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(54) **RAIL-MOUNTED CAR HAVING AN ARTICULATED JOINT FOR PERMANENTLY CONNECTING TWO UNDERBODIES OF THE RAIL-MOUNTED CAR**

SCHIENENGEBUNDENER WAGEN MIT EINER GELENKVERBINDUNG ZUR DAUERHAFTEN VERBINDUNG VON ZWEI UNTERBÖDEN DES SCHIENENGEBUNDENEN WAGENS

VEHICULE FERROVIAIRE PRESENTANT UNE ARTICULATION PERMETTANT DE RELIER DE MANIERE PERMANENTE DEUX SOUBASSEMENTS DU VEHICULE FERROVIAIRE

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EP-A1- 1 312 527 **EP-A2- 1 151 905**
DE-A1- 10 153 460 **US-A- 4 962 861**

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Description

Technical Field of the Invention

[0001] This invention relates to a rail-mounted car that comprises two chassis, which are permanently connected via a link device, which comprises two link members connected to a chassis each, which members are turnably connected to each other via a hinge.

[0002] More precisely, the invention relates to a link device as such intended for permanently connecting two car chassis.

Description of the Prior Art

[0003] Link devices or link couplings for permanently connecting two chassis or car bodies included in a rail-mounted car or railroad car are richly described in the patent literature. See, for instance, US-A-2 051 958, US-A-3 667 820, DE-A-1 094 289, DE-AS-1 605 188, DE-19638763A1, DE-4121080A1, DE-10153460A1, FR-A-2 398 651, EP-A-0279245, EP-A-0343482, EP0771710A1 and EP1312527B1.

[0004] The hinge that connects the two link members in couplings of the kind in question has the purpose of, between the link members, transferring intermittent tensile, compressive and torsion stresses of the type that arise under all the conditions that occur in driving train units at low as well as high speeds, i.e., allowing all types of translations and rotations irrespective of these acting in the longitudinal, lateral or vertical direction, e.g., upon cornering and in driving in hilly topography, respectively. For this reason, the hinge has to be made with a vertical pin in order to enable horizontal turning laterally, as well as a more sophisticated, spherical bearing in which an elastic impact- and vibration-absorbing body (elastomer body) is included, and which can absorb the translations and rotations of the link members.

[0005] Such link couplings are permanent in the sense that they essentially have the purpose of permanently holding together two or more wheel-carried chassis or car bodies that together form an individual car, which in turn may be connected to and disconnected from other cars. Thus, during normal circumstances, the chassis in one and the same car are permanently connected to each other. However, every now and then, need arises for separating the chassis of the car from each other, e.g., in connection with repairs and maintenance and upon transportation to final customer.

[0006] It is common for previously known link couplings that they in practice only enable separation and renewed connection, respectively, of the chassis by dismounting and remounting, respectively, of the hinge between the two link members. However, this is a delicate work and difficult to carry out because the hinge includes a plurality of components, which in particular upon renewed connection has to be brought together with high accuracy; something which is complicated, time-consuming and ergonomically trying because the proper link members as well as the different hinge components are extraordinary heavy. The work is made more difficult if the chassis of the car would not be set up on an ideally horizontal ground.

[0007] Theoretically, it is feasible, per se, to dismount or release the fixing of one of the link members against the appurtenant chassis. However, in practice, this alternative is even more difficult to carry out and at times entirely impossible for reasons of construction and space.

[0008] EP 1 312 527 discloses a link device for a rail car comprising two chassis which are permanently connected via the link device. In the link device, a first link member connected to a first car chassis is hinged to a second link member connected to a second car chassis. For disconnection of the car chassis, either the hinge must be opened, or any of the link members must be dismounted from its associated car chassis. Either of these operations involves the problems discussed above.

[0009] Similar to EP 1 312 527, US 4,962,861 disclose an articulated connector for joining together two rail car platforms which are supported on a common truck bolster. In order to separate the rail cars, a hinged drawbar connection between connector portions requires dismounting. The connector portions are rigidly secured to the rail car chassis such as by welding.

[0010] Likewise similar to EP 1 312 527, EP 1 151 905 discloses an articulated connection between links secured by bolts to the chassis of two interconnected rail cars which requires, in order for separation of the rail cars, that either the articulated connection be opened and dismounted, or the links be dismounted from the rail car chassis.

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car chassis.

Objects and Features of the Invention

[0014] The present invention aims at obviating the above-mentioned drawbacks of previously known link couplings and at providing an improved link coupling or link device, as well as a rail-mounted car having improved possibilities of separating and again connecting two chassis included in the car. Thus, a primary object of the invention is to provide a link coupling that enables disconnection and connection, respectively, of two chassis included in a car without having to dismount and remount, respectively, the hinge between the two link members of the coupling, or dismounting and remounting, respectively, anyone of the fixings of the link members against a chassis; all with the purpose of enabling a quick and simple disconnection and connection, respectively, of two car chassis, e.g., in connection with intermittently occurring repair and maintenance work.

[0015] According to the invention, the above-mentioned object is attained by the features defined in the characteristic parts of the independent claim 1. Preferred embodiments of the link device according to the invention are furthermore defined in the dependent claims.

