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(54) **Displaceable rolling bogie for railway vehicles**

Verstellbarer Rollkörper für Schienenfahrzeuge

Chariot roulant amovible pour véhicules de chemin de fer

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Description

Field of the Invention

[0001] The present invention relates to the railway sector, providing a displaceable rolling bogie for railway vehicles capable of adapting to the gauge of the track automatically.

State of the Art

[0002] The rolling bogies of railway vehicles incorporate the corresponding axles on which the wheels which move on the two rails forming the railway track are mounted. These wheels are separated from one another by a distance defined by the distance between the rails of the tracks along which it will move.

[0003] Since there are different configurations of railway tracks in which the distance between their two rails is different, such as the case within Spain with the so called "Renfe" track gauge and the so called "UIC" track gauge, variable gauge rolling bogies in which the change of track gauge is done automatically have been developed, this being the field to which the present invention is limited.

[0004] In this field of railway vehicles in which the distance between their wheels is automatically adapted to the distance between the two rails of the track along which they move, a distinction is made, for example, between those rolling bogies in which the axle body on which the wheels are mounted is fixed, and the wheels rotate on it, and those in which said axle body is rotary and rotates together with the wheels. For the case of railway vehicles with fixed axle, the solution disclosed by the Spanish Patent ES 2204483 of the same applicant as the present invention is known, for example.

[0005] In the case of railway vehicles with rolling bogie incorporating a rotary axle body, solutions as disclosed by the Spanish Patent ES 2184538 also belonging to the applicant of this invention, or the solution disclosed by document WO 2009/133227 of "Patentes Talgo", are known.

[0006] Likewise, another classification can be made depending on the system used for unlocking the wheels of the bogie during automatic change, there being fundamentally two types of solutions. On one hand, a solution is known in which the axial unlocking of the wheels with respect to the axle body is done by means of an actuation on latches travelling with the wheels. This actuation is established through locking/unlocking guides which form part of a fixed installation arranged on the ground close to the rails; so that when the railway vehicle reaches, in its path, the point in which the locking/unlocking guides are located, these guides will act on said latches, displacing them against retaining means to thus release the wheels, allowing the axial displacement of the wheels along the axle body to its new position. Such is the case of the solution proposed in the aforementioned

document WO 2009/133227 and in the Japanese Patent JP2007314134 of "RTRI".

[0007] On the other hand, there are those solutions in which said unlocking is done as a result of a vertical movement of the axle body of the bogie, this movement being caused by gravity so that when the axle body is displaced by gravity, the automatic release of the locking means fixing the position of the wheels is produced, this is the case of the systems disclosed in French patent application publication FR 2383810 as well as in the aforementioned patent ES 2204483, and it is to what relates the present invention that proposes a variable gauge and automatic change bogie with a rotary axle body which, upon reaching the point of automatic change of the track gauge, said axle body falls by gravity, releasing the locking means of the wheels to allow the axial and automatic displacement of these along the axle body to the new position, in which they also automatically lock as the axle body returns to its initial position.

[0008] The solution proposed by the present invention has been designed to achieve an automatic change of track gauge in bogies of railway vehicles, including both electric and diesel self-driven as well as towed vehicles which may reach service speeds up to 300 km/h and axle loads up to 22.5 Tm., these values are given as the indication of the high performance required but not in a limiting sense.

Object of the invention

[0009] The present invention relates to displaceable rolling bogie for railway vehicles according to claim 1.

[0010] As indicated in the claim, the locking system is by gravity, taking advantage of the vehicle weight itself to ensure that the locking pins fixing the position of the wheels are maintained in their sockets in the end support boxes.

[0011] When changing track gauge, there is a downwardly inclined track sector with the current gauge, reaching two additional rails on to which sheaves that are incorporated in the end support boxes take support and roll. When the end support boxes take support, the axle body starts dropping by gravity, the two locking pins coming out of each wheel, out of one of the two pairs of sockets of the end support boxes, which allows the displacement of the wheels along the axle body until reaching the position corresponding to the new track gauge, at which time the process is reversed; so that the locking pins now penetrate the other pair of sockets, which fixes the wheels in the new position of track gauge.

Description of the Drawings

[0012]

Figure 1 is a view of a rotating axle body (1) with its wheels (4) arranged in a position corresponding to a track gauge.

Figure 2 is a view such as Figure 1 but with the wheels (4) arranged in the position corresponding to the other track gauge.

Figure 3 shows one end of the axle body (1) cut out at the locking pins (11 and 12) when the wheels (4) occupy the position corresponding to one of the two possible track gauges.

Figure 4 shows one end of the axle body (1) in the same position as Figure 3 but now cut out at a longitudinal middle plane to see the components (5a, 5b and 5c) of the transmission (5).

Figures 5 and 6 are respective views such as Figures 3 and 4, respectively, but in the position corresponding to the lowered axle body (1) and the unlocked pins (11 and 12).

Figures 7 and 8 are respective views such as Figures 3 and 4, respectively, but now with the wheels (4) arranged in the position corresponding to the other track gauge.

Figure 9 is a perspective view of one of the ends of the axle body (1) which allows seeing the pins (11 and 12) and their sockets (16 and 17).

Figure 10 is also a perspective view such as Figure 9, but now with the sockets (16 and 17) already closed by their covers (22 and 23).

Figure 11 is also a perspective view such as Figure 10, but now seen from the lower part to enable seeing the sheave (14) and the skid (25).

Figure 12 shows the fundamental components of each safety latch in perspective.

Figure 13 is a top and schematic plan view showing the installation fixed on the ground in the point where the track gauge changes.

Detailed Description of the invention

[0013] The object of the present invention is a variable gauge rolling bogie, which, as seen in Figures 1 and 2, has a rotating axle body (1). On this rotating axle body (1) is mounted, on one hand, the corresponding transmission (2), in the case of driving bogies, the braking discs (3) and the rolling members formed by the wheels (4). On the other hand, the corresponding bogie frame is assembled through the end support boxes (10) and the primary suspension (13) made from a pack of helical springs located on the upper part of the support box (10) and responsible for transmitting the vertical loads. The transmission (2) directly drives the axle body (1), providing it with torque and rotation speed necessary for its movement.

[0014] The wheels (4) are mounted on to the axle body (1) with the radial clearance necessary to allow the transverse movement thereof on said axle body (1), this enabling the positioning of such wheels (4), according to the distance required by the separation between the rails (15) of the track along which it will drive.

[0015] Both wheels (4) are driven by the axle body (1) through respective couplings (5) which transmit the

torque and the rotation to the wheels (4) for the different possible relative axial positions of said wheels (4) along the axle body (1).

[0016] Each coupling (5), as seen in Figures 4, 6 and 8, has three parts identified with the references (5a, 5b and 5c) which interact with one another by means of two conjugated gearing pairs formed therein. The inner most part (5a) is locked onto the axle body (1), being solid with it, and has an outer gearing through which it meshes with an intermediate spacer which is the part (5b), which part in turn meshes with an outer bushing which is the part (5c) that is flanged at the wheel (4).

[0017] Thus, the rotating axle body (1) drives the wheels (4) in rotation, for any relative axial position between the latter and the former. The two gearing pairs are curved cogs, to be able to absorb the possible misalignments between the axle body (1) and the axles of the wheels (4). As seen in Figure 1, the couplings (5) are assembled on the outer side of the wheels (4), identified as the grips side, leaving the central part of the axle body (1) free for assembling the demultiplier of the transmission (2) and the braking discs (3).

[0018] The fixing of the transverse position of each wheel (4) on the axle body (1) is established by means of mounting axial bearings (6), arranged on the outer part (5c) of the coupling (5). Each bearing (6) is housed in a locking bushing (7), which is a non-rotating piece. These bearings (6) support the wheel (4) - rail (15) transverse forces, these forces being finally absorbed in the support boxes (10).

[0019] Each locking bushing (7), as seen in Figure 9, determines respective symmetrical arm-like cantilever expansions (7a) escorting the axle body (1) in diametric opposite position. In the free end of each expansion (7a) is arranged a locking pin (11). In correspondence with the two locking pins (11) of each locking bushing (7), there are two pairs of sockets (16) solid with the end support box (10).

[0020] With the penetration of the two locking pins (11) of each locking bushing (7) into one or the other of the two pairs of sockets (16) of the end support box (10), the two possible transverse positions of each wheel (4) along the axle body (1) are fixed to be able to thus condition the distance between the wheels (4) to the two different track gauges.

[0021] As seen in Figures 3, 5 and 7, the locking pins (11) determine lower expansions (11a) establishing both a guiding action and stopping action in the transverse movements of the wheels (4) when the lower expansions (11a) are displaced along openings existing in the end support box (10).

[0022] In the ends of the rotary axle body (1) known as grips are assembled bearings (8) on which the support boxes (10) rest, transmitting the vertical load of the vehicle towards the track. These bearings (8) are axially immobilized with respect to the axle body (1) and on each of them is mounted a sleeve (9) which allows fixing the axle body (1) to the support box (10), maintaining the

relative distance between both support boxes (10) and, therefore, between the two wheels (4), see Figures 1 and 2.

[0023] For fixing the axle body (1) to the support boxes (10), each sleeve (9) determines respective arms (9a) which, as seen in Figure 9, are extended symmetrically in diametric opposite position with respect to the axle body (1). In each of these arms (9a) is assembled a locking pin (12); such that, in correspondence with each locking pin (12), there is a socket (17) solid with the support box (10).

[0024] On the other hand, each end support box (10) comprises, as seen in Figure 1, a sheave (14) in correspondence with an additional rail (18), see Figure 2.

