

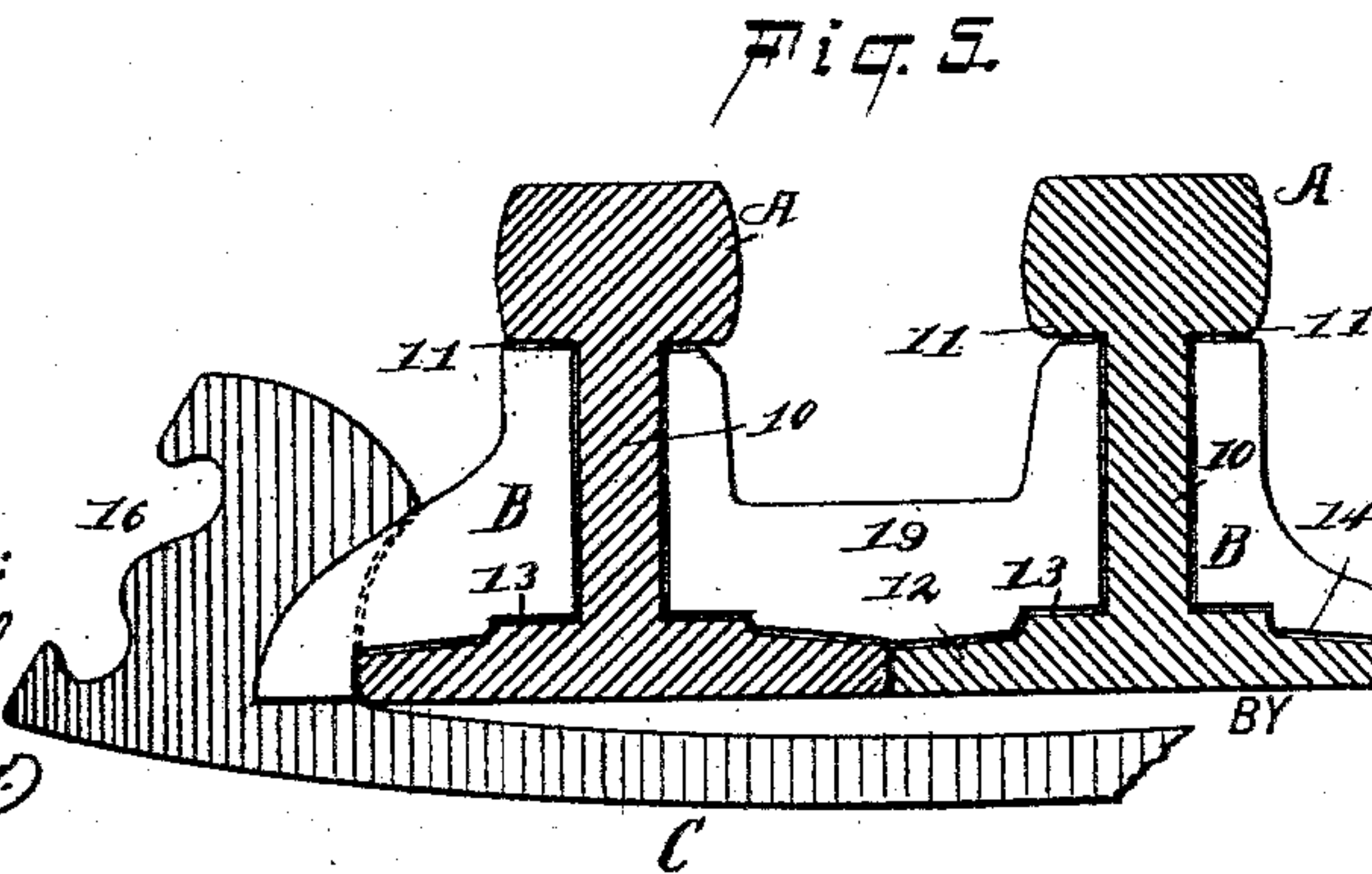
