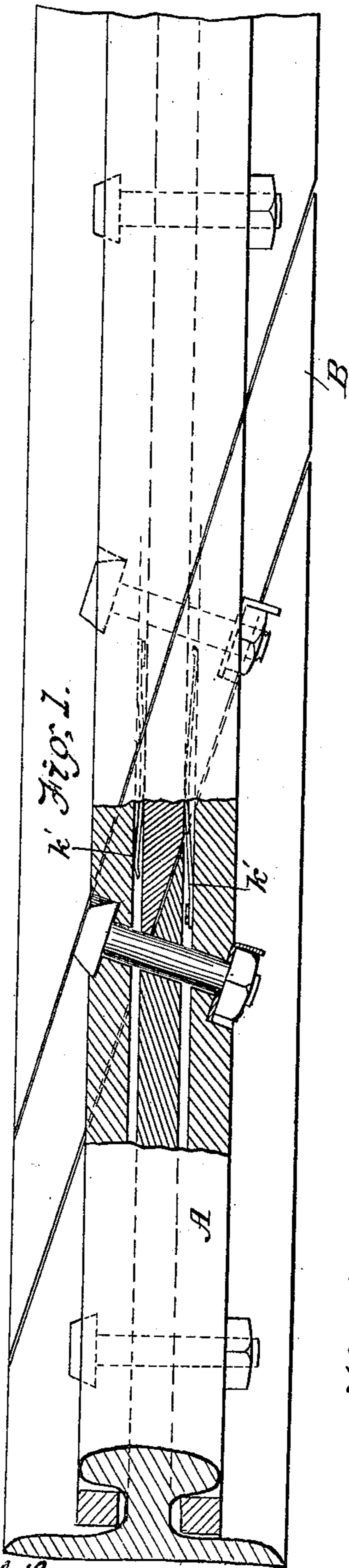


(No Model.)

G. PALMER.
RAIL JOINT.

No. 245,551.

Patented Aug. 9, 1881.