[0025] Figure 13 depicts the fixed installation on the ground, for changing the track gauge. This installation comprises: a downwardly inclined track sector (15a) with the current track gauge (15); the additional rail (18); two deflector guides (19) which are responsible for bringing each wheel (4) to its position for the new track gauge once they have been unlocked, and an upwardly inclined track sector (15b) with the new track gauge (15c).

[0026] The operation for changing track gauge is the following: the unit goes through the installation for changing track gauge at low speed driven by its own traction equipment. The wheels (4) move over the rolling rail (15) which starts a progressive downward inclination in the sector identified with the reference (15a); so that it will reach a time where the end support boxes (10) are supported through the sheave (14), by the additional rail (18). When the end support boxes (10) are supported, the axle body (1) starts dropping until the separation existing between the support box (10) and the sleeve (9) is consumed, the axle body (1) thus being completely unloaded, at which time the rail of the downwardly inclined track (15a) disappears.

[0027] As the axle body (1) drops, the anchoring pins (11) come out of one of the two pairs of sockets (16) in the body of the support box (10); so that the wheels (4) are unlocked and, therefore, with freedom for transverse movement along the axle body (1).

[0028] With the wheels (4) unlocked, the deflector guides (19) bring the wheels (4) to their position for the new track gauge and, when the wheels (4) are duly positioned, the rail (15b) with the new track gauge and with an upwardly inclined ramp path appears, forcing the axle body (1) to rise vertically until reaching a point in which the locking pins (11) have already penetrated into the other pair of sockets (16), fixing the wheels (4) in this new position of track gauge, as seen in Figures 3, 5 and 7.

[0029] At that time, the wheels (4) are already supported by the rail (15c) with the new track gauge and the support of the sheave (14) on the additional rail (18) has ended, the automatic change of the track gauge being completed, at which time the load is again supported by the new track through the wheels (4).

[0030] It must be mentioned that, as seen in Figures 3, 5 and 7, the locking pins (12) have, on their lower part,

a threaded shank (12b) with a bushing (12a); such that when the body of the axle (1) drops by gravity, it lowers the sleeve (9) with its arms (9a) and the set of locking pin (12), threaded shank (12b) and bushing (12a), with a guided movement with respect to the end support box (10), such that during the entire process of automatic change of track gauge, the position between the axle body (1) and the support boxes (10) is thus fixed and therefore the position of the support boxes to one another (10) is fixed.

[0031] Figures 3, 5 and 7 show how the sockets (16 and 17) are determined by bushing-like parts identified with the references (16a and 17a), respectively. The sockets (16) are closed top-wise by covers (22); so that between these covers (22) and each bushing (16a) extend springs (20). In the same manner, the sockets (17) are closed top-wise by covers (23), between which covers and the bushings (17a) extend springs identified with the reference (21), see Figure 9.

[0032] With this embodiment, both the bushings (16a) and (17a) are mounted according to a floating arrangement, which allows compensating different degrees of penetration of the pins (11 and 12) into said bushings (16a and 17a).

[0033] On the other hand, each end support box (10) incorporates, in its lower part, a safety latch. As seen in Figures 11 and 12, each safety latch is formed by a pivoting lever (24) provided with a skid (25) intended to slide, either on the additional rail (18) itself or on a rail attached thereto. Upon sliding the skid (25) a rotation of the lever (24) is established against the action of a torsion spring which maintains it in a stable position, in which a bolt (26) prevents the lowering movement of the bushing (9) with respect to the support box (10). The rotation of the lever (24) against the action of the torsion spring also causes the rotation of the bolt (26) which is thus brought to an unlocking position.

[0034] Thus, during the operation for changing track gauge, the bolt (26) is removed from its normal position by the change installation itself, upon sliding the skid (25) on the corresponding rail and it is brought to the unlocking position, thus only then allowing the drop of the axle body (1). Thus, the bolt (26) prevents the drop of the axle body (1) in driving conditions and in case a wheel accidentally loses all the vertical load of the vehicle gravitating thereon. A proximity sensor which will verify the opening and closing sequence of the bolt (26) has been foreseen for the purpose of ensuring that the through the bolt (26) is adequately locked after its passage through the installation for changing the track gauge.

Claims

1. A displaceable rolling bogie for railway vehicles comprising a rotating axle body (1) on which the wheels (4) are assembled, the wheels (4) being coupled to the axle body (1) by respective couplings (5) for

- transmitting torque and rotation, and having a possibility of displacement transversely along the axle body (1) to automatically change the track gauge, this change being carried out by means of a drop of the axle body (1) by gravity and consequent release of locking means which then allow the displacement of the wheels (4) to the new position in which they are fixed by actuating said locking means again as the axle body (1) rises to the initial position; wherein in relation to each wheel (4) there is an axial bearing (6) which is housed in a non-rotating locking bushing (7) which is axially coupled to the wheel (4) and incorporates first locking elements (11); wherein, corresponding with the first locking elements (11) of each wheel (4), there are pairs of first sockets (16) located in corresponding end support boxes (10); and wherein during the drop of the axle body (1) by gravity the first locking elements (11) of each wheel (4) come out from one of the pairs of first sockets (16), thus allowing the displacement of the wheel (4) to the new track gauge position and upon lifting the axle body (1), the first locking elements (11) penetrate into another pair of first sockets (16), fixing the wheel (4) in this new position; and wherein, at each end of the axle body (1) another bearing (8) is mounted, that is axially immobilized with respect to said axle body (1) and housed in a sleeve (9) which is located within the support box (10) and incorporates second locking elements (12) in correspondence with second sockets (17) solid with the support box (10) so that the penetration of the second locking elements (12) in the second sockets (17) fixes the axle body (1) axially with respect to the support boxes (10) .
2. The displaceable rolling bogie for railway vehicles according to claim 1, **characterized in that** each locking bushing (7) determines respective cantilever expansions (7a) symmetrically escorting the axle body (1), each expansion (7a) incorporating at least one first locking element (11).
 3. The displaceable rolling bogie for railway vehicles according to claim 1, **characterized in that** each sleeve (9) determines respective cantilever arms (9a) symmetrically perpendicular with respect to the expansions (7a); and wherein at least one second locking element (12) is arranged in each arm (9a).
 4. The displaceable rolling bogie for railway vehicles according to claims 1 and 2, **characterized in that** each first locking element (11) is formed by a pin determining a lower expansion (11a) in correspondence with an opening existing in the end support box (10) to thus establish a guide in the displacement of the wheels (4) between the two positions corresponding to the two track gauges and a limiting stop for limiting these positions.
 5. The displaceable rolling bogie for railway vehicles according to claims 1 and 3, **characterized in that** each second locking element (12) is formed by a pin having, on its lower part and in longitudinal prolongation, a threaded shank (12b) with a coaxial bushing (12a) traversing a hole of the end box (10), such that upon the lowering of the second locking element (12) during the drop of the axle body (1) by gravity, the set of bushing (12a) and threaded shank (12b) slide through the hole of the end support box (10), thus accomplishing guiding and stopping functions.
 6. The displaceable rolling bogie for railway vehicles according to claim 1, **characterized in that** each socket (16) is formed by a bushing (16a) intended for receiving the corresponding first locking element (11), and by an upper cover (22), several springs (20) being arranged between the bushing (16a) and the cover (22), providing the bushing (16a) with a floating-type assembly.
 7. The displaceable rolling bogie for railway vehicles according to claim 1, **characterized in that** each second socket (17) is formed by a bushing (17a) intended for receiving the corresponding second locking element (12), and by an upper cover (23), several springs (21) being arranged between the bushing (17a) and the cover (23), providing the bushing (17a) with a floating-type assembly.
 8. The displaceable rolling bogie for railway vehicles according to claim 1, **characterized in that** the actuation of each wheel (4) from the axle body (1) is done through said coupling (5) for transmitting torque and rotation, which coupling (5) is assembled on the outer side of the wheel (4) and formed by three parts (5a, 5b and 5c), of which a first, inner most part (5a) is attached solidly on to the axle body (1), a second part (5b) is an intermediate spacer and a third part (5c) is flanged to the wheel (4); these three parts (5a, 5b and 5c) interacting with one another through conjugated gearing pairs of curved cogs.
 9. The displaceable rolling bogie for railway vehicles according to claim 8, **characterized in that** the axial bearing (6) of each wheel (4) is assembled on the outer part (5c) of each coupling (5), said axial bearing (6) thus being arranged between the outer part (5c) and the locking bushing (7).
 10. The displaceable rolling bogie for railway vehicles according to claim 1, **characterized in that** each support box (10) incorporates in its lower part a support sheave (14) on an additional rail (18) for when the axle body (1) has to move downwards by gravity, and a safety latch formed by a bolt (26) integral with a pivoting lever (24) which is maintained by the action of a torsion spring, in a stable position, said pivoting

lever (24) incorporating a support skid (25).