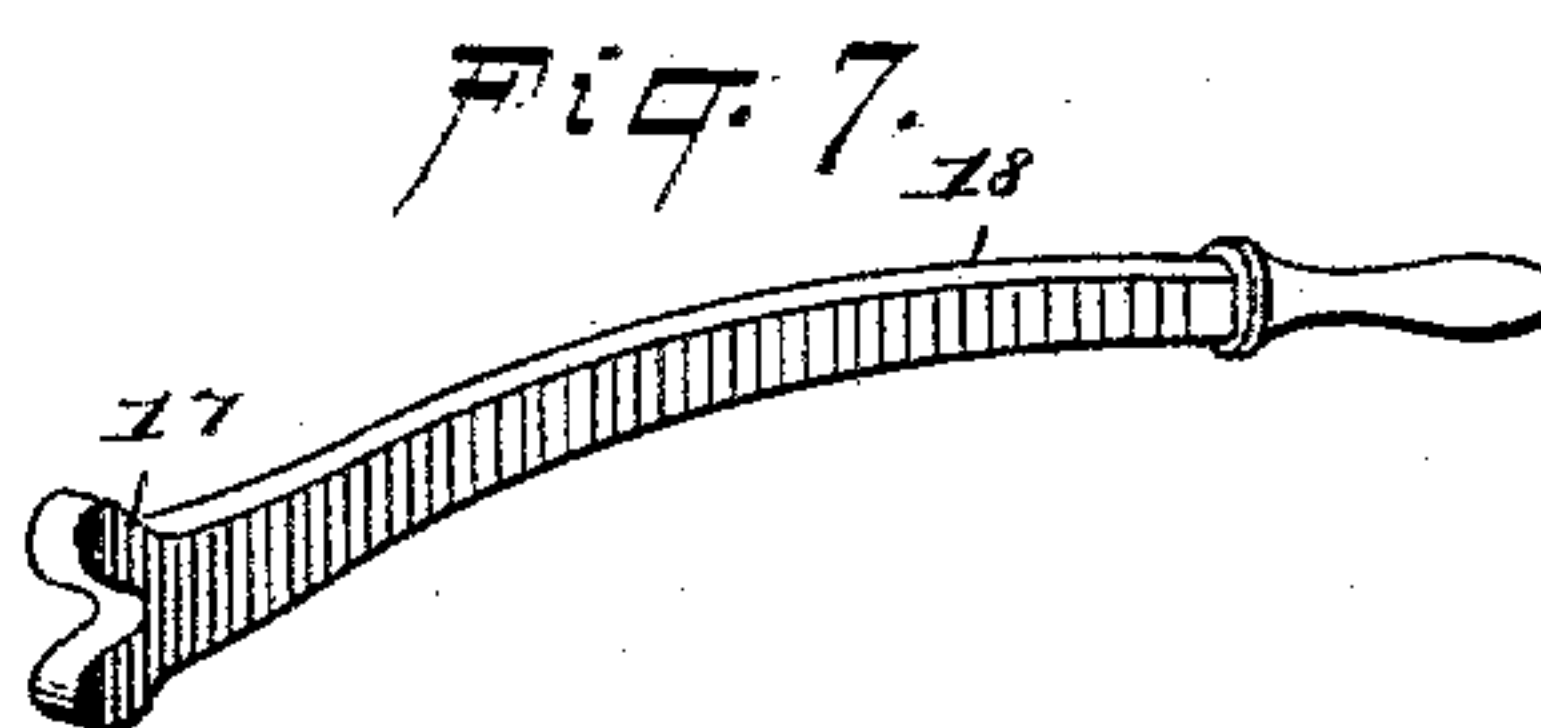
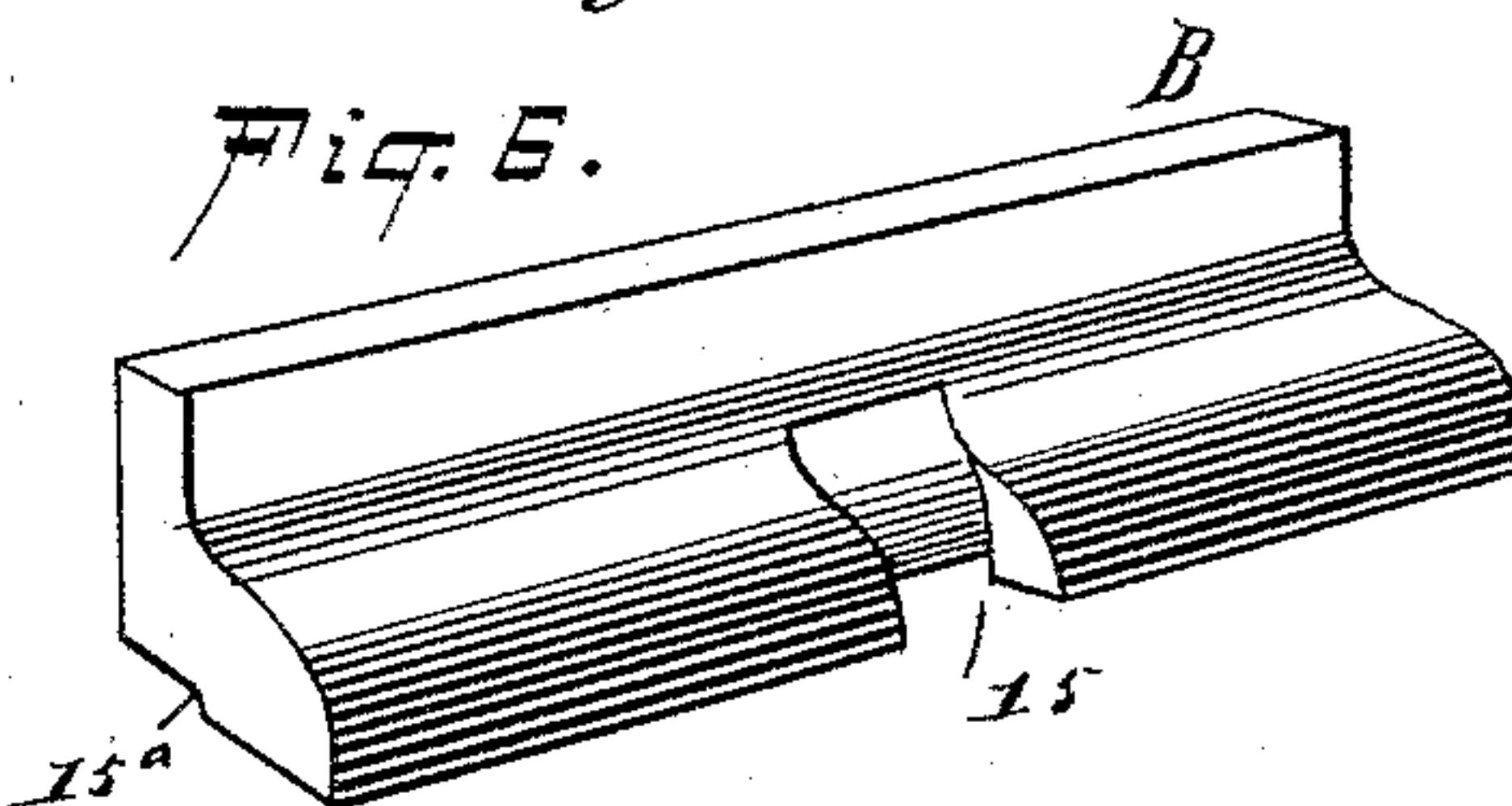