Summary of the Invention

[0016] The invention is based on the idea to make one of the two link members of the link coupling partable by constructing the same from two parts releasably connected to each other, namely a first part, which may be permanently connected to the hinge, and a second part, which is fastenable on one of the chassis, wherein the second link member can be allowed to be permanently fastened on the other chassis. Separation of the chassis may then be carried out by removing dismountable connecting elements, e.g., screws, which normally hold together the two parts of the partable link member. Advantageously, one part of the partable link member may be of a male-like character and insertable in a female-like seating in the second part. In such a way, the two chassis of the car may be brought together without major demand on precision in connection with reconnection. Although it is feasible, per se, to apply the invention in connection with such cars that include two independently wheel-carried chassis or car bodies, i.e., chassis that individually are carried by two pairs of wheel or wheel bogies, the same is particularly suitable for use in cars of the type that includes a so-called Jakobs bogie, i.e., a bogie that simultaneously carries ends of chassis facing each other, which chassis have own wheels or wheel bogies only at the opposite ends thereof.

Brief Description of the Appended drawings

[0017] In the drawings:

Fig. 1 is a simplified, perspective exploded view showing parts of two chassis or bodies included in a car, and a centrally placed Jakobs bogie carrying the same, as well as parts of a link coupling according to the invention, all objects being shown regarded obliquely from above,

Fig. 2 is an enlarged perspective view of a link arrangement belonging to the left chassis in fig. 1,

Fig. 3 is corresponding perspective view of a link arrangement belonging to the right chassis in fig. 1,

Fig. 4 is an exploded view corresponding to fig. 1 and showing the chassis and the Jakobs bogie obliquely from below,

Fig. 5 is an exploded view corresponding to fig. 2 and showing said link arrangement obliquely from below,

Fig. 6 is a perspective view corresponding to fig. 3 and show- ing the same link arrangement obliquely from below,

Fig. 7 is an enlarged, partial longitudinal section through the link coupling according to the invention in assem- bled state,

Fig. 8 is a perspective and additionally enlarged exploded view showing the arrangement according to fig. 2 more in detail,

Fig. 9 is a perspective exploded view illustrating a collision protection included in the arrangement according to fig. 8, and

Fig. 10 is an enlarged longitudinal section showing a detail included in said collision protection.

Detailed Description of a Preferred Embodiment of the Invention

[0018] In figs. 1 and 4, numerals 1, 2 designate parts of two chassis or car bodies, which together form a rail-mounted car for railway traffic. At the visible ends thereof facing each other, the two chassis are carried by a common Jakobs bogie generally designated 3, while the same chassis at the non-visible ends thereof are carried by own wheels or wheel bogies. In a conventional way, the schematically shown Jakobs bogie 3 includes a framework 4 and at least two pairs of wheels 5 and shock absorption means in the form of four elastic cushions 6 arranged in pairs and applied under assembling plates 7, which can be fixed underneath the individual chassis. The joint between the assembling plates 7 and the individual car chassis is outlined by means of male elements or pins 8 on the top sides of the plates and downward open seatings or holes 9 on the bottom sides of the chassis.

[0019] Reference is now made to fig. 7, which in longitudinal section illustrates an assembled link coupling according to the invention. This link coupling is generally designated 10 and includes two link members, which are

interconnected via a hinge in its entirety designated 11, which in the previously described way includes a vertical pin 12, which enables turning of the link members in relation to each other in the horizontal direction, as well as a partly spherical bearing box 13 (so-called elastomer bearing), which enables rotary motions and oscillatory motions in the vertical direction between the link members. The vertical, geometrical axis of the pivot pin 12 is designated C. A first link member 14, which is connected to the chassis 2, is situated to the right of the hinge 11 in fig. 7, while a second link member 15, which is connected to the chassis 1, is situated to the left of the hinge 11. At the ends thereof turned away from each other, said link members 14, 15 are permanently fixed at the respective chassis in so far that they after initial mounting on the chassis should not need to be removed even in connection with repairs and maintenance. However, it should be pointed out that the link members are not welded to the chassis, but rather connected to the same via releasable connecting elements, which enable exchange of the link members, e.g., after emergence of serious damage on the same or the chassis.

[0020] In accordance with the invention, one of the two link members 14, 15, namely. the first link member 14, is partable by being composed of two parts releasably connected to each other, namely a first part 16, which is permanently connected to the second link member 15 via the hinge 11 (see figs. 2 and 5), and a second part 17 (see figs. 3 and 6), which is permanently connected to the chassis 2. Among the applicant's designers, the part 16 is denominated "bearing bracket", while the part 17 popularly is denominated "shelf". More concrete, the first link part 16 is of a male-like character and insertable in a female-like seating in the second link part 17.

[0021] As is seen in figs. 3 and 6, the link part 17 is composed of a bottom plate 18, an upright transverse end plate 19, and two vertical side pieces or side plates 20, which are stiffly united to the end plate 19 as well as the bottom plate 18, preferably by being welded against the same. Thus, between the side pieces, an upward as well as forward open seating or space is defined in which the bearing bracket 16 can be received. In the backward direction from the end plate, two fastening plates 21 extend to which two longitudinal, vertical guide plates 22 are stiffly united. Said last-mentioned plates may be inserted between two blocks 23 protruding downward from the bottom side of the chassis and being of a type that is standard on car chassis of the kind in question. The blocks 23 are located in the area between the two support surfaces 24, which rest against the assembling plates 7 of the Jakobs bogie. Together, the plates 18-22 (see fig. 3) form a shelf-like frame that is form-stiff and capable of sustaining weight. In the rearward protruding fastening plates 21, holes 25 are recessed for dismountable fastening or locking elements 26, e.g., screws, by means of which the fastening plates may be fixed against the bottom sides of the blocks 23. In an analogous way, holes 27 are formed in the end wall 19 for horizontal screws or fastening elements 28, which may be tightened in holes in the front surfaces of the blocks 23. In the part of the end plate 19 that extends between the side pieces 20, additional holes 29 are formed, which are through and co-operate with sleeves 30, which extend in the direction axially rearward from the end plate. By means of said sleeves 30, comparatively long bolts or screws 31 may be guided inward towards the holes 29 and be inserted through the same in order to be tightened in threaded holes 32 in the end surface of the link part or of the bearing bracket 16 (see fig. 5).