Patentansprüche

1. Verschiebbares Drehgestell für Schienenfahrzeuge, das einen rotierenden Achskörper (1) umfasst, an dem die Räder (4) montiert sind, wobei die Räder (4) mit dem Achskörper (1) durch jeweilige Kupplungen (5) zur Übertragung von Drehmoment und Rotation gekoppelt und mit der Möglichkeit ausgestattet sind, quer entlang des Achskörpers (1) verschoben zu werden, um automatisch die Spurweite verändern zu können, wobei diese Änderung vorgenommen wird, indem der Achskörper (1) durch Schwerkraft abgesenkt wird und anschließend Verriegelungsmittel gelöst werden, die dann die Verschiebung der Räder (4) zu der neuen Position erlauben, in der sie fixiert werden, indem die Verriegelungsmittel erneut betätigt werden, wenn der Achskörper (1) zu der Anfangsposition angehoben wird, wobei es in Bezug auf jedes Rad (4) ein Axiallager (6) gibt, das in einer nicht-rotierenden Verriegelungsbuchse (7) aufgenommen ist, die axial mit dem Rad (4) gekoppelt ist und erste Verriegelungselemente (11) enthält, wobei entsprechend den ersten Verriegelungselementen (11) jedes Rades (4) Paare erster Fassungen (16) vorhanden sind, die sich in entsprechenden Endstützkästen (10) befinden, und wobei während des Absenkens des Achskörpers (1) durch Schwerkraft die ersten Verriegelungselemente (11) jedes Rades (4) aus einem der Paare erster Fassungen (16) heraustreten, wodurch die Verschiebung des Rades (4) zu der neuen Spurweitenposition ermöglicht wird und beim Anheben des Achskörpers (1) die ersten Verriegelungselemente (11) in ein anderes Paar erster Fassungen (16) eindringen und das Rad (4) in dieser neuen Position fixieren, und wobei an jedem Ende des Achskörpers (1) ein anderes Lager (8) montiert ist, das in Bezug auf den Achskörper (1) axial immobilisiert und in einer Hülse (9) aufgenommen ist, die sich innerhalb des Stützkastens (10) befindet und zweite Verriegelungselemente (12) entsprechend zweiten Fassungen (17) enthält, die fest an dem Stützkasten (10) angebracht sind, so dass das Eindringen der zweiten Verriegelungselemente (12) in die zweiten Fassungen (17) den Achskörper (1) axial in Bezug auf die Stützkästen (10) fixiert.
2. Verschiebbares Drehgestell für Schienenfahrzeuge nach Anspruch 1, **dadurch gekennzeichnet, dass** jede Verriegelungsbuchse (7) jeweilige frei tragende Erweiterungen (7a) definiert, die den Achskörper (1) symmetrisch begleiten, wobei jede Erweiterung (7a) mindestens ein erstes Verriegelungselement (11) enthält.
3. Verschiebbares Drehgestell für Schienenfahrzeuge nach Anspruch 1, **dadurch gekennzeichnet, dass** jede Hülse (9) jeweilige frei tragende Arme (9a) symmetrisch senkrecht in Bezug auf die Erweiterungen (7a) definiert, und wobei mindestens ein zweites Verriegelungselement (12) in jedem Arm (9a) angeordnet ist.
4. Verschiebbares Drehgestell für Schienenfahrzeuge nach den Ansprüchen 1 und 2, **dadurch gekennzeichnet, dass** jedes erste Verriegelungselement (11) durch einen Stift gebildet wird, der eine untere Erweiterung (11a) entsprechend einer Öffnung definiert, die in dem Endstützkasten (10) vorhanden ist, um so eine Führung bei der Verschiebung der Räder (4) zwischen den zwei Positionen, die den zwei Spurweiten entsprechen, und einen Begrenzungsstopp zum Begrenzen dieser Positionen zu bilden.
5. Verschiebbares Drehgestell für Schienenfahrzeuge nach den Ansprüchen 1 und 3, **dadurch gekennzeichnet, dass** jedes zweite Verriegelungselement (12) durch einen Stift gebildet wird, der an seinem unteren Teil und in einer Längsverlängerung einen Gewindeschacht (12b) mit einer coaxialen Buchse (12a), die ein Loch des Endkastens (10) durchquert, aufweist, dergestalt, dass beim Absenken des zweiten Verriegelungselements (12) während des Abwerfens des Achskörpers (1) durch Schwerkraft der Satz aus Buchse (12a) und Gewindeschacht (12b) durch das Loch des Endstützkastens (10) gleitet, wodurch Führungs- und Stoppfunktionen realisiert werden.
6. Verschiebbares Drehgestell für Schienenfahrzeuge nach Anspruch 1, **dadurch gekennzeichnet, dass** jede Fassung (16) durch eine Buchse (16a), die zum Aufnehmen des entsprechenden ersten Verriegelungselements (11) vorgesehen ist, und durch eine obere Abdeckung (22) gebildet wird, wobei mehrere Federn (20) zwischen der Buchse (16a) und der Abdeckung (22) angeordnet sind, wodurch die Buchse (16a) mit einer schwimmenden Baugruppe versehen wird.
7. Verschiebbares Drehgestell für Schienenfahrzeuge nach Anspruch 1, **dadurch gekennzeichnet, dass** jede zweite Fassung (17) durch eine Buchse (17a), die zum Aufnehmen des entsprechenden zweiten Verriegelungselements (12) vorgesehen ist, und durch eine obere Abdeckung (23) gebildet wird, wobei mehrere Federn (21) zwischen der Buchse (17a) und der Abdeckung (23) angeordnet sind, wodurch die Buchse (17a) mit einer schwimmenden Baugruppe versehen wird.
8. Verschiebbares Drehgestell für Schienenfahrzeuge

nach Anspruch 1, **dadurch gekennzeichnet, dass** die Betätigung jedes Rades (4) von dem Achskörper (1) aus mittels der Kupplung (5) zum Übertragen von Drehmoment und Rotation erfolgt, wobei die Kupplung (5) auf der Außenseite des Rades (4) montiert ist und durch drei Teile (5a, 5b und 5c) gebildet wird, von denen ein erster, innerster Teil (5a) fest an dem Achskörper (1) angebracht ist, ein zweiter Teil (5b) ein Distanzstück ist und ein dritter Teil (5c) an dem Rad (4) angeflanscht ist, wobei diese drei Teile (5a, 5b und 5c) durch konjugierte Verzahnungspaare aus gekrümmten Zähnen miteinander interagieren.

9. Verschiebbares Drehgestell für Schienenfahrzeuge nach Anspruch 8, **dadurch gekennzeichnet, dass** das Axiallager (6) jedes Rades (4) an dem äußeren Teil (5c) jeder Kupplung (5) montiert ist, wodurch das Axiallager (6) zwischen dem äußeren Teil (5c) und der Verriegelungsbuchse (7) angeordnet ist.
10. Verschiebbares Drehgestell für Schienenfahrzeuge nach Anspruch 1, **dadurch gekennzeichnet, dass** jeder Stützkasten (10) in seinem unteren Teil eine Stützscheibe (14) auf einer zusätzlichen Schiene (18) für die Situation enthält, wo der Achskörper (1) sich durch Schwerkraft abwärts bewegen muss, und einen Sicherheitsriegel enthält, der durch einen Bolzen (26) integral mit einem Schwenkhebel (24) gebildet wird, der durch die Wirkung einer Torsionsfeder in einer stabilen Position gehalten wird, wobei der Schwenkhebel (24) einen Stützschlitten (25) enthält.

Revendications

1. Chariot roulant déplaçable pour véhicules ferroviaires comprenant un corps d'essieu rotatif (1) sur lequel les roues (4) sont assemblées, les roues (4) étant couplées au corps d'essieu (1) par des couplages (5) respectifs pour transmettre le couple et la rotation, et ayant une possibilité de déplacement transversalement le long du corps d'essieu (1) pour modifier automatiquement l'écartement de voie, cette modification étant réalisée au moyen d'une chute du corps d'essieu (1) par gravité et de la libération consécutive des moyens de verrouillage qui permettent alors le déplacement des roues (4) dans la nouvelle position dans laquelle elles sont fixées en actionnant à nouveau lesdits moyens de verrouillage lorsque le corps d'essieu (1) s'élève à la position initiale ; dans lequel par rapport à chaque roue (4), il y a un palier axial (6) qui est logé dans une bague de verrouillage non rotative (7) qui est axialement couplée à la roue (4) et comprend des premiers éléments de verrouillage (11) ; dans lequel, correspondant aux premiers éléments de verrouillage (11) de chaque roue (4), on trouve des paires de premières

douilles (16) positionnées dans des boîtes de support d'extrémité (10) correspondantes ; et dans lequel pendant la chute du corps d'essieu (1) par gravité, les premiers éléments de verrouillage (11) de chaque roue (4) sortent de l'une des paires de premières douilles (16), permettant ainsi le déplacement de la roue (4) dans la nouvelle position d'écartement de voie et suite au levage du corps d'essieu (1), les premiers éléments de verrouillage (11) pénètrent dans une autre paire de premières douilles (16), fixant la roue (4) dans cette nouvelle position ; et dans lequel, au niveau de chaque extrémité du corps d'essieu (1), on monte un autre palier (8) qui est axialement immobilisé par rapport audit corps d'essieu (1) et logé dans un manchon (9) qui est positionné à l'intérieur de la boîte de support (10) et comprend des seconds éléments de verrouillage (12) en correspondance avec les secondes douilles (17) solidaires avec la boîte de support (10) de sorte que la pénétration des seconds éléments de verrouillage (12) dans les secondes douilles (17) fixe le corps d'essieu (1) axialement par rapport aux boîtes de support (10).

2. Chariot roulant déplaçable pour véhicules ferroviaires selon la revendication 1, **caractérisé en ce que** chaque bague de verrouillage (7) détermine des expansions en porte-à-faux (7a) respectives accompagnant symétriquement le corps d'essieu (1), chaque expansion (7a) incorporant au moins un premier élément de verrouillage (11).
3. Chariot roulant déplaçable pour véhicules ferroviaires selon la revendication 1, **caractérisé en ce que** chaque manchon (9) détermine des bras en porte-à-faux (9a) respectifs symétriquement perpendiculaires par rapport aux expansions (7a) ; et dans lequel au moins un second élément de verrouillage (12) est agencé dans chaque bras (9a).
4. Chariot roulant déplaçable pour véhicules ferroviaires selon les revendications 1 et 2, **caractérisé en ce que** chaque premier élément de verrouillage (11) est formé par une broche déterminant une expansion inférieure (11a) en correspondance avec une ouverture existante dans la boîte de support d'extrémité (10) pour établir ainsi un guide dans le déplacement des roues (4) entre les deux positions correspondant aux deux écartements de voie et une butée de limitation pour limiter ces positions.
5. Chariot roulant déplaçable pour véhicules ferroviaires selon les revendications 1 et 3, **caractérisé en ce que** chaque second élément de verrouillage (12) est formé par une broche ayant, sur sa partie inférieure, et dans le prolongement longitudinal, une tige filetée (12b) avec une bague coaxiale (12a) traversant

sant un trou de la boîte d'extrémité (10), de sorte que suite à l'abaissement du second élément de verrouillage (12) pendant la chute du corps d'essieu (1) par gravité, l'ensemble composé de la bague (12a) et de la tige filetée (12b) coulisse à travers le trou de la boîte de support d'extrémité (10), accomplissant ainsi des fonctions de guidage et de butée.

position stable, ledit levier de positionnement (24) comprenant un patin de support (25).

