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CA 2855131 C 2016/11/08

(11)(21) 2 855 131

(12) BREVET CANADIEN / CANADIAN PATENT

(13) C

(22) Date de dépôt/Filing Date: 2014/06/25

(41) Mise à la disp. pub./Open to Public Insp.: 2014/12/27

(45) Date de délivrance/Issue Date: 2016/11/08

(30) Priorité/Priority: 2013/06/27 (ATGM 215/2013)

(51) Cl.Int./Int.Cl. *E01B 7/10* (2006.01)

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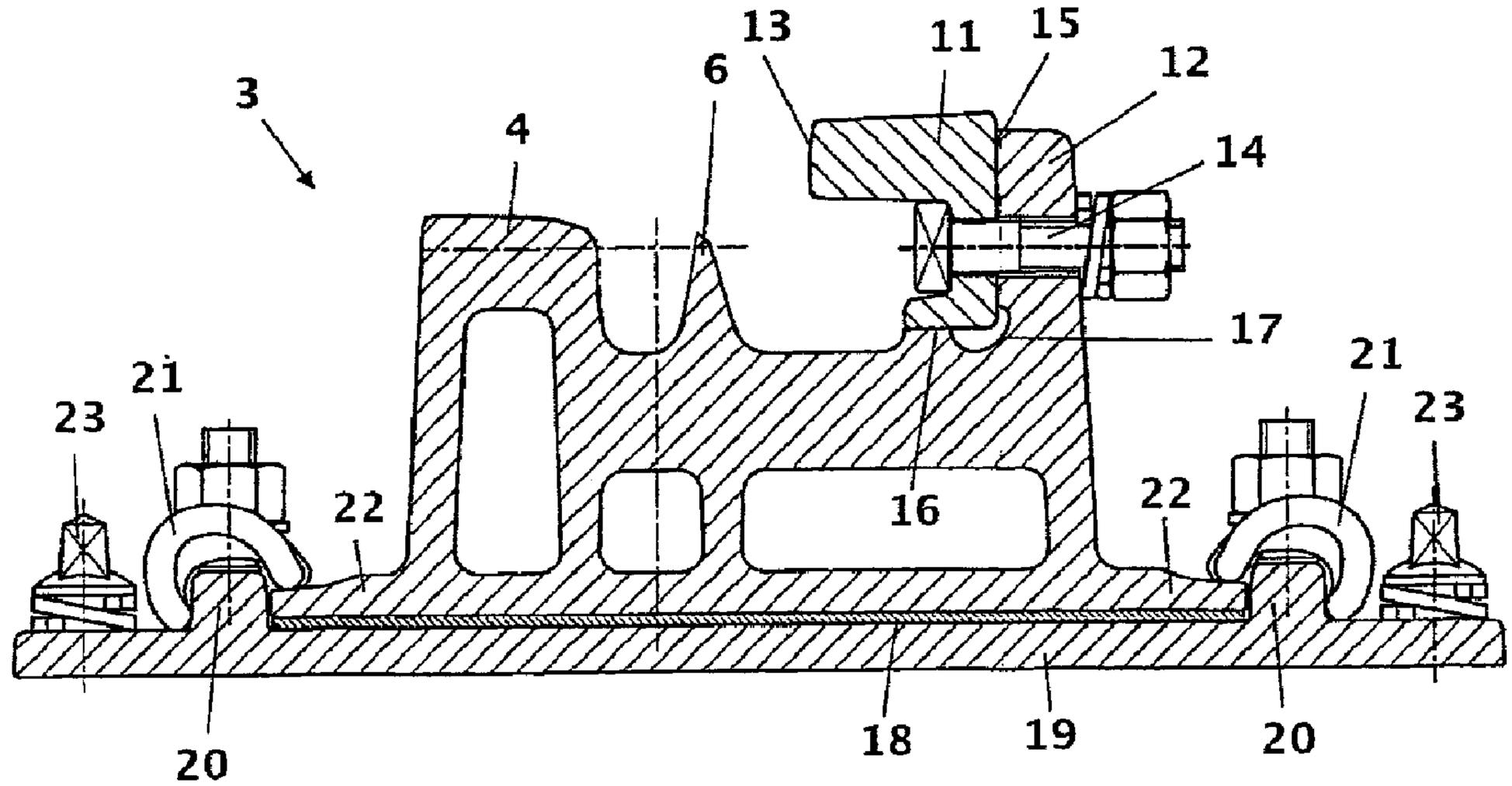
(54) Titre : COEUR DE CROISEMENT DOUBLE POUR TRAVERSES FERROVIAIRES
(54) Title: DOUBLE FROG FOR TRACK CROSSINGS



(57) Abrégé/Abstract:
In a double frog for track crossings with two opposing noses that are realized in a common material block and to which a check rail with at least one guide surface for a wheel is assigned, the check rail region featuring the guide surface is separably fastened on a check rail mounting that is realized in one piece with the material block.

