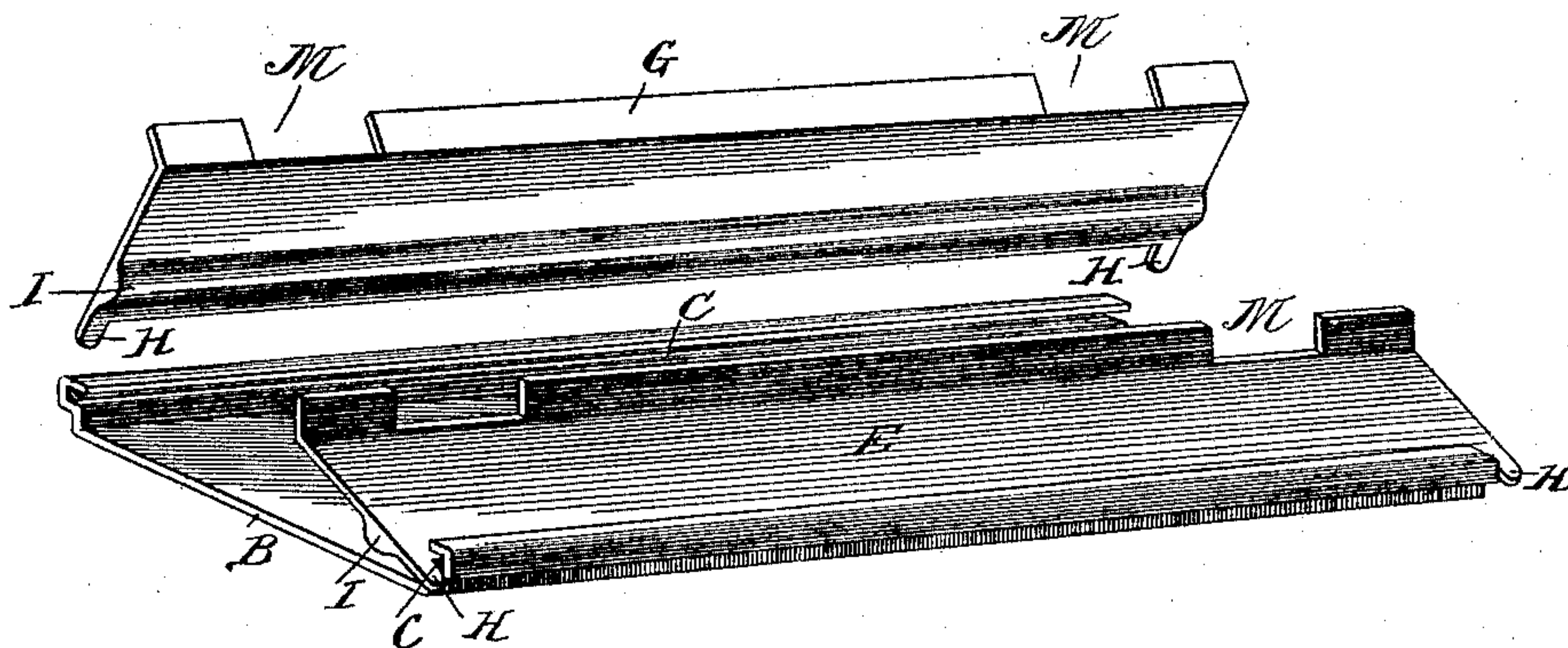


Fig. 6.

