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(54) A PARKING BRAKE ARRANGEMENT FOR A RAIL VEHICLE BOGIE BRAKE

FESTSTELLBREMSANORDNUNG FÜR SCHIENENFAHRZEUGDREHGESTELLBREMSE

**AGENCEMENT DE FREIN DE STATIONNEMENT POUR UN FREIN DE BOGIE DE VÉHICULE
FERROVIAIRE**

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(56) References cited:

EP-A1- 1 457 401 GB-A- 1 600 730
GB-A- 2 424 049

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Description

Technical Field

[0001] The present invention relates to a parking brake arrangement for a rail vehicle bogie brake, comprising at least one rotatable means at or in the bogie for receiving a manually provided parking brake force, a cardan shaft for transmitting a rotational movement from the rotatable means to a gear box mounted on a brake beam, having at least one brake actuator, and transmitting means for transmitting the parking brake force to the actuator.

Background of the Invention

[0002] Typical examples of parking brake arrangements for bogie brakes are shown in DE 42 17 231 A, EP 1 097 075 B, US 6 186 284 B, and EP 1 457 401 B. In the first-mentioned and the last-mentioned of these, use is made of a hand wheel at the side of the bogie for the application and release, respectively, of the parking brake arrangement.

[0003] In EP 1 457 401 there are shown two different embodiments of a parking brake arrangement of the kind defined above. In the first embodiment of Fig 1 the bogie brake is generally conventional, whereas in the second embodiment of Fig 10 in combination with Fig 7 one of the brake beams is unconventional and contains two brake actuators. In both embodiments, however, the parking brake arrangements apply their application force to the piston or the pistons, respectively, of the brake actuators. This means that relatively complex means have to be provided in conjunction with the pistons for transforming a rotational movement from the hand wheel to a translational movement affecting the piston.

[0004] The main object of the invention is to maintain the general advantages of the arrangement disclosed in EP 1 457 401 while improving the transmittal of the parking brake force from the gear box into and past the brake actuator and providing a simplified design.

The Invention

[0005] This is according to the invention attained in that the transmitting means is an operating shaft having a spindle-and-nut arrangement for transforming the rotational movement from the gear box to a translational movement to a parking brake lever of the brake actuator, the lever being connected to the outgoing push rod of the actuator.

[0006] The rotatable means may be a hand wheel at the side of the bogie.

[0007] Preferably, a hand wheel is preferably provided at each side of the bogie, and the brake beam is preferably provided with two brake actuators.

Brief Description of the Drawings

[0008] The invention will be described in further detail below under reference to the accompanying drawings, in which

Fig 1 is an isometric view of a rail vehicle bogie with a parking brake arrangement according to the invention,

Fig 2 is an isometric view of the bogie brake included in the bogie of Fig 1,

Fig 3 is a detail view of a portion of the bogie brake of Fig 2 (with the housing of a gear box partly broken away), and

Fig 4 is a partly sectioned side view of a push shaft of the bogie brake of Fig 2.

Detailed Description of Embodiments

[0009] Fig 1 shows a conventional rail vehicle bogie 1 comprising as its main constituents a bolster 2, two side frames 3 and - journaled in the side frames - two wheel sets 4.

[0010] The bogie 1 is provided with a bogie brake, further shown in Fig 2 and for example of the general type disclosed in EP-B-1 097 075. As is well known for any person skilled in the art, such a bogie brake comprises two brake beams 5A and 5B. These beams are provided with brake blocks at their ends for braking engagement with the treads of the wheels and in the shown case suspended from the bolster 2.

[0011] Means are provided for service braking by pressing the two brake beams apart for accomplishing the braking engagement of the brake blocks with the wheel treads. In the present case these means are two normally pneumatically operated brake actuators or brake units 6 mounted in the fore brake beam 5A and connected to the other brake beam 5B by means of push rods 6'.

[0012] The present invention relates to a parking brake arrangement for the so far described bogie brake.