[0022] In this connection, it should be pointed out that in the area axially behind the blocks 23 together with the abutment surfaces 24, there is a fairly well sized space for the operator that has the task of mounting and dismounting, respectively, the screws 31. Therefore, the work of, on one hand, connecting the two link parts 16, 17 to each other (by application of the screws 31), and on the other hand separating the same (by dismounting the screws 31), does not present any considerable difficulties in ergonomical respect.

[0023] In order to centre the Jakobs bogie and the hinge 11 in relation to each other - in the case such a bogie is included in the car - two co-operating centring devices are arranged, namely a first device 33 on the framework 4 of the bogie and a second device 34 (see fig. 6), which is included in the link part 17. In the example, the first centring device 33 is in the form of a protruding male element having a rotationally symmetrical basic shape, while the device 34 consists of a downwardly opening, analogously shaped seating in which the male element 33 engages. As is seen in fig. 7, the seating 33 is formed in the bottom side of the bottom plate 18 the link part 17, the pivot pin 12 not having contact with the centring devices. However, in the assembled state of the link coupling, the link part 16 is stiffly united to the link part 17 (by means of the screws 31), the construction being so formed that the pivot pin 12 and the male element 33 automatically are centred in relation to the geometrical centre axis C when the link part 16 assumes correct position in relation to the link part 17.

[0024] In fig. 8, it is seen how the second link member 15 includes a front link head 35 and a rear carrier generally fixedly connectable to an appurtenant chassis and designated 36. Like the shelf-like link part 17, said carrier includes one or two bottom plates 37 and a vertical plate 38 in the form of a front plate from which two vertical side pieces 39 extend, which are stiffly united to the front plate as well as the bottom plate. The side pieces are oriented perpendicularly to the front plate and mutually spaced-apart, at the same time as they separately are located at a certain distance inside the opposite side edges of the bottom plate 37. In practice, the frame 36 (as well as the frame 17) is made from a strong steel plate, e.g., having a thickness within the range of 25-50 mm. A back piece 40 included in the carrier is even stronger, which piece advantageously can be made in the form of a solid cast iron body, which is connected to the side pieces 39 of

the frame 36 via one or more strong connecting elements 41, e.g., thick bolts or pins. In analogy with the link part 17, the frame 36 may be connected to the appurtenant chassis by means of bolts that are tightened in the block 23 of the chassis via holes 25, 27.

- Reference is now made to figs. 9 and 10, which more in detail illustrate the nature of the link member 15. In fig. 9, it is seen that the link head 35 at a rear end has a cross piece 42, which extends perpendicularly to the geometrical longitudinal axis of the link head. More precisely, the cross piece 42 is of a rectangular basic shape, grooves 43 being recessed in the opposite short side edges thereof. In the mounted state, the link head 35 projects through a central opening 44 in the front plate 38 of the frame 36, the cross piece abutting against the back side of the front plate. In the cross piece 42, four threaded holes 45 are formed for receipt of equally many screws or bolts 46 (see fig. 10), which have the purpose of holding the link head in place. In the area between the male thread and head of the individual screw, the shank of the screw is somewhat weakened via a waist 47, the diameter of which decides the strength of the screw. By endowing the waist 47 a suitable diameter, it may be predetermined at which stress the screw should break. If the link coupling in its entirety would be exposed to extreme, axial impulsive forces of the type that may arise in connection with collisions, accordingly the link head 35 may be detached from the frame 36 by the fact that the screws 46 break, and then be set in an axial, translational motion in the backward direction.

[0025] On the inside of the individual side piece 39, an axially oriented guide bar 48 is arranged, which engages a co-operating groove 43 in the cross piece 42 of the link head. Upon translational move of the link head in relation to the frame, accordingly the link head is guided by the bars 48.

[0026] In the shown, preferred embodiment of the link coupling, a collision protection is integrated in the link member 15, which in the example is in the form of three tubes or sleeves 49, 50, namely a central tube 49 of a first type, and two co-lateral tubes 50 of another type. All tubes are deformable and co-operate with through bores 51, 52 formed in the back piece 40, which bores have a smaller diameter than the appurtenant tube. As is clearly seen in fig. 9, the intermediate deformation tube 49 together with the appurtenant bore 51 has a larger diameter than the two co-lateral tubes 50 and the bores 52 thereof. Although the bores 50, 51 have different diameters, the same are formed in principally the same way. See in this respect fig. 10, which shows a thin deformation tube 50 together with the appurtenant bore 52. In this bore, a funnel-like, conical mouth 53 is formed, which widens in the forward direction. The deformation tube 50 is of a cylindrical basic shape, but has at the rear end thereof a conical tapering portion 54, which is inserted into the conical mouth 53. In this position, the tube is kept in place by means of a holder in its entirety designated 55. The mouth 53 and the conical portion 54 of the tube has one and the same conicity or cone angle. Said cone angle should amount to at least 5° and at most 20°, and suitably be within the range of 10-16°. Tests that form the basis of the invention have been most successful when the cone angles have varied within the range of 11-15°.