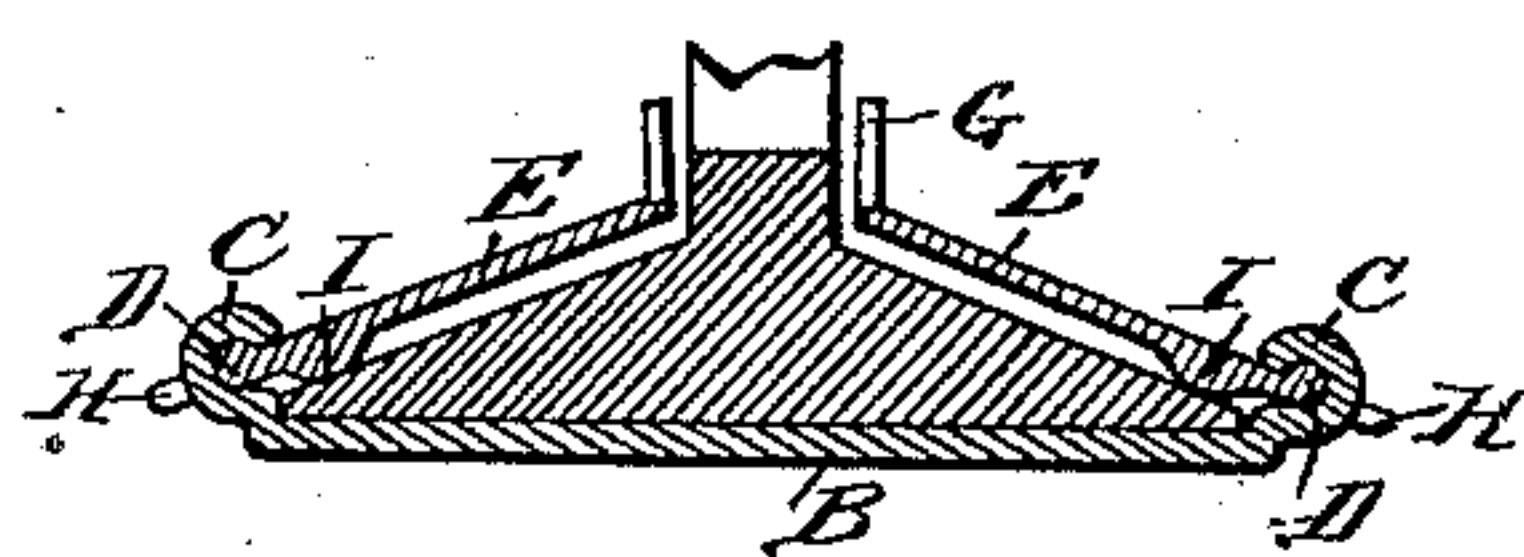


Fig. 7.