[0013] A rotatable means for receiving a parking brake force in the form of a hand wheel 7 is journaled for rotation at each side of the bogie 1. By means of a cardan shaft 8 the hand wheel 7 is connected to a gear box 9.

[0014] As appears most clearly in Fig 3, the gear box 9 is mounted on the fore brake beam 5A, preferably centrally thereon. In Fig 3 the housing of the gear box 9 is partly broken away, and it appears that it contains gears for obtaining a suitable gear ratio between a rotational input shaft 10 from each of the preferably two cardan shafts 8 and a rotational output shaft 11 directed towards each of the two brake actuators 6.

[0015] For the mounting of the gear box 9, the brake beam 5A is preferably provided with longitudinal, axial holes, which together with a mounting arrangement of the gear box 9 with a minor play on the brake beam 5A allows a certain relative movement between gear box

and beam. In this way a certain variation in brake block play at either side of the beam may be compensated for
[0016] The brake actuator 6 is provided with a rotationally arranged parking brake lever 12 in operational connection with its outgoing push rod 6', which thus is pushed out for parking brake actuation at counter-clockwise rotation of the lever 12.

[0017] The brake actuator 6 is for example of the type disclosed in US 3 995 537 B, where there is no operational contact between the parking brake lever 12 and the service brake piston in the actuator and the former acts on the outgoing push rod 6'.

[0018] The rotational output shaft 11 is connected to the lever 12 by means of a parking brake force transmitting means in the form of an operating shaft 13. As shown in Fig 4, the operating shaft 13 is a spindle-and-nut-arrangement for transforming a rotational movement from the output shaft 11 into a translational movement to the parking brake lever 12. In the shown arrangement the operating shaft 13 is a push shaft, but it may alternatively be a pull shaft.

[0019] The above-mentioned "floating" mounting of the gear box 9 has the effect that no unfavorable forces will be introduced in the gear box at the possible occurrence of different strokes for the two parking brake levers 12, but that rather the gear box 9 will move slightly laterally on the brake beam 5. Also, the forces in the operating shaft 13 will be the same, resulting in the same brake forces on the two brake actuators 6.

[0020] By means of the shown and described parking brake arrangement, a manual rotation of the hand wheel 7 (preferably in the clockwise direction) will result in a translation movement to the parking brake lever 12 on the brake actuator 6, so that the brake blocks are manually applied to the wheel treads for parking braking. A release of the parking brake is performed by turning the hand wheel 7 in the opposite direction.

[0021] In the shown and described embodiment there are hand wheels 7 at either side of the bogie 1, and the brake beam 5A is provided with two actuators. Other embodiments with regard to the number and positioning of these means are possible.

[0022] In a second embodiment, not shown in the drawings, a hand wheel for applying the parking brake force is provided outside the bogie, for example on an end platform of the rail vehicle on which the bogie is mounted. In such a case the bogie may be provided with a rotatable means for receiving the parking brake force from the hand wheel and applying it on the cardan shaft.

[0023] Further modifications are possible within the scope of the appended claims.

Claims

1. A parking brake arrangement for a rail vehicle bogie brake, comprising at least one rotatable means (7) at or in the bogie (1) for receiving a manually provided

parking brake force, a cardan shaft (8) for transmitting a rotational movement from the rotatable means (7) to a gear box (9) mounted on a brake beam (5A), having at least one brake actuator (6), and transmitting means (13) for transmitting the parking brake force to the actuator, **characterized in that** the transmitting means (13) is an operating shaft having a spindle-and-nut arrangement for transforming the rotational movement from the gear box (9) to a translational movement to a parking brake lever (12) of the brake actuator (6), the lever (12) being connected to the outgoing push rod (6') of the actuator.

2. An arrangement according to claim 1, wherein the rotatable means is a hand wheel (7) at the side of the bogie (1).
3. An arrangement according to claim 2, wherein a hand wheel (7) is provided at each side of the bogie (1) and wherein the brake beam (5A) is provided with two brake actuators (6).
4. An arrangement according to claim 1, wherein the operating shaft (13) is a push shaft.
5. An arrangement according to claim 1, wherein the gear box (9) is mounted on the brake beam (5) with a certain possibility to move there along.