F. L. Middleton
D. H. Mead } Attest

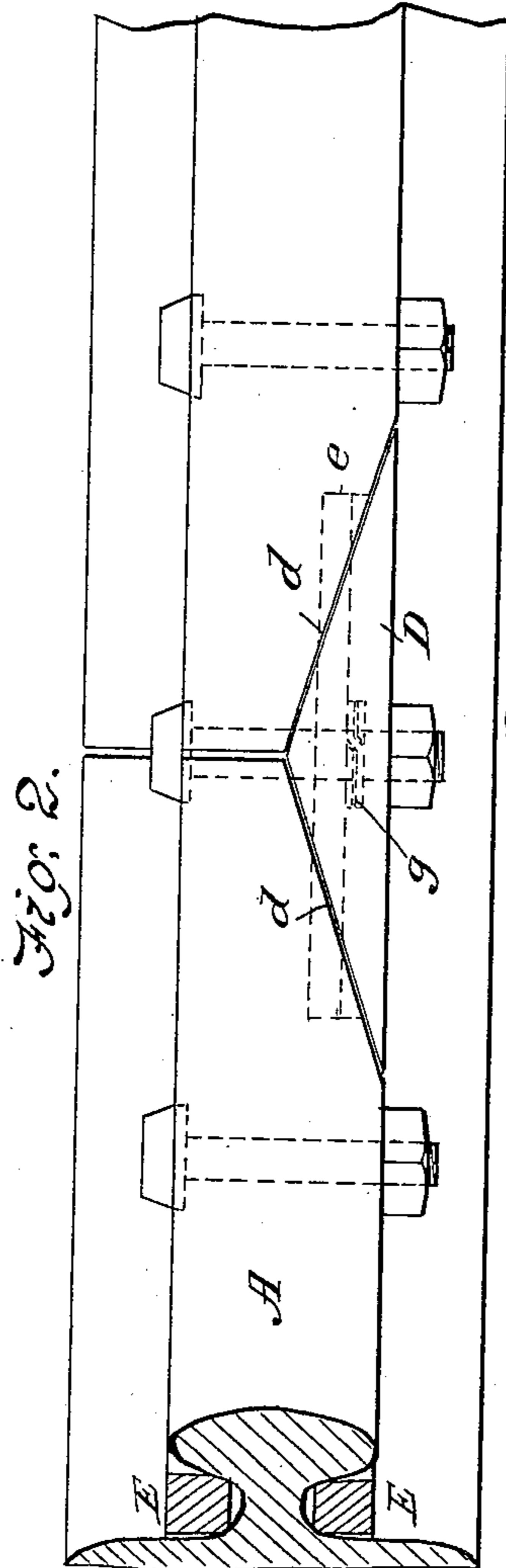


Fig. 3.