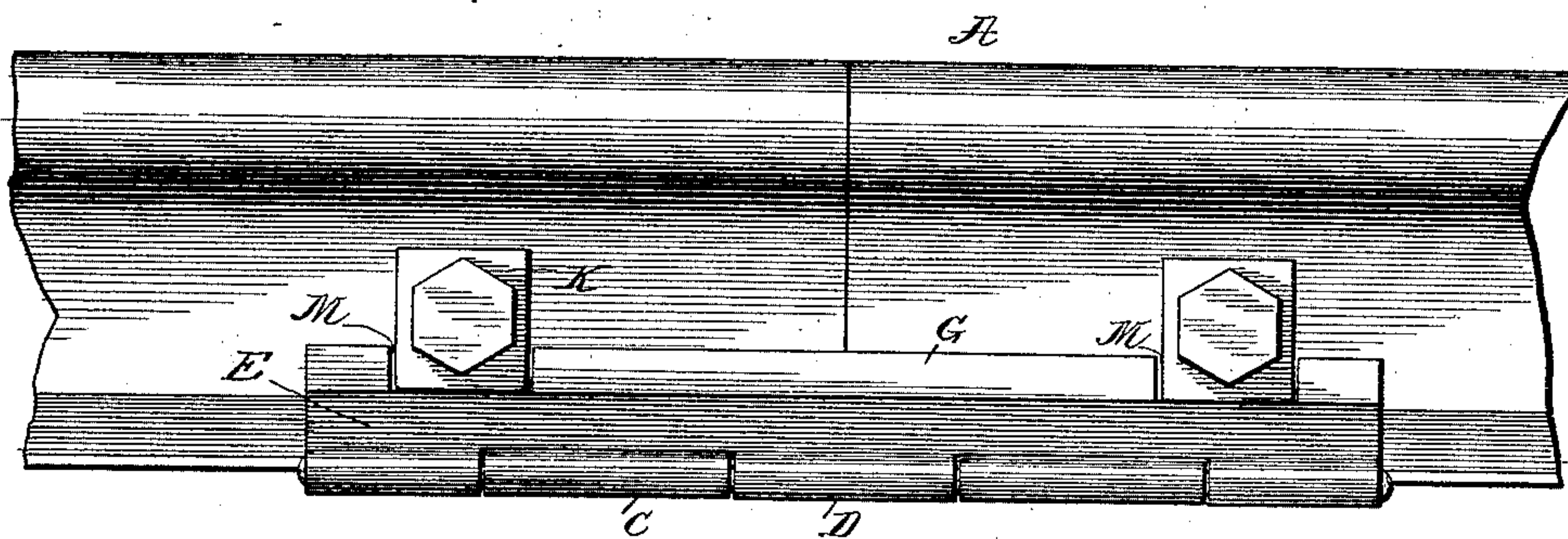


Fig. 9.

