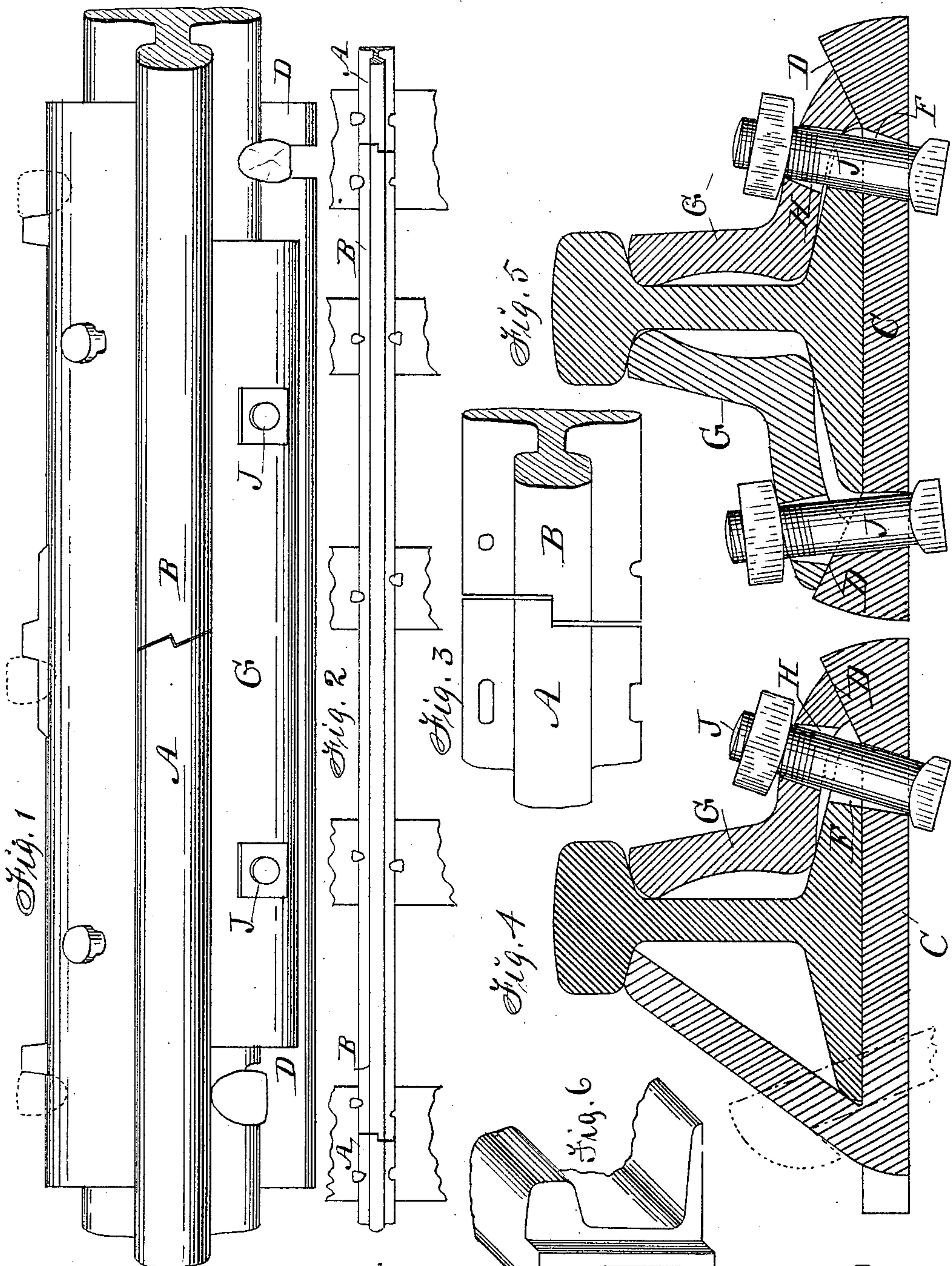


(No Model.)

W. F. GOULD.  
RAILWAY RAIL JOINT.

No. 353,675.

Patented Dec. 7, 1886.



Witnesses:  
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# UNITED STATES PATENT OFFICE.