6. Chariot roulant déplaçable pour véhicules ferroviaires selon la revendication 1, **caractérisé en ce que** chaque douille (16) est formée par une bague (16a) prévue pour recevoir le premier élément de verrouillage (11) correspondant, et par un couvercle supérieur (22), plusieurs ressorts (20) étant agencés entre la bague (16a) et le couvercle (22), dotant la bague (16a) d'un assemblage de type flottant. 5 10 15
7. Chariot roulant déplaçable pour véhicules ferroviaires selon la revendication 1, **caractérisé en ce que** chaque seconde douille (17) est formée par une bague (17a) prévue pour recevoir le second élément de verrouillage (12) correspondant et par un couvercle supérieur (23), plusieurs ressorts (21) étant agencés entre la bague (17a) et le couvercle (23), dotant la bague (17a) d'un assemblage de type flottant. 20 25
8. Chariot roulant déplaçable pour véhicules ferroviaires selon la revendication 1, **caractérisé en ce que** l'actionnement de chaque roue (4) à partir du corps d'essieu (1) est réalisé par le biais dudit couplage (5) pour transmettre le couple et la rotation, lequel couplage (5) est assemblé sur le côté externe de la roue (4) et formé par trois parties (5a, 5b et 5c), dont la première partie la plus interne (5a) est fixée de manière solidaire au corps d'essieu (1), une deuxième partie (5b) est un dispositif d'espacement intermédiaire et une troisième partie (5c) est bridée sur la roue (4) ; ces trois parties (5a, 5b et 5c) interagissant entre elles par le biais de paires d'engrenages conjugués de dents incurvées. 30 35 40
9. Chariot roulant déplaçable pour véhicules ferroviaires selon la revendication 8, **caractérisé en ce que** le palier axial (6) de chaque roue (4) est assemblé sur la partie externe (5c) de chaque couplage (5), ledit palier axial (6) étant ainsi agencé entre la partie externe (5c) et la bague de verrouillage (7). 45
10. Chariot roulant déplaçable pour véhicules ferroviaires selon la revendication 1, **caractérisé en ce que** chaque boîte de support (10) comprend, dans sa partie inférieure, un disque à gorge de support (14) sur un rail supplémentaire (18) lorsque le corps d'essieu (1) doit se déplacer vers le bas par gravité, et un verrou de sécurité formé par un boulon (26) solidaire avec un levier de pivotement (24) qui est maintenu par l'action d'un ressort de torsion, dans une 50 55