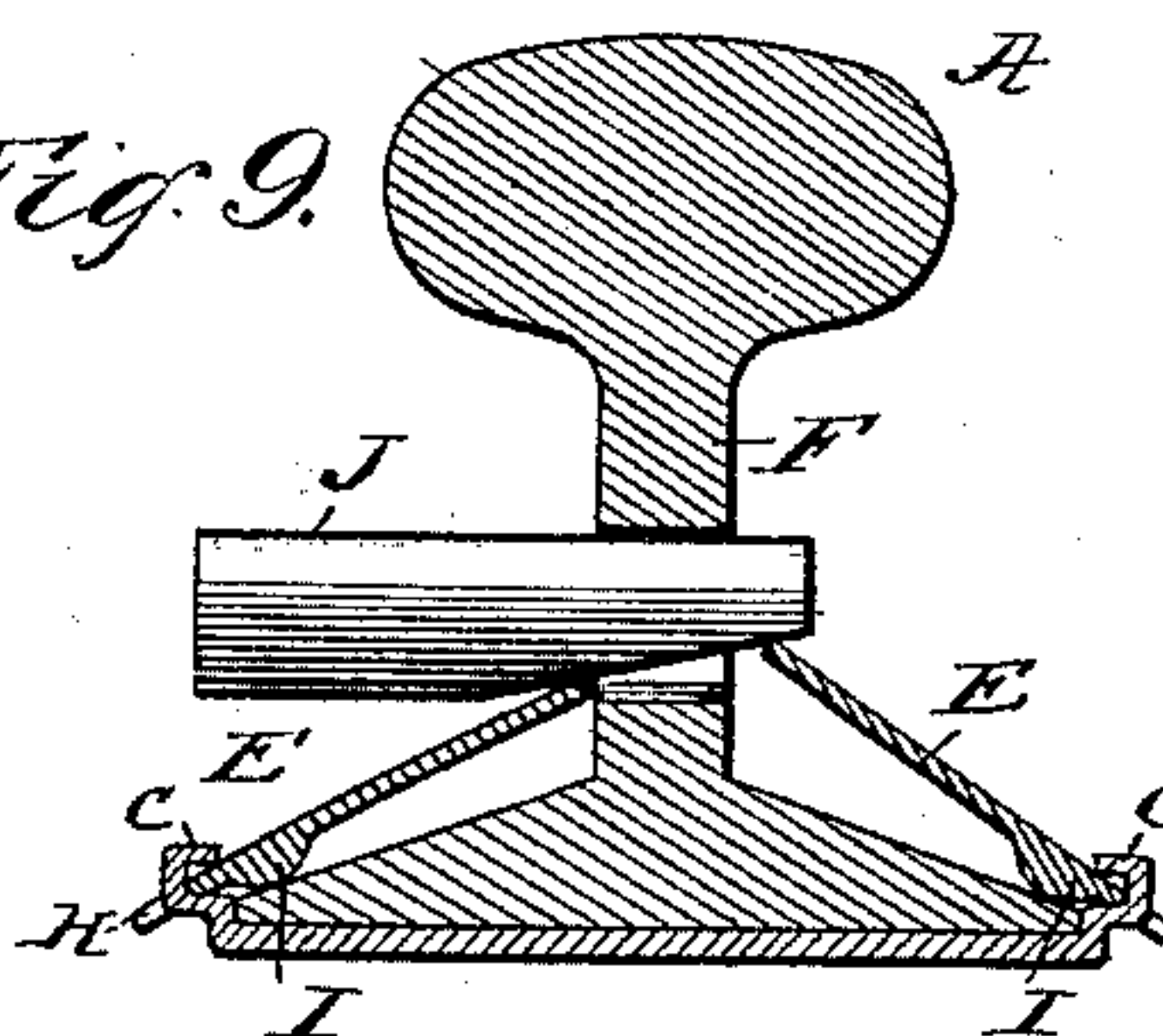


Fig. 8.

