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(54) Steering links for railway bogies

Lenkarme für ein Drehgestell eines Schienenfahrzeuges

Barre de guidage pour bogie d'un véhicule ferroviaire

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Description

[0001] This invention relates to steering links for bogies and to wagons incorporating such bogies.

[0002] There is a significant need for wagons which can carry containers throughout the rail network in the United Kingdom. For historical reasons many of the bridges and structures extending over the rail in the network are too low to receive containers on wagons with beds at the normal wagon height. The initial approach was to form the rail equivalent of a low loader with a low bed spanning between the bogies of the wagon. This however rendered a significant length of any set of wagons completely redundant. Proposals have been made to overcome this problem by reducing the wheel diameter and hence allowing for a lower bed or deck height which can still extend over the bogies and overcome the redundant length problem. However, these new wheel sets are much more sensitive to cornering forces and the current arrangements experience significant wheel wobble. Self-steering bogies are known, but these tend to be quite expensive to configure. Bogies have been provided with yaw dampers and traction rods incorporating rubber bushings for taking out vibration and other distortion forces.

[0003] WO-A-00/07864 describes a variable length steering link assembly for a bogie.

[0004] From one aspect the invention consists in a variable length steering link assembly as claimed in claim 1.

[0005] It will be seen that in this way the first mentioned chamber arrangement allows for telescopic contraction along an axial direction, whilst the second mentioned chamber allows for telescopic extension of the link assembly. In all cases the link assembly is always acting to compress a spring.

[0006] The arrangement is particularly economic to manufacture and assemble, because the anchor portions and springs can be identical and only a single spring has to be manipulated in the assembly of each anchor.

[0007] Even more conveniently the link may have a central element and two head elements, the head elements being identical and therefore requiring a small inventory of easy to manufacture parts.

[0008] The link assembly may include hard stops for limiting extension or contraction of the assembly. These conveniently can be provided by rigid cylinders circumjacent respective springs.

[0009] From another aspect the invention consists in a wagon as claimed in claim 9.

[0010] It will be understood that in the terms of this specification a steering link is a device which reactively responds to forces moving the wheel sets relative to the frame to control and limit that movement.

[0011] The or each link is constituted by a steering link assembly as defined above.

[0012] Although the invention has been defined above, it is to be understood it includes any inventive combination of the features set out above or in the following de-

scription.

[0013] The invention may be performed in various ways and specific embodiments will now be described, by way of example, with reference to the accompanying drawings, in which:

Figure 1 is a side view of a low deck wagon;

Figure 2 is an enlarged side view of a bogie of Figure 1;

Figure 3 is a perspective view of a steering link; and
Figure 4 is a cross-sectional view through the steering link of Figure 3.

[0014] A wagon for containers is generally indicated at 10. It includes a pair of bogies 11, having 577mm diameter wheels 12, and a deck 13 which is carried on side bearers 14 of the bogies 11. The deck height is 730mm above the rail level.

[0015] Referring particularly to Figure 2, the bogie 11 includes a frame 15, which is suspended on wheel sets 16, by respective suspensions 17. The frame is cranked at 18 to allow for a low position of the side bearers 14.

[0016] Steering links 19 are provided to extend respective fixed points 20 on the frame 15 and the respective axle boxes of respective wheel sets 16.

[0017] Each steering link 19 can be extended and contracted in a controlled manner in response to longitudinal displacement of the associated wheel 12 so as to simultaneously allow a degree of movement, but in a controlled fashion.

[0018] Thus, whilst a bogie is going round a curve on a rail, those wheels which are travelling on the inner part of the curve will tend to move in a sense to contract the link 19, whilst those on the outer side of the curve will move in a sense to extend their associated link 19. It will be understood that there are links on each side of the bogie.

[0019] This arrangement enables the disadvantages that arise from using the smaller wheels, i.e. wheels of less than 600mm diameter, whilst avoiding the significant cost of fully steerable or self-steerable wheel sets.

[0020] A particularly economic form of steering link 19 is illustrated in Figures 3 and 4. The steering link 19 comprises a central elongate link element 22 having T-shaped heads 23 fixed to its respective ends, and anchor portions 24, which telescopically house the heads 25 of the members 23.

