

No. 736,123.

PATENTED AUG. 11, 1903.

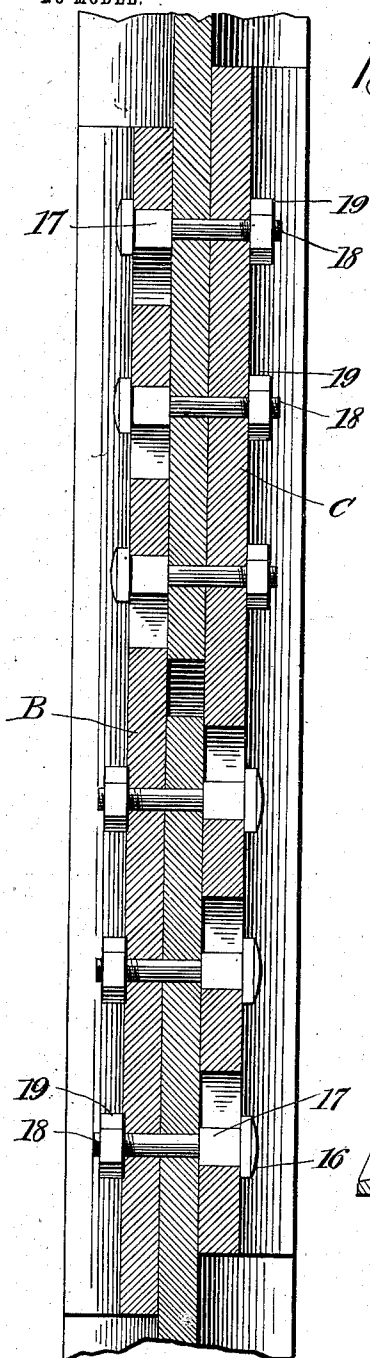
P. J. LUKES.  
RAIL JOINT.

APPLICATION FILED APR. 15, 1903.

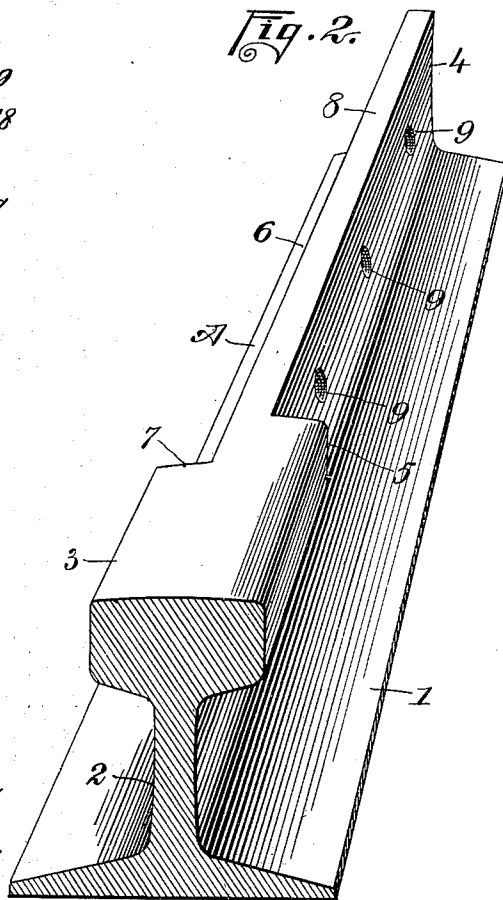
NO MODEL.

2 SHEETS—SHEET 1.

*Fig. 1.*



*Fig. 2.*



WITNESSES:

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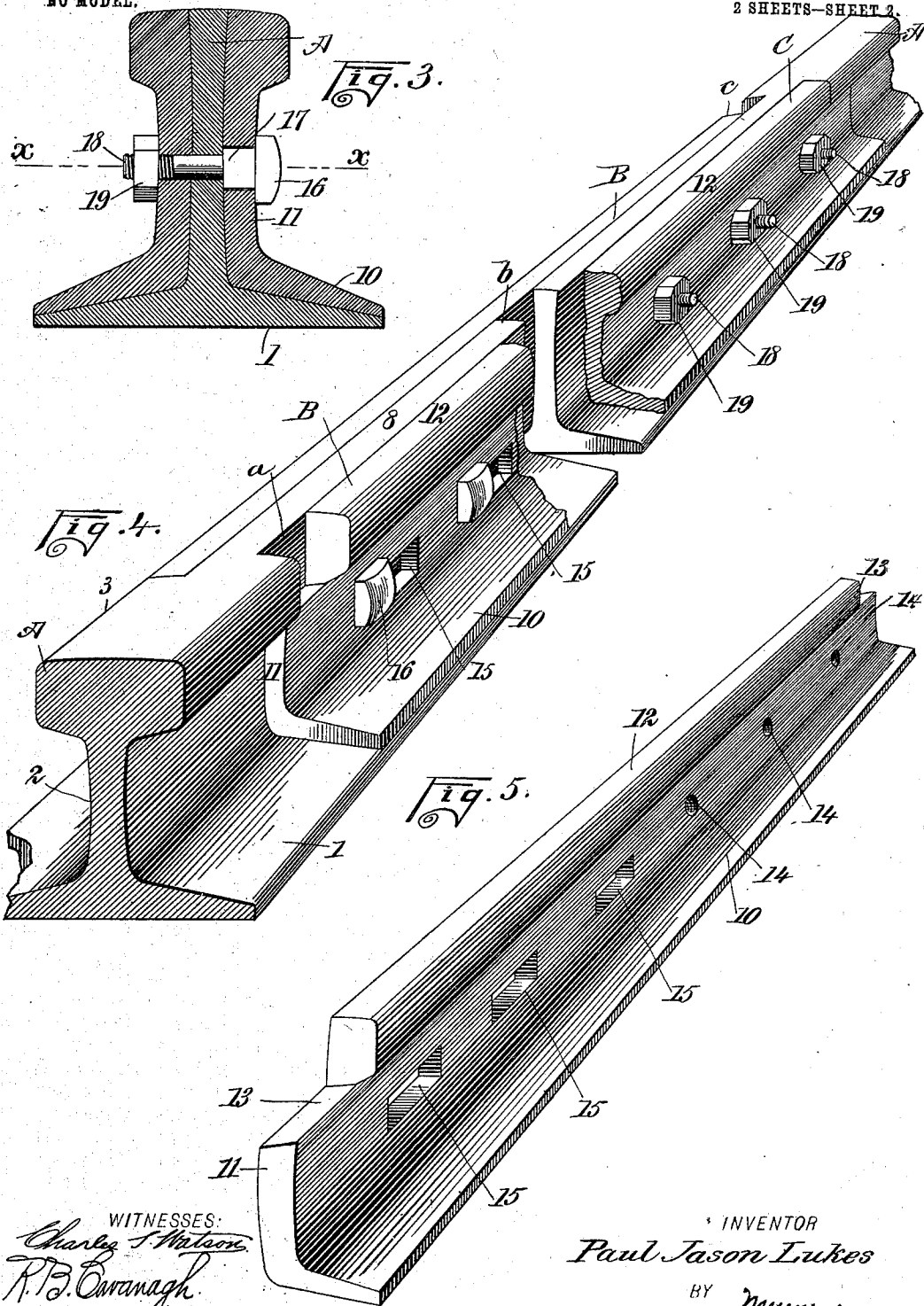
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2 SHEETS—SHEET 2.



WITNESSES:  
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# UNITED STATES PATENT OFFICE.

PAUL JASON LUKES, OF BALLS FERRY, CALIFORNIA.

## RAIL-JOINT.

SPECIFICATION forming part of Letters Patent No. 736,123, dated August 11, 1903.

Application filed April 15, 1903. Serial No. 152,692. (No model.)

*To all whom it may concern:*

Be it known that I, PAUL JASON LUKES, a citizen of the United States, and a resident of Balls Ferry, in the county of Shasta and State of California, have invented new and useful Improvements in Rail-Joints, of which the following is a full, clear, and exact description.

This invention relates to certain novel and useful improvements in rail-joints, and pertains particularly to means for joining and connecting contiguous ends of rails.