[0027] At the opposite, front end 56 thereof, the deformation tube 50 is distanced from the cross piece 42 of the link head via a gap 57. The tube end 56 may advantageously consist of a planar, ring-shaped surface, which extends perpendicularly to the geometrical longitudinal axis of the tube. The axial extension of the gap 57 may be within the range of 10-20 mm. In this connection, it should be pointed out that the corresponding gap of the intermediate deformation tube 49 may have another, for instance smaller, axial extension than the gap 57 of each thin deformation tube 50. For instance, the corresponding gap length of the tube 49 may be within the range of 5-15 mm. By the fact that the gaps are of different sizes, the different deformation tubes will be impinged by the cross piece 42 at different points of time.

[0028] Here, it should be pointed out that the collision protection shown in figs. 8-10 and briefly described is the subject of a simultaneously filed Swedish patent application having the denomination "COLLISION PROTECTION IN A COUPLER FOR RAIL-MOUNTED VEHICLES AND A COUPLER EQUIPPED THEREWITH FOR PERMANENTLY CONNECTING TWO RAIL-MOUNTED VEHICLE UNITS". In the same patent application, the collision protection is described more in detail. Briefly, it should, however, be mentioned that the screws 46 upon a strong collision break, whereby the link head 35 is detached and can move in the direction of the back piece 40. In doing so, the cross piece 42 impinges on the deformation tubes 49, 50, which will be pressed into the appurtenant bore 51, 52 in the back piece up to a point where the cross piece is stopped against the back piece. When the individual tube is pressed into the appurtenant bore, the same will be deformed successively by being compressed or pressed together in the radial direction, while the outer diameter of the tube is reduced to the same inner diameter as the smallest diameter of the cone mouth 53. During this deformation work, the kinetic energy in the detached link head is converted into heat in the deformation tubes as well as the back piece. This means that a substantial part of the kinetic energy is extincted before it has time to be transferred from one of the car chassis to the other.

The Function and Advantages of the Link Coupling According to the Invention

[0029] When the two chassis or car bodies 1, 2 is to be assembled while forming a usable car, in a first step the link part 17 is mounted on one of the chassis 2 and

the link member 15, with the ensuing link part 16, on the other chassis 1. Fixation of the shelf and box-like frames 36, 17, respectively, is carried out in the above described way by means of screws or bolts 26, 28, which are tightened in threaded holes in the blocks 23 of the chassis. In the next step, the end of the chassis 2 not equipped with wheels is lifted in above the Jakobs bogie 3 and is located in a position in which the male elements 8 can be brought to engagement with the seatings 9 at the same time as the centring devices 33, 34 engage each other. When this has taken place, also the end of the other chassis 1 not equipped with wheels is lifted in above the Jakobs bogie and is lowered down so that the male-like link part or bearing bracket 16 is located in the female-like seating that is delimited by the bottom plate, end plate and side pieces of the link part 17. Vertical lowering of the link part 16 into said seating is possible as a consequence of the seating being open upward. In a final step, the link parts 16, 17 are fixed in relation to each other by means of the screws 31.

[0030] During normal circumstances, the described link coupling in co-operation with the Jakobs bogie guarantee a permanent keeping together of the two chassis. However, would a need arise for separating the chassis from each other, this can be carried out by means of the simple measure of dismounting the screws 31 and remove the chassis from the Jakobs bogie in the opposite order.

[0031] A fundamental advantage of the invention is that two chassis included in a car can be connected and disconnected without any need for manipulating the hinge between the link members of the link coupling. Neither the more or less theoretical possibility of removing a link member from the appurtenant chassis needs to be resorted to.

Feasible Modifications of the Invention

[0032] The invention is not limited only to the embodiment described above and shown in the drawings. Thus, the invention is applicable also to such link devices or link couplings that lack collision protection. It is also feasible to apply the invention to such link couplings that do not co-operate with any Jakobs bogie. Thus, the link coupling can also be used for such cars the chassis of which are separately wheel-carried at the two ends thereof.

List of Reference Designations

[0033]

1 Chassis
2 Chassis
3 Jakobs bogie
4 Framework
5 Wheels
6 Damping cushions
7 Assembling plates
8 Male element
9 Seatings
10 Link coupling
11 Hinge
12 Pivot pin
13 Bearing box
14 First link member
15 Second link member
16 First link part
17 Second link part
18 Bottom plate
19 End plate
20 Side pieces
21 Fastening plates
22 Guide plates
23 Blocks
24 Support surfaces
25 Screw hole
26 Screws
27 Screw hole
28 Screws
29 Via hole
30 Sleeves
31 Screws
32 Screw hole
33 Lower centring device
34 Upper centring device
35 Link head
38 Front plate
39 Side pieces
40 Back pieces
41 Fixing screws
42 Cross piece
43 Guiding groove
44 Opening
45 Screw hole
46 Screws
47 Waist
48 Guide bar
49 Intermediate deformation tube
50 Lateral deformation tube
51 Bore

52 Bore

53 Coned mouth

54 Cone tip

55 Holder

56 Tube end

57 Gap

36 Carrier

37 Bottom plate

Claims

1. A link device for permanently connecting two chassis of a rail-mounted car, comprising two link members (14, 15) connectable to a chassis each, which members are pivotally connected to each other via a hinge (11), wherein a first link member (14) is divisible by being composed of two parts (16, 17) releasably connected to each other, namely a first part (16) connected to the hinge (11) and a second part (17) which is connectable to one of the chassis (2), and the second link member (15) being connectable to the other chassis (1), the releasable joint between said link parts (16, 17) having the purpose of enabling separation of the chassis from each other, and wherein the first part (16) of the divisible link member (14) is of a male-like character and inserted into a female-like seating in the second part (17) and fixed therein by means of dismountable connecting elements (31), **characterized in that** said second link part comprises a shelf-like frame (17) composed of a bottom plate (18), an upright end plate (19), and two vertical side pieces (20) which project in the forward direction from the end plate and are stiffly united to the same as well as to the bottom plate while defining said seating.