[0021] As can be clearly seen in Figure 4, each anchor member 24 comprises a ball joint 26 which is integrally connected to a first housing member 27, which can be joined with a second housing member 28, by means of bolts 29 to form a chamber 30 in which a head 25 is received. Each chamber 30 also contains a compression spring 31 and a rigid cylinder 32 which is circumjacent the spring 31.

[0022] At the right hand end, the compression spring 30 is mounted to act between the first housing member 27 and the end face 33 of the head 25, whereas at the

left hand end the spring 31 is located to act between the second housing member 28 annular rear face 34 of the head 25.

[0023] It will readily be appreciated that on compression of the link 19 telescopic contraction will take place in the right hand anchor member 24, whilst on extension of the link telescopic extension will take place in the left hand anchor member 24. At all times these movements will take place by compressing the respective spring 31 and so they can be controlled.

[0024] It will be understood that the design is such that it has a very low component count and is very easy to assemble. Further springs of different rating can easily be put into their respective chambers 30 so that tuning can take place as necessary.

[0025] The sleeves 32 provide "hard stops" for the respective heads 25 so as to limit the degree of longitudinal movement that can occur for the wheels 12, for example under heavy braking.

Claims

1. A variable length steering link assembly for a bogie (11) **characterised in that** the assembly (19) includes an elongate link (22) having a generally T-shaped head (23) at each end and an anchor (24) for each end, wherein each anchor (24) defines an axially extending chamber (30) for slidably receiving a respective head (23) and a compression spring (31) wherein in one chamber (30) the spring (31) acts on the end face (32) of its associated head (23) and in the other chamber the spring acts on the back face of its associated head (23).
2. A variable length steering link assembly as claimed in claim 1, wherein at least one anchor (24) includes a ball joint (36) for connecting to a part of the bogie (11).
3. A variable length steering link assembly as claimed in claim 1 or claim 2 wherein each link (22) has a central element and two heads (23).
4. A variable length steering link assembly as claimed in claim 1 wherein the anchors (24) are identical.
5. A variable length steering link assembly as claimed in claim 1 including hard stops (32) for limiting the extension or contraction of the assembly.
6. A variable length steering link assembly as claimed in claim 1 wherein at least one anchor (24) includes a ball joint (26) for connecting to a part of the bogie (11) and wherein the link (19) has a central element (22) and two heads (23).
7. A variable length steering link assembly as claimed

in claim 6 wherein the anchors (24) are identical.

8. A variable length steering link assembly as claimed in any one of claims 1 to 4 and claims 6 or 7 including hard stops (32) for limiting the extension or contraction of the assembly.
9. A container wagon (10) having at least a pair of bogies (11) having wheels (12) of diameters of less than 600mm, each bogie having a steering link (19) extending from its frame to a wheel set, for each wheel set wherein there are a pair of steering links (19) for each wheel set, one on each side of the bogie (11) **characterised in that** each link (19) is a variable length steering link assembly (19) as claimed in claim 1, wherein each steering link (19) is extendable and includes a pair of compression springs (31), one of which is compressed on extension of the link (19) and one of which is compressed on contraction of the link (19).