Abstract:

In a double frog for track crossings with two opposing noses that are realized in a common material block and to which a check rail with at least one guide surface for a wheel is assigned, the check rail region featuring the guide surface is separably fastened on a check rail mounting that is realized in one piece with the material block.

Fig. 1

DOUBLE FROG FOR TRACK CROSSINGS

The invention relates to a double frog for track crossings with two opposing noses that are realized in a common material block and to which a check rail with at least one guide surface for a wheel is assigned.

Track crossings are formed by the intersection of two railroad tracks in one plane and comprise two double frogs including wing rails and guide rails that have the function of substitutionally supporting and guiding the wheel at the location, at which the running rail needs to be interrupted due to the passage of the wheel flanges (so-called flange groove).

In the context of the present invention, the term track crossings also includes slip switches.

In a double frog, the outer running rails of the intersecting tracks converge in an obtuse angle at the so-called knee of the frog and form the wing rails or joggled rails in this region. If the frog including wing rails consists of a casting (so-called monoblock-cast frog), e.g. of a hard manganese steel, the wing rails are typically connected to the abutting running rails by means of a welded joint. In this case, the noses approximately have the same length as the wing rails and likewise are connected to the following running rails, e.g., by means of welding.

The check rails may be realized in one piece with the casting. Alternatively, the check rails may also be supported on a separate support construction as described

with reference to a switch, as well as with reference to a crossing, in DE 4224159 A1.

The check rails serve for guiding the respectively opposing wheel in the region that is unguided due to the interruption of the running edge. In this case, the check rail presses against the outer side of the wheel flange in order to avoid a collision of the opposing wheel flange when the wheel rolls onto the nose of the frog. The check rail therefore is subjected to significant wear such that it needs to be regularly checked with respect to the exceedance of upper wear limits and replaced, if so required. When a check rail is realized in one piece with a monoblock-cast frog as it is generally preferred for durability reasons, the entire double frog needs to be exchanged in order to replace the check rail, wherein this exchange is associated with significant effort, a long service interruption and high costs.

In some embodiments, the present invention therefore aims to reduce the effort for the replacement of the check rail.

In a double frog of the initially described type, according to an aspect, the invention proposes to separably fasten the region of the check rail that features the guide surface on a check rail mounting that is realized in one piece with the material block. This design can provide a number of advantages. In comparison with a design, in which the check rail is fastened on a separate support construction, the number of components can be reduced such that the effort for the installation of the double frog can be reduced. In comparison with a design, in which the entire check rail is cast together with the double frog, in some embodiments the invention can provide the advantage

that it is not necessary to exchange the entire double frog in order to replace the check rail, but rather only the region of the check rail that features the guide surface and is separably fastened on the material block of the double frog. In this way, the service life of the double frog is extended. The design of the check rail region that features the guide surface in the form of a separate, separably fastened component furthermore makes it possible to realize this component of a material that is especially adapted to the respective operating conditions.

In order to allow a particularly simple exchange of the part of the check rail that is subjected to significant wear, in some embodiments, it is advantageously proposed that the separable fastening of the check rail region featuring the guide surface comprises screw joints.

According to a preferred enhancement of the invention, in some embodiments a particularly wear-resistant design can be achieved if the check rail region featuring the guide surface consists of a wear-resistant material or carries a wear-resistant coating on the guide surface, wherein the wear-resistant material preferably has a Brinell hardness number of at least 350 HBW, particularly at least 400 HBW. Particularly suitable steel alloys are known, for example, under the brand names Hardox® and Dillidur®.

If the material block is conventionally realized in the form of a casting, it is proposed, according to a preferred enhancement in some embodiments of the invention, to cast the check rail mounting together with the casting. The check rail mounting therefore is integrated into the cast

center block frog such that a particularly simple manufacture can be achieved.

