No. 621,956. Patented Mar. 28, 1899.

F. F. BRAY.

RAIL JOINT.

(Application filed Nov. 14, 1898.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.

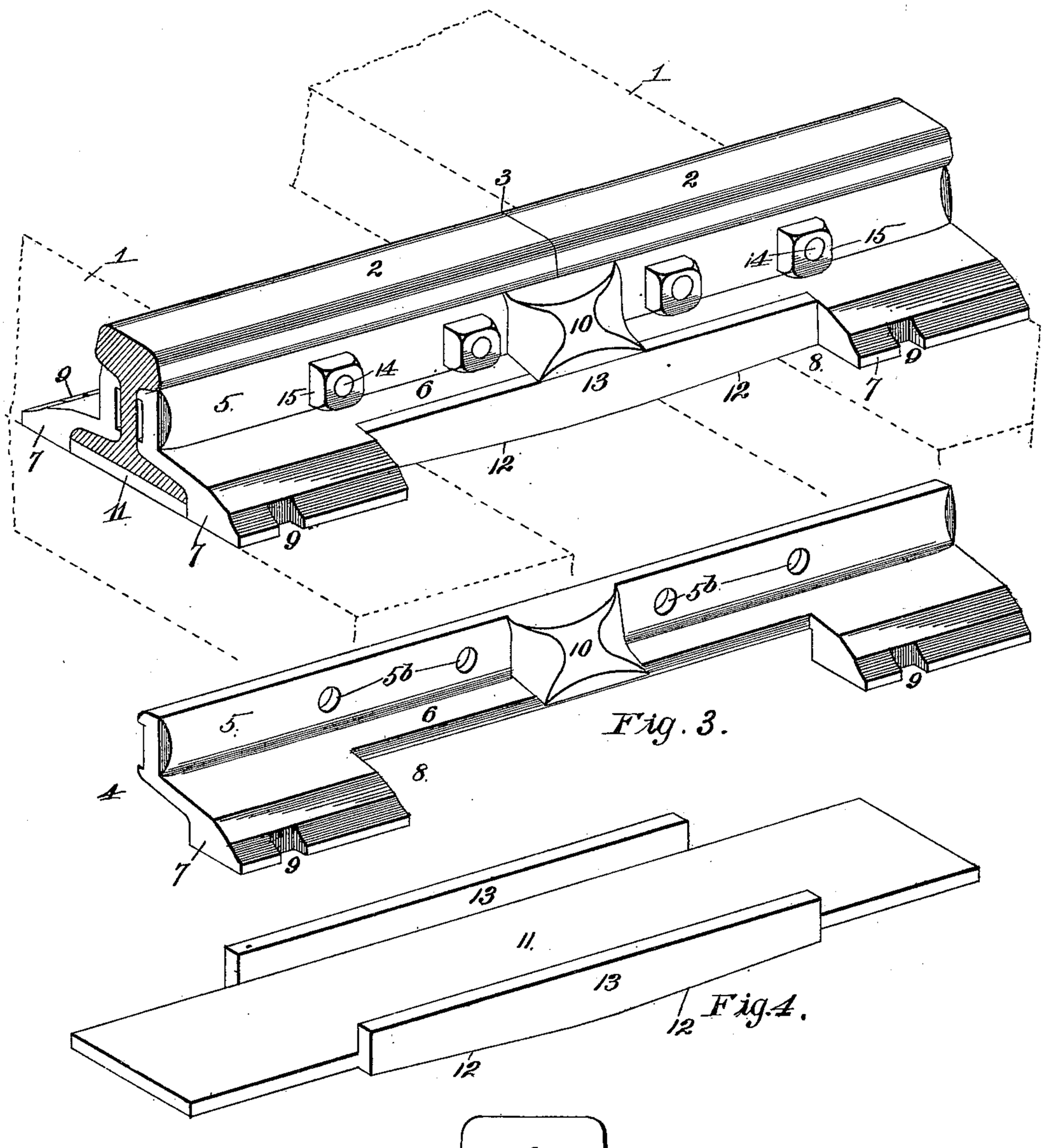

Fig. 3.

Fig. 4.