Patentansprüche

1. Lenkarm-Anordnung variabler Länge für ein Drehgestell (11), **dadurch gekennzeichnet, daß** die Anordnung (19) einen langgestreckten Arm (22) aufweist, der einen im allgemeinen T-förmigen Kopf (23) an jedem Ende sowie einen Anker (24) für jedes Ende hat, wobei jeder Anker (24) eine sich axial erstreckende Kammer (30) zur verschiebbaren Aufnahme eines entsprechenden Kopfes (23) aufweist sowie eine Schraubenfeder (31), und wobei in der einen Kammer (30) die Feder (31) auf eine Stirnfläche (32) des zugehörigen Kopfes (23) einwirkt und in der anderen Kammer die Feder auf die Rückseite des zugehörigen Kopfes (23) einwirkt.
2. Lenkarm-Anordnung variabler Länge nach Anspruch 1, **dadurch gekennzeichnet, daß** wenigstens ein Anker (24) ein Kugelgelenk (36) zur Verbindung mit einem Teil des Drehgestells (11) aufweist.
3. Lenkarm-Anordnung variabler Länge nach Anspruch 1 oder 2, **dadurch gekennzeichnet, daß** jeder Arm (22) ein zentrales Element und zwei Köpfe (23) aufweist.
4. Lenkarm-Anordnung variabler Länge nach Anspruch 1, **dadurch gekennzeichnet, daß** die Anker (24) identisch sind.
5. Lenkarm-Anordnung variabler Länge nach Anspruch 1, **dadurch gekennzeichnet, daß** feste Anschläge zur Begrenzung der Dehnung oder der Kontraktion der Anordnung vorhanden sind.
6. Lenkarm-Anordnung variabler Länge nach An-

spruch 1, **dadurch gekennzeichnet, daß** wenigstens ein Anker (24) ein Kugelgelenk (26) aufweist, das zur Verbindung mit einem Teil des Drehgestells (11) dient und wobei der Arm (19) ein zentrales Element (22) und zwei Köpfe besitzt.

7. Lenkarm-Anordnung variabler Länge nach Anspruch 6, **dadurch gekennzeichnet, daß** die Anker (24) identisch sind.
8. Lenkarm-Anordnung variabler Länge nach irgendeinem der Ansprüche 1 bis 4 und Anspruch 6 oder 7, **gekennzeichnet durch** feste Anschläge (32) zur Begrenzung der Dehnung oder Kontraktion der Anordnung.
9. Ein Container-Waggon (10), der mit einem Paar Drehgestelle (11) ausgerüstet ist, die Räder (12) mit einem Durchmesser von weniger als 600 mm aufweisen und jedes Drehgestell einen Lenkarm (19) hat, der sich von seinem Rahmen zu einem Radsatz erstreckt, wobei für jeden Radsatz ein Paar Lenkarme (19) vorgesehen ist, einer auf jeder Seite des Drehgestells (11), **dadurch gekennzeichnet, daß** jeder Arm (19) eine Lenkarm-Anordnung (19) variabler Länge nach Anspruch 1 ist, wobei jeder Lenkarm (19) verlängerbar ist und ein Paar Schraubenfedern (31) aufweist, von denen eine bei Dehnung des Arms (19) zusammengedrückt wird und eine von ihnen zusammengedrückt wird, wenn der Arm (19) kontrahiert.

Revendications

1. Ensemble barre de direction à longueur variable pour un bogie (11) **caractérisé par le fait que** l'ensemble (19) comprend une barre allongée (22) ayant une tête globalement en forme de T (23) à chaque extrémité et un ancrage (24) pour chaque extrémité, chaque ancrage (24) définissant une chambre s'étendant axialement (30) pour recevoir de manière coulissante une tête respective (23) et un ressort de compression (31), dans lequel, dans une chambre (30), le ressort (31) agit sur la face d'extrémité (32) de sa tête associée (23) et, dans l'autre chambre, le ressort agit sur la face arrière de sa tête associée (23).
2. Ensemble barre de direction à longueur variable selon la revendication 1, dans lequel au moins un ancrage (24) comprend un joint à rotule (36) pour liaison à une partie du bogie (11).
3. Ensemble barre de direction à longueur variable selon l'une des revendications 1 ou 2, dans lequel chaque barre (22) a un élément central et deux têtes (23).

4. Ensemble barre de direction à longueur variable selon la revendication 1, dans lequel les ancrages (24) sont identiques.

5 5. Ensemble barre de direction à longueur variable selon la revendication 1, comprenant des butées dures (32) pour limiter l'extension ou la contraction de l'ensemble.

10 6. Ensemble barre de direction à longueur variable selon la revendication 1, dans lequel au moins un ancrage (24) comprend un joint à rotule (26) pour liaison à une partie du bogie (11) et dans lequel la barre (19) a un élément central (22) et deux têtes (23).

15 7. Ensemble barre de direction à longueur variable selon la revendication 6, dans lequel les ancrages (24) sont identiques.