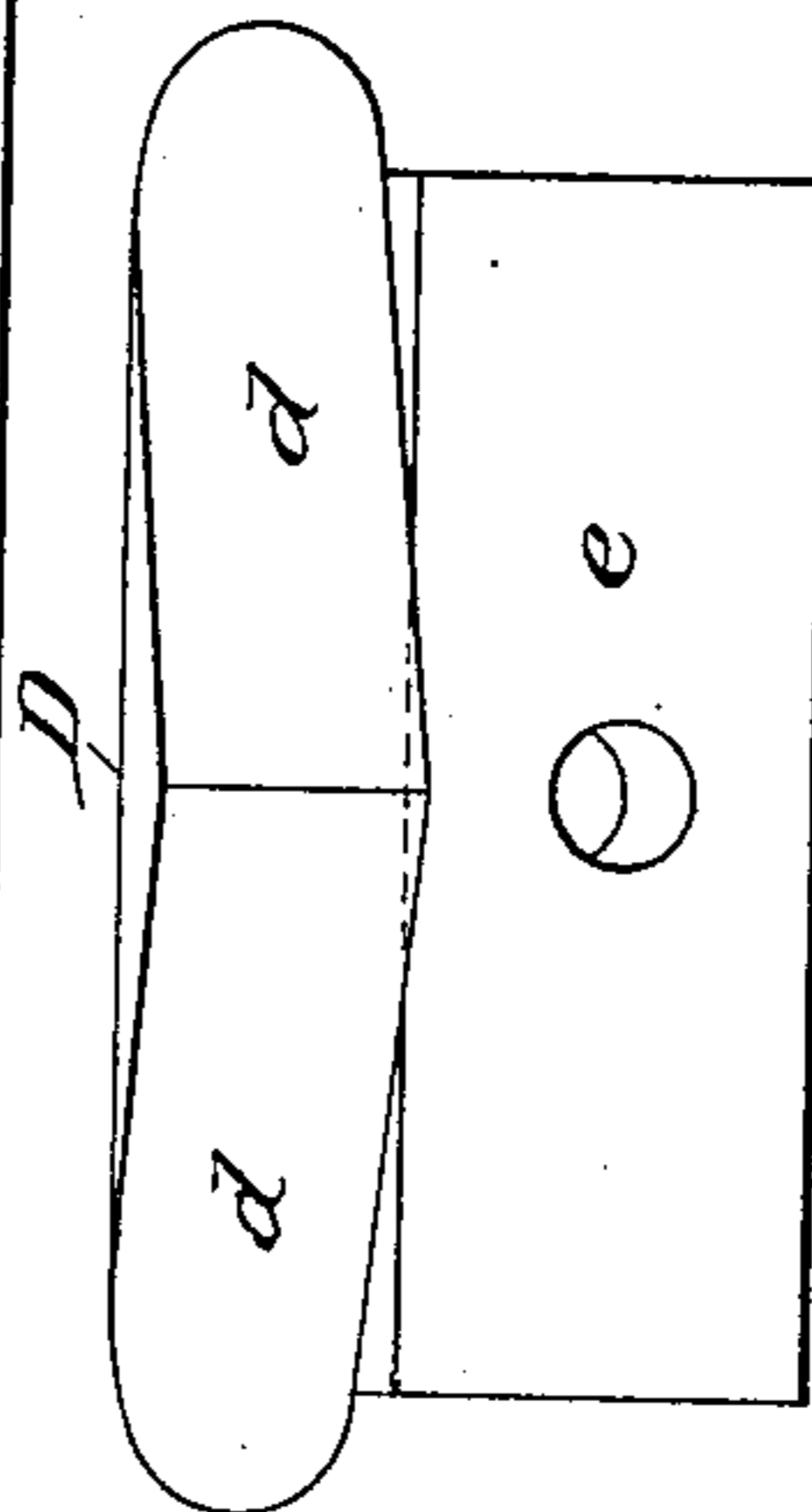
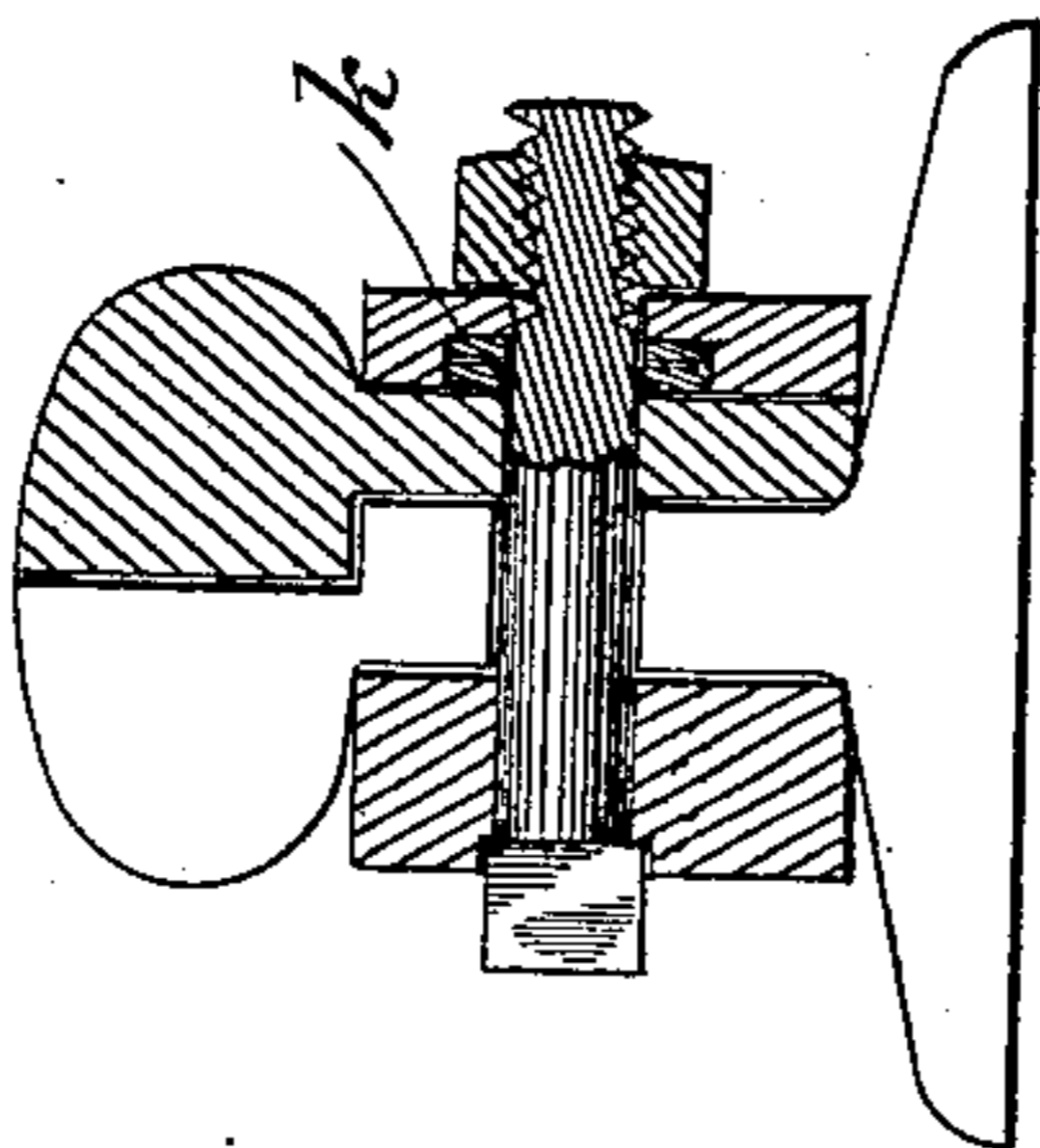
