Nov. 22, 1938. A. LODETTI 2,137,918

CONNECTING MEANS FOR RAILS

Filed Nov. 13, 1937

Fig. 1

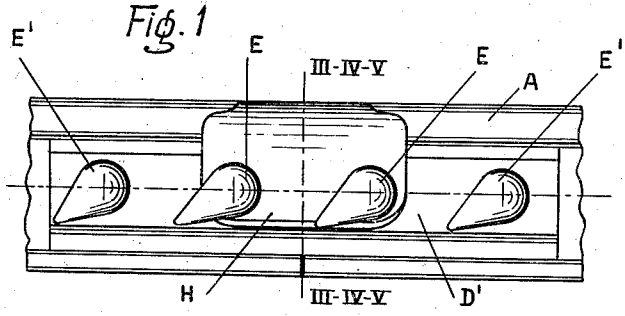


Fig. 3

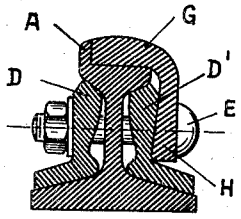


Fig. 2

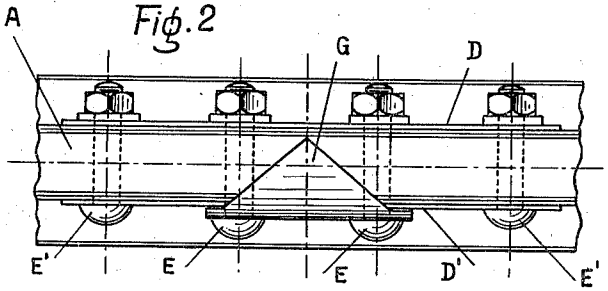


Fig. 4

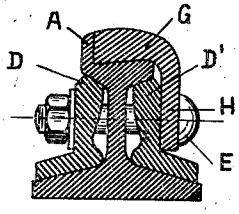


Fig. 6

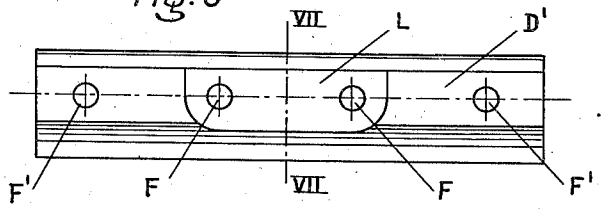


Fig. 5

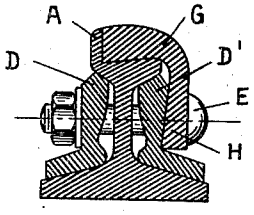


Fig. 7

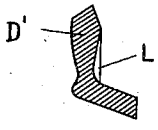


Fig. 8

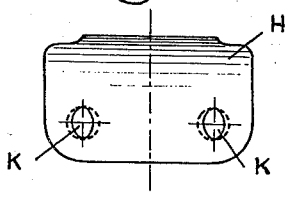


Fig. 9

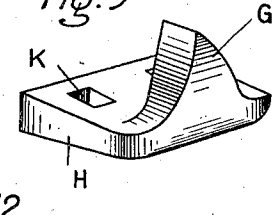


Fig. 10

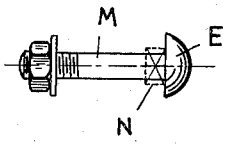


Fig. 11

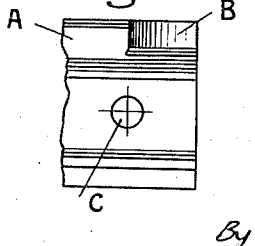
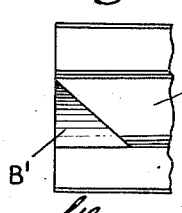


Fig. 12



A. Lodetti
Inventor

By: Mascock Downing & Leebed
Attys.

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CONNECTING MEANS FOR RAILS

Angelo Lodetti, Milan, Italy, assignor of seventy percent to Bruno Negrini and Angelo Sbarberi, Bologna, Italy

Application November 13, 1937, Serial No. 174,439
In Italy December 1, 1936

4 Claims. (Cl. 238—221)

This invention has for its object some improvements in the connecting means for railway and tramway rails and aims to provide means for overcoming the jolting which takes place by the rolling of the wheels on the point of connection of two rail sections.

As is known many systems have been proposed in order to overcome this inconvenience which grows more and more serious by the increase of speed and of the weight of the rolling stock.

Furthermore, the rolling stock suffers very much from the jolting in correspondence with the joints, and especially the electric locomotives in which the motors are fitted, exclusively or in part, on the axles, without interposition of springs.