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## RAILWAY-RAIL JOINT.

SPECIFICATION forming part of Letters Patent No. 353,675, dated December 7, 1886.

Application filed June 30, 1884. Serial No. 136,371. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM F. GOULD, a citizen of the United States of America, and a resident of Des Moines, in the county of Polk and State of Iowa, have invented an Improved Railway-Rail Joint, of which the following is a specification.

My invention consists in the construction and combination of rails, railway-chairs, adjustable fish-plates, and screw-bolts, as hereinafter fully set forth:

Figure 1 of my accompanying drawings is a top view showing the ends of two rails, my chair, and one of my adjustable fish-plates combined and fastened together by means of screw-bolts and spikes. Fig. 2 is a top view showing one complete rail and the ends of two rails combined as required to prevent a continuous track from creeping. Fig. 3 is an enlarged view of the ends of two rails prepared as required to prevent a track from creeping. Fig. 4 is a transverse section of my chair and adjustable fish-plate combined with a rail. Fig. 5 is a modification of Fig. 4, showing a chair and two adjustable fish-plates combined with a rail. Fig. 6 is a perspective view of the end of a rail having a scarf extending through the base, the web, and the ball.

Jointly considered these figures clearly illustrate the construction, operation, and utility of my complete invention.

A and B represent the abutting ends of two of my improved rails, in which the novelty consists in forming a scarf on each end of each rail in such a manner that they will overlap longitudinally in their centers from top to bottom, so that there will never be a transverse opening entirely through a joint, as is the common result when they are contracted by frost; and by thus scarfing the ball, the web, and the base of each rail, a continuity of track will be maintained when the rails do shrink longitudinally.

In Fig. 1 the ends of the rails are cut off diagonally and the shoulders and overlapping portions angle in reverse ways relative to each other and extend diagonally across the center of the continuous track. By scarfing the ends in this manner no independent lateral movement is allowed to either one of the overlapping ends, and each end of each rail will fit either end of any rail so formed—a desider-

atum that is obtained by no other form of interlocking ends of rails in which provision is made to prevent independent lateral motion of the abutting ends—to maintain continuity of track and to allow longitudinal contraction and expansion.

In Figs. 2 and 3 the ends of the rails are cut off square and halved in a common way in such a manner as to produce a square shoulder in the center to accomplish all the results of the scarf-joint shown in Fig. 1, excepting that the ends of the rails can slip laterally relative to each other and independently move in opposite directions relative to the center of the continuous track.

To cut off the ends of rails as required to produce scarfs or shoulders that extend vertically in the center, I make cuts on the opposite sides of the center and in parallel planes by means of saws, or in any suitable way.

C represents the flat base of my improved chair.

D represents an inclined plane extending along its edge and top surface, and adapted to support my adjustable fish-plate. In Fig. 5 each side of the chair is provided with such an inclined plane. In Fig. 4 one side of the chair extends vertically, and is adapted to engage the edge of the flange of a rail, and also the under side of the ball of a rail. These chairs are preferably made from wrought metal by means of rollers, but may be made of malleable iron or cast-steel.

F are conical perforations in the flat portions C of the chairs at the base of each inclined plane D, and adapted to admit and retain an adjustable bolt. When the chair has only one inclined plane D, it is provided with perforations on the opposite side of the inclined plane, to admit spikes, as indicated in dotted lines in Fig. 4.

G represents my adjustable fish-plate. It is elbow-shaped in its cross-section, and adapted to engage the inclined plane D of the chair, the top surface of the flange of a rail, and the under side of the ball of a rail, as clearly shown in Figs. 4 and 5. It has conical perforations H, coinciding with the perforations F in the chair.