2. The link device according to claim 1, **characterized in that** one or more fastening plates (21) extend rearward from the end plate (19) for connection to a chassis.

3. The link device according to claim 1 or 2, **characterized in that** in the end plate (19) a number of through holes (29) are formed adjacent to which there are sleeves (30) extending rearward for said connecting elements (31).

4. The link device according to claim 1 or 2, **characterized in that** the bottom plate (18) of the frame (17) includes a centring device (33) for co-operation with an analogous centring device (34) on a Jakobs bogie.

Patentansprüche

1. Verbindungsvorrichtung zum permanenten Verbinden zweier Unterböden eines schienengebundenen Wagens, mit zwei Verbindungselementen (14, 15), die mit je einem der Unterböden verbindbar sind, welche Verbindungselemente miteinander über ein Gelenk (11) schwenkbar verbunden sind, wobei ein erstes Verbindungselement (14) unterteilbar ist, indem es aus zwei Teilen (16, 17) besteht, die lösbar miteinander verbunden sind, nämlich einem ersten Teil (16), der mit dem Gelenk (11) verbunden ist, und einem zweiten Teil (17), der mit einem der Unterböden (2) verbindbar ist, und das zweite Verbindungselement (15) mit dem anderen Unterboden (1) verbindbar ist, wobei die lösbare Verbindung zwischen den Verbindungsteilen (16, 17) den Zweck hat, ein Trennen der Unterböden voneinander zu ermöglichen, und wobei der erste Teil (16) des trennbaren Verbindungselementes (14) einen männlichen Charakter hat und in einen weiblichen Sitz im zweiten Teil (17) eingesetzt und darin mittels eines demontierbaren Anschlußelementes (31) fixiert ist, **dadurch gekennzeichnet, daß** der zweite Verbindungsteil einen regalartigen Rahmen (17) umfaßt, der aus einer Bodenplatte (18), einer aufrecht stehenden Endplatte (19) sowie zwei vertikalen Seitenteilen (20) gebildet ist, die von der Endplatte in Richtung nach vorne ragen und mit derselben sowie mit der Bodenplatte steif verbunden sind, während sie den Sitz definieren.

2. Verbindungsvorrichtung nach Anspruch 1, **dadurch gekennzeichnet, daß** sich eine oder mehrere Befestigungsplatten (21) zur Verbindung mit einem Unterboden von der Platte (19) nach hinten erstrecken.

3. Verbindungsvorrichtung nach Anspruch 1 oder 2, **dadurch gekennzeichnet, daß** in der Endplatte (19) eine Anzahl von Durchtrittslöchern (29) ausgebildet ist, denen benachbart Hülsen (30) vorgesehen sind, die sich von den Anschlußelementen (31) nach hinten erstrekken.

4. Verbindungsvorrichtung nach Anspruch 1 oder 2, **dadurch gekennzeichnet, daß** die Bodenplatte (18) des Rahmens (17) eine Zentriervorrichtung (33) zum Zusammenwirken mit einer analogen Zentriervorrichtung (34) eines Jakobs-Bogie aufweist.

Revendications

1. Dispositif de liaison permettant de raccorder de ma-

nière permanente deux châssis d'un véhicule ferroviaire, comprenant deux éléments de liaison (14, 15) pouvant chacun être raccordé à un châssis, lesquels éléments sont raccordés de manière pivotante l'un à l'autre par l'intermédiaire d'une articulation (11), dans lequel un premier élément de liaison (14) peut être séparé étant donné qu'il est composé de deux parties (16, 17) raccordées de manière amovible l'une à l'autre, à savoir une première partie (16) raccordée à l'articulation (11) et une seconde partie (17) qui peut être raccordée à l'un des châssis (2), et le second élément de liaison (15) pouvant être raccordé l'autre châssis (1), l'articulation amovible entre lesdites parties de liaison (16, 17) ayant pour but de permettre la séparation des châssis l'un par rapport à l'autre, et dans lequel la première partie (16) de l'élément de liaison séparable (14) est de type mâle et insérée dans un appui de type femelle dans la seconde partie (17) et fixée à l'intérieur au moyen d'éléments de raccordement démontables (31), **caractérisé en ce que** ladite seconde partie de liaison comprend un support de type épaulement (17) composé d'une plaque inférieure (18), d'une plaque d'extrémité verticale (19) et de deux pièces latérales verticales (20) qui font saillie dans la direction avant depuis la plaque d'extrémité et sont unies de manière rigide à celle-ci ainsi qu'à la plaque inférieure tout en définissant ledit appui.

2. Dispositif de liaison selon la revendication 1, **caractérisé en ce qu'**une ou plusieurs plaques de fixation (21) s'étendent vers l'arrière depuis la plaque d'extrémité (19) pour le raccordement à un châssis.

3. Dispositif de liaison selon la revendication 1 ou 2, **caractérisé en ce que** dans la plaque d'extrémité (19) plusieurs trous traversants (29) sont formés de manière adjacente auxquels il y a des manchons (30) s'étendant vers l'arrière pour lesdits éléments de raccordement (31).

4. Dispositif de liaison selon la revendication 1 ou 2, **caractérisé en ce que** la plaque inférieure (18) du support (17) comprend un dispositif de centrage (33) permettant une coopération avec un dispositif de centrage (34) analogue sur un bogie Jacobs.