In the case of a casting, the wing rails of the double frog preferably can also be realized in one piece with the casting.

In some embodiments, the invention can alternatively also be realized in a design, in which the wing rails of the double frog are connected to the material block on one or both sides by means of screw joints. The one-sided arrangement of the wing rails is in this case realized in a track crossing without switch. The wing rails are arranged on both sides of the double frog in slip switches, wherein the wing rails are in this case typically realized in the form of spring switch blades. The wing rails are preferably screwed to the material block with the aid of intermediately arranged lining elements in this case.

According to an aspect of the present invention, there is provided a double frog for track crossings with two opposing noses that are realized in a common material block and to which a check rail with at least one guide surface for a wheel is assigned, wherein a check rail region featuring the guide surface is separably fastened on a check rail mounting that is realized in one piece with the material block.

The invention is described in greater detail below with reference to exemplary embodiments that are schematically illustrated in the drawings. In these drawings, Fig. 1 shows a track crossing with two double frogs according to

a first embodiment, Fig. 2 shows a section along the line II-II in Fig. 1, Fig. 3 shows a double frog according to a second embodiment, Fig. 4 shows a section along the line IV-IV in Fig. 3 and Fig. 5 shows a section along the line V-V in Fig. 3.

Fig. 1 shows a track crossing, in which two tracks intersect at an acute angle. The first track comprises parallel running rails 1. The parallel running rails of the second track are identified by the reference symbol 2. The running rails 1 and 2 are interrupted in the region of the track crossing and respectively connected to one another by means of a double frog 3. The design of the double frog 3

is described in greater detail below with reference to the double frog illustrated in the upper portion of Fig. 1, wherein the double frog illustrated in the lower portion of the drawing is realized diametrically opposed. The double frog 3 features wing rails 4 that respectively originate at the outer running rails 1 and 2 and converge at the knee 5 of the frog. The double frog 3 furthermore features two opposing noses 6. The wing rails 4 and the noses 6 are welded to the running rails 1 and 2. The running edges of the first track and the second track are identified by the reference symbols 7 and 8 and drawn with bold lines in Fig. 1, wherein it is obvious that the running edges 7 and 8 are interrupted due to the passage of the respectively other flange groove 9 or 10. In order to improve the guidance of the wheel flanges in the unguided region, a check rail 11 is provided, on which the outside of the wheel flange can be guided.

In the embodiment according to Fig. 1, the double frog is realized in the form of a casting of the type illustrated in Fig. 2, wherein the nose 6, the wing rail 4 and a check rail mounting 12 are realized in one piece. The actual check rail 11 with its guide surface 13 is separably connected to the check rail mounting 12 by means of a screw joint 14. In this case, the check rail 11 and the check rail mounting 12 feature cooperating vertical stopping faces 15, as well as cooperating horizontal supporting surfaces 16. A material recess in the form of an undercut 17 is provided in the intersecting region of the stopping face 15 and the supporting surface 16 of the check rail mounting 12 in order to reduce potentially occurring stress concentrations. The double frog 3 in the form of a casting is arranged on a ribbed base plate 19 with the aid of an

elastic intermediate layer 18, wherein tension springs 21 are provided in the region of the ribs 20 in order to clamp the base 22 of the double frog against the ribbed base plate 19. Schematically indicated sleeper screws 23 are provided in order to fasten the ribbed base plate 19 on a not-shown sleeper.

The embodiment according to Fig. 3 features a modified design of a double frog 25 for a slip switch. This figure once again shows the running rails 1 and 2 of the first and the second track, as well as the outer wing rails 26 that are realized in the form of spring switch blades in this case. In addition, wing rails 24 that are realized in the form of spring switch blades and serve for transferring the wheel from the first track to the second track are also provided on the inner side in this case. The noses are identified by the reference symbol 27 and, in contrast to the embodiment according to Fig. 1, not realized in one piece with the respective wing rails 26 and 24. According to Figs. 4 and 5, the frog is composed of a center block 29, to both sides of which the wing rails 24 and 26 are screwed with the aid of intermediately arranged lining elements 28. For this purpose, the center block 29 and the lining element 28 feature corresponding through-bores for the through bolt 30. According to the sectional representation in Fig. 5, the nose 27 and a check rail mounting 31, on which the check rail 32 is separably fastened by means of a screw joint 33, are realized in the center block 29. In addition, Fig. 5 also shows a wheel 34 with a wheel flange 35.