To combine my adjustable fish-plate with my chair having an inclined plane to support it and the abutting ends of two rails, as required to



form a firm joint or splice, I slip the chair under the rails, or put the chair in position and place rail ends upon it, and then place the fish-plate in position as required to pass screw-bolts J upward through the coinciding perforations F and H. After inserting the bolts I place nuts on their ends and draw them tight, so that the fish-plate will bind upon the inclined plane D of the chair, the top surface of the flanges of the rail, and the under sides of the balls of the rails, and not the webs of the rails. Heretofore chairs have had the semblance of inclined planes at their side edges and fish-plates that engaged the webs of the rails rested upon such planes; but my manner of forming an inclined plane on a chair and combining a fish-plate therewith, so that the lower and outer edge of the fish plate will slide inward and downward upon the inclined plane of the chair and its center or elbow inward and upward upon the flanges of the rails, and its top edge upward relative to the balls of the rails, is novel and greatly advantageous while in contact with the under sides of said balls.

To adjust the fish-plate to compensate for wear and to tighten the joint when it becomes loose, I simply draw the nuts on the bolts J, and thereby cause the lower edge of the fish-plate to slide downward on the inclined plane D, upward on the inclined surfaces of the flanges of the rails toward their webs, and upward and outward relative to the under sides of the balls of the rails. The coinciding conical perforations in the chair and fish-plate and notches in the flanges of the rails through which the bolts extend prevent the bolts from binding as they are thus moved relative to the chair and the rails to adjust the fish-plate.

To prevent a track from creeping I fasten every other rail in a continuous track firmly to the ties and allow each intermediate rail longitudinal movement. I accomplish this by making elongated notches or slots in the flanges of the rails that are to have longitudinal play, and pass the bolts or spikes that secure them to the ties and chair through the elongated openings. By making the notches or perforations round or square, and using bolts or spikes large enough to fill such openings, longitudinal movement is practically prevented in individual rails, and by having the alternate rails fast and loose in a continuous track the contraction and expansion in each rail will be independent, and dangers and accidents incident to the joint movement and creeping of all the rails in a track will be prevented by my method of fixing every other rail in a continuous track firmly, and allowing longitudinal movement to each intermediate rail to accommodate the expansion and contraction of the metal. In place of making elongated openings in the flanges of the rails, they may be made in one end of each chair and each fish-plate.

I am aware that lap-joints have been made by making vertical longitudinal cuts in the ends of rails and diagonal transverse cuts

at the ends of the vertical longitudinal cuts, in such a manner that there could be no independent lateral motions of such abutting and overlapping ends in a track; but cutting away the half of the web of a rail and removing longitudinal sections of the complete rail produces a longitudinal and vertical seam in the track that weakens it, and forming such joints also causes waste of material and more labor and expense than my manner of forming a scarf-joint that prevents independent lateral motions of the abutting ends of the rails. By making two vertical diagonal cuts from the opposite sides of a rail, so as to produce a shoulder that extends diagonally and vertically through the center of the base, the web, and the ball of the rail, there is no waste of material except the metal removed by the saw, and when two ends thus formed abut in a track the short diagonal shoulders will not weaken the joint or track, but each end of each rail will remain solid and the track firm. The diagonal shoulders in the centers of the ends of the rails will correspond in size with the width of the cuts made by the straight and square edge of the saw used to make the cuts.

I claim as my invention—

1. A railway-rail having two parallel vertical planes at each end that extend diagonally from its opposite sides, and are connected at their inner ends and at the center of the rail by a single vertical plane that extends diagonally relative to the longitudinal center of the rail, to produce scarf-joints in the manner set forth, for the purposes stated.

2. A fish-plate of elbow shape in its cross-section, having a plain beveled edge at its bottom, and its top edge adapted in shape to engage the under side of the ball of a rail, in combination with a chair having an inclined plane on its top side and outside edge that will allow the beveled edge of the fish-plate to move inward and downward thereon relative to the flanges of a rail, while the top edge of the same fish-plate is in contact with the ball of the rail and moves upward relative to the rail.

3. A railway-chair consisting of a horizontal base having a vertical extension at one side that inclines inward to engage the bottom of the ball of a rail, and a plane on the top of its opposite edge inclined inward and downward, a fish-plate that is elbow-shaped in its cross-section, and has a plain beveled edge at its bottom, and its top edge adapted in shape to engage the under side of the ball of a rail, and screw-bolts passed through coinciding perforations in the said chair and fish-plate, in combination with the abutting ends of two railway-rails, to operate in the manner set forth, for the purposes stated.

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Witnesses:

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