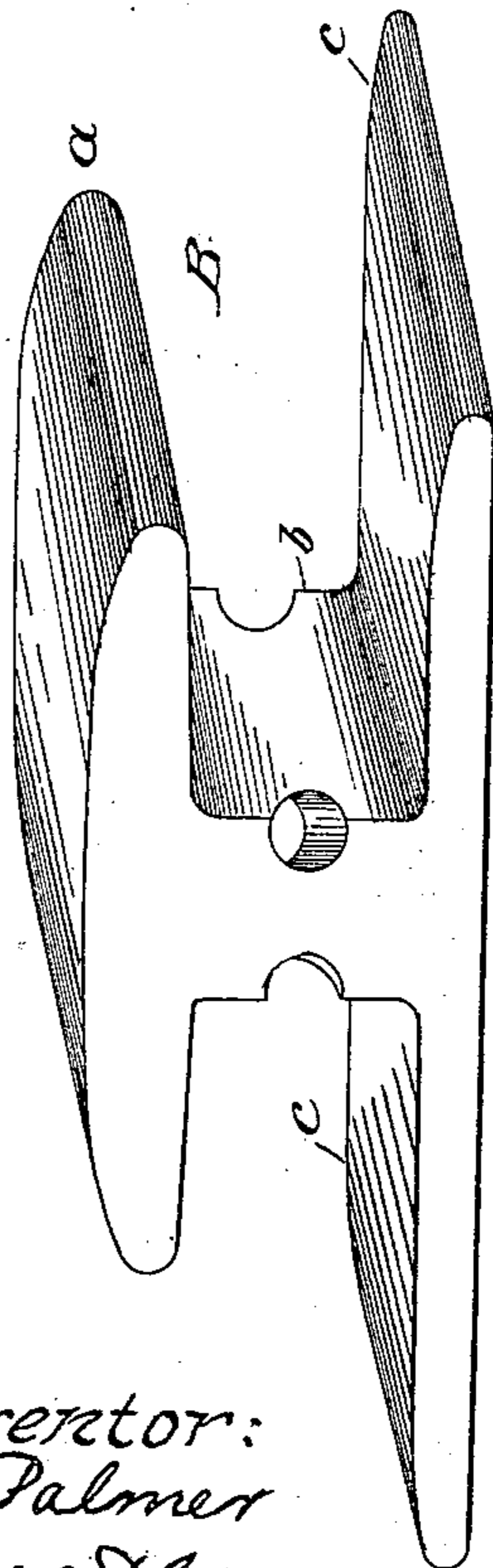