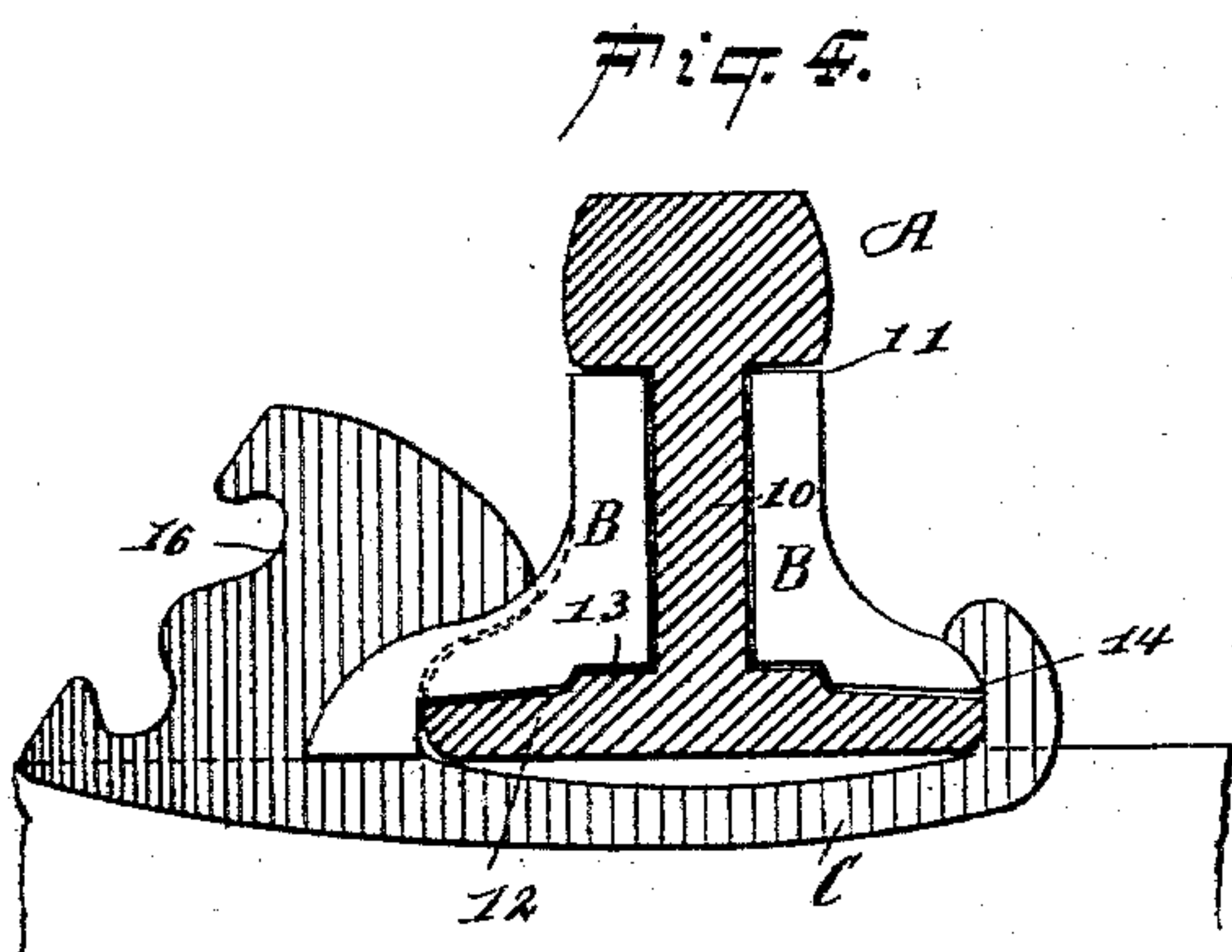