In order to eliminate this inconvenience it has been proposed to cut at an angle other than right the rail ends in such a manner as to provide that the gap between the abutting rail sections is inclined with regard to the rail axis.

By this system, however, there are sharp edges at the inside of the rails, which are easily deformable and when deformed can abut against the wheel flanges and cause the train to derail.

According to other systems it has been proposed to cut the ends of the rails in wedge form and to fill the resulting pockets by means of two wedge-like inserts forming part of special fish-plates or splices to be substituted for the usual fish-plates.

According to the known systems these carrier fish-plates may be fitted on one or both sides of the rails. Anyway they must be such as to withstand a double stress, viz: the stress to which the usual fish-plates are subjected and the stress resulting from the passage of the train on the bridging portion or tongue at level with the rail surfaces. Therefore the modified fish-plates or splices, besides being of a somewhat complicated construction, must be worked with such a precision as to have the largest bearing area against the base flanges of the rails and this in order to minimize the stress transmitted by the splice to the fish-bolts. Thus these systems become very expensive due to the precision required in the construction and fitting of these modified splices and notwithstanding all the bolts of these splices or fish-plates are subject to a double stress and their nuts are subject to become loosened, due to heavy vibration of the splices. Now, if some of these splices become loosened, the corresponding rail sections are no more firmly connected together and a derailment of the train ensues.

According to the invention all inconveniences of the previous systems are overcome by cutting in known manner the outside edges of a part of the rail-head not as far as the inner rail edges and the bottom end of the said rail-head and by joining these modified rail sections by means of fish-plates or splices, which are fastened by means of usual bolts passed through the outside fish-holes. The resulting pocket formed in correspondence of the contiguous ends of two rail-sections is filled, according to the invention, by means of a bridge-like member having a flange adapted to bear against the outer fish-plate, the said bridge-member being fastened to the fish-plates and rails by means of the two middle fish-bolts. Thus all the fish-bolts are practically not subjected to any additional stress, but, even if the middle fish-bolts should resist the vibration and some additional stress imparted thereto by the bridge-like member and their nuts should become loosened, due to the fact that the outside fish-bolts are never subjected but to the usual stress and hold tight, the rail sections do not become disconnected even when the corresponding bridge-member should become slackened.

According to the invention, furthermore, means are provided in order to keep the bridge-like member against the rail and to avoid the transmission of any substantial additional stress on the fish-bolts.

The invention will be better understood by the following description made by reference to the attached drawing in which:

Figure 1 is a side view of a joint fitted to the rails modified according to the invention;

Figure 2 is a plan view;

Figures 3, 4 and 5 show in section on line III—III, IV—IV and V—V of Figure 1 respectively three embodiments of the joint according to the invention;

Figure 6 is a side view of a modified outer fish-plate or splice;

Figure 7 is a section on line VII—VII of Figure 6;

Figures 8 and 9 are a side view and a perspective view of two forms of bridge members;

Figure 10 shows a form of fish-bolt adapted for use in connecting together and to the rails the fish-plates and bridge member; and

Figures 11 and 12 are respectively an outer side view and a plan of the two rail ends modified so as to permit of using the wedge-like bridge member according to the invention.

With reference to the drawing, the outer edges

of the ends of the rail-head A are cut away in known manner at an angle to the rail axis, but not so far as the inner edges and for a certain thickness of the head, for instance ½ to ⅔ of the thickness of this part, as shown at B and B', Figs. 11 and 12 and in Figs. 3 to 5, in such a manner as to provide that a substantially prismatic triangular pocket is formed in correspondence of the joint when the ends of two rail sections are brought together, this pocket having its wider end directed towards the exterior of the rails.

The rail sections thus modified are connected together by means of fish-plates D—D' of usual design, whereby at first only the outer fish-bolts E'—E' are fitted through fish-holes F'—F'.

The substantially prismatic triangular pocket constituted by the two adjoining parts B and B' is filled by a wedge-like bridge-member G in one piece with a flange H made in such a manner as to bear against the outer fish-plate D', when the wedge-like part G is fitted in place. This flange H has two apertures K—K, Figures 8 and 9, which are positioned like the middle openings F—F, Fig. 6, of the outside fish-plate D'. The member G—H is fastened in position by means of fish-bolts E passed through holes K and the aligned fish-holes F (Fig. 6) and C (Fig. 11).

In order to overcome any tendency of the bridge-member G to slip outwardly or to exert an additional stress on the fish-bolts E, means are provided in order to draw the part G towards the inside of the rail-head A, or also to draw the part H against the outer fish-plate D', or both. To this purpose many arrangements are possible, but the following are proven the best ones:

In the arrangement according to Figure 3, the bottom of the pocket formed between the adjacent ends of the heads of two rail sections is substantially horizontal, but the outer fish-plate D' has intermediate of its ends a flattened part L slightly inclined inwardly with regard to the vertical.