Fig. 5.

Fig. 4.



Inventor:
George Palmer
By Ellis Spear
Atty

UNITED STATES PATENT OFFICE.

GEORGE PALMER, OF LITTLESTOWN, PENNSYLVANIA.

RAIL-JOINT.

SPECIFICATION forming part of Letters Patent No. 245,551, dated August 9, 1881.

Application filed May 2, 1881. (No model.)

To all whom it may concern:

Be it known that I, GEORGE PALMER, of Littlestown, in the county of Adams and State of Pennsylvania, have invented a new and useful Improvement in Continuous Rails; and I do hereby declare that the following is a full, clear, and exact description of the same.

My invention is an improved joint for railway-rails, more particularly for the repair of joints where the rails have become frayed or battered at their ends by passage of trains; but it is also applicable, with good effect, to rails when first laid.

My invention consists of a piece having inclined faces abutting against the inclined ends of the rails, forming, with the rails, a continuous tread, and adapted to receive the fish-plates, which are combined therewith, and to be supported by said fish-plates, upon which the interposed piece rests.

Heretofore it has been customary when the ends of the rails have become frayed or battered to cut them off and shift the rails endwise to compensate for the part removed. Attempts have been heretofore made to provide a splice for railway-rails with beveled or inclined faces, which, coming flush with the surface or tread of the rail, should make a continuous splice or overlapping part; but such splices, as heretofore made, have not solved the difficulties which are met in practice.

In Letters Patent granted to me on the 24th day of September, 1867, No. 69,241, a splice was shown having inclined faces adapted to fit against correspondingly-inclined faces upon the ends of the rails, the parts being so connected that the wheel in passing would move partly upon the splice and partly upon the rail while going over the joint; but this splice-piece was made as a solid piece without any separate fish-plate connected therewith, or, as shown in the drawings of said patent, with a fish-plate formed as a part of the inclined splice-piece. There were obvious difficulties in the manufacture of this splice-piece, which I have sought to overcome.

In my present invention I secure practically a continuous rail with closed joints under all circumstances, without regard to the expansion and contraction of the rails, and I present to

the passage of the wheels an oblique joint, so that the wheel in passing bears at all times both upon the rail and the splice-piece, and does not at any time pass abruptly from the end of one rail to the end of another, so that there are no open joints to batter, and no joint exposed to the direct stroke of the wheel in its passage. At the same time I provide a splice-piece which can be combined with an ordinary fish-bar, which can be made cheaply, and which does not in any respect weaken the rail, and may be applied either to old rails when they need repair, or to new rails when they are first laid down, and in either case will lengthen the life of the rails by preventing further battering and fraying at the ends.

In the accompanying drawings, Figure 1 is a plan view of the rail as laid, and provided with my splice. Fig. 2 is a like view of a modified form of the interposed piece. Fig. 3 is a central transverse section of Fig. 1. Figs. 4 and 5 represent the interposed pieces separately.

In these drawings A A represent the rails, which are the ordinary flat-bottom rails, as now made, with slightly-inclined bearing-surfaces underneath the head for the fish-plates to rest against. The ends of these rails are represented in the drawings as cut in vertical planes obliquely to the rail. This obliquity may be greater or less, but for the best results may be such as to give a splice on an ordinary rail of eight inches. It will be understood that this oblique cut may be given to the rails when first made, or that rails which have been in use and the ends of which have become battered may be cut in this way. Between the ends of the rails thus beveled or inclined I place a section of the rail, cut or shaped to fit the inclined ends of the rails heretofore described, so as to form, when in place between the ends of said rails, a continuous rail. This interposed piece is marked B. It may be made of steel or hardened iron, so as to bear better the action of the wheels. The piece B is made up of a head, *a*, and web *b* and flanges *c c*, but it is not necessary in all cases to provide the flanges *c c*. These may be advantageously used when the splice rests upon a tie or plate; but when the splice does not so rest upon a

tie or plate the flanges may be omitted, and the rail may be cut obliquely down to the flanges, leaving the flanges of the rails to meet each other without any interposed flange between them, so that in that case there would be interposed between the oblique ends of the rails only the head and the web. This piece is comparatively small, and may be made cheaply, either by rolling and cutting or by swaging or casting.

It will be understood that the tread and the web of the interposed piece correspond exactly in shape and size with the tread or head and web of the rails. When in place the fish-plates are put on in the ordinary manner and the bolts applied, so as to hold the fish-plates in place.

A hole may be made through the web of the interposed piece; but this will not be necessary when the flanges *c c* are formed upon the piece. When these flanges are used the interposed piece will be held securely in place, and will be supported and prevented from rising by the fish-bars alone.

It will be clear, from an inspection of Fig. 1, that the wheel, in passing over the joint between the interposed piece and the ends of rails, does not pass instantly from one rail to the other, or from the rail to the interposed piece, but moves at all times upon both, and its line of motion at an angle to the line of junction of the splice, so that it is not possible for the wheel to beat against the end of the rail, as is the case with the old form of squarely-abutting rails.