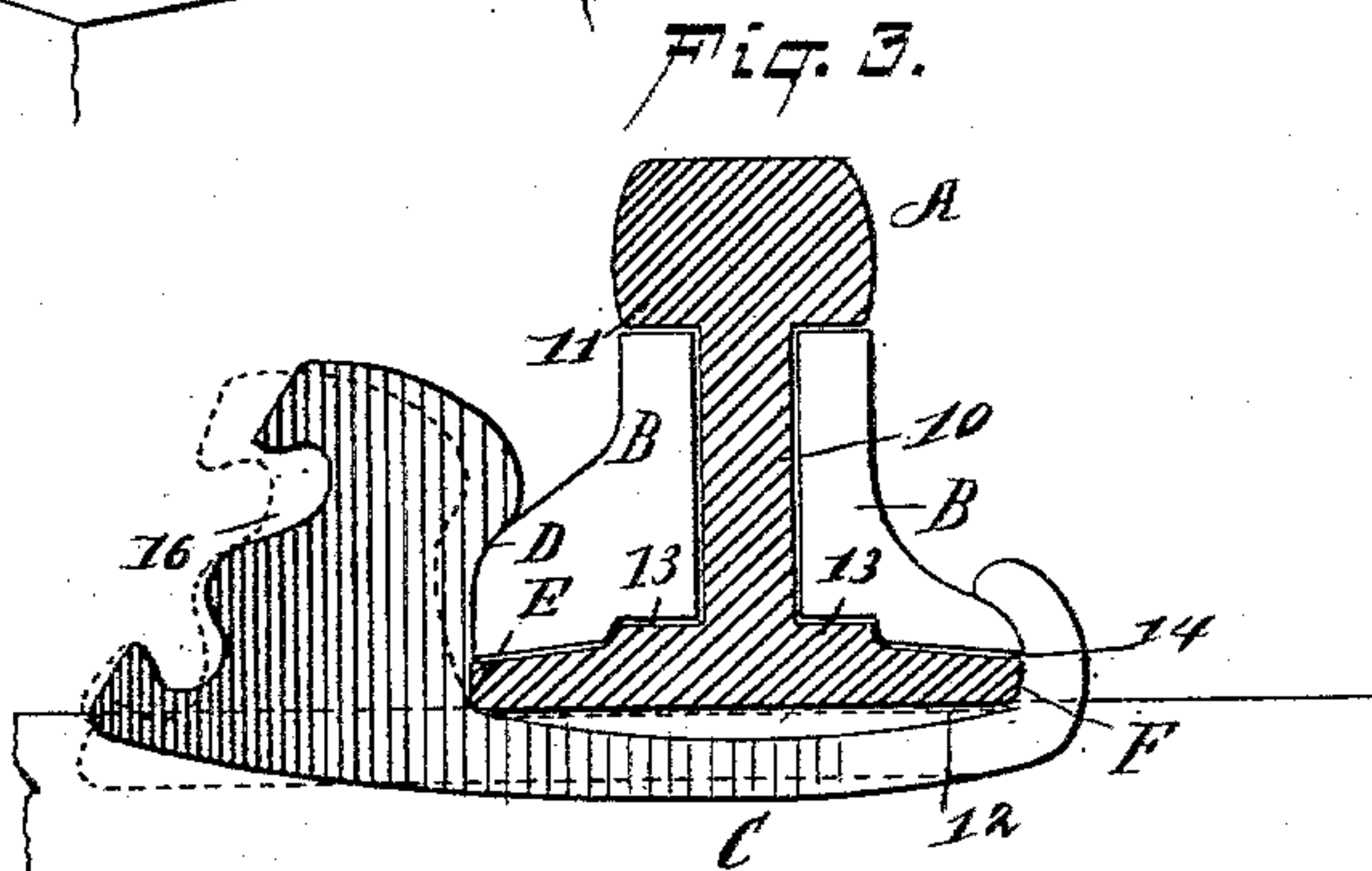
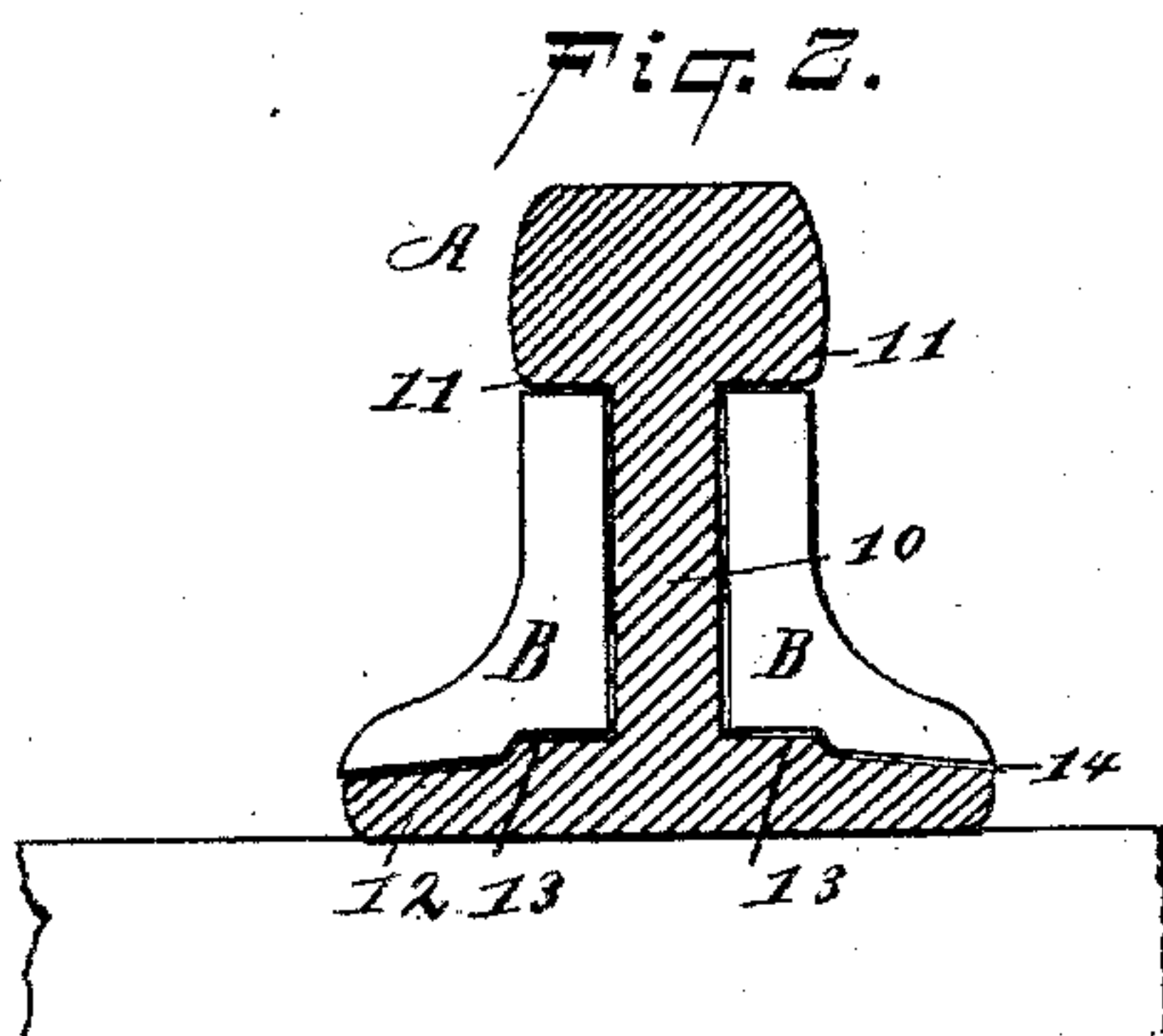