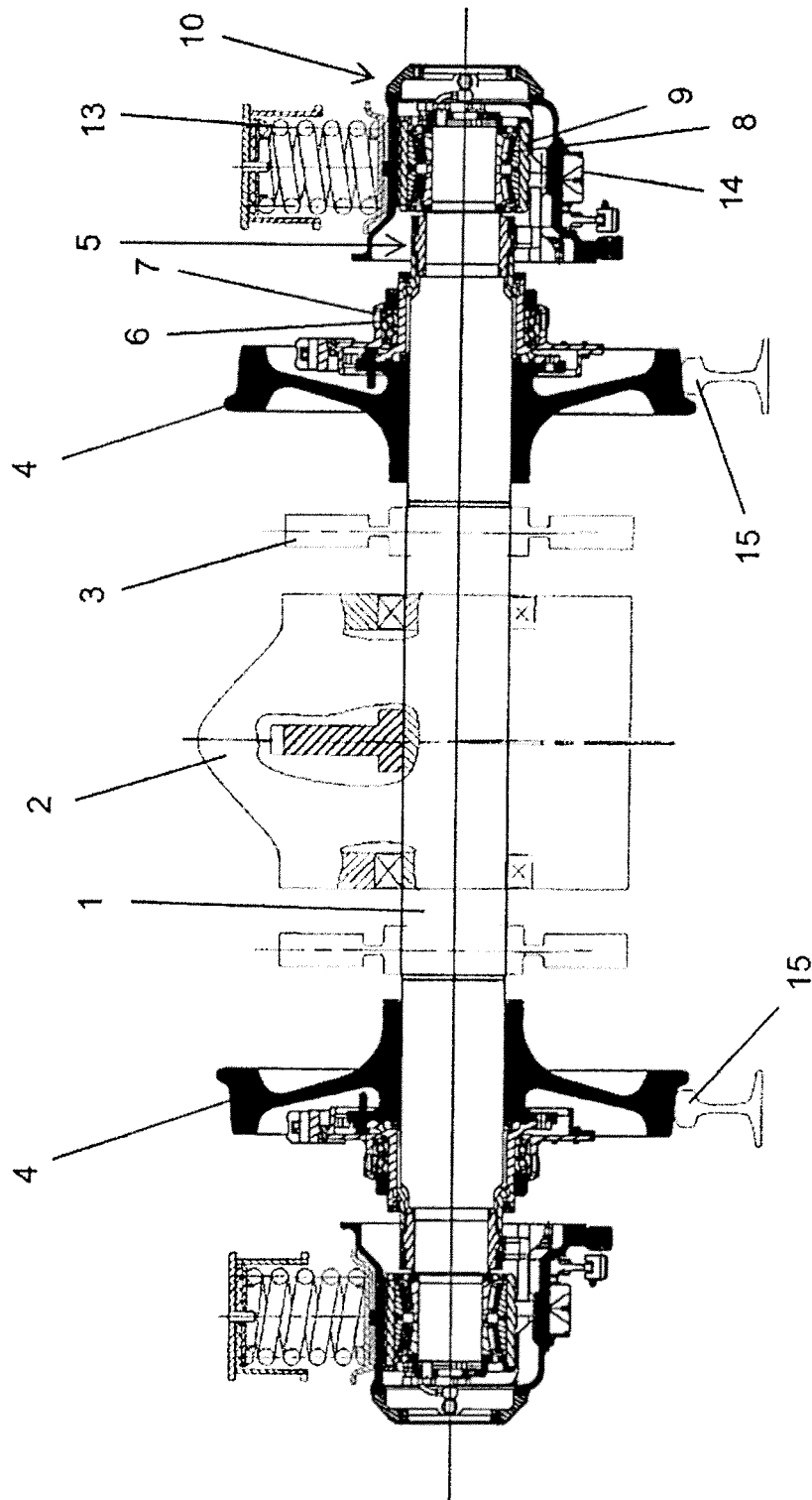


Fig. 1

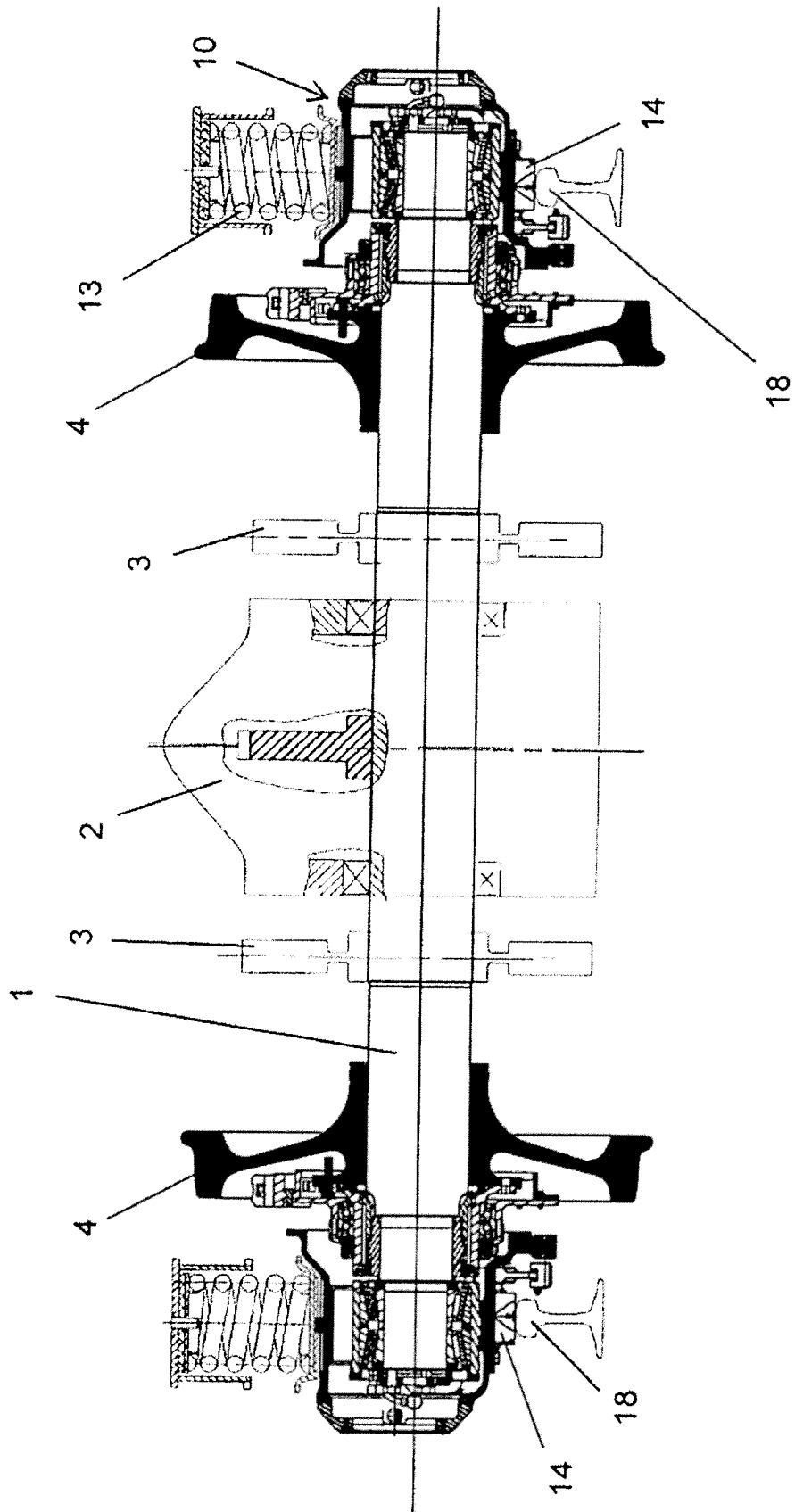


Fig. 2

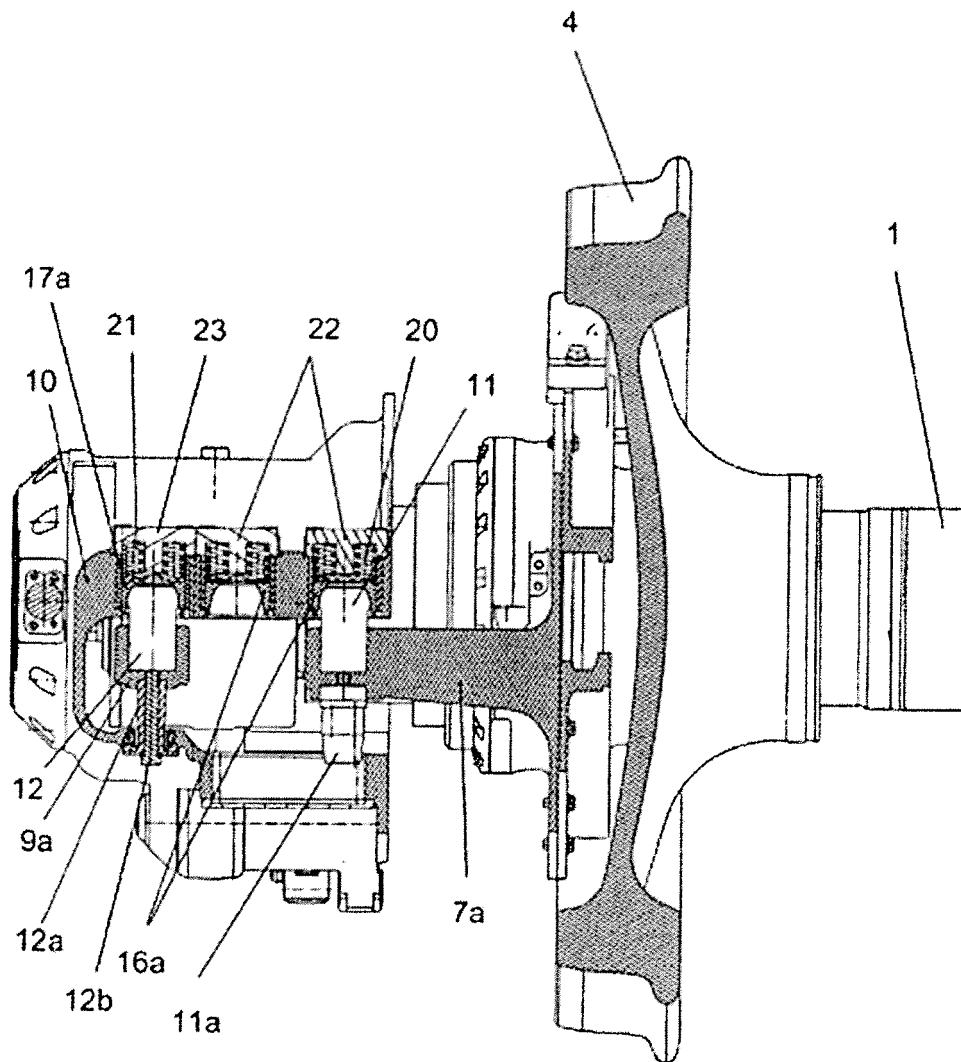


Fig. 3

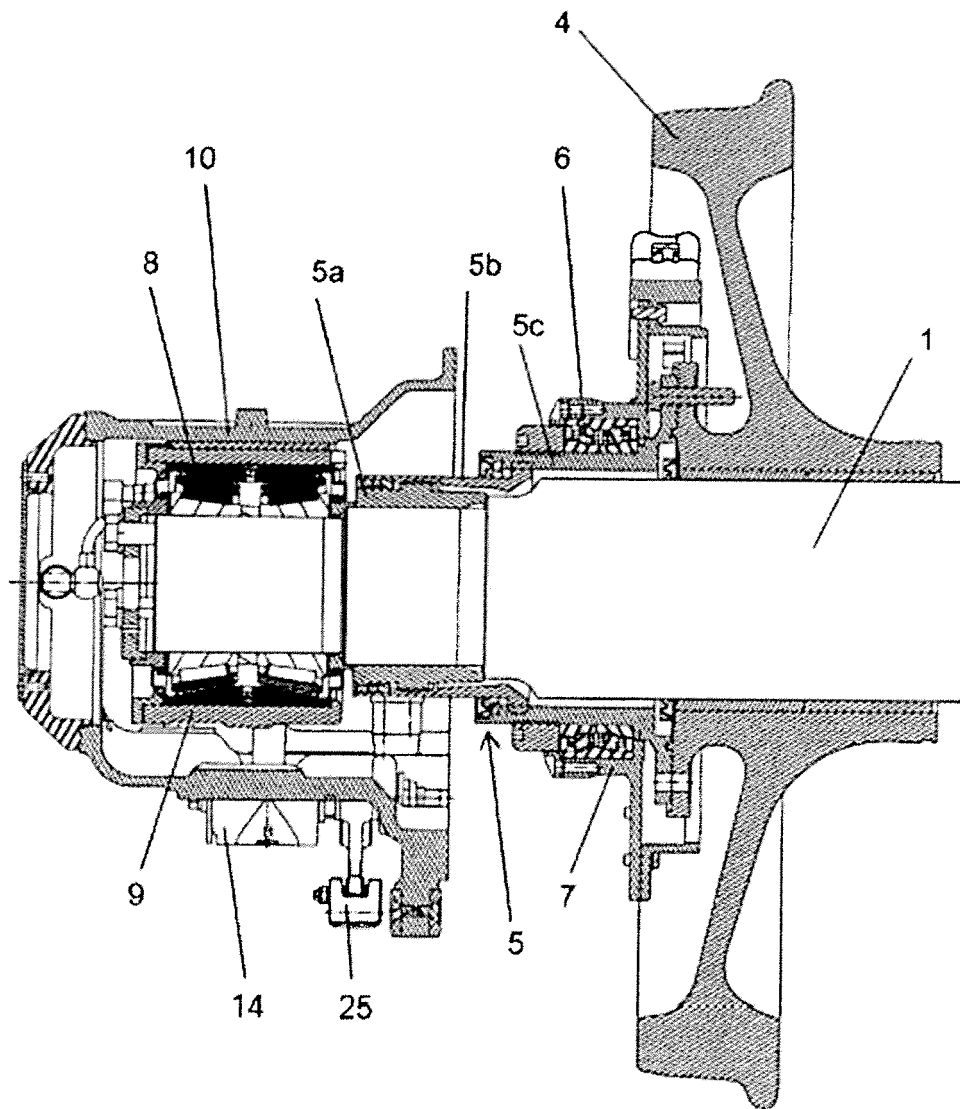


