

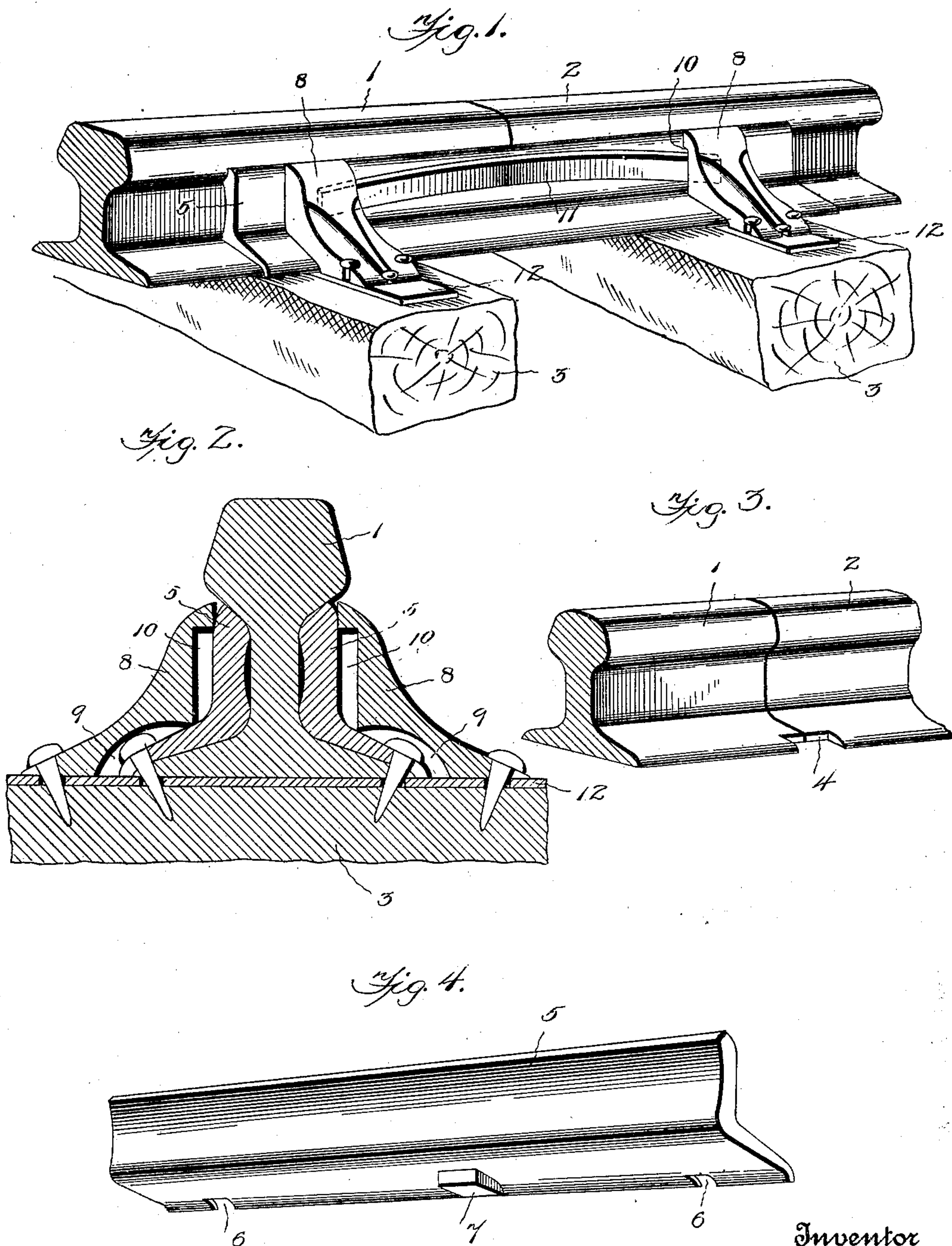
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J. A. HYLE.
RAIL JOINT.

(Application filed Dec. 20, 1900.)

(No Model.)



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UNITED STATES PATENT OFFICE.

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RAIL-JOINT.

SPECIFICATION forming part of Letters Patent No. 672,370, dated April 16, 1901.

Application filed December 20, 1900. Serial No. 40,563. (No model.)

To all whom it may concern:

Be it known that I, JACOB A. HYLE, a citizen of the United States, residing at Altoona, in the county of Blair and State of Pennsylvania, have invented certain new and useful Improvements in Rail-Joints; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it ap-
10 pertains to make and use the same, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

My invention relates to improvements in rail-joints, and has for its primary object the provision of a joint or connector which will permit of the rail-sections having their meet-
15 ing ends arranged intermediate the supporting-ties, in contradistinction to devices in which the meeting ends are located directly over the tie.

A further object is to provide a joint in which the rails are held securely in position without the use of connecting devices—such
25 as bolts, nuts, &c.—which pass through the web of the rail, the latter in the present invention being entirely free from any openings.