Patentansprüche

1. Feststellbremsenanordnung für eine Schienenfahrzeugdrehgestellbremse, mit zumindest einer drehbaren Einrichtung (7) am oder in dem Drehgestell (1) zum Empfangen einer händisch bereitgestellten Feststellbremskraft, einer Kardanwelle (8) zum Übertragen einer Drehbewegung von der drehbaren Einrichtung (7) zu einem auf einem Bremsbalken (5A) montierten Getriebe (9), die zumindest einen Bremsaktuator (6) und eine Übertragungseinrichtung (13) zum Übertragen der Feststellbremskraft auf den Aktuator umfasst, **dadurch gekennzeichnet, dass** die Übertragungseinrichtung (13) eine Bedienungs- welle mit einer Spindel/Mutter-Anordnung zum Wandeln der Drehbewegung aus dem Getriebe (9) in eine Translationsbewegung für einen Parkbremsenhebel (12) des Bremsaktuators (6) ist, wobei der Hebel (12) mit der Ausgangsbetätigungs- stange (6') des Aktuators verbunden ist.
2. Anordnung nach Anspruch 1, bei der die drehbare Einrichtung ein Handrad (7) an der Seite des Drehgestells (1) ist.
3. Anordnung nach Anspruch 2, bei der ein Handrad (7) an jeder Seite des Drehgestells (1) vorhanden ist und bei der der Bremsbalken (5A) mit zwei Brems-

aktuatoren (6) versehen ist.

4. Anordnung nach Anspruch 1, bei der die Bedienungswelle (13) eine drückende Welle ist.

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5. Anordnung nach Anspruch 1, bei der das Getriebe (9) auf dem Bremsbalken (5) mit einer gewissen Möglichkeit der Verschieblichkeit darauf montiert ist.