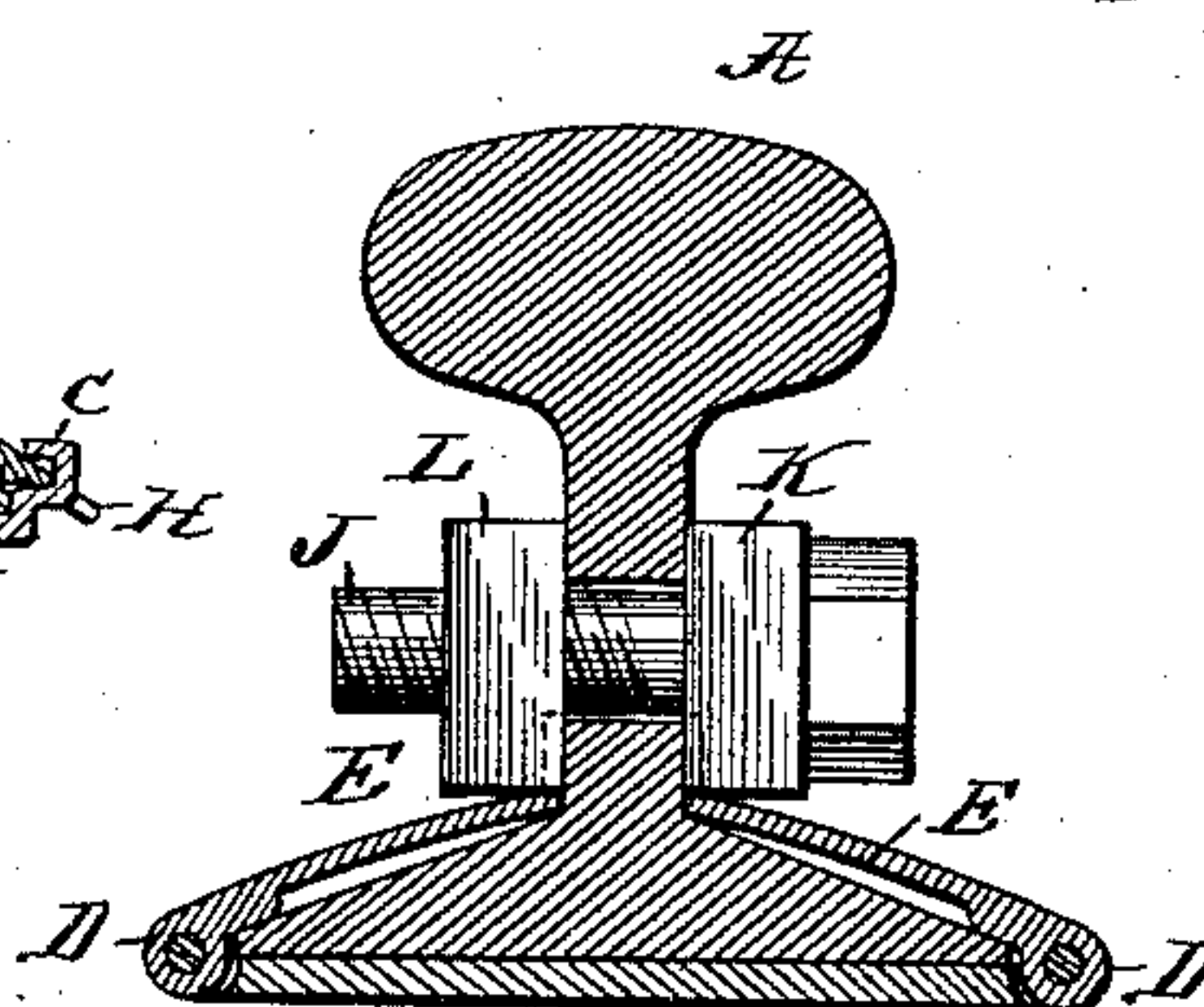
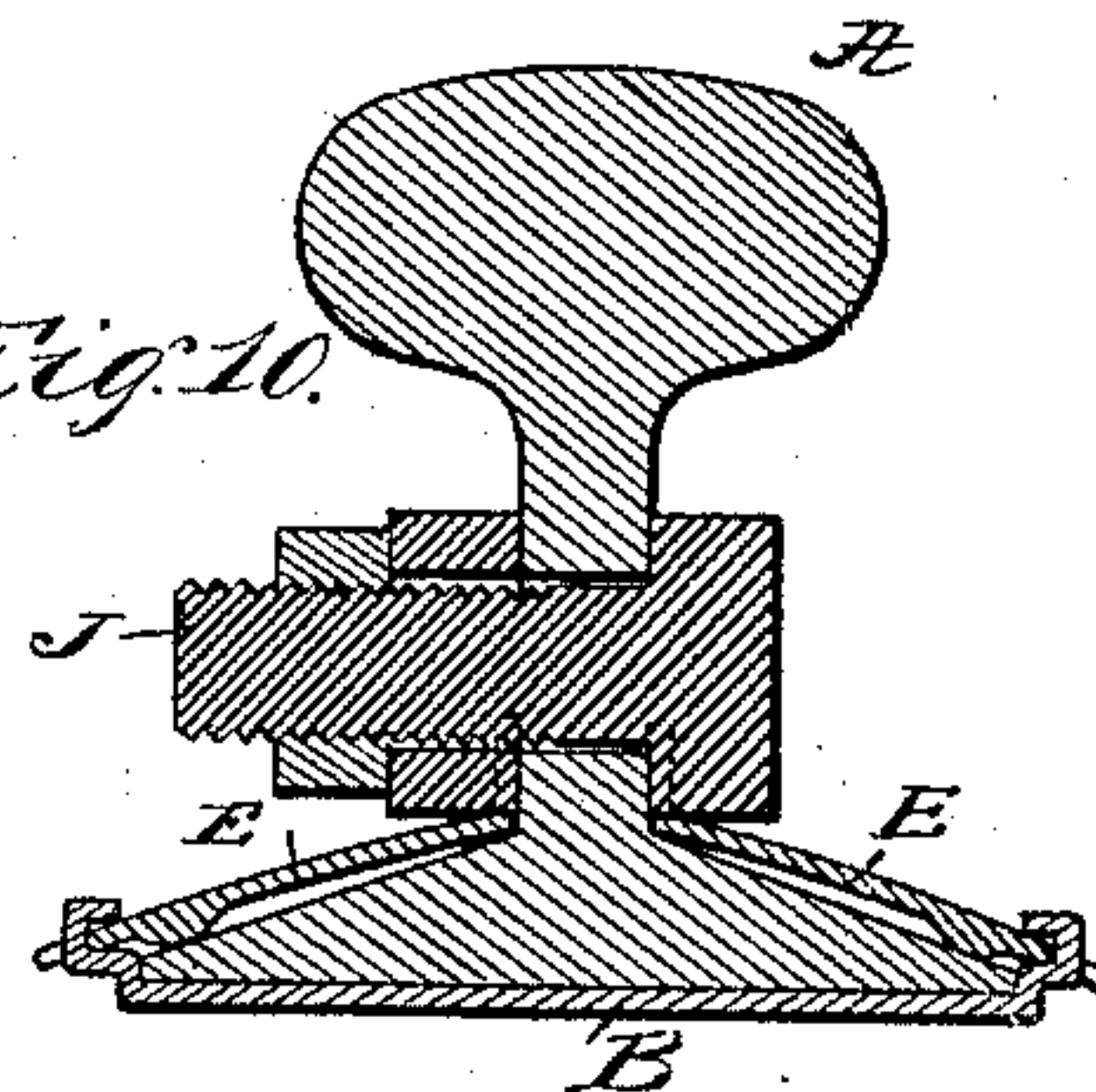