A further object is to provide a joint which will hold the rails from spreading relatively to
30 each other in a lateral direction, as well as preventing the spreading of the rails relative to the ties, but which will permit of the normal expansion and contraction of the metal forming the rails.

A further object is to provide means for preventing the “creeping” of the rails, said
35 means being located to operate in conjunction with the base of the rail-sections.

A further object is to provide a joint which
40 is durable in construction, can be readily applied, will retain the rail-sections in proper positions relative to each other and to the ties, and which can be manufactured at low cost.

The construction of the improved joint will
45 be fully described hereinafter in connection with the accompanying drawings, which form a part of this specification, and its novel features will be defined in the appended claims.

In the drawings, Figure 1 is a view in per-
50 spective of two rail-sections connected by my

improved joint. Fig. 2 is a vertical cross-sectional view taken through one of the rails, the fish-plates, and the chairs, the bar or spring being omitted to more clearly show the interior construction and formation of the chair. 55
Fig. 3 is a detail perspective view of the meeting ends of two rail-sections and showing the recess formed in the base portion of the rail-sections at their meeting ends. Fig. 4 is a detail perspective view of one of the fish-
60 plates, showing the lug which rests within the recess shown in Fig. 3.

So far as I am aware the general type of connectors or joints for rail-sections are so constructed that the meeting ends of the rails
65 are located directly over a tie, necessitating a great amount of labor and time being expended when repairs are being made and generally including the relaying of the rail-sections, &c. This location of the meeting ends
70 is due to the fact that the weight of the rolling-stock passing over the rail-sections at their meeting ends tends, unless a provision is made to prevent, to depress the ends successively, and thus constantly change the relative vertical positions of the meeting ends.
75 The location of the tie under the meeting ends is intended to reduce this tendency to vertical movement. The necessity for the location of the tie at this point is also presented
80 by the general form of joints used, wherein the fish-plates are positively connected together by bolts, &c., passing through the web of the rails, and thereby weakening the same structurally. In such construction the rela-
85 tive vertical movement of the meeting ends of the rail-sections acts to destroy the bolts by gradually cutting or breaking them and necessitating frequent repairs. In the present invention I not only dispense with the
90 weakening of the structural form of the rails by eliminating the providing of openings within the web of the rails, but also place the meeting ends of the rail-sections intermediate the ties. As is hereinafter described,
95 the joints or connectors on opposite sides of the rails are practically independent of each other, there being no connections between them which could be destroyed by any vertical movement, if such were to take place. 100

Furthermore, auxiliary means are provided which substantially lock the meeting ends against such relative vertical movement.

In order that a clear understanding may be had of the invention, I will now describe the same in detail, referring to the drawings, in which similar numerals of reference indicate similar parts in all of the figures.

1 and 2 designate, respectively, the meeting ends of two rail-sections of the usual or any preferred type, said rails being supported on the ties 3. The web portions of the rails are free from lateral openings of any kind, each section having, however, at its end a cut-out portion formed at the outer edge of the base portion, the cut-out portions of two meeting rail-sections forming, combinedly, a recess 4, as shown in Fig. 3. This recess may be formed on one or both sides, as desired, and, if necessary, the base portion of the rails may be provided with other recesses or openings for the reception of spikes, &c., adapted to be driven into the tie.

5 designates a fish-plate which substantially fits the under surface of the head of the rail, the web, and the upper surface of the base portion, as shown in Fig. 2. There need not be a close fit along the surface of the web portion; but it is essential that the contacting portions of the plate and the rail-sections below the head portion and at the juncture of the web and base portion form a close fit, as shown. Each plate 5 is provided with spike holes or recesses 6 near its ends and along its outer edge. One or both of the plates 5 are further provided, on the under surface of the flange portion thereof, preferably midway of its length, with a downwardly-projecting lug 7, of a size which will fit somewhat loosely (so far as the distance lengthwise of the plate is concerned) within the recess 4, the purpose being to prevent the creeping movements of the rail-sections and yet permitting of the expansion of the metal of the rails, the ends of the plates being held in position to resist such movement by the spikes, &c.

8 designates a chair, one being provided for each end of the fish-plates, having an external form to fit the outer face of the plate, as shown in Fig. 1. Each chair extends outwardly a sufficient distance to enable a number of spikes to be driven through a flange formed thereon into the tie, as shown. The chairs are provided with a recess or recesses 9 on the under surface, as shown in Fig. 2, to permit of the proper seating of the chair over the heads of the spikes which secure the fish-plate. Each chair 8 is further provided with an elongated recess 10, extending vertically therein contiguous to the vertical face of the fish-plate, said recess extending a suitable distance into the body of the chair, as shown in dotted lines in Fig. 1. The chairs being arranged in pairs, the recesses 10 are arranged to oppose each other—that is, the recesses extend inwardly from the opposing faces of the

two chairs and are provided for the purpose of receiving the ends of a resilient bar or spring 11, as shown in Fig. 1. The bar 11 is formed to withstand heavy pressure, and being in the form of an arc of a circle or bow-shaped provides a spring of great power, the purpose of which will be hereinafter set forth.