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. A double frog for track crossings with two opposing noses that are realized in a common material block and to which a check rail with at least one guide surface for a wheel is assigned, wherein a check rail region featuring the guide surface is separably fastened on a check rail mounting that is realized in one piece with the material block.

2. The double frog according to claim 1, wherein the material block is realized in the form of a casting, and wherein the check rail mounting is cast together with said casting.

3. The double frog according to claim 2, wherein wing rails of the double frog are realized in one piece with the casting.

4. The double frog according to claim 1 or 2, wherein wing rails of the double frog are connected to one or both sides of the material block by means of screw joints.

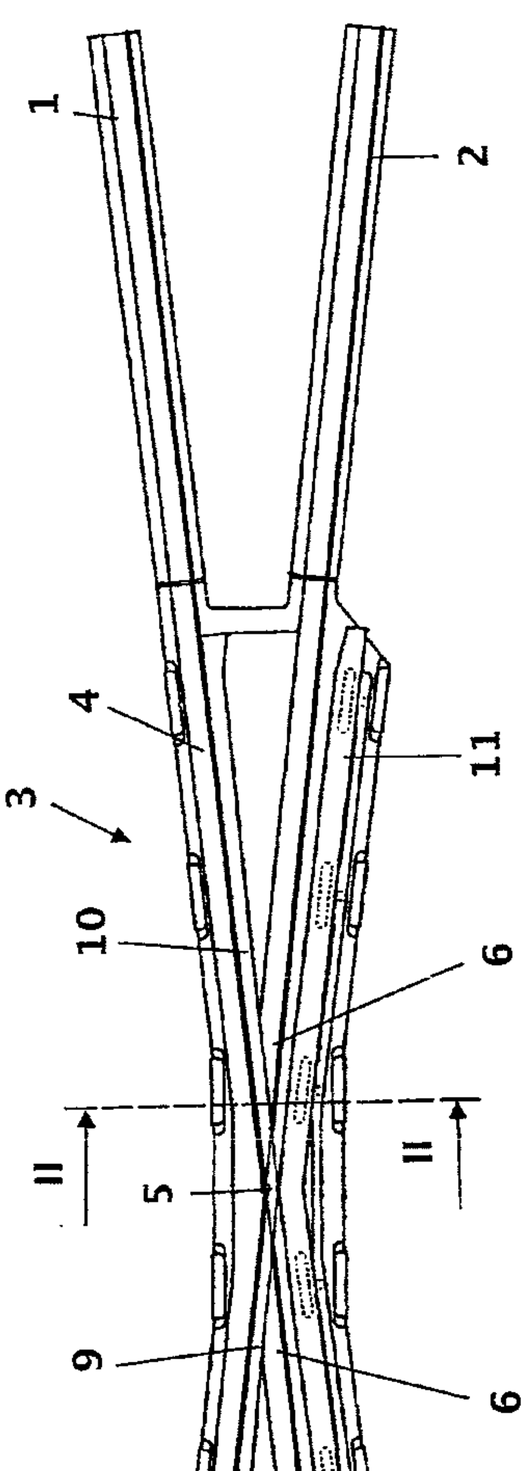
5. The double frog according to claim 4, wherein the wing rails are screwed to the material block with an intermediately arranged lining elements disposed therebetween.

6. The double frog according to any one of claims 1 to 5, wherein the separable fastening of the check rail region featuring the guide surface comprises screw joints.

7. The double frog according to any one of claims 1 to 6, wherein the check rail region featuring the guide surface consists of a wear-resistant material or carries a wear-resistant coating made of the wear-resistant material on the guide surface.

8. The double frog according to claim 7, wherein the wear-resistant material has a Brinell hardness number of at least 350 HBW.

9. The double frog according to claim 7, wherein the wear-resistant material has a Brinell hardness number of at least 400 HBW.