The flange H of the bridge member G is correspondingly bent so as to provide that its inside face forms a slightly acute angle with the bottom face of G. This may be effected either by a corresponding bending of H or by making this part H of increased thickness from the part issuing from tongue G towards the lower part, as better shown in Figure 9. Due to the co-action of the inclined inside face of this part H against the inclined plane L of the outer fish-plate D', when the nuts of bolts E are tightened the part H is drawn downwardly and towards the rails and the wedge-like tongue G is caused to tightly bear against the bottom of the pocket in which it is inserted.

In the arrangement shown in Figure 4 the depth of the pocket formed at the ends of the rail-head increases from the outside towards the inside of the rail and the wedge-like tongue G is of correspondingly increased thickness from its wider end towards the apex, as shown in Figure 9. In this case the flange H may be of constant thickness and bent at such an angle as to bear against the corresponding side of a usual fish-plate D', i. e. a fish-plate without any specially flattened part.

It is apparent that, due to the shape of the bridging tongue G and of the corresponding pocket formed at the end of the rails the part G tends always to slide towards the inside of the rails.

A combination of the arrangements shown in Figures 3 and 4 is shown in Figure 5, in which the pocket in the rail-head is of increased depth towards its apex, the bridging tongue G is of correspondingly increased thickness and its flange H is also of increased thickness towards its lower end and bears against an inclined surface formed intermediate of the ends of the outer fish-plate D', as in the case described with reference to Figures 3, 6 and 7. It is apparent that this latter arrangement combines the advantages of the arrangements shown in Figures 3 and 4.

In order to avoid of any torsional or radial stress being transmitted from flange H to fish-bolts E, a certain play is necessary between the stem of fish-bolts E and the corresponding fish-holes K of flange H. To this purpose these holes K are made either circular, but of larger diameter than those of the stem M of the fish-bolts, as shown by dotted lines in Figure 8, or also oval, as shown by full lines in the same figure, or also rectangular, as shown in Figure 9. When rectangular holes are preferred, in order to check any tendency of the part G—H to be displaced angularly, under the head of the middle fish-bolts E a square part N is provided.

It is apparent that the invention can underlie some modifications especially as regards the shape of the bridge and it will be understood that although the prismatic triangular form is considered as the best form, the bridge may also be of trapezoidal shape, of heart-shaped form, or with otherwise curved walls and suitably shaped, provided the upper edges do not remain at right angles to the rail axis.

Furthermore, in order to avoid any tendency of the bridge-member G—H slipping towards the exterior, the bottom of the pockets and/or the outer side of the outer fish-plate may be grooved or ribbed and the abutting parts of the bridge-like member may be made with ribs engaging the grooves or vice-versa.

I claim:

1. In a rail joint the combination with a pair of rail sections, the webs of which are provided with holes while portions of the outside edges of the heads are cut away at an angle to the rail axis up to a certain distance from the inner edge and from the bottom part of the head so as to form a substantially prismatic triangular pocket on the tread surface at the meeting edges of the abutting rail sections, fish plates arranged on opposite sides of the web portions and contacting the adjacent faces of the head and base portions of the rail sections, a bridge member including a tongue-like portion and an integral flange portion, said portions being angularly disposed at slightly less than 90° relative to each other, the tongue-like portion filling the pocket while the flange portion is disposed against the outer face of the adjacent fish plate, the web portions of the rail sections, the fish plates and flanged portion of the bridge member being provided with aligning apertures, and nut and bolt arrangements engaged in the aligning apertures for fastening the parts together whereby due to the angular disposition of the tongue-like portion and the flange portion of the bridge member the adjacent parts of the joint will be jammed into engagement with each other.

2. A rail joint as claimed in claim 1, in which the outer surface of the fish plate which coacts with the flange portion of the bridge member is provided with a vertically inclined surface.

3. A rail joint as claimed in claim 1, in which the bottom of the pocket is inclined downwardly from the outer edge to the inner end thereof.

4. A rail joint as claimed in claim 1, in which the bottom of the pocket is inclined downwardly from the outer edge to the inner end thereof and in which the outer surface of the fish plate adjacent the flange portion of the bridge member is inclined downwardly while the tongue-like portion and the flange portion of the bridge member are tapered slightly from their outer edges to their point of juncture for respectively coacting with the inclined surface of the pocket and the inclined surface of the fish plate.

ANGELO LODETTI.