Fig. 10.



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# UNITED STATES PATENT OFFICE.

MILTON C. NILES, OF CHICAGO, ILLINOIS.

## RAIL-JOINT.

SPECIFICATION forming part of Letters Patent No. 387,314, dated August 7, 1888.

Application filed December 12, 1887. Serial No. 257,570. (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, 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 meeting ends of rails are supported upon a base-plate, the base-plate having heretofore been provided with clamping-plates, either fastened thereto or to the rails for completing the joint.

The prime object of this invention is to have clamping-plates of such a character that they may be held firmly in position, and thereby complete the rigid joint between the rails without being bolted to or otherwise directly attached either to the rails or base-plate.

Another object is to have the clamping-plates of such a character that they may be held in position and firmly clamp the rails by means of bolts passing through the rails only, the nuts and washers of which bear upon but do not otherwise engage said plates.

A further object is to have a detachable connection between the base-plate and the clamping-plates, whereby, when the bolts are loosened up, the latter may be disconnected from the base-plate without disturbing said plate, and a joint may be more quickly and readily effected than by the prior devices in which a rigid connection exists between the base and clamping plates.

A further object is to pass the bolts through the rails at such a point that the nuts and washers thereof will engage and be prevented from rotating by the clamping-plates, whereby, when the bolt is operated, the clamping-plates will impinge against and firmly clamp the rail, thereby dispensing with the necessity of bolts passing through the plates.

A still further object is to so construct the clamping-plates that not only will they be prevented from shifting upon the base-plate but both the clamping and the base plates will be prevented from "creeping" upon the rail without interfering with the longitudinal expansion and contraction of the rail; and, finally, to so construct and dispose of the several parts of my rail-joint that the tightening of the bolts for securing the clamping-plates

will cause the nuts thereof to be automatically locked, which lock, however, may be readily released without violence or injury to the parts.

I attain these objects 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 horizontal section thereof on the line *x x*, Fig. 1; Fig. 3, a transverse vertical section on the line *y y*, Fig. 1, showing the parts in position for fastening before the bolt is screwed up; Fig. 4, a similar view showing the bolt screwed up and all the parts in their operative position; Fig. 5, a detail perspective showing the base-plate and clamping-plate ready to be put together; Fig. 6, a detail sectional view showing a modified form of connection between the base and clamping plates; Figs. 7 and 8, respectively, a side elevation and transverse section of a joint, showing another modified form of connection between the base and clamping plates; Figs. 9 and 10, a detail sectional view showing modifications of the devices used for securing the clamping plates to the rails.

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

Referring by letter to the accompanying drawings, A represents the rails, and B a base-plate upon which the rails rest, the ends thereof meeting about the center of length of said plate, which latter is of a slightly-greater width than the flange of the rails. That portion of the base-plate projecting beyond the flange of the rail upon each side is turned up at substantially a right angle and has formed on the inner faces thereof—that is to say, the faces next the flange—longitudinal groove C, extending longitudinally of said plate, into which fit the side edges, D, of clamping-plates E, which latter lie in a plane substantially parallel with the upper or inclined surface of the rail-flange. These clamping-plates are of a width about equal to the width of the rail-flange upon each side of the web F, the inner side edges, G, being turned up at nearly a right angle, so as to lie parallel with and against the sides of the web when the plates are secured in their operative position. These upturned edges of the clamping-plates serve to effectually prevent a lateral shifting of



either the said plates or of the base plate, while projecting lugs H, formed at the ends of the outer side edges of said clamping-plate, prevent a longitudinal shifting of said plates relative to the base-plate, and at the same time, in conjunction with the said upturned edges, serve to prevent a creeping of the joint as a whole upon the rails, as will hereinafter be more fully described.