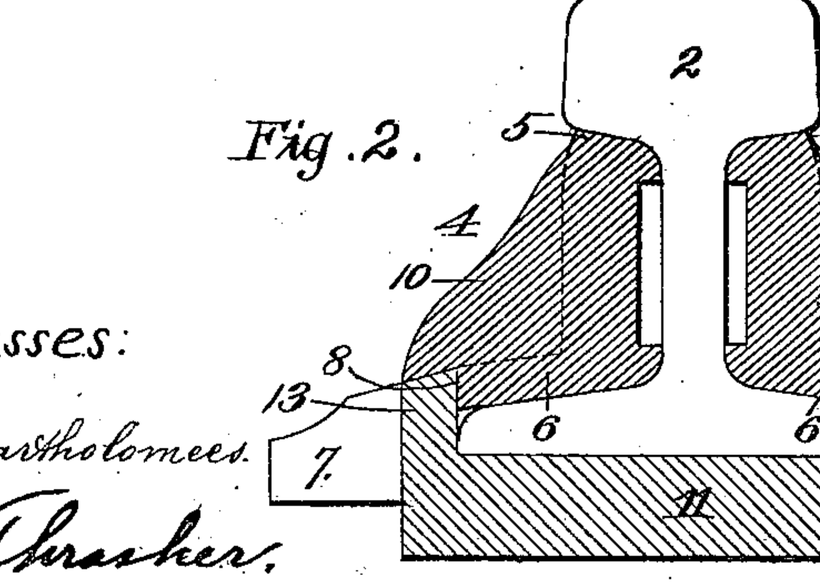

Fig. 2.

Witnesses:

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(No Model.) 2 Sheets—Sheet 2.

Fig. 5.