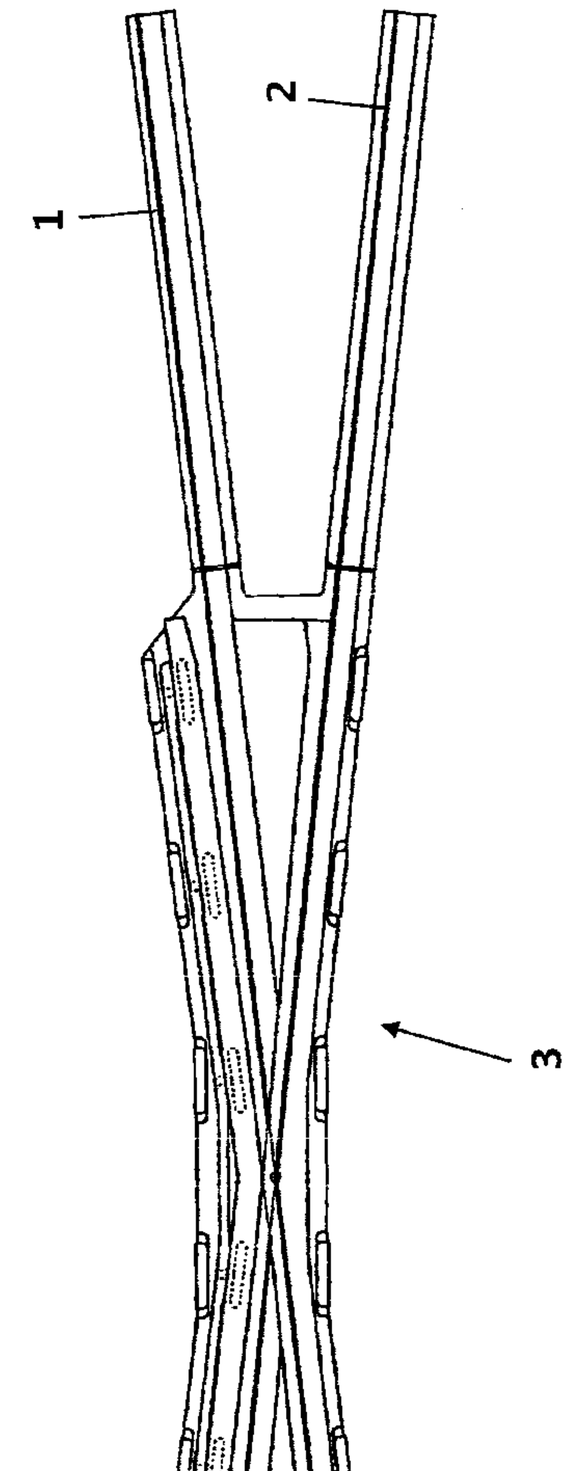


Fig. 1

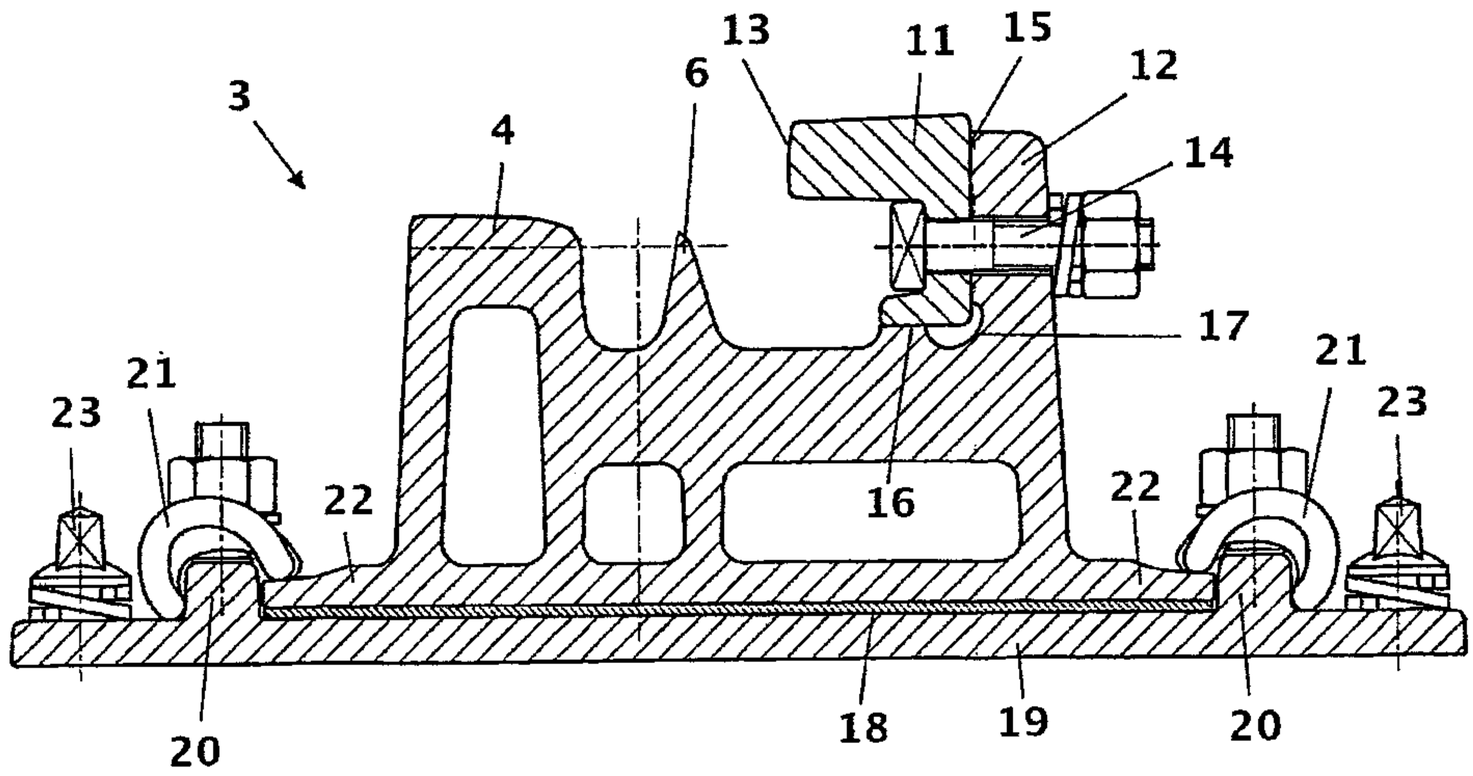