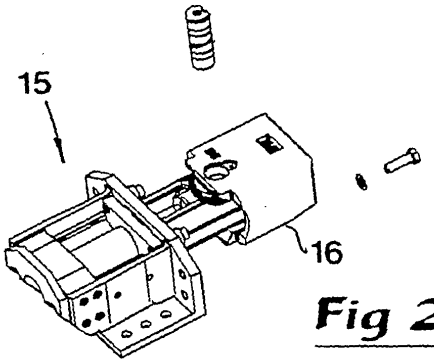


Fig 2

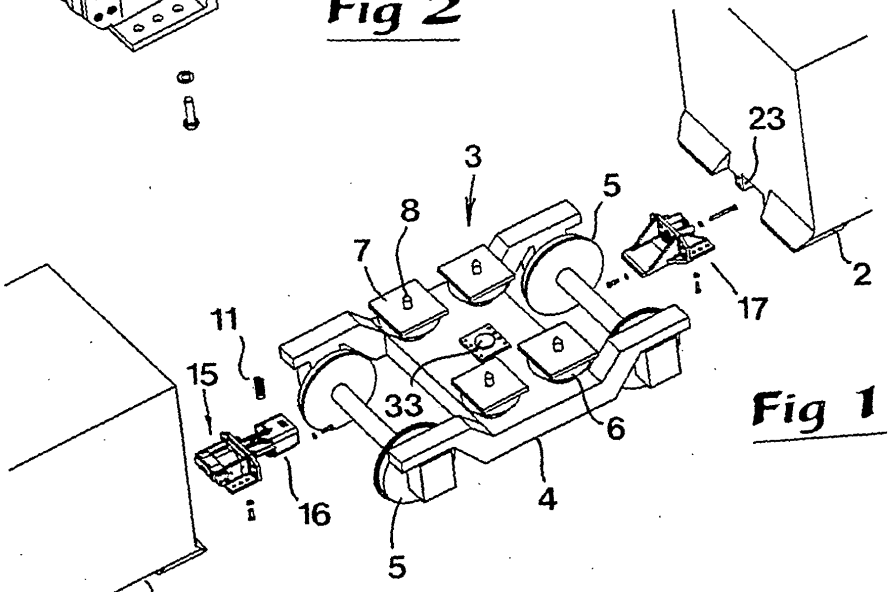
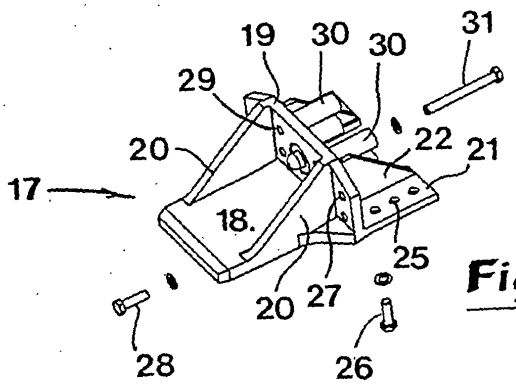


Fig 1



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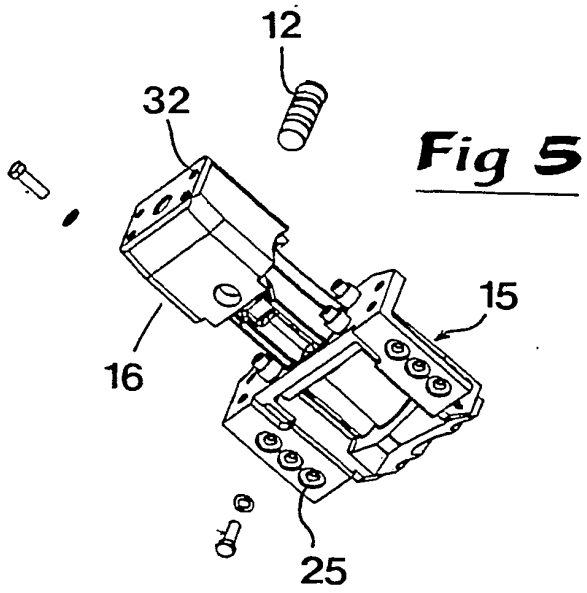