In carrying out the present invention I have particularly in view as an object the provision of means whereby the contiguous ends of the rails may be jointed or connected in such manner that the expansion and contraction under the influence of heat and cold shall be permitted, while at the same time the rail shall be securely locked, thereby avoiding the possibility of accidents owing to the disjoining or unlocking of the bolts.

A further object of my invention is to provide a rail-joint which shall be exceedingly simple in its character and one which may be easily and readily applied to any ordinary T-rail.

A further object of the invention is to provide an improved fish-plate for connecting the adjacent ends of the rails, said fish-plate being formed and applied to the rails in such a manner that a continuous tread surface with the ball of the rail is formed.

With the above-recited objects and others of a similar nature in view my invention consists in the construction, combination, and arrangement of parts as described in this specification, delineated in the accompanying drawings, and set forth in the appended claims.

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

Figure 1 is a top sectional view taken through the neck of a rail, showing my improvement applied, such view being taken on the line *xx* in Fig. 3. Fig. 2 is a perspective view of a rail used in connection with my improvement. Fig. 3 is a transverse vertical sectional view of my improved rail-joint.

Fig. 4 is a perspective view of the rail and joint, and Fig. 5 is a perspective view of one of the fish-plates used in connection with my improved rail-joint.

Referring now to the accompanying drawings in detail, A designates as a whole a rail to which my improvement is applied, such rail being of the character known as a "T-rail," consisting of a flange or base portion 1, a neck portion 2, and a ball or tread portion 3. In the drawings I have shown two rails which are adapted to be placed end to end contiguous to each other and connected in a manner which I will now proceed to describe. As both rails are similar in construction, the description herein is understood to be applicable to both. The tread or ball portion 3 of the rail A is cut away vertically on one side, as shown at 4, in such manner that a shoulder 5 is formed, while on the opposite side the ball or tread of the rail is formed with a similar cut-away portion 6, which extends along the body of the rail a little farther than the cut-away portion 4, thereby forming a shoulder 7, parallel with but not directly opposite the shoulder 5. A reduced central tread tongue or rib 8 is formed at each end of the rail. The reduced tongues of the rails are placed end to end, as shown in Figs. 1 and 4, each of said reduced tongue portions being provided with a series of apertures 9 to permit the passage therethrough of the connecting-bolts. When the rails are in such end-to-end position, they are connected or jointed by means of fish-plates of the character substantially as shown in detail in Fig. 5. This fish-plate is formed with a base-flange 10, a neck portion 11, and a tread 12, such tread being so formed that when the base-flange 10 of the fish-plate rests upon the base 1 of the rail, as shown in Fig. 4, the ball or tread of such plate will fit snugly in the cut-away portion of the tread of the rail, forming for all practical purposes a substitute for the portion of the rail which is removed, and when two of such fish-plates are applied to the rail, one on each side of the reduced tongue portion, the tread portion of the rail will be as complete as though it had never been cut or reduced. In the drawings I have shown two of these fish-plates as applied to the rail, such plates being design-

nated as a whole by B and C. The tread portion at each end of the fish-plates is cut away clear to the neck portion 11 thereof, whereby a shoulder 13 is formed at each end, the construction being such that the tongue or extension formed at the neck portion of the rail by the shoulder 13 will fit snugly and tightly against the under surface of the tread or ball of the rail, thereby preventing the vertical movement of the fish-plate relative to the rail portion when such plate is mounted thereupon, as heretofore described and as shown in Fig. 4.

In order to secure the rails and tongue portions in position and to provide for the contraction and expansion of the rails, one part of the web of the fish-plates is provided with round apertures 14, adapted to align with the apertures in the reduced or tongue portion of the rail, the remaining part of the web of said plate being provided with a series of elongated slots 15, adapted to align with the apertures in the end portion of the opposite rail. It is to be noted that each plate is formed similarly or is a counterpart of the other—that is to say, is formed with similar apertures and shoulder portions; but when used to secure the rail in position the elongated apertures 15 of one plate are in alignment with the round apertures 14 of the plate at the opposite side of the rail, so that a securing-bolt employed will pass through the elongated slot of one plate, through the aligning apertures in the neck of the rail, and through a round hole in the plate on the opposite side of the rail, there being always the same number of elongated slots as round apertures in a plate.