If desired, the ties may be provided with a plate 12, having suitable openings for the passage of spikes, the openings being preferably arranged to permit the spikes being driven at an angle, as shown in Fig. 2, although, if desired, the arrangement may be such as will permit the spikes to be driven vertically, the preferred form, however, tending to prevent bodily vertical movement of the rail-sections.

In securing the rail-sections in position they are first laid and the fish-plates placed in proper position relative thereto, the parts fitting closely, as hereinbefore described. One of the chairs 8 is now placed in its proper position and spiked down securely. The bar or spring 11 is then placed with one of its ends within the recess 10 of the chair, the bowed portion being against the fish-plate, and a clamp of suitable form is passed over the bar near its free end, which clamp, cooperating with a fixed support, such as the rail, will when operated draw the free end of the bar toward the fish-plate. The other chair 8 is then placed in position, the recess 10 receiving the free end of the spring or bar, and securely spiked down. When the clamp is removed, the spring will be held at its ends by the chairs and with its contacting portion against the fish-plate in alinement with the meeting ends of the rails, so that the tension of the spring is exerted against the fish-plate directly at the point where there would be a tendency of the rails to have a relative lateral movement. Either one or both sides of the rails may be provided with the spring or bar 11; but in case but one side is so provided I prefer that the inner side have this protection. It will be readily seen, therefore, that any tendency of the ends of the rail-sections to move vertically relative to each other, even though unsupported by a tie, must be against the natural resisting force of the vertical portion of the fish-plate, supplemented by the angular junction of the vertical and flange portions of the fish-plate. The result of such vertical movement would be the attempt to bend the vertical portion of the plate outward, which movement would be resisted not only by the frictional contact with the head of the portion, but by the tension of the bar or spring 11, which exerts its pressure in a direction to counteract this spreading movement of the fish-plates. This support, while the equivalent in results to the positive connecting of the fish-plates by bolts, yet is such as will permit under extraordinary strain such slight spreading of the fish-plates, although the tension of the spring is of sufficient power to prevent any such movement other than such as

would perhaps accrue under such extraordinary circumstances. With the removal of these circumstances there would be an immediate return of the parts to normal conditions, while with the bolt connections the latter would be destroyed by being snapped, and thus render the joint valueless. My construction therefore provides a means for preventing the creeping movement of the rails (through the medium of the lug 7 and recess 4) without preventing the natural expansion and contraction of the metal, prevents the lateral movement of the sections relative to each other, as described, and also prevents the vertical movement of the rail-sections relative to each other, and withal permitting of the meeting ends of the rail-sections being located at a point intermediate the supporting-ties.

It will be readily understood that the parts described may be removed for repairs without disturbing the position of the rail-section.

Having thus described my invention, what I claim as new is—

1. The combination with the meeting ends of rail-sections having their webs free from grooves and lateral openings, of connectors of uniform width and general configuration from end to end, located on opposite sides thereof and held against movement longitudinally of the rails, said connectors being positively supported solely at points approximately the opposite ends thereof and adapted to retain said sections against movement relative to each other.

2. The combination with the meeting ends of rail-sections having their webs free from grooves and lateral openings, of a fish-plate of uniform width and general configuration from end to end, said plate having its ends held fixedly against lateral movement, and being held bodily from movement longitudinally of the rails, and auxiliary means intermediate the ends for supporting the intermediate portion of the plate.

3. The combination with the meeting ends of rail-sections having their webs free from grooves and lateral openings, of a fish-plate of uniform width and general configuration from end to end fitting said sections and hav-

ing a flange overlapping the base thereof, said plate having its ends held fixedly against lateral movement and being held bodily from movement longitudinally of the rail-sections; and means intermediate the ends of said plate and exerting pressure toward the rail-sections for preventing lateral movement of the center of the fish-plate under downward pressure of the rail-sections, said means being yieldable under excessive pressure.

4. The combination with the meeting ends of rail-sections, of a fish-plate fitting said sections and having a flange overlapping the base thereof, and chairs fitting said fish-plate and overlapping the flange thereof, said chairs being located approximately the ends of said fish-plates, and means held in position by said chairs for supporting the fish-plate intermediate its ends against lateral movement under strain.

5. The combination with the meeting ends of rail-sections, of a fish-plate fitting said sections and having a flange overlapping the base thereof, chairs fitting said fish-plate and overlapping the flange thereof, said chairs being located approximately the ends of said fish-plate, and a spring held in position by said chairs, for supporting the fish-plate intermediate the ends thereof against lateral movement under strain.

6. A rail-joint comprising rail-sections having a recess formed along the outer edge of the base thereof at their meeting ends, the webs of said sections being free from grooves and lateral openings; a fish-plate closely fitting the upper surface of said bases, said plate having a depending lug loosely fitting with said recess; chairs fitting said fish-plate and located approximate the ends thereof; and means held in position by said chairs, for supporting the fish-plate intermediate its ends against lateral movement under strain.

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

JACOB A. HYLE.

Witnesses:

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J. Q. NICODEMUS.