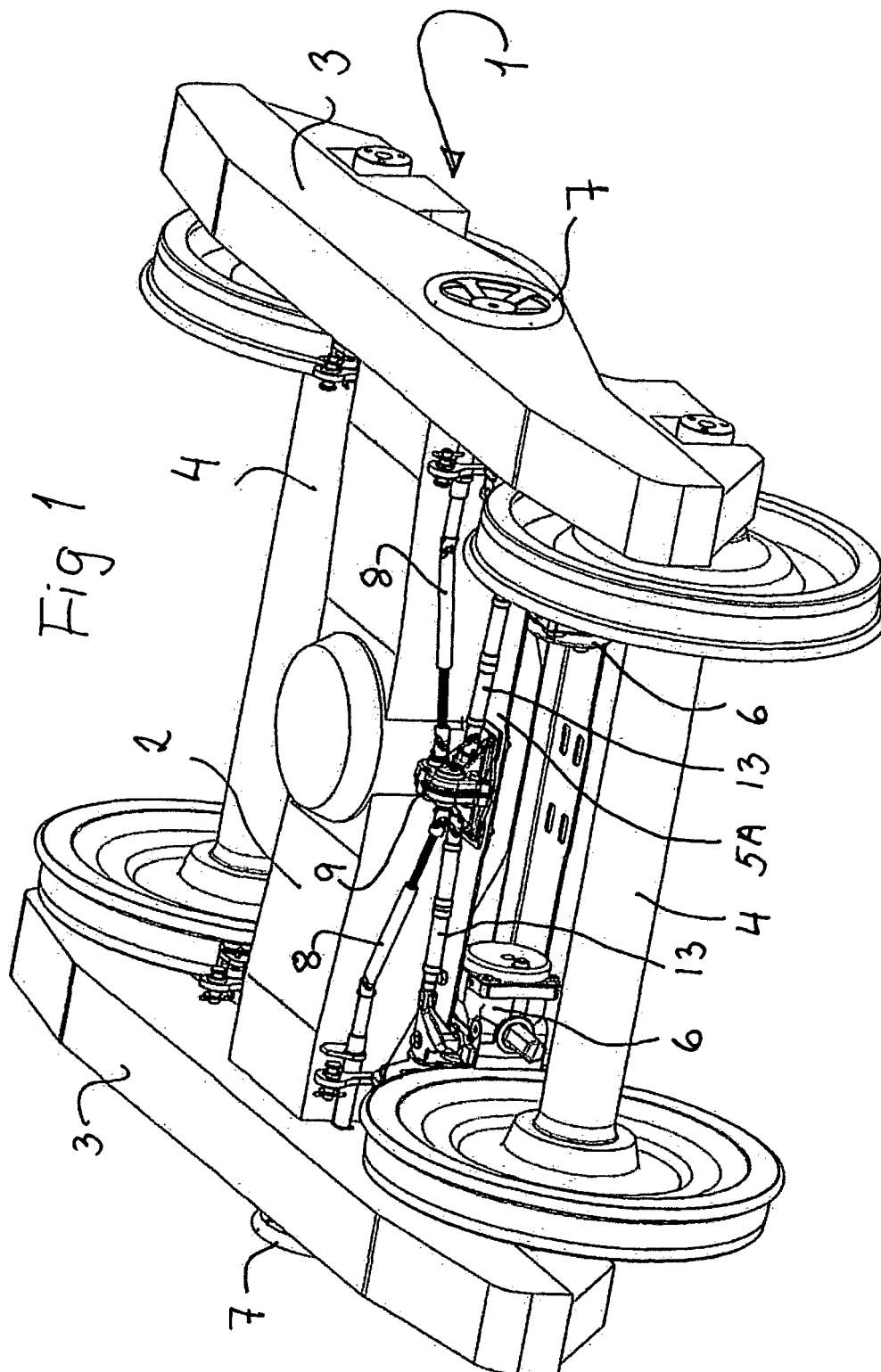
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