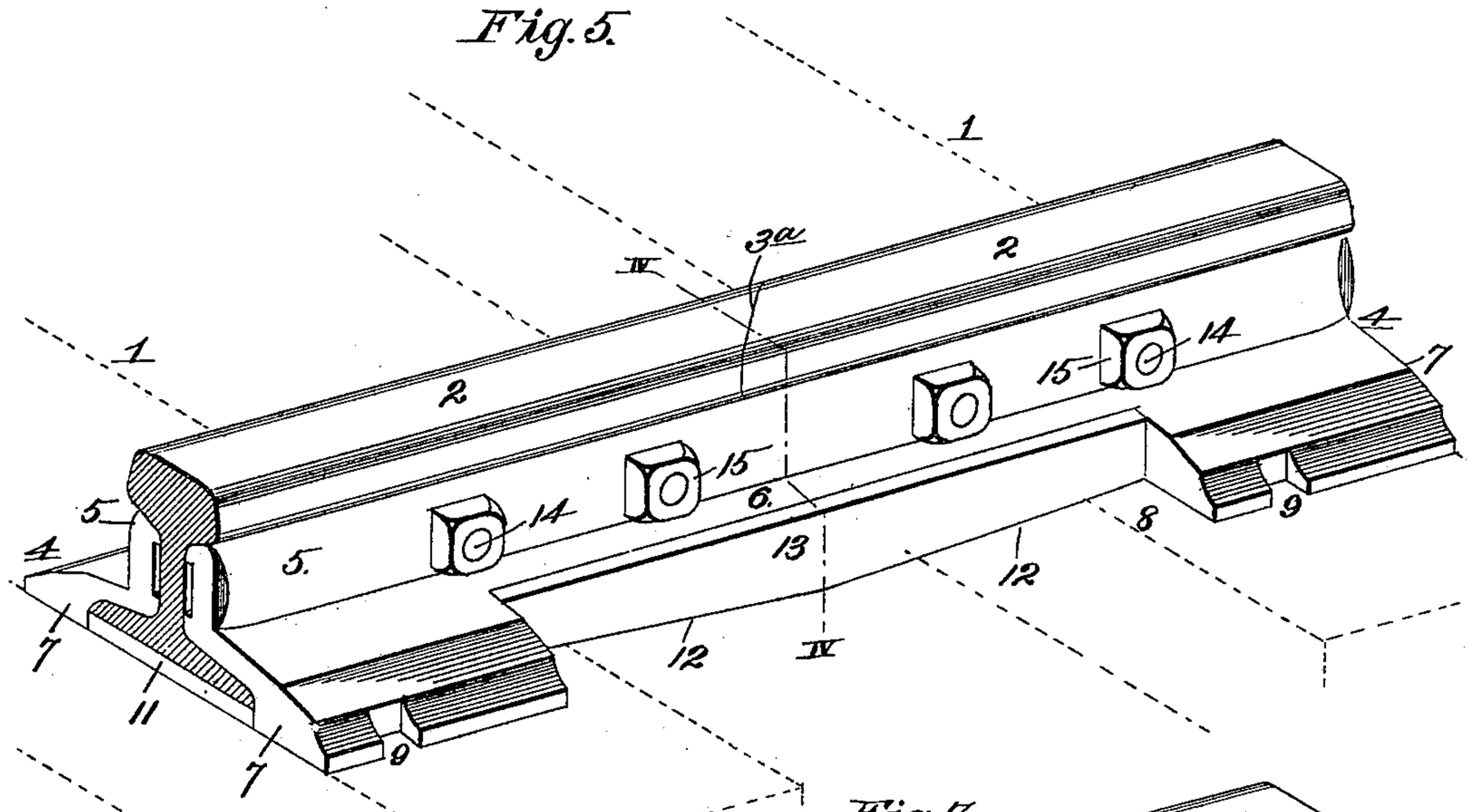


Fig. 7.

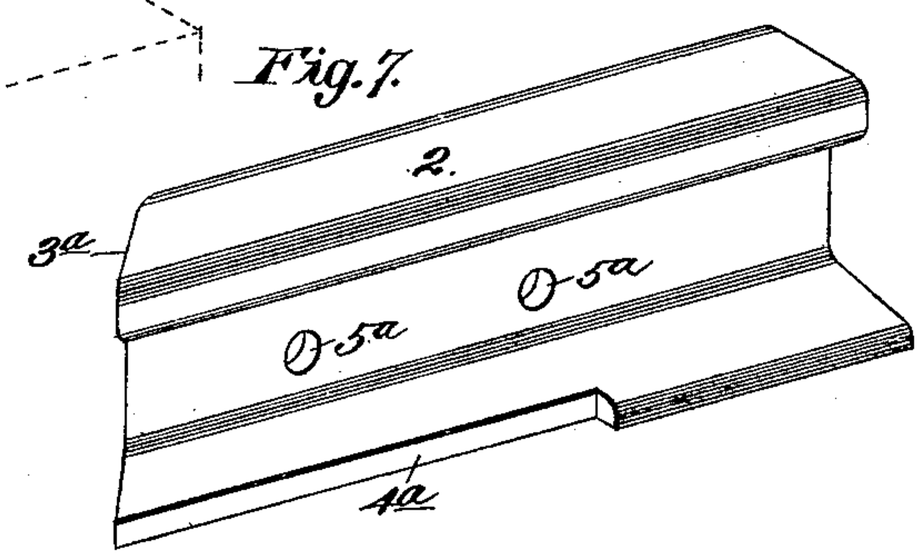


Fig. 8.