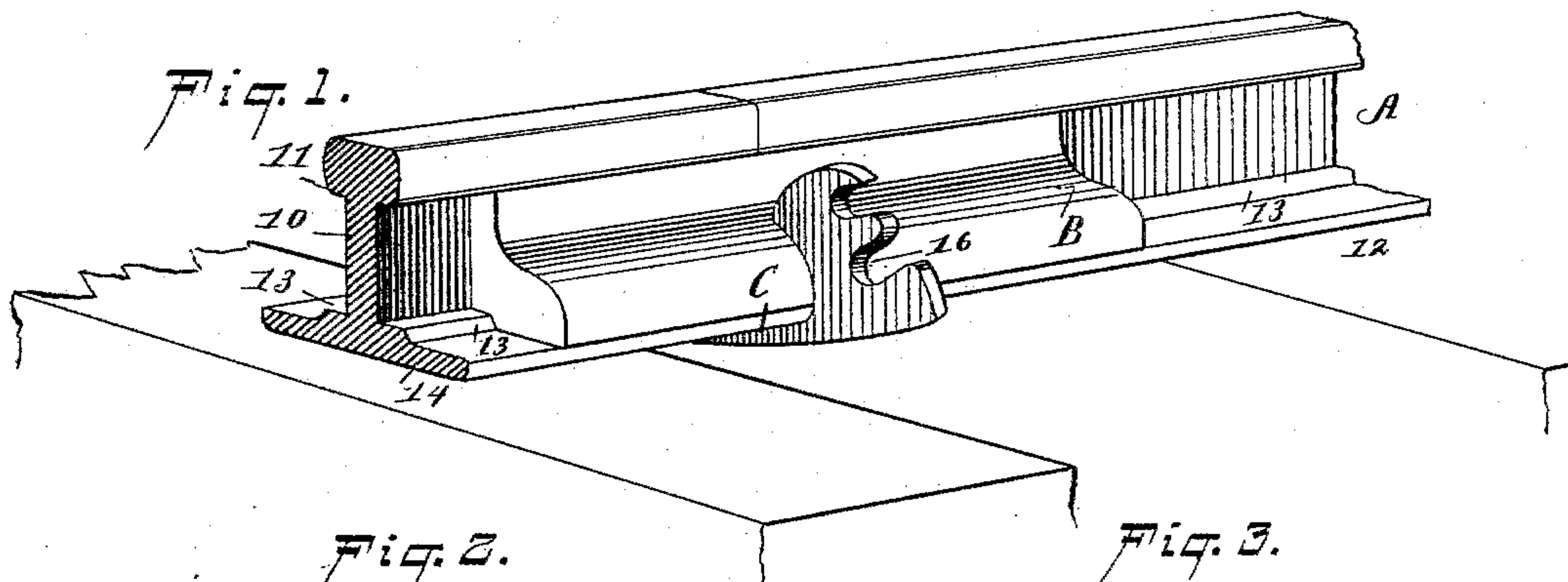
(No Model.)