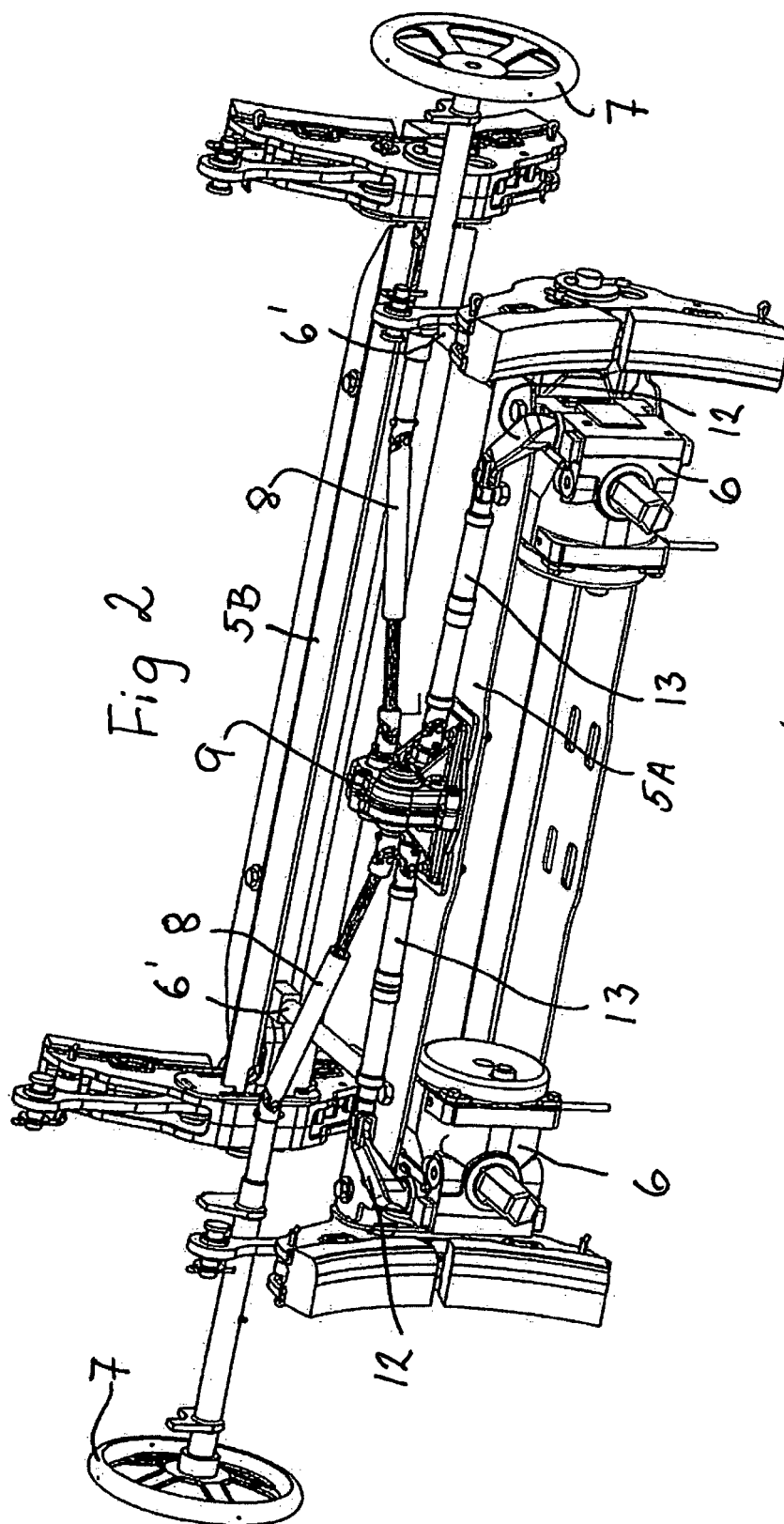
Revendications