Fig. 2

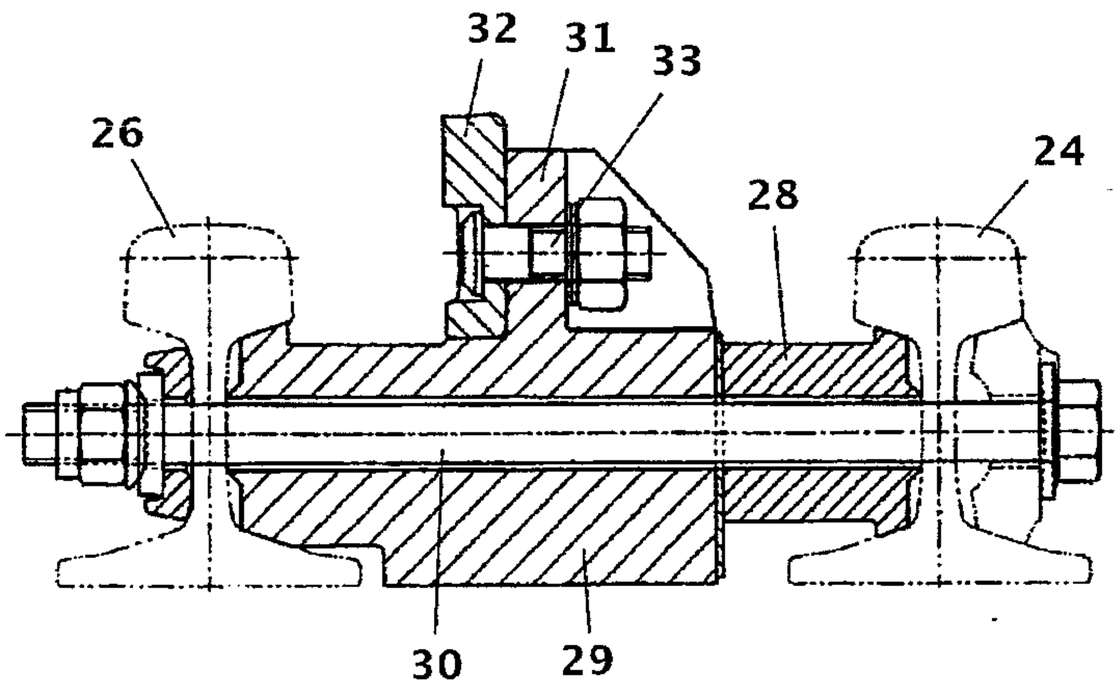


Fig. 4

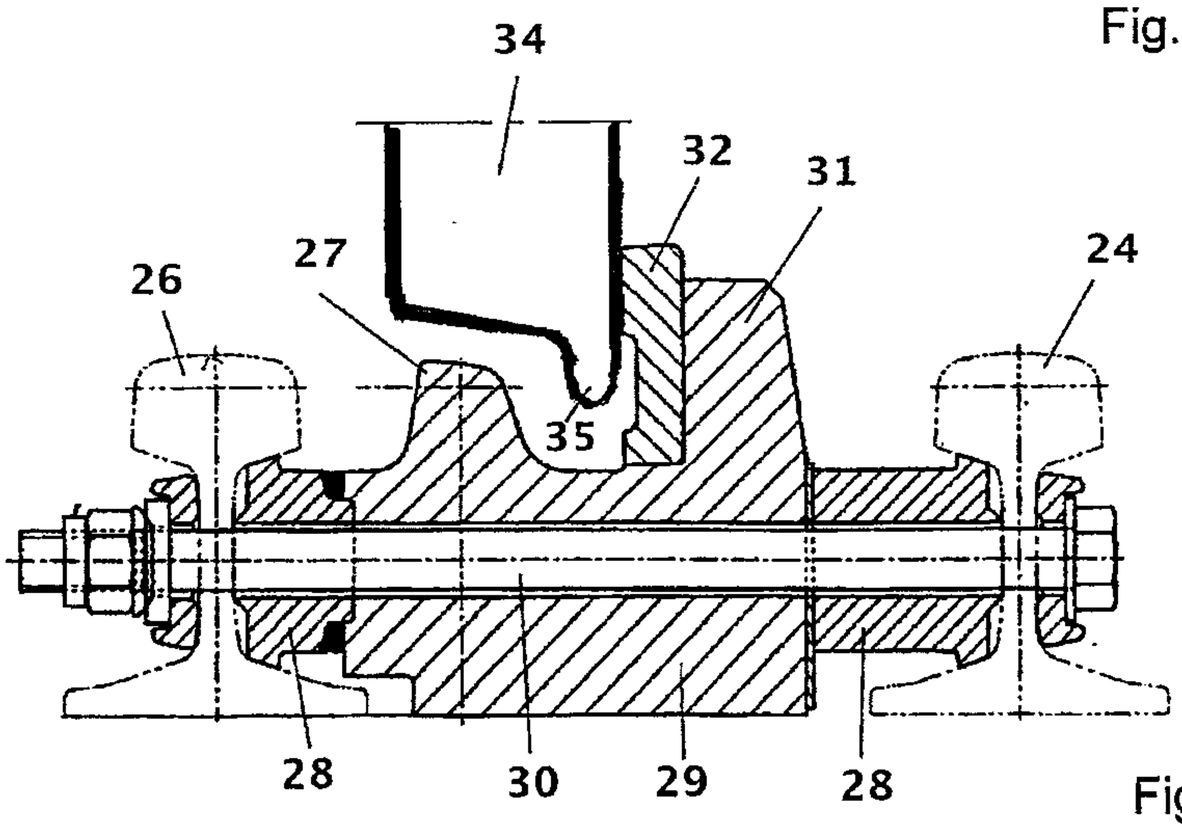