J. JOHNSTON.

FISH PLATE AND MEANS FOR HOLDING SAME.

No. 589,729.

Patented Sept. 7, 1897.



WITNESSES:

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JAMES JOHNSTON, OF BRADFORD, PENNSYLVANIA.

FISH-PLATE AND MEANS FOR HOLDING SAME.

SPECIFICATION forming part of Letters Patent No. 589,729, dated September 7, 1897.

Application filed December 10, 1894. Serial No. 531,377. (No model.)

To all whom it may concern

Be it known that I, JAMES JOHNSTON, of Bradford, in the county of McKean and State of Pennsylvania, have invented a new and
5 useful Improvement in Fish-Plates and Means for Holding the Same, of which the following is a full, clear, and exact description.

My invention relates to an improvement in railway-rails, fish-plates, and means for hold-
10 ing the same to the rails; and the prime object of this invention is to provide a fish-plate and means for so locking the said plates in engagement with the rails that the rails need not be punctured or in any manner broken
15 at joints, since bolts or like locking devices are not employed, the locking device being a band so constructed as to clamp the fish-plates to the rails, engaging with both of the plates and extending beneath the flange of
20 the rail.

A further object of the invention is to so construct the band, tie, or clamp that it may be removed from engagement with the fish-plates through the medium of a suitable ap-
25 pliance or it may remain a fixture; and a further object of the invention is to so construct the fish-plates and ties or clamps that the rail may be rolled as readily as the rail at present in use.

30 The invention consists in the novel construction and combination of the several parts, as will be hereinafter fully set forth, and pointed out in the claims.