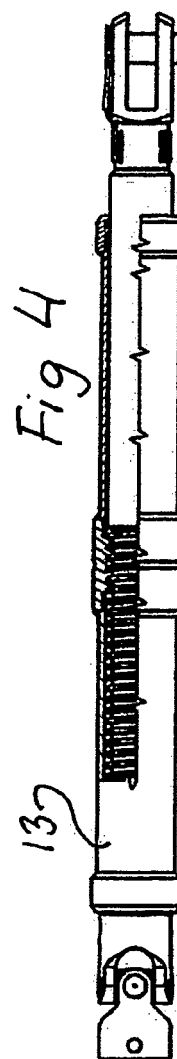
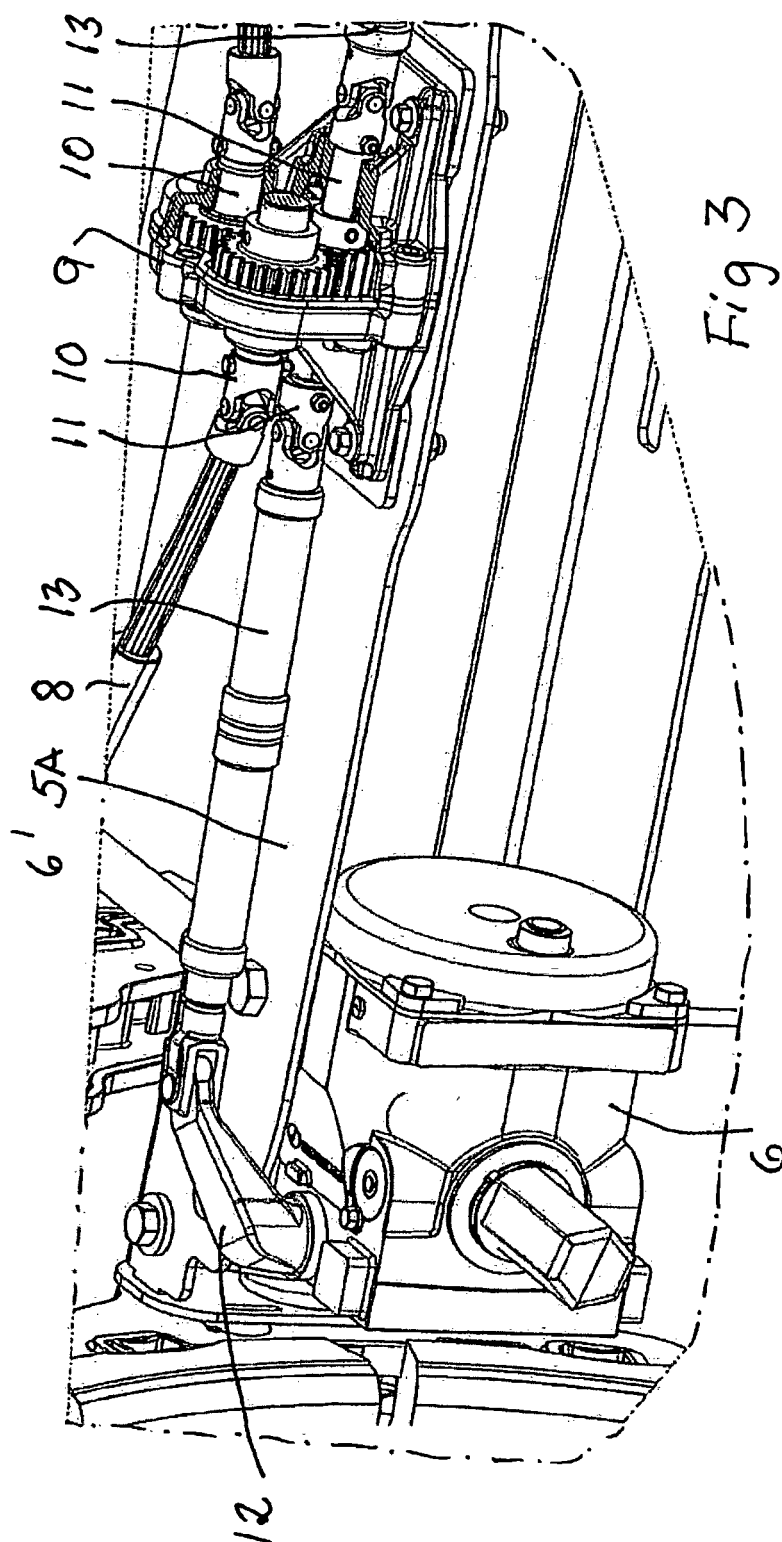
1. Agencement de frein de stationnement pour un frein de bogie de véhicule ferroviaire, comprenant au moins un moyen rotatif (7) au niveau de ou dans le bogie (1) pour recevoir une force de frein de stationnement fournie manuellement, un arbre à cardan (8) pour transmettre un mouvement de rotation du moyen rotatif (7) à une boîte d'engrenages (9) montée sur un triangle de frein (5A), ayant au moins un actionneur de frein (6), et un moyen de transmission (13) pour transmettre la force de frein de stationnement à l'actionneur, **caractérisé en ce que** le moyen de transmission (13) est un arbre de commande ayant un agencement de broche et d'écrou pour transformer le mouvement de rotation de la boîte d'engrenages (9) en un mouvement de translation à un levier de frein de stationnement (12) de l'actionneur de frein (6), le levier (12) étant raccordé à la tige de poussée sortante (6') de l'actionneur.
2. Agencement selon la revendication 1, dans lequel le moyen rotatif est un volant (7) du côté du bogie (1).
3. Agencement selon la revendication 2, dans lequel un volant (7) est prévu de chaque côté du bogie (1) et dans lequel la poutre de frein (5A) est prévue avec deux actionneurs de frein (6).
4. Agencement selon la revendication 1, dans lequel l'arbre de commande (13) est un arbre de poussée.
5. Agencement selon la revendication 1, dans lequel la boîte d'engrenages (9) est montée sur la poutre de frein (5) avec une certaine possibilité de se déplacer le long de cette dernière.

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REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- DE 4217231 A [0002]
- EP 1097075 B [0002] [0010]
- US 6186284 B [0002]
- EP 1457401 B [0002]
- EP 1457401 A [0003] [0004]
- US 3995537 B [0017]