20 8. Ensemble barre de direction à longueur variable selon l'une quelconque des revendications 1 à 4 et des revendications 6 ou 7, comprenant des butées dures (32) pour limiter l'extension ou la contraction de l'ensemble.

25 9. Wagon porte-conteneurs (10) ayant au moins une paire de bogies (11) ayant des roues (12) de diamètres inférieurs à 600 mm, chaque bogie ayant une barre de direction (19) s'étendant de son châssis à un essieu monté, pour chaque essieu monté, dans lequel il y a une paire de barres de direction (19) pour chaque ensemble roue, une sur chaque côté du bogie (11), **caractérisé par le fait que** chaque barre (19) est un ensemble barre de direction à longueur variable (19) selon la revendication 1, chaque barre de direction (19) étant extensible et comprenant une paire de ressorts de compression (31), dont l'un est comprimé lors de l'extension de la barre (19) et dont l'un est compressé lors de la contraction de la barre (19).

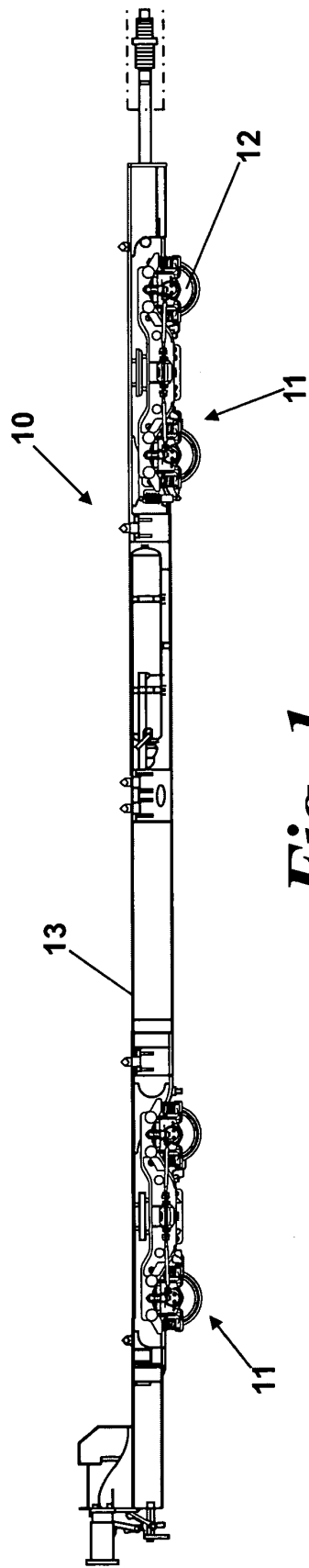


Fig. 1

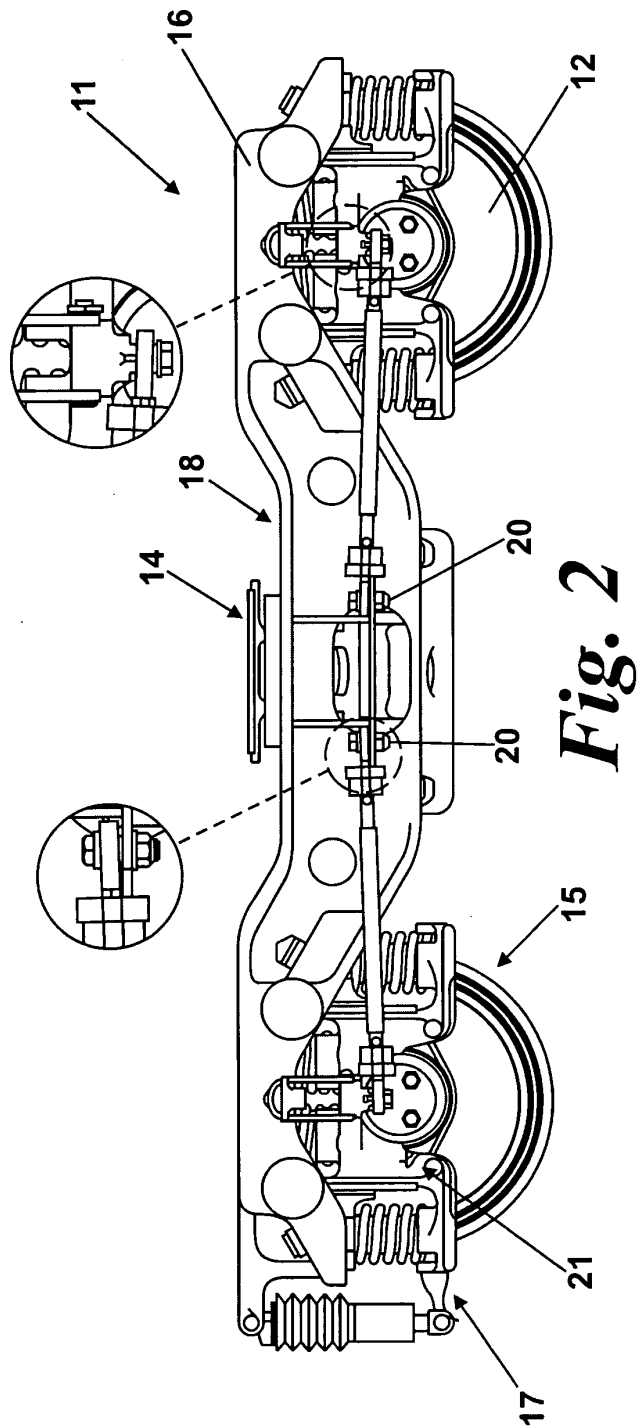


Fig. 2

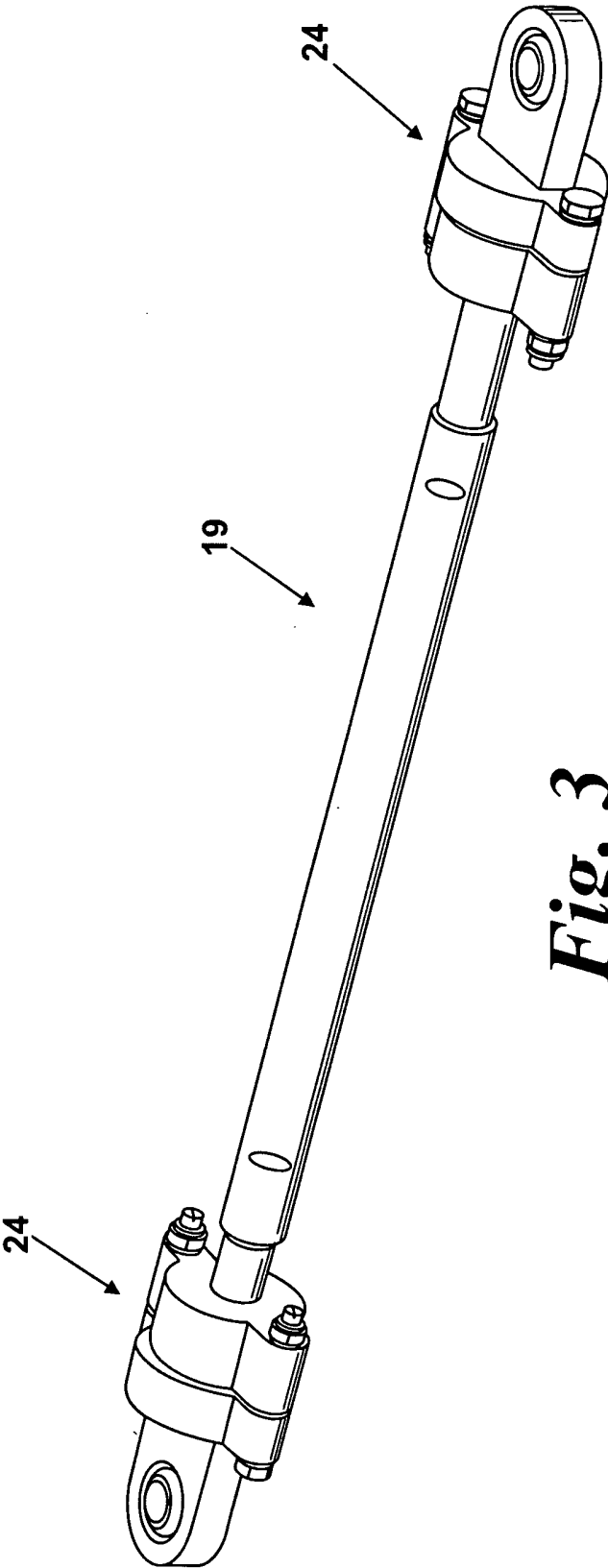
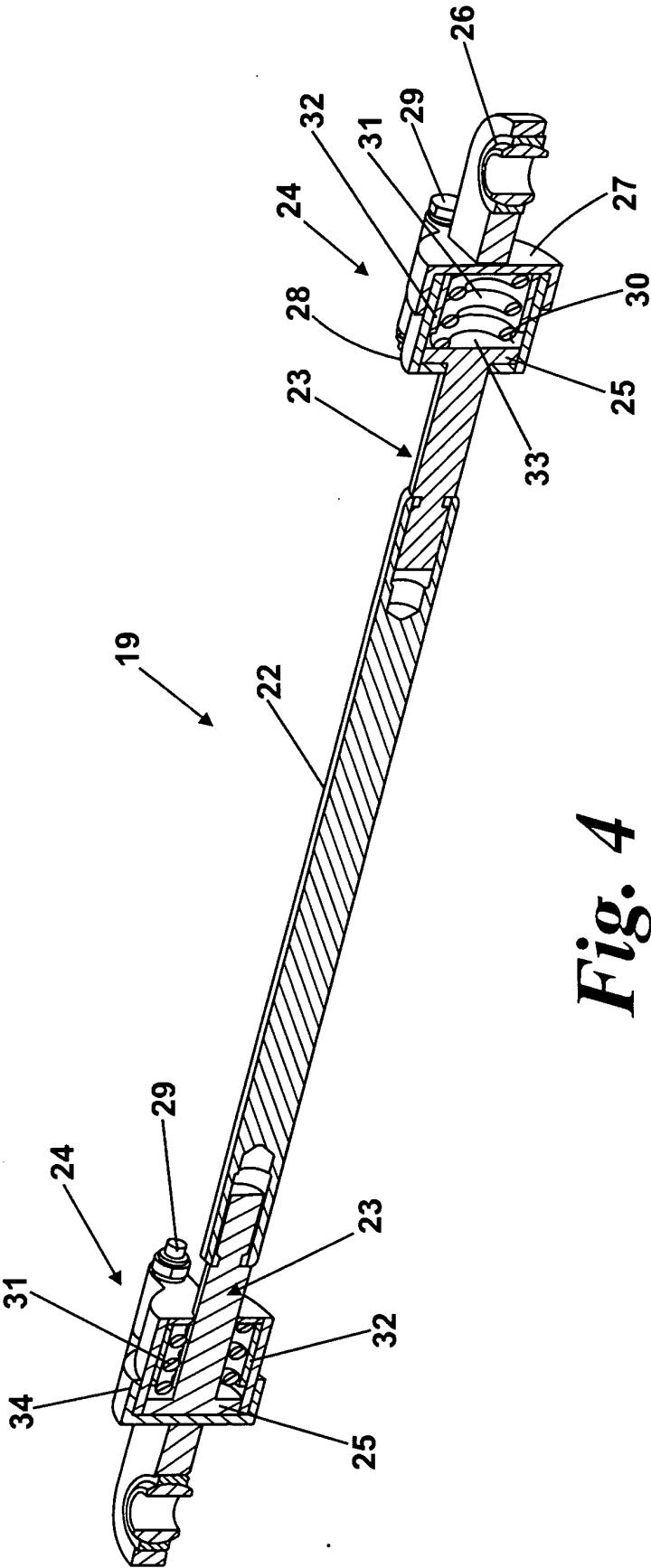


Fig. 3



REFERENCES CITED IN THE DESCRIPTION

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