Fig. 4

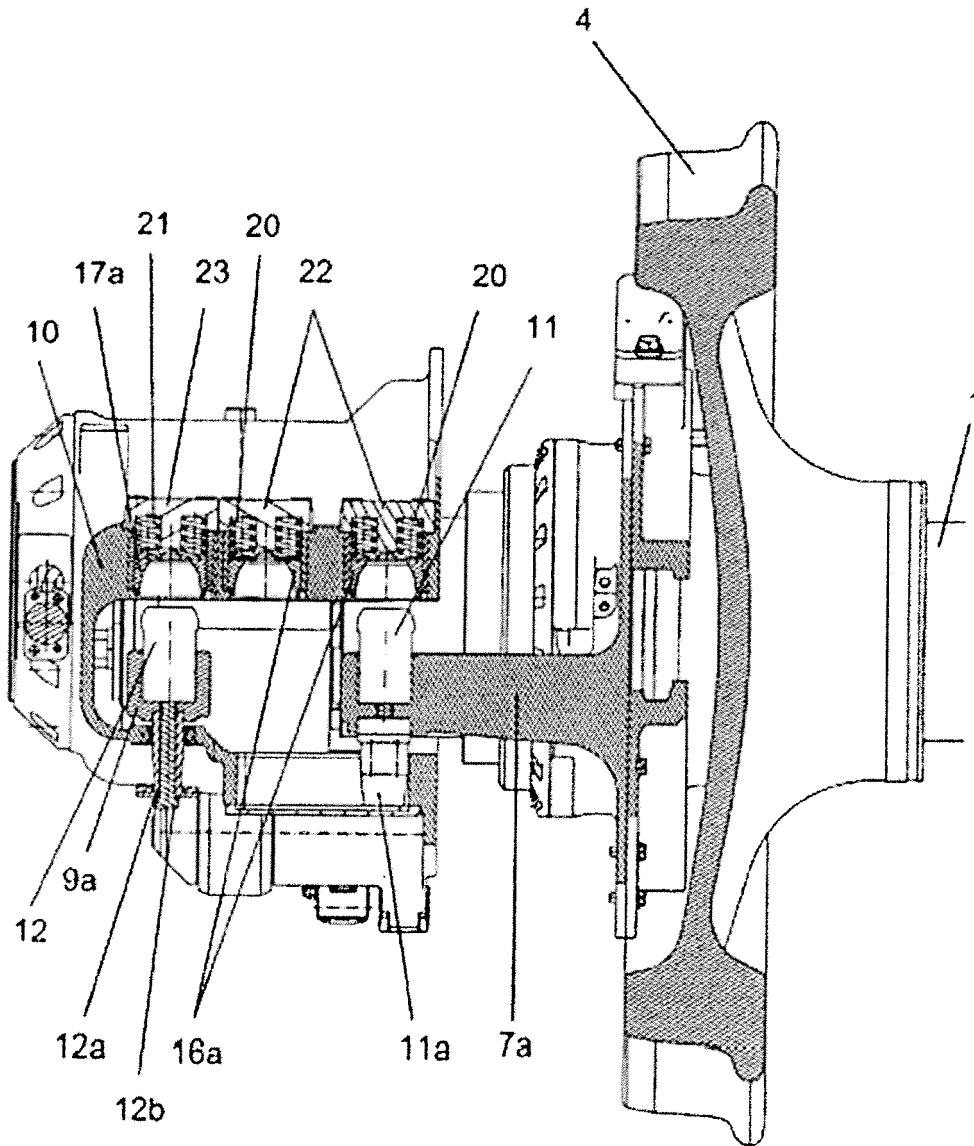


Fig. 5

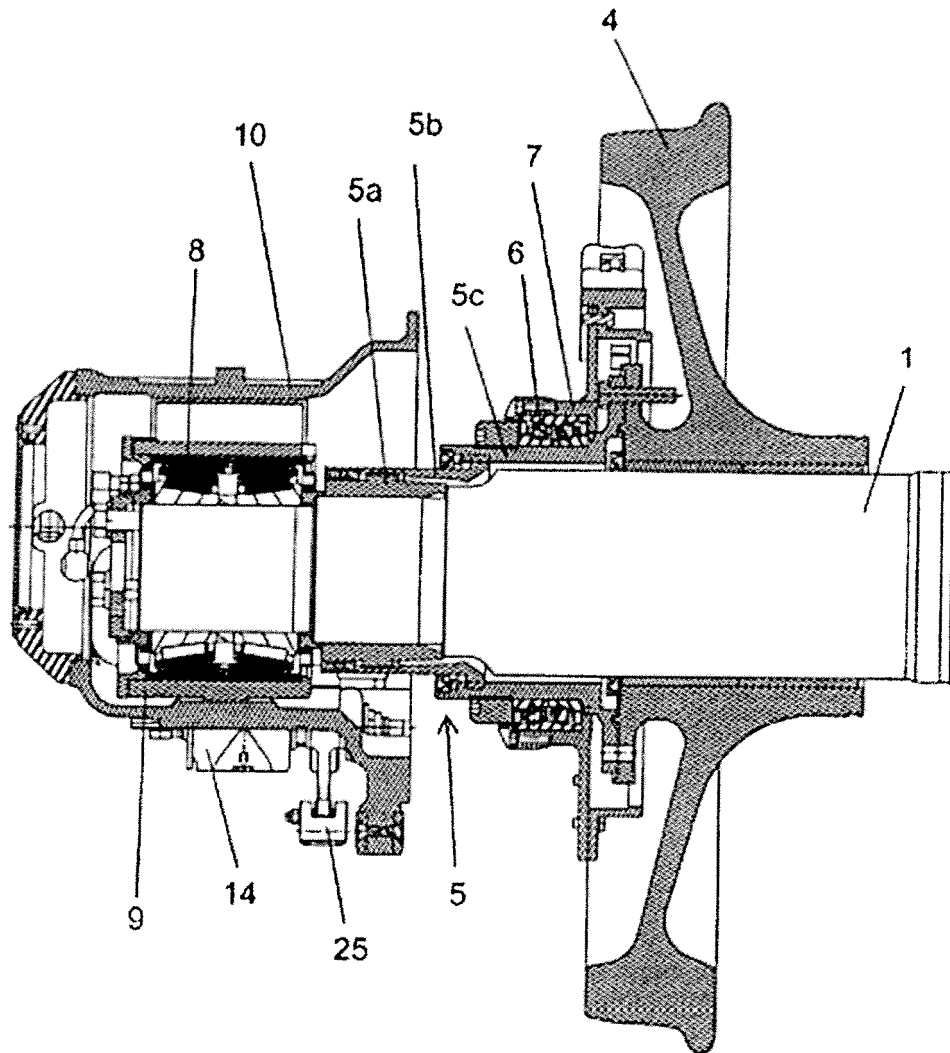


Fig. 6

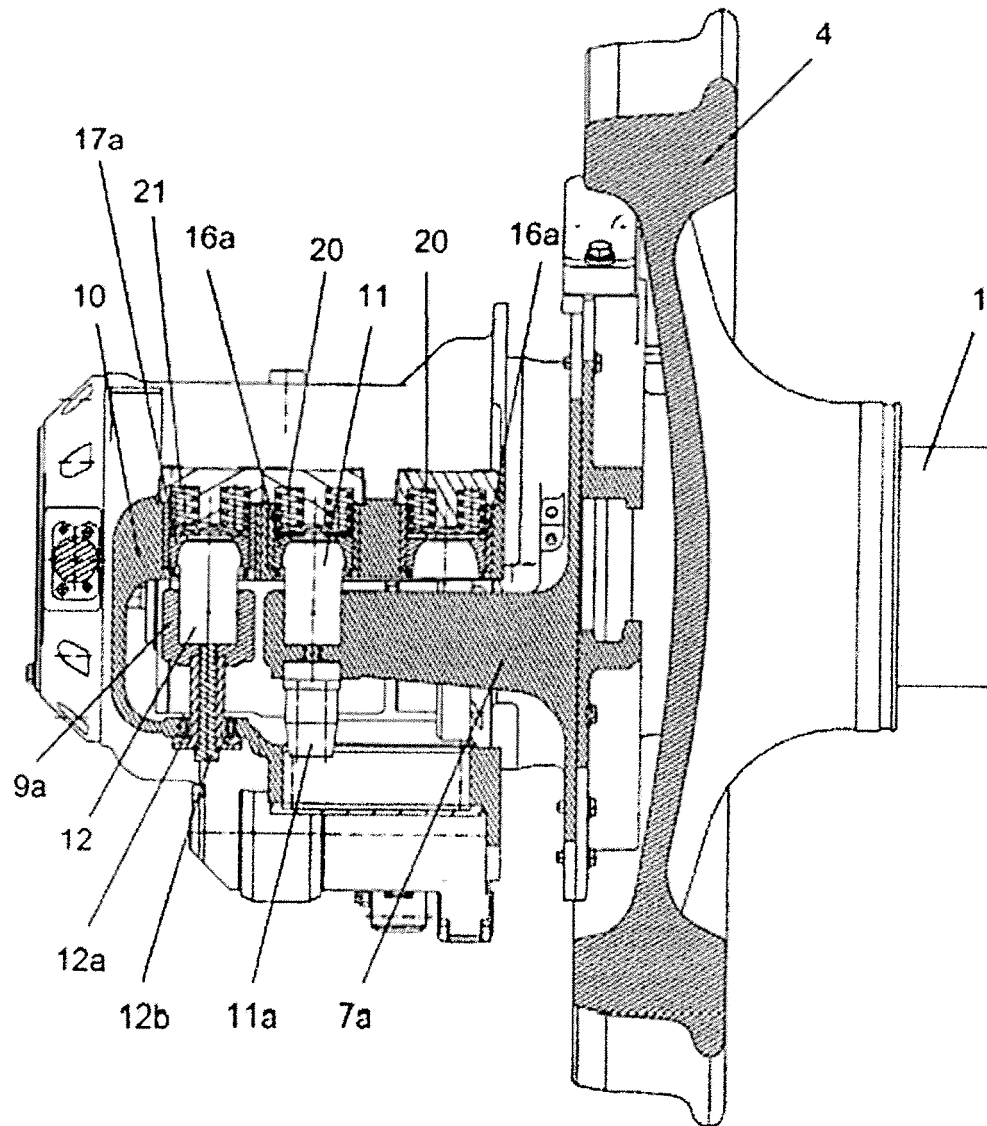


Fig. 7