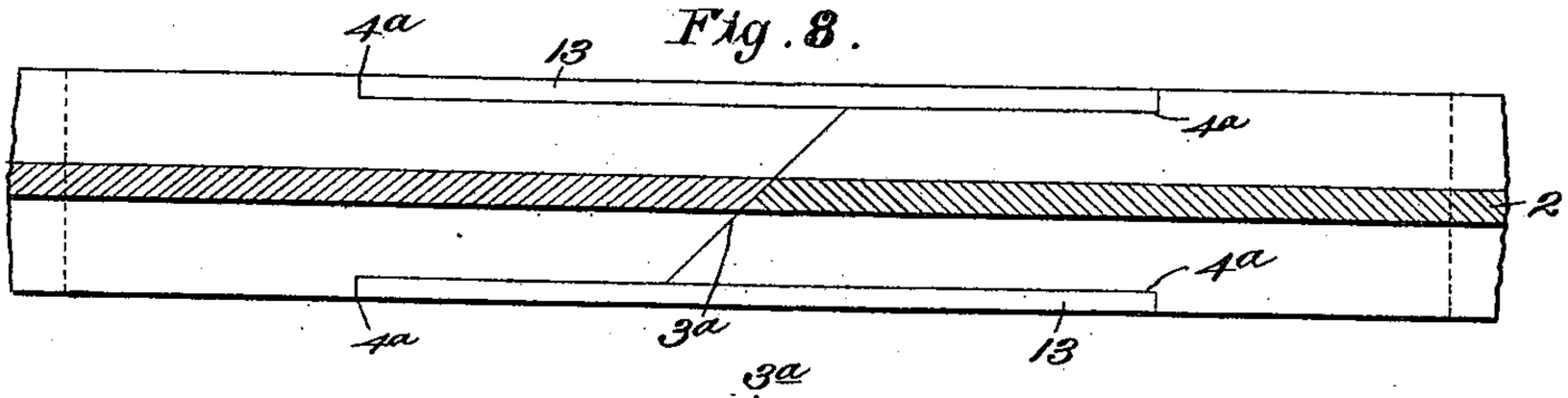
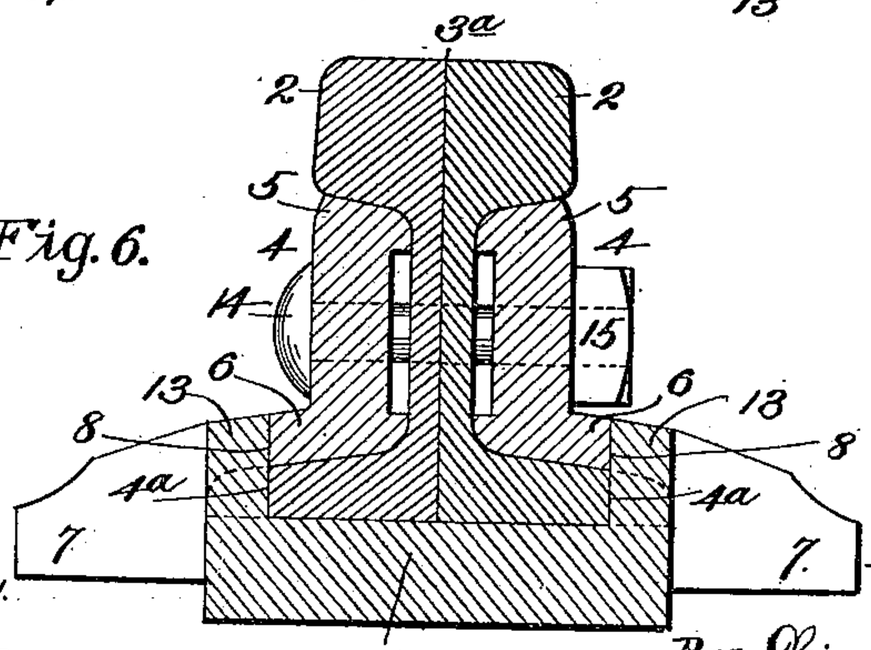


Fig. 6.



Witnesses;

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Inventor:

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UNITED STATES PATENT OFFICE.

FRANK F. BRAY, OF KANSAS CITY, MISSOURI, ASSIGNOR OF ONE-THIRD TO J. B. ARBUTHNOT AND A. C. G. BRANDON, OF SAME PLACE.

RAIL-JOINT.

SPECIFICATION forming part of Letters Patent No. 621,956, dated March 28, 1899.

Application filed November 14, 1898. Serial No. 696,325. (No model.)

To all whom it may concern:

Be it known that I, FRANK F. BRAY, of Kansas City, Jackson county, Missouri, have invented certain new and useful Improvements in Rail-Joints, of which the following is a specification.

My invention relates to rail-joints; and my object is to provide a joint for the meeting ends of two rails which will practically unite them into a single rail and will continue to support them in position if the bolts which extend through the fish-plate and the webs of the rails are displaced.

A further object is to provide a rail-joint which is of simple, compact, strong, durable, and inexpensive construction.