Fig. 5

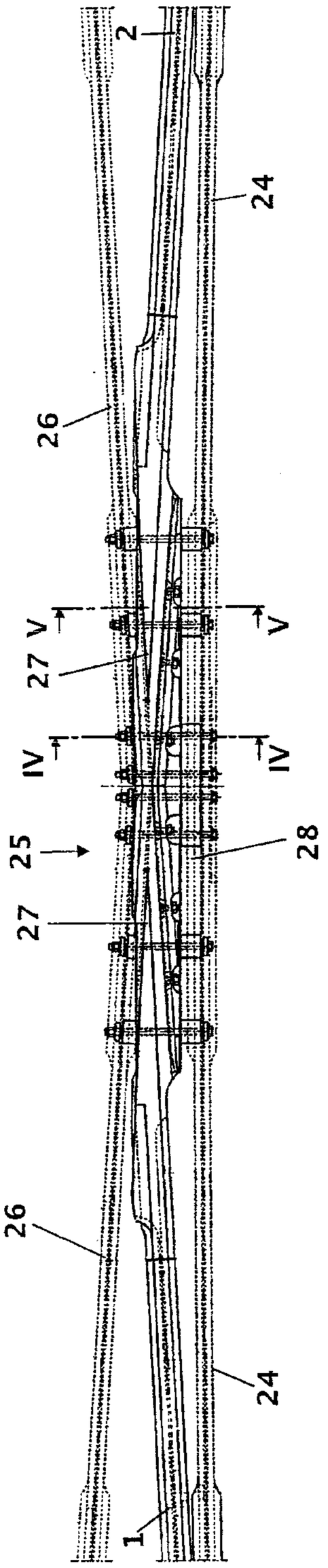