Along the under side of the clamping-plates, near the outer side edge thereof—that is, the edge next the bed-plate—is formed a longitudinal rib, I, preferably extending the entire length of the plate, which, when the side edge of the plate is inserted in the groove of the base-plate, bears upon the upper surface of the rail-flange and thereby prevents the main body of said plate toward the inside edge from resting upon said flange unless forcibly depressed, as clearly shown in Fig. 3, the free end of said plate, however, being held suspended and clear of the flange. In order to secure these clamping-plates firmly in position, I have provided the bolts J, passing through the web of the rail just above the flange thereof, between the head of which and the web on one side of the rail is confined a loose square or rectangular washer, K, and upon the end of the bolt, upon the opposite side of the web, is screwed a nut, L, for securing the bolt in position. Both the nut and the washer are enough larger than the head of the bolt to insure the free rotation of the bolt without the latter coming in contact with the top of the clamping-plate, upon which rests a flat side of said nut and washer, and in consequence of which they are prevented from rotating when the bolt is screwed up. This nut and washer are so disposed that they engage the free ends of the clamping-plates before the bolt is screwed up; and hence, when the latter is manipulated, the nut and washer, being prevented from rotation, will be forced toward each other, riding down the free ends of said plates and thereby forcing the plates toward the rail-flange until the nut and washer are tight against the side of the web, as shown in Fig. 4.

From the foregoing it will readily be seen that with the outside edges of the clamping-plates engaging the grooves in the base-plate and the ribs I resting upon the flange of the rail when the inner free edges of the clamping-plates are depressed, the said plates will be fulcrumed upon the ribs, which latter, by reason of the rigidity of the base-plate, will firmly clasp the flange of the rails and effectively prevent the unseating or disjoining thereof.

Those portions of the upturned edge G of the clamping-plates which would oppose the nuts and washers are cut away, not alone for the purpose of permitting the nuts and washers to bear against the web but also, in conjunction with the lugs or projections upon the clamping-plates, to prevent the creeping of the joints as a whole upon the rail, which lat-

ter are left free to contract and expand by the bolts J working through slot N in the web thereof. It will also be observed that by reason of the engagement of the nuts with the clamping-plates the nut is effectually locked against accidental turning from the jar of the rail or other cause, and the bolt itself is likewise prevented from turning by the upward pressure of the clamping-plates, which cause it to bind very tightly against the upper side of the slot in the rail through which they work. The clamping-plate being composed of the stiff metal of which such devices are usually made would, when sprung down into their operative positions, exert a binding force on the bolt from which no accidental power to which they are subjected could release them.

The detachable connection between the base-plate and the clamping-plate, which may be of various other forms, one of which is illustrated in Fig. 6, is of great value both in making and separating a joint, and rendering the parts readily separable from each other without the exercise of any force whatever, and it likewise renders the substitution of a new for a broken clamping-plate especially convenient when the base-plate rests upon a tie, in which case it is only necessary to loosen up the bolt, while the base-plate remains undisturbed. Aside from these advantages, however, all the other valuable features of my invention would be included in such a hinge or flexible connection as is shown in Figs. 7 and 8, which may or may not be separable, and as this feature as far as I am now aware is novel I desire to claim, broadly, such a connection independent of any particular kind of fastening devices.

The steps to be followed in putting together the joint are important if it is desired to secure a nut-lock as hereinbefore described, for otherwise the same parts can be put together and accomplish every other object of this invention except the nut-locks, as shown in Fig. 10. For instance, in joining the parts in the preferred manner, after the clamping-plates have been connected to the base-plate the washer is slipped upon the bolt, and the latter then passed through the rail until it engages the nut, after which the bolt is rotated until the nut and washer ride down the clamping-plates and are tight against the rail-web, thus accomplishing a nut-lock, as before described; but with the form shown in Fig. 10 the operation is exactly the reverse, the bolt being first passed through the rail until the head engages the clamping-plate; then a washer is slipped on the end thereof, on the opposite side of the rail; and, finally, a nut is placed on the end of the bolt and screwed up until the bolt-head and washer bear against the web of the rail; but it is obvious that no nut-lock results from such a construction.