Reference is to be had to the accompanying
35 drawings, forming a part of this specification, in which similar figures and letters of reference indicate corresponding parts in all the views.

Figure 1 is a perspective view of connecting
40 rails tied together through the medium of the improved fish-plates and clamps. Fig. 2 is a vertical section through the rail, the said fish-plates being in end view, illustrating the concave form of the latter. Fig. 3 is a similar
45 section illustrating one fish-plate as rendered exteriorly concavo-convex and showing likewise the tie, band, or clamp in locking engagement with the rail and with the fish-plates. Fig. 4 is a similar view illustrating
50 a slight modification in the fish-plates, one of them being exteriorly concave and the other what may be termed a "buttress" pattern,

and likewise illustrating the application of the tie, band, or clamp. Fig. 5 is a vertical section through guard-rails, illustrating the
55 manner in which they are tied together and the spacing-block and fish-plates employed. Fig. 6 is a perspective view of one of the concavo-convex fish-plates; and Fig. 7 is a perspective view of the lever employed in plac-
60 ing the removable bands, ties, or clamps in position and detaching them from said position.

In carrying out the invention the rail A is provided with a straight web 10, and the head
65 is provided with an under straight surface or shoulder 11 at right angles to the web, while the flange 12 is provided upon its upper face at each side of the web with a rib 13, constituting, essentially, a step upon the upper face
70 of each side of the flange, while the upper marginal portions of the flange are straight, as shown at 14 in the drawings, and the under marginal edge, or that engaging with the sleepers, is rounded more or less inwardly.
75

The web of the rail is perfectly straight and square with the head and flange, and the head and flange are square with the web for a distance nearly equal to the thickness of the web. The fish-plates B fit closely to the web of
80 the rail and their underfaces are stepped, as shown at 15 in Fig. 6, or are correspondingly formed with the upper surfaces of the flange, having a recess to receive the ribs 13 of the latter. The fish-plates nearly or quite equal
85 the web in strength, and as their upper edges fit closely upon the shoulders 11 of the head of the rail they support the head, so that at the joint the ends of the rails have virtually three webs, two of which pass from one to the
90 other.

The toe of the fish-plate, as heretofore stated, follows the shape of the upper face of the flange of the rail and forms with it a rounded edge above the ground-level of the
95 rail. The outer face of the fish-plate will be either concaved, as shown in Fig. 2, or concavo-convex, as shown in Fig. 6, according to the means used for holding it in place. These fish-plates being made to fit snugly, it
100 is plain that to hold them in place it is only necessary to secure the points of their toes in their position in even contact with the margins of the flange of the rails. This fasten-

ing is designed to be done in either of two ways, according as it is desired to make a permanent joint or one that may be easily and quickly separated.

5 To make the joint securely and permanently, it is only necessary to pass a band, tie, or clamp C under the flange of the rail and turn up both of its ends to overlap the toes of the fish-plates, as shown at the right
10 in Figs. 3 and 4. The band may be as wide and as heavy as may be desired and is heated, hammered, and shrunk in position, and the fish-plates may be provided with recesses 15 to receive the band, if in practice it is found desirable. Under this construction a very
15 stiff and neat joint is obtained. Nothing about the joint is subject to wear and it should stand until the rails are worn out. One band should be enough at each joint, but
20 on curves or where side pressure is likely to be great two or more bands may be used. These bands are preferably located between the sleepers, or if upon a sleeper the latter
25 should be channeled to receive it. The bands bear no part of the weight of the train, but simply act to hold the fish-plates in substantially like manner as the hand holds a nail under the hammer.

These fish-plates fitting snugly and being
30 held in place, as described, it is obvious there will be no click or "churning" at the joint. The stiffness of the rail, it is conceded, depends on the stiffness—that is, the height and thickness—of its web. Therefore the ends
35 of the rails connected in this way and having virtually three webs would constitute the stiffest portion of the track. The extra stiffness not only prevents clicking or the striking of a passing wheel against the end of a
40 rail before going onto it, but allows no up-and-down play between the ends of the rails and there is nothing to loosen or wear out the bands or ties.

The rail differs in shape from that now in
45 use, but not radically, so that it presents no difficulties to the manufacturer, but may be rolled in exactly the same way, and it has this advantage that it is finished when it leaves the rolls, requiring to be straightened,
50 perhaps, but not requiring to be drilled for fish-plate bolts.