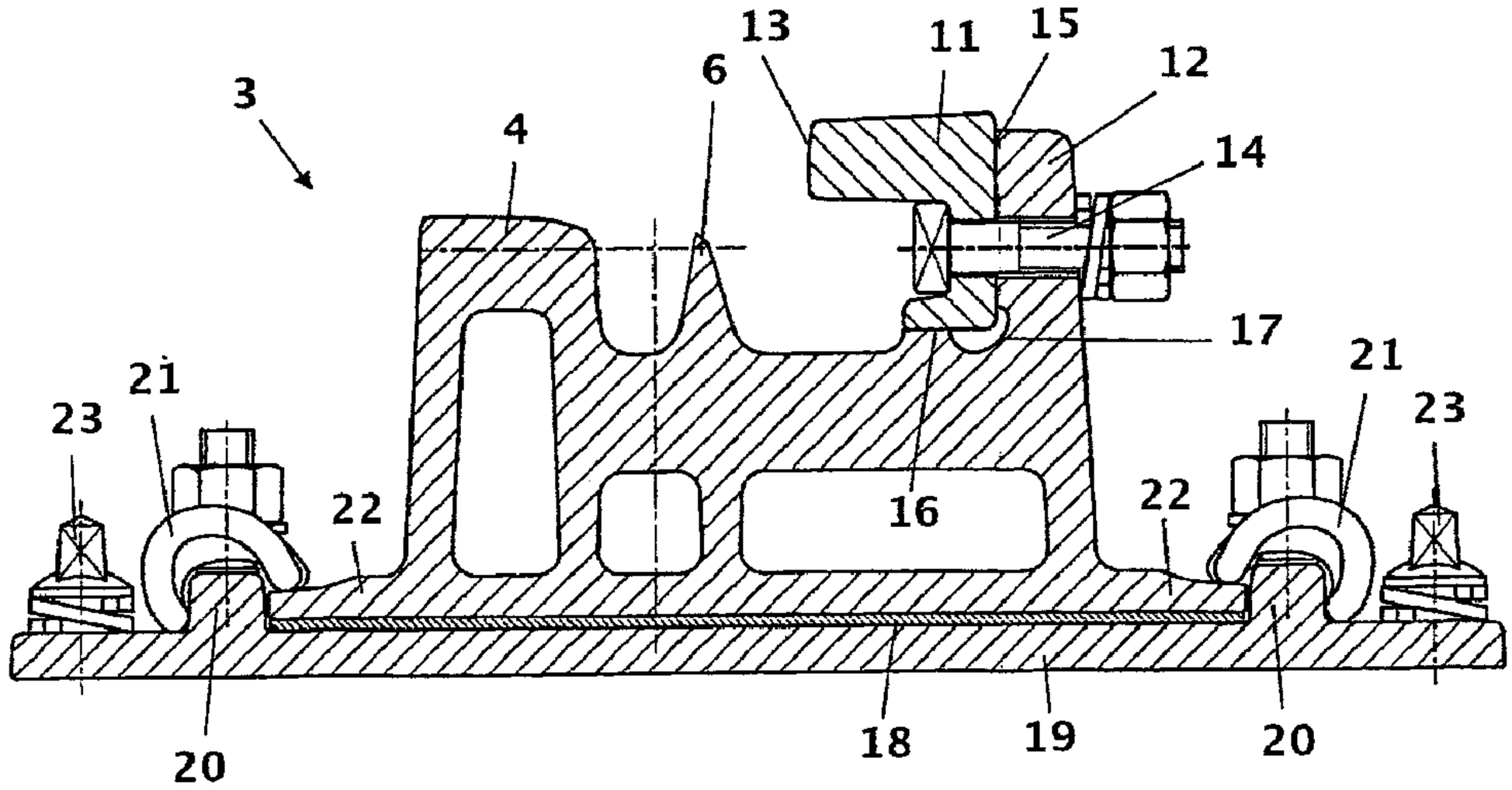


Fig. 3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