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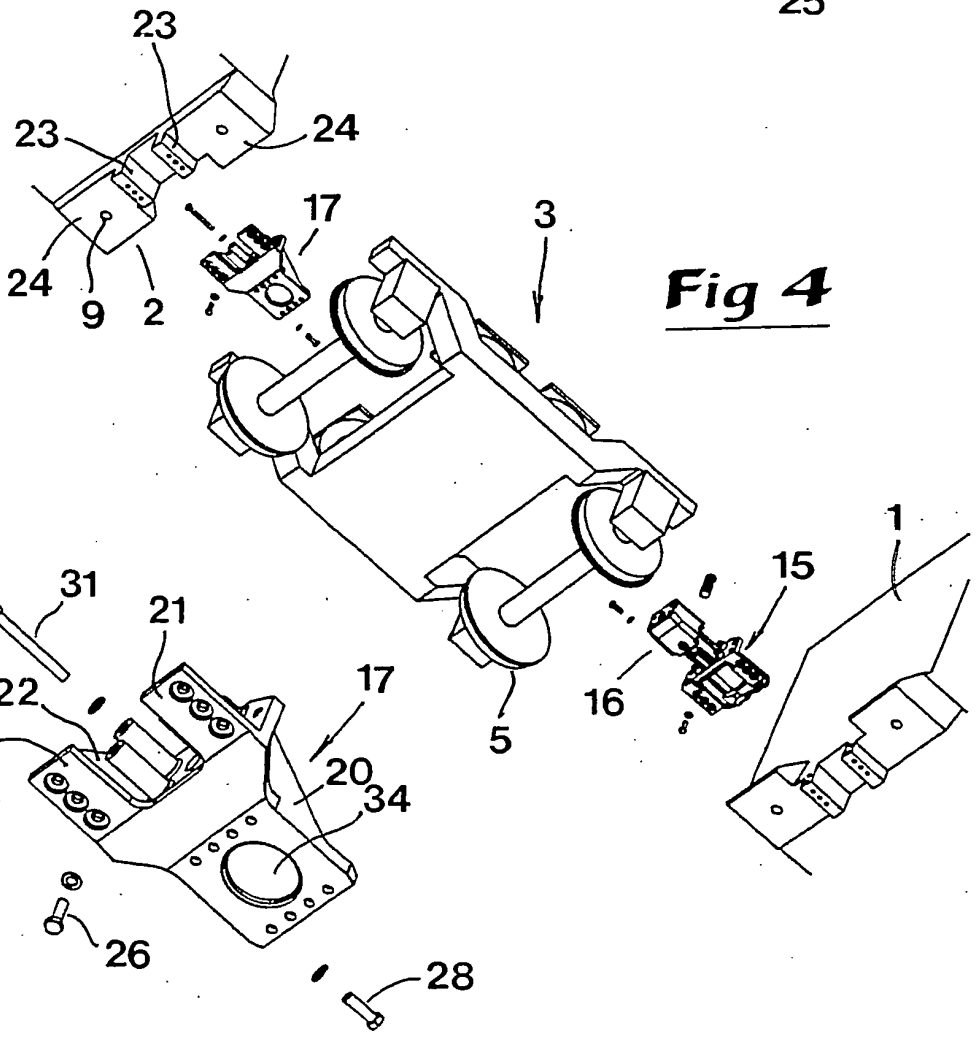

Fig 4

Fig 6

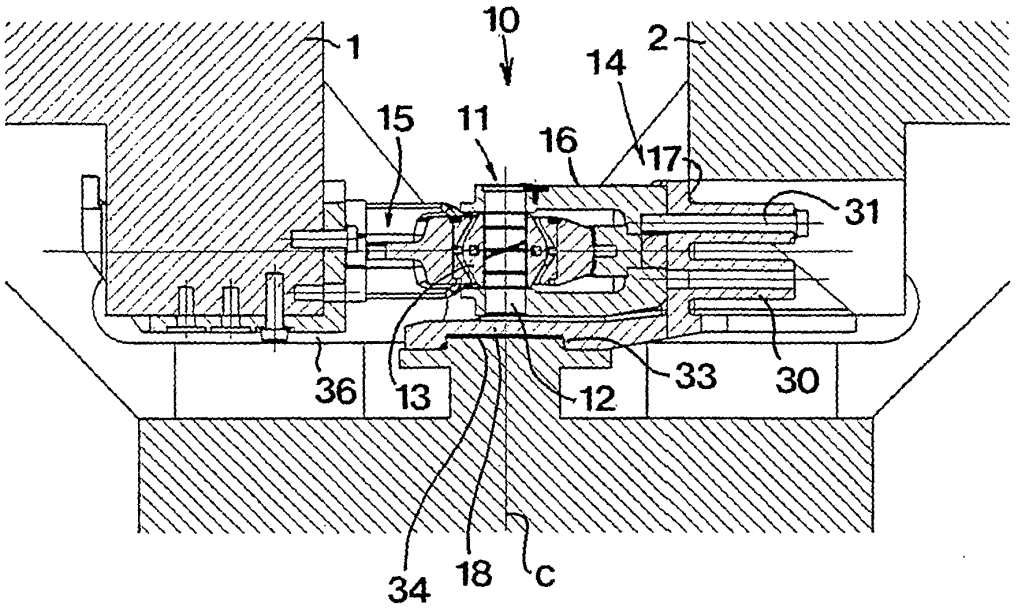
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Fig 7

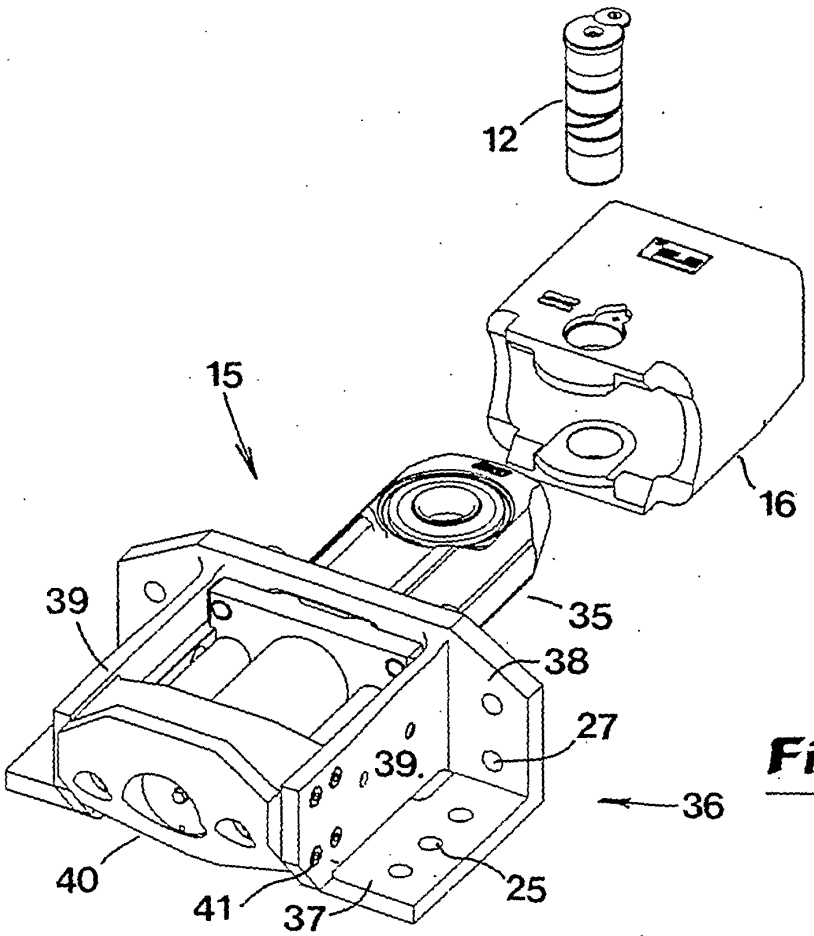
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Fig 8