In conclusion, I may add that it is otherwise immaterial what particular form or arrangement of bolts and nuts is used so long as they accomplish the prime object of this invention—



namely, the depressing of the free inner edges of the clamping-plates without passing there-through, so that the fulcrumed part of said plates will firmly bind against the rail-flange; and hence such a device as shown in Fig. 9 is clearly within my invention, although no nuts or washers are employed, the bolts being driven through the rails so as to ride down the clamping-plates, and the bolts are afterward secured in position by riveting, splitting, or any other convenient manner. It is equally immaterial whether the inner edges of the clamping-plates come in contact with the rail when depressed, for such contact is not depended upon to secure the said plates upon the rail, main dependence being placed upon the grip the fulcrumed parts of said plates have upon the rails as a consequence of the immense leverage gained by the construction hereinbefore described, whether the fulcrum is formed upon the clamping-plates, as shown, or by separate strips laid upon the rails, or by ribs formed upon the rails themselves.

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

1. In a rail-joint, the base-plate and the clamping-plates connected thereto, in combination with bolts passing through the rail bearing upon but not otherwise engaging said clamping plates, whereby they are held rigidly in position, substantially as described.

2. In a rail-joint, the rails, the base-plate, the clamping-plates, and a connection between said base and clamping plates, in combination with bolts working through the web of the rail, and nuts upon one side and washers upon the opposite side of the rails engaged by said bolts, said nuts and washers bearing upon and prevented from rotating by the clamping-plates, substantially as described.

3. In a rail-joint, the rail and the base-plate, in combination with clamping-plates, a hinge-like connection between said clamping and base plates, said clamping-plates being fulcrumed on the rail-flange and adapted to clamp the rail when the inner edges are forced downwardly, substantially as described.

4. In a rail-joint, the rail, the base-plate, the clamping-plates, and a hinge-like connection between said clamping and base plates, said clamping-plates being fulcrumed upon the rail-flange, in combination with screw-bolts passing through the rail-web, and non-rotatable

ble nuts and washers on said bolts, actuated thereby to depress the inner side edges of said plates, substantially as described.

5. In a rail-joint, the rails, the base-plate, the clamping-plates, and a connection between the outside edges of said clamping and base plates, in combination with ribs on the under side of said clamping-plates near the outer edges thereof, and means for depressing the inner free side edges of said plates, substantially as described.

6. In a rail-joint, the rails, the base-plate, clamping-plates, and a connection between the outside edges of said clamping and base plates, in combination with ribs on the under side of said clamping-plates near the outer edges thereof, and bolts passing through the rail engaging and depressing the inner free side edges of said plates, substantially as described.

7. In a rail-joint, the rails, the base-plate, clamping-plates, and a connection between the outside edges of said clamping and base plates, in combination with ribs on the under side of said clamping-plates near the outer edges thereof, bolts passing through the rails, and nuts and washers upon said bolts engaging and prevented from rotating by the clamping-plates, substantially as described.

8. In a rail-joint, the rails, the base-plate, clamping-plates, and a connection between the outside edges of said clamping and base plates, in combination with ribs on the under side of said clamping-plates near the outer edges thereof, bolts passing through the rails, and nuts and washers upon said bolts upon each side of the rail engaging and depressing the free side edge of said clamping-plates when the bolt is screwed up, substantially as described.

9. In a rail-joint, the rails, the base-plate, clamping-plates, a detachable connection between said plates and the base-plate, and lugs or projections on one of said plates for preventing a longitudinal shifting of these plates relative to each other, in combination with bolts passing through the rails, bearing upon said clamping-plates and securing them in position, and notches or projections upon said plates engaging the bolts, substantially as described.

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