While any desired sort of fastening-bolts may be employed to secure the rail and joint, I prefer to employ a bolt of the character shown in Fig. 3—that is, one having an enlarged head portion 16, a squared flange portion 17, and a screw-threaded shank 18 extending from the aforesaid flanged portion. When the bolt is employed to lock the joint, its squared portion 17 is adapted to be passed through the elongated slotted portion 15 of the fish-plate, the round shank of the bolt extending through the aperture 9 in the neck of the rail and through the round hole 14 in the opposite fish-plate, a nut of any suitable character, as at 19, being screwed upon the threaded portion of the shank of the bolt which protrudes through the aforesaid round aperture in the plate. It will be observed that the squared flange below the head of the bolt, resting, as it does, in the slots in the fish-plate, prevents such bolt from turning or working loose, while at the same time it permits the longitudinal movement of the rails relative to each other when contracting and expanding under the influence of cold and heat. This movement is permitted because the shoulder or portion 17 abuts against the tongue A of the rail, as in Fig. 3, and thereby prevents the head 16 of the bolt from binding

the fish-plate when the nut 19 is screwed up tight. The shoulder 17 of the bolt also allows the fish-plate B and the tongue A of the rail to be bound firmly together, allowing no movement whatever between them, but does allow the fish-plate C to move along the tongue A of the rail during expansion and contraction. If desired, a spring-washer may be placed between the head 16 of the bolt and the neck 11 of the fish-plate.

From the above description the construction and operation of my improved joint will be readily apparent. The fish-plates are fitted to the rails in the manner heretofore described—that is to say, so that the tread portion 12 of each plate shall cooperate with the cut-away portion of the rail to complete the tread or ball thereof, while the tongue or extension at each end of the plate, fitting, as it does, under the tread or ball of the rail, will prevent the vertical movement of such plates relative to such rail. After the plates have been applied in the manner as hereinbefore described the rail will be permitted to expand under the influence of heat at the points *a b c*, this being possible owing to the arrangement of the slots in the fish-plates and the threaded bolts moving in said slots. It should be noted that although the points *a b c* are open as far as possible the slotted tongue or extension 13 at the end of the fish-plates is still under the ball or tread of the rail. Therefore the slotted tongue or extension 13 at the end of the fish-plate, Fig. 3, is as much longer than the extension or tongue at the other end of the fish-plate provided with the round apertures as the length of the slots—that is, the length of the slotted tongue 13 at the end of the fish-plates equals the sum of the length of the apertured extension or tongue at the end of the plates plus the length of the slots. The rail is permitted to expand only at the points *a b c* and in no other place. There is therefore always about two-thirds of the surface of the tread at the joints for the wheel to run on.

While I have shown and herein described one particular embodiment of my invention, it is of course to be understood that I do not limit myself to the precise details of construction shown therein, as there may be modifications and variations in certain respects without departing from the essential features of the invention or sacrificing any of the advantages thereof.

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

1. The combination of rails placed end to end, the tread portion of each of the rails at the ends thereof being cut away at each side to form shoulders and tongue portions, one side of each of the rails being cut away a relatively greater distance than the other side, and fish-plates of equal length connecting said rails, the construction being such that each plate will bear at one end against the

shoulder formed by the short cut of one rail and at its opposite end against the shoulder formed by the long cut of the adjacent rail, and bolts connecting the fish-plates with the rails in such manner that the contracting and expanding of said rails is permitted, substantially as set forth.

2. The combination of rails placed end to end, the tread portion of each of the rails at the ends thereof being cut away at each side to form shoulders and tongue portions, one side of each of the rails being cut away a relatively greater distance than the other side, and fish-plates of equal length connecting said rails, the construction being such that each plate will bear at one end against the shoulder formed by the short cut of one rail

and at its opposite end against the shoulder forming the long cut of the adjacent rail, each of said plates having a series of slots, and a series of apertures therein, the slots of one plate being designed to register with apertures in the rail and the apertures of the opposite plate, and a bolt passing through the registering slots and apertures, the construction being such that the rails may contract and expand, substantially as set forth.

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

PAUL JASON LUKES.

Witnesses:

BERT HALL,  
L. D. CHENEY.