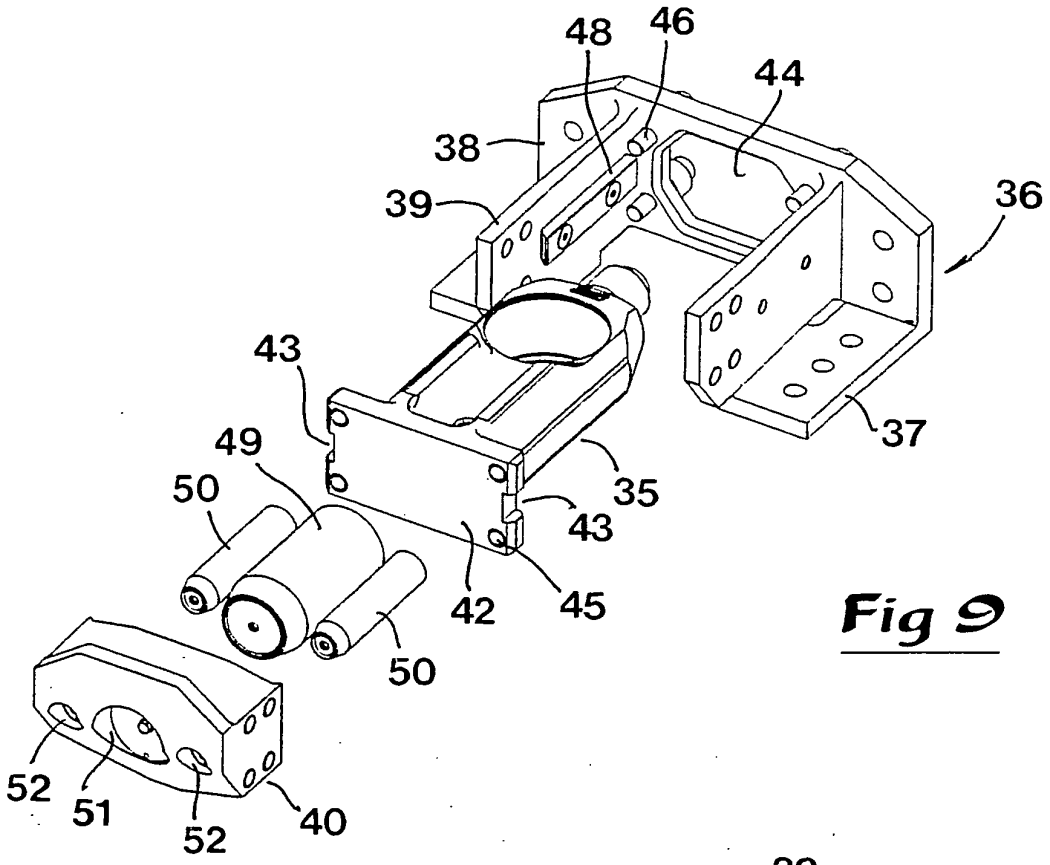
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Fig 9

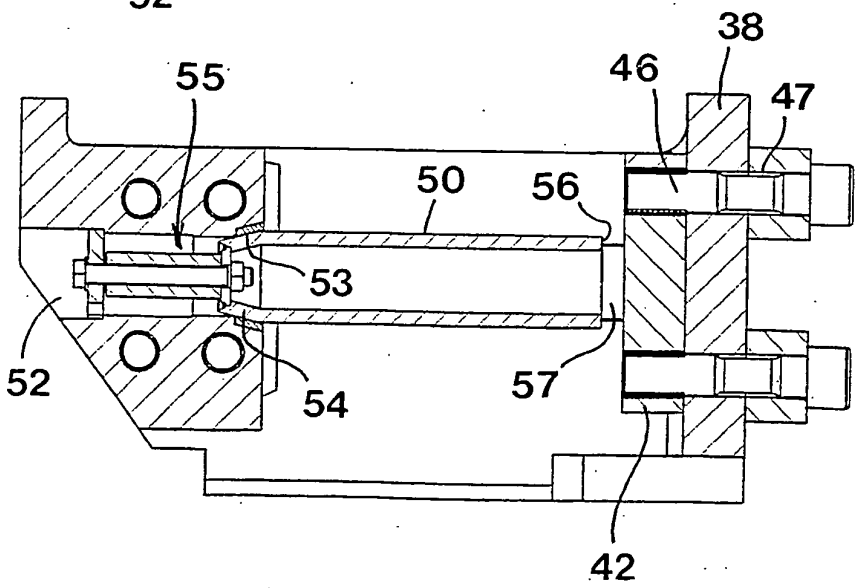
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Fig 10

REFERENCES CITED IN THE DESCRIPTION

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