The invention consists, essentially, in the employment of a pair of fish-plates, which must be fitted laterally against opposite sides of the webs of the rails and adapted to rest at their ends upon a pair of cross-ties, and a base-plate, which bridges the joint between the rails at their lower side and fits between said fish-plates, being provided with upwardly-projecting flanges, which embrace opposite sides of the base-flanges of the rails and of the fish-plates.

The invention also embraces an enlargement of the fish-plates which rests upon the upper edges of said base-plate flanges.

Other features of the invention will hereinafter appear, and be pointed out in appended claims, and in order that the invention may be fully understood I will proceed to describe it with reference to the accompanying drawings, in which—

Figure 1 is a perspective view of the meeting ends of two rails connected by a rail-joint structure embodying my invention. Fig. 2 is a central vertical section of the same. Fig. 3 is a perspective view of one of the fish-plates. Fig. 4 is a perspective view of the base-plate. Fig. 5 is a view similar to Fig. 1, but showing a slightly-modified form of construction. Fig. 6 is a section of the same, taken on the line IV IV of Fig. 5. Fig. 7 is a perspective view of the meeting end of one rail. Fig. 8 is a horizontal section of the meeting ends of the rails and also shows the base-plate connecting the same.

Referring to the drawings, where like reference-numerals refer to corresponding parts in all the figures, 1 1 designate the cross-ties adjacent to and at opposite sides of the joint between the rails 2 2, the joint-line being indicated on Sheet 1 by the numeral 3 and on Sheet 2 by the numeral 3^a, the former being the square joint and the latter the miter or lap joint.

4 designates the fish-plates, consisting of the vertical flanges 5 and the base-flanges 6. These fish-plates bridge the joint between the rails, the vertical flanges 5 fitting tightly against the opposite sides of the webs of the rails and against the substantially horizontal shoulders at the under side of the balls or heads of the rails, so as to provide a rigid support therefor. The base-flanges 6 bear tightly upon the base-flanges of the rails and at their opposite ends are provided with extensions 7, which rest upon the cross-ties. The formation of these extensions 7 provides recesses 8 between them, these recesses by preference being of such length that they overlap two inches, more or less, the cross-ties, as shown in Figs. 1 and 5. The extensions 7 are also provided with notches 9 in their outer edges, these notches being designed to receive the customary spikes. (Not shown.) On Sheet 1 the fish-plates at their middle are by preference provided with enlargements 10, which at their lower ends project outward beyond the outer edges of the base-flanges 6 for a purpose which is hereinafter explained.

11 designates a base-plate corresponding in width to the base-flange of the rail and in length to the fish-plates, and therefore about equal to the distance between the outer edges of the two adjacent cross-ties at opposite sides of the joint. This base-plate increases in thickness toward its middle, as at 12, from points at equal distances from its ends, being formed thus like a truss in order to have increased strength and rigidity. It is provided at its opposite edges with the upwardly-projecting flanges 13, said flanges being equal in length to the recesses 8. To assemble these parts in operative position with relation to the rails and each other, it is absolutely essen-

tial that the fish-plates be first fitted laterally against opposite sides of the meeting ends of the rails and preferably secured in this position by means of the bolts 14 and nuts 15, said bolts extending through the customary holes 5^a in the webs of the rails and holes 5^b in the fish-plates. The base-plate is then fitted in position from below and can only be properly disposed from this direction. As it is fitted against the bottom of the rails it comes snugly between the extensions 7 of the base-flanges of the fish-plates and its flanges 13 snugly embrace the opposite edges of the rail-flanges and base-flanges 6 of the fish-plates, fitting snugly in recesses 8, as shown, and squarely up against the shoulders of the projecting or overlapping enlargements 10 when the latter are employed. The rails are then deposited upon the ties, as shown in Figs. 1 and 5, and the customary spikes driven into the ties through the notches 9 to not only prevent any upward movement of the rails, but also to eliminate lateral movement and all chance of creepage longitudinally. The securing-spikes are not illustrated, as they are of the common or any preferred type. By having that portion of the base-plate bridging the space between the cross-ties like a truss and the fish-plates, which bear tightly up against the balls of the rails, provided with the enlargements 10, bearing down upon said flanges 13, and said fish-plates displaceable only by direct lateral movement, prevented obviously by the flanges 13, it is clear that a perfect joint will be maintained even if the bolts 14 become displaced. It is impossible to remove said fish-plates without first raising the rails and fish-plates sufficiently high to clear the upper edges of the flanges 13 of the base-plates, and the latter maintain their positions on the ties almost as if part of the same, in order that a slight sinkage of the ties will be accompanied by a corresponding movement of the base-plate, which will therefore always provide a solid and substantial base for the meeting ends of the rails.