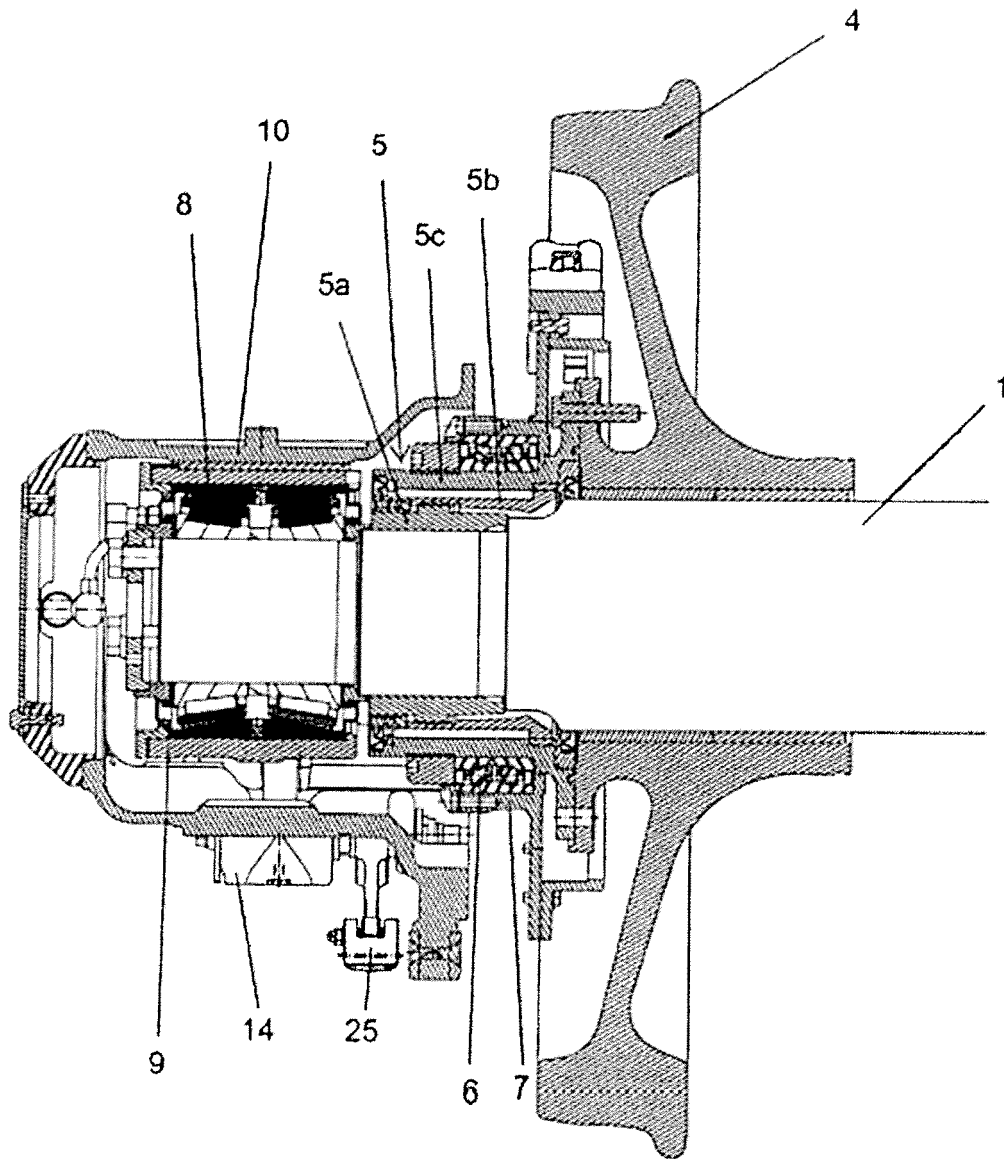


Fig. 8

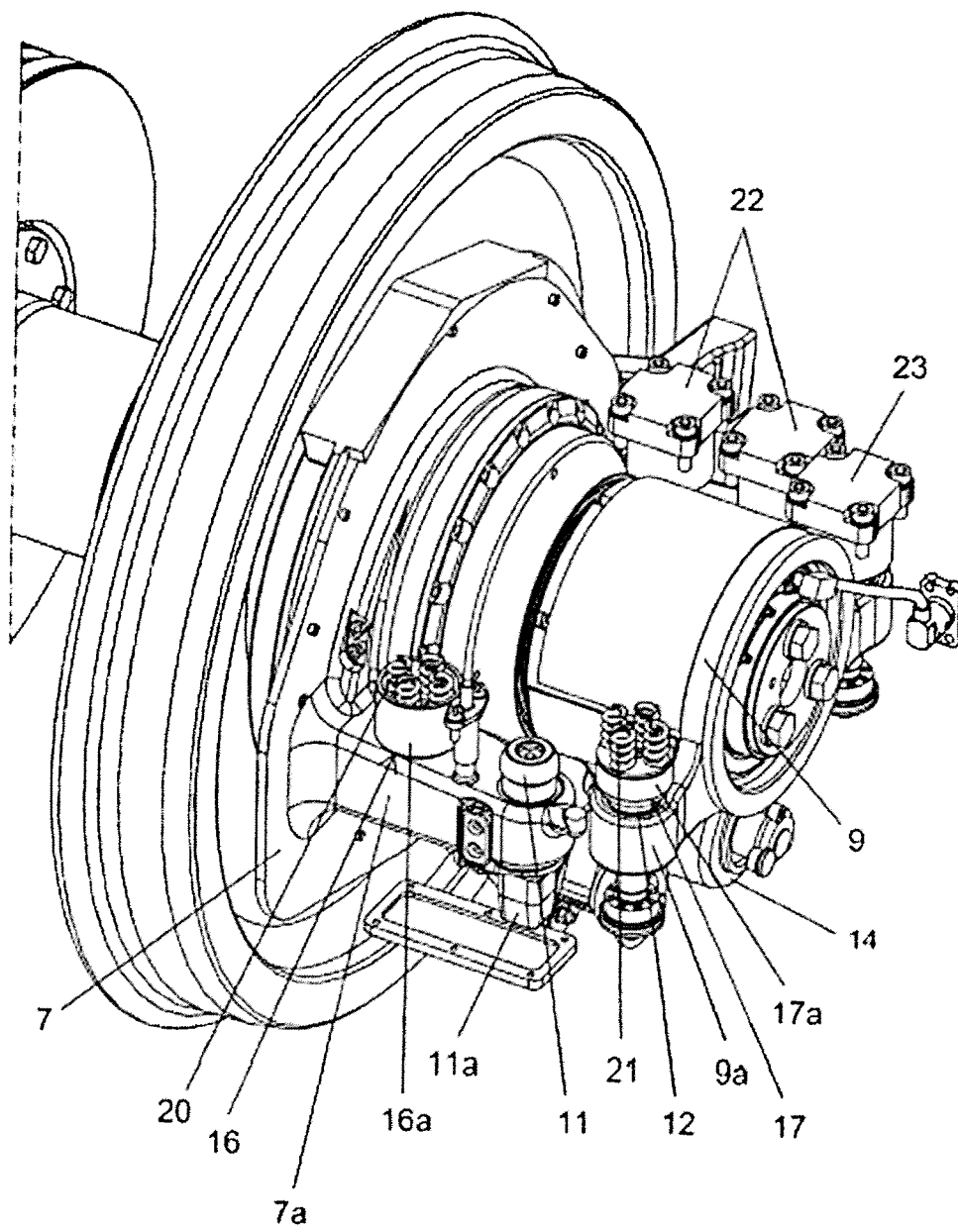


Fig.9

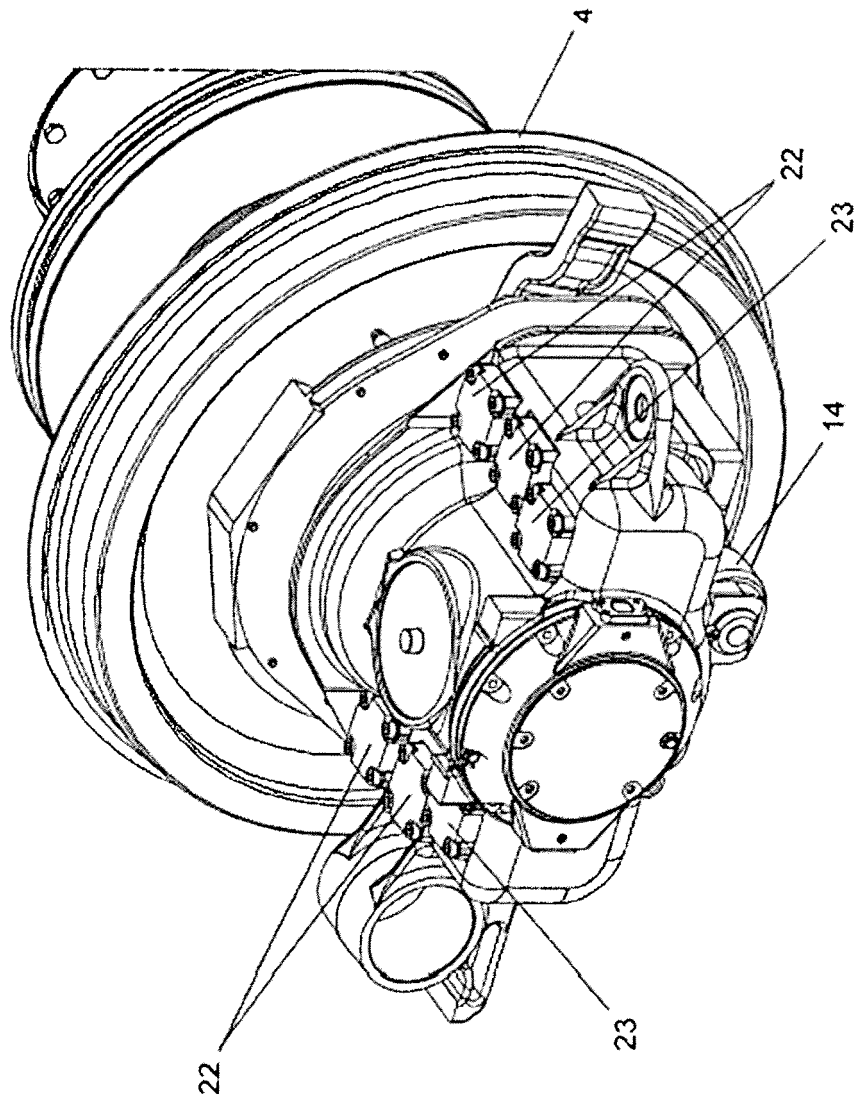


Fig. 10

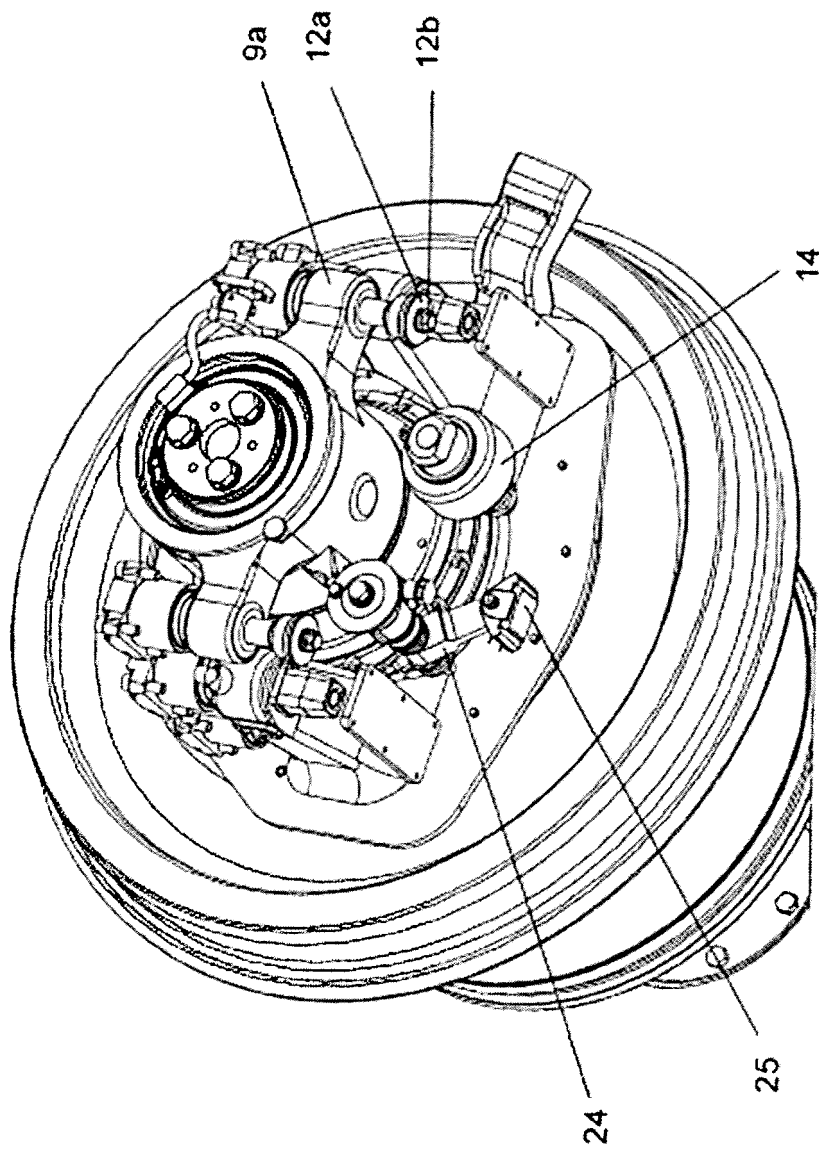


Fig. 11