In order to prevent the joints from opening I may use the oblique bolts having bearings for the head and nut in the fish-plates parallel with the inclined faces of the rail and interposed piece; the direction of the bolts being at right angles to said faces. This permits of expansion and contraction without opening the joints, since the bolt-heads and nuts slide upon their bearings in the fish-plates parallel with the faces of the rails, and hold with equal force, whether the rails expand or contract, so that the joints cannot, under any circumstances, open unless the bolts are loose. This is the arrangement of bolts shown in my patent aforesaid. The bolt-holes, either in the web of the rail or in the splice-pieces, must be slightly elongated to permit of the movement endwise of the rails. Instead of this diagonal arrangement of the bolts, however, I may use springs, either of rubber or any other material, between the fish-plates and the web of the rail, so as to keep the overlapping ends constantly pressed toward each other, and prevent them from opening when the rails contract. These springs may be conveniently made of a disk, *k*, of rubber, which may be inserted in recesses in the fish-bar, or may be put upon the bolts between the fish-bar and the rail. Of course flat springs may be used, or the fish-plate may be bowed slightly, so as to form a spring of itself.

Instead of having the interposed piece cut obliquely, as shown at B, I may make this interposed piece as shown at D, in which, instead of having parallel oblique sides and extending through equally from one side of the rail to the other, the piece may be made of oblique sides inclining toward each other in the head of the piece, or in that part which fits into the head of the rail, while the part which corresponds with the web of the rail is made plain and lies up against the web, to which it is held, either by a bolt alone or by the ordinary bolts of the fish-plates. This piece (represented at D) has inclined surfaces *d d*, fitting into corresponding surfaces made vertically in the ends of the head of the rail. The web-piece *e* lies up against the web of the rail, and the lower edge of it bears upon the bottom flanges of the rail, while a part of the upper edge, at the ends, bears on a shoulder underneath the head of the rail. The piece D may extend a part or the whole way across the rail, as in the dotted line of Fig. 2, or, if it extends only part of the way, one may be used on each side. Both these pieces, as described, are held in place by the ordinary fish-plates E. The principal difference between the two pieces is that in that first described the web of the interposed piece is interposed between the webs of the rails and forms a part thereof, while in the piece D the web of the piece may lie up against the web of the rail; but in both cases the fish-plate bears against the web of the interposed piece and under the head thereof, so as to hold it in place against the rail, and to support it, when under vertical pressure of the passing train, exactly as the fish-plate holds up by bearing against the under side of the head of the rail as ordinarily applied.

It will be observed that in the interposed piece D there is a shoulder or bearing-surface under the outside of the head of said piece, (indicated at *f*), so that the piece D has a bearing on the upper edge of the fish-plate. The piece D may be pressed in by a single spring, *g*, bearing against it about midway, or by any form of spring heretofore described, or a bolt may be passed through the center of the piece D at the junction of the rails.

The fish-plate may be recessed sufficiently to receive the thickness of *e* in the body of the fish-plate, provided the webs at the rail ends are not recessed to receive the same, to fit over the web *e* of the piece D, so as to permit it to be brought up snugly to its bearings on the web of the rails. If desired, the fish-plate need not be recessed, and in this case, being brought up against the side of the web of the piece D, the elasticity of the fish-plate itself would be sufficient to keep the piece D pressed up constantly, so as to prevent the opening of the joint. This piece D may be used to repair the rail at any point without fish-plates whenever the rail becomes battered by the wear. It will be understood that in applying this piece D, last described, the flanges of the rail are not

cut at all, it being only necessary to bevel off the head of the rail, or the head and web.

Having thus described my invention, what I claim is—

5 1. The combination of the rail ends, cut inclined, with an interposed piece having corresponding inclines and provided with a web, and an ordinary fish-bar adapted to bear against the web and hold such interposed piece in position.

10 2. The interposed piece B, having head, web, and flanges, as described, in combination with the rails A A and the fish-plates E E, as set forth.

3. The combination, with the railway-rails 15 having inclined ends, of the interposed piece formed with correspondingly-inclined faces, fish-plates, and devices, substantially as described, for compensating for the expansion, whereby the joints are kept closed under all 20 circumstances, as set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

GEORGE PALMER.

Witnesses:

ALBERT H. NORRIS,
F. L. MIDDLETON.