The base-plate is provided with the flanges 13, not only as a means for securing the fish-plates in position, but also to lend rigidity to the plate, and as long as said plate and the fish-plates retain their original relation to the rails all chance of the depression of the rail ends is practically eliminated, the flanges forming the truss resting at each end on the cross-ties.

The nuts and bolts employed to secure the fish-plates to the webs of the rails are designed, primarily, to prevent in a large degree independent expansion and contraction of the rails and fish-plates. This independent expansion might cause the vertical flanges of the fish-plates to buckle or bend outward, or the contraction might make a loose instead of a tight joint between said flanges and the opposing surfaces of the rails. These bolts by binding said parts closely together make the expansion and contraction practically the same, or at least will prevent any possible chance of displacement of the fish-plates from either of the causes mentioned.

In Sheet 2 the construction is precisely the same as that described, except that the rails are provided with a miter-joint, hereinbefore referred to, and are recessed in their side edges, as at 4^a, between the extensions 7 of the base-flanges of the fish-plates. The base-plate 11 in this case differs in construction from that shown in Sheet 1 only in the fact that the flanges 13 project upward within the side margins of the body portion of the plate, and therefore fit snugly in the recesses 4^a, formed in the base-flanges of the rails. These flanges, projecting into the recesses 4^a, not only serve to prevent lateral movement of the rails and also of the fish-plates, (because they project sufficiently high to embrace the base-flanges 6, as already described,) but, furthermore, by fitting in the recesses of the rails themselves they assist the spikes (not shown) in preventing the rails from creeping longitudinally, as will be readily understood. In this case the enlargements 10 to overlap and bear down upon the flanges 13 may be employed, if desired.

From the above description it will be apparent that I have produced a rail-joint which might properly be named a "safety" rail-joint, because the connection is secure if the bolts are removed, the bolts in any case being used only as a precautionary measure against extremes of heat or cold. It will also be apparent from the above description that I have produced a rail-joint which embodies the features of advantage enumerated as desirable in the statement of invention and which, owing to the fact that the fish-plates cannot be removed without first raising the rails and removing the base-plate, eliminates practically all chance of danger due to accidental disarrangement of the rails. It will be further seen that this truss-like support will maintain the tread-surface of the rails in the same plane, and by so doing will reduce the wear and tear on the rolling-stock in a large measure, as there will be practically but little pounding at the joint-line; in fact, with the miter-joint there will be practically no pounding.

It is to be understood, of course, that I reserve the right to make such changes as do not involve a departure from the spirit and scope of my invention.

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

1. A rail-joint, comprising fish-plates embracing the webs of the rails and bearing tightly against the base-flanges and the balls of the rails, provided with base-flange extensions, and enlargements midway their length which project outward beyond the edges of said base-flanges, and a base-plate underlapping the meeting ends of the rails and resting upon the ties, provided at its opposite

edges with upwardly-projecting flanges embracing the opposite sides of the base-flanges of the fish-plates between said extensions, and bearing against the under side of said centrally-located enlargements, substantially as described.

2. A rail-joint, comprising fish-plates embracing the webs of the rails and embodying vertical flanges to support the balls of the rails, and base-flanges resting upon the base-flanges of the rails, provided with extensions to rest upon the ties, a base-plate underlapping the meeting ends of the rails, resting upon the ties and between the extensions of the fish-plate base-flanges, and increasing in thickness toward its middle, and provided with upwardly-projecting flanges embracing the opposite sides of the base-flanges of the rails and of the fish-plates between said extensions, substantially as described.

In testimony whereof I affix my signature in the presence of two witnesses.

FRANK F. BRAY.

Witnesses:
M. R. REMLEY,
F. S. THRASHER.