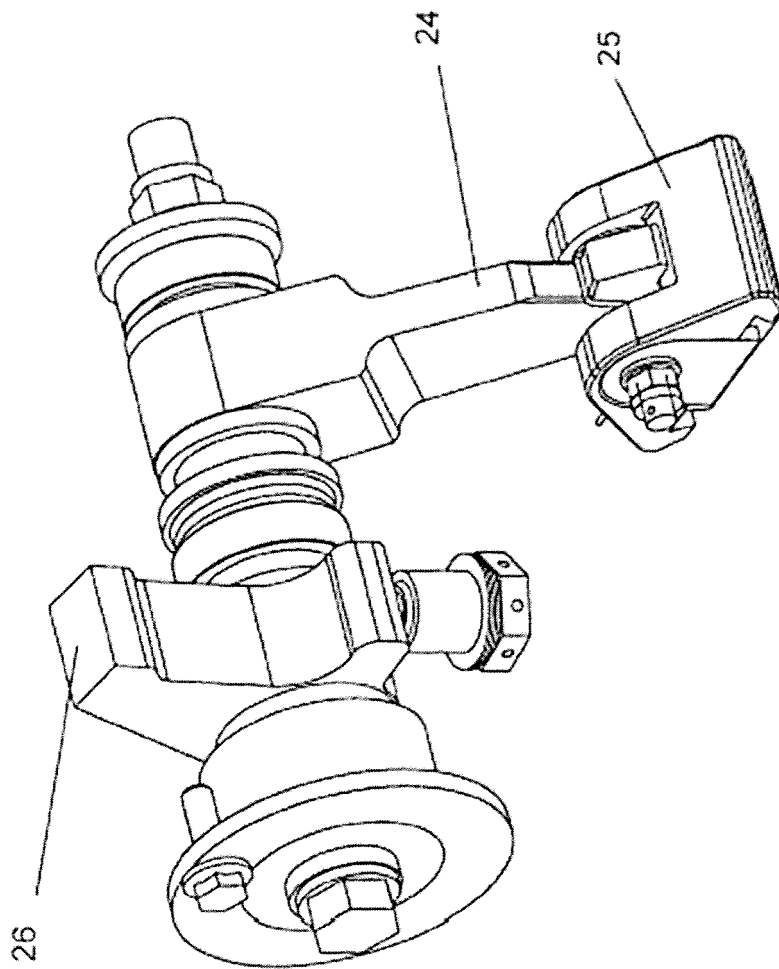


Fig. 12

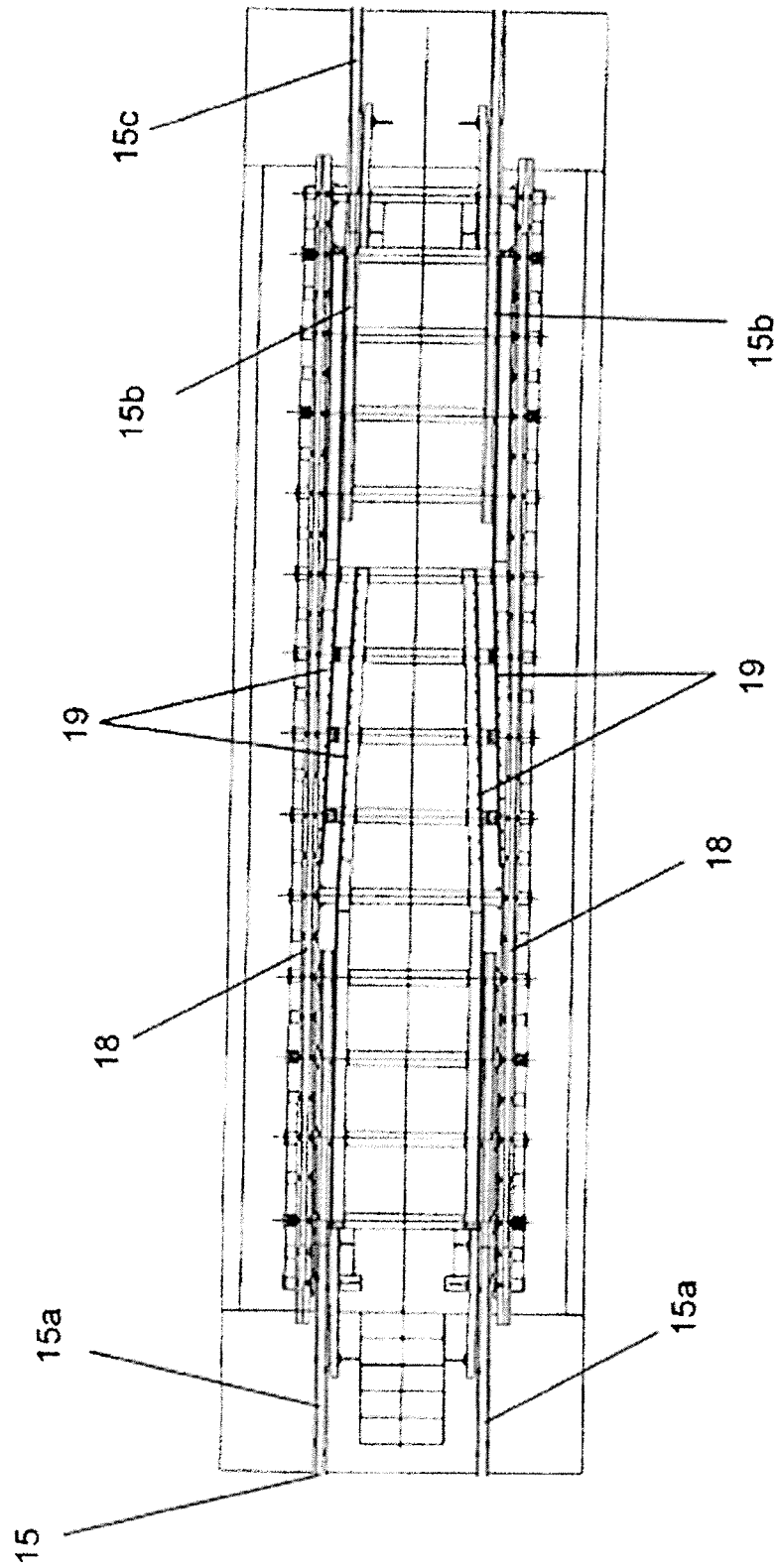


Fig. 13

REFERENCES CITED IN THE DESCRIPTION

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