For use in a permanent joint both fish-plates are concaved—that is to say, they are exactly
55 alike. They may be rolled in long rods with a slight curve toward the flat side and cut into lengths. These must fit accurately, especially in their perpendicular measurement. The slight curve will keep the ends tight to the web of the rail and will make it necessary to
60 use a powerful clamp to put it in place to get the middle of the fish-plate bearing against the rail. If the clamp is kept on until the band is cool, the tendency of the fish-plate to bulge in the middle will serve to make and
65 keep the band C tight and will help one band to serve for one joint. The ends of the bands, especially on the outside of the rails, must be

worked up smooth against the web of the fish-plate or countersunk into it, so that they will not be sheared off by a derailed wheel.

There is no limit to the size of the bands. They must be strong enough to resist any force likely to be met with in legitimate use.

The outer surfaces of the fish-plates may be made corrugated or countersunk in the rolls. Such a construction would assist in protecting
75 a joint against being tampered with by reason of its being impossible to drive the plates lengthwise out of the grasp of the bands C.

In Figs. 4 and 5 I have illustrated what I
80 call a "buttress" fish-plate, one that is carried down over the margin of the flange of the rail and made to rest on the sleeper at all points in its length, except where the band is fitted
85 on. In order to provide a means for holding these plates so that they may be removed and replaced at will, the form of band shown in
90 Figs. 1, 3, 4, and 5 has been devised, the said band being made of a spring material. Each spring-band is made to contain an angle, represented by the letters D, E, and F. If
95 the point F be fixed, the operation of the spring is such that if it be pulled open the point D will move backward, as shown in dotted lines in Fig. 3, and at the same time
100 the portion between E and F becomes very nearly straight. When this spring is to be used, I employ with it a heavy fish-plate, one
105 made with an outer concavo-convex face, as shown in Fig. 6. Both ends of the band are made to clamp firmly a fish-plate and a margin of the rail-flange. One of the ends is simply bent up a short distance over the toe
110 of the outer fish-plate, while the end that is carried over the toe of the inner fish-plate is of much greater size, extending a greater distance upward upon the plate, and the outer
115 or perpendicular edge of this end is provided with a cavity or recess 16, which may be formed, as shown in the drawings, upon the lines of a compound curve, being adapted to receive the forked or correspondingly shaped
120 head 17 of the lever 18, and through the medium of this lever, when introduced into the said recess 16, the band is either sprung upon or from the fish-plates. It is evident
125 that under such a construction of band the plates will be held firmly in engagement with the rails and that the rails at a joint will not only be held firmly and closely together, admitting at the same time of expansion or contraction of the rails, but also that the rails
130 at their point of connection will be rendered much stronger than at any other point.

With reference to the guard-rail illustrated in Fig. 5 a long spring clamp or band may be employed to hold it, or it may be fastened permanently by the bands heated, hammered, or shrunk, all as heretofore described. In this
135 form of rail a center or spacing block 19 is employed, being made to fit at right angles to the heads and webs of both rails, and the rails have a bearing against one another where they come together, which, together with the

block, absolutely prevents overriding or tipping. The inside fish-plate B of the guard-rail is extended to the ties, forming a buttress, and supports the guard-rail at an angle of forty-five degrees. The lower edge of this buttress-plate is sharp, so that if it had to bear the weight of the train it would simply cut into the tie or sleeper and hold it.

The use of this device does not prevent the use of all the means now employed for securing guard-rails. It is simply additional to them, but it will hold the two rails together, and although, of course, the whole structure would be thoroughly spiked to the track the guard-rail could not turn over or get away, even if every one of the spikes were drawn.

It will be understood that each rail will be secured to the road-bed in the middle of its length in order to prevent creeping, and also to secure equal contraction from the ends of each rail toward its center.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. The combination, with a rail the head of which is provided with a flat under surface, and the flange with a rib upon its upper face at each side of the web, of fish-plates engaging with the under surface of the head and with the upper face of the rail-flanges, con-

forming to the latter and likewise engaging with the web, and a band of spring material extending beneath the flange of the rail and held in clamping engagement with the outer faces of the fish-plates, one end of the band being fitted to receive a lever, as and for the purpose specified.

2. The combination with a rail, of fish-plates shaped to fit upon and engage with the web, flanges and under surface of the head of the rail, and a band of spring material extending beneath the flange of the rail and held in clamping engagement with the outer faces of the fish-plates, one end of the band having a recess formed therein, as and for the purpose set forth.

3. The combination with the fish-plates shaped to fit upon the rail of a spring-band extending beneath the flanges and adapted to engage with the outer faces of the fish-plates, one end of said band being bent upward to engage the toe of one of said fish-plates, and the other end being enlarged and having recesses in its outer edge to receive the head of a lever, as and for the purpose specified.

JAMES JOHNSTON.

Witnesses:

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GEO. L. ROBERTS.