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Description

[0001] The invention relates to a commercial vehicle chassis comprising a chassis frame which comprises wheel axles having associated wheels, and comprises longitudinal members and transverse members, of which a rear end transverse member which closes the chassis frame at the rear end is part of a chassis frame rear end, and the rear end transverse member and at least one further transverse member have locking elements for locking a payload, in particular a container, the chassis frame rear end comprising the rear end transverse member being designed as a compact rear end having a central beam which is arranged at a distance underneath the rear end transverse member and which extends between two rear-end wheels and/or extends between two wheel covers associated with the rear-end wheels, the rear end transverse member being arranged at least in regions above rear-end wheels and/or above the wheel covers associated with the rear-end wheels, the compact rear end having the rear end transverse member and the central beam being designed so as to be movable in the longitudinal direction of the commercial vehicle chassis, and it being possible for the central beam to be transferred from its position between the rear-end wheels or from its position between the wheel covers associated with the rear-end wheels together with the rear end transverse member from its position at least in regions above rear-end wheels or wheel covers associated with the rear-end wheels into a set-back position, and the compact rear end having the rear end transverse member and the rear-end central beam being part of a compact rear end extension.

[0002] When transporting goods using commercial vehicles, it is recognised that the permissible payload of the commercial vehicle must not be exceeded, so as not to impair road safety and operational safety.

[0003] In this case, the load distribution is of particular importance. When loading the commercial vehicle, it is not only necessary to take into account the maximum payload, but also an exact positioning of the payload on the corresponding loading surface, i.e. the commercial vehicle chassis with the chassis frame thereof.

[0004] The positioning of the payload on the loading surface depends, inter alia, on the centre of gravity of the payload, the permissible axle loads and what is referred to as the fifth-wheel load, i.e. the load on the fifth wheel of the tractor. The legal requirements must be observed for both the fifth-wheel load and the drive axle load.

[0005] For cross-border traffic, it is required that the drive axles of the tractor be loaded with no less than 25% of the total weight of the commercial vehicle. If the payload is positioned unfavourably, this may result in the permissible loads being exceeded or not reached, even though the permissible payload has not been exceeded. Exceeding the axle load can cause damage to tyres and axles, for example. In contrast, falling below the axle load has a significant effect on the steering behaviour or behaviour while pulling away of the commercial vehicle.

[0006] In the field of container transport, the positioning of the cargo is predetermined by the locking positions of the locking elements on the chassis frame.

[0007] In order to observe the legal requirements for load distribution, specifically for the transport of a 20' container, various commercial vehicle chassis for container transport are known. However, the technical complexity of the available container chassis together with corresponding potential solutions is relatively high.

[0008] For example, a commercial vehicle chassis for container transport that allows a chassis frame for flexible load distribution is known. In this case, two chassis frames are moved into one another in order to change the position of the loaded container. Container chassis frames which are to be moved towards one another are referred to as sliding bogie trailers. The central transport position allows an even distribution of the load on the axles of the commercial vehicle chassis and of the commercial vehicle. For the purpose of loading and unloading, the chassis frames can be moved into one another when the containers are loaded, so that the rear of the container can be positioned flush with a loading ramp.

[0009] In addition, another commercial vehicle chassis is known which has a telescopic chassis frame. In this case, longitudinal members of a front part of the chassis frame are to be telescoped into open longitudinal members of a rear part of the chassis frame. After the selected telescopic position is assumed after loading the commercial vehicle with a container, it is no longer possible to change the position of the loaded container. If, for a selected transport position, a uniform load distribution on the axles of the chassis and the commercial vehicle is therefore achieved, in which the loaded container is at a distance from the chassis frame rear end, it is no longer possible to change the position of the container after loading. A positioning for unloading that is flush with the rear end can therefore no longer be assumed if the container was not previously loaded flush with the rear end for the transport position.

[0010] In both designs of the commercial vehicle chassis of the known types, the legal requirements for underrun protection must also be observed. Therefore, the rear end transverse members of the chassis frame rear end are at a distance from the rear-end wheels of the commercial vehicle chassis in both known alternatives of the previously known commercial vehicle chassis. This is disadvantageous and requires a large number of components which have an adverse effect on the total production costs of the commercial vehicle chassis.

[0011] A commercial vehicle chassis of the type mentioned at the outset is known from US 4,836,735 A, in which a rear end transverse member and a central beam extend behind the rear-end wheels, the rear end transverse member being arranged above rear-end wheels at least in regions. The chassis frame rear end comprising the rear end transverse member is designed as a compact rear end and can be moved together with the central beam in the longitudinal direction of the commercial vehicle chassis. The rear is therefore to be moved into a set-back position together with the central beam, so that the compact rear end together with the rear end transverse member and the rear-end central beam is part of a compact rear end extension.

[0012] There are many advantages to this commercial vehicle chassis, but said chassis also has disadvantages with regard to underrun protection.

[0013] A commercial vehicle chassis which has an extendable chassis frame rear end and is designed similarly to the commercial vehicle chassis according to US 4,836,735 A is also known from GB 2 523 809 A.

[0014] The problem addressed by the present invention is that of improving a commercial vehicle chassis of the type mentioned at the outset such that the flexibility thereof is increased.

[0015] In order to solve this problem, the commercial vehicle chassis of the type mentioned at the outset is characterised in that a pivotable or movable outer beam is provided on the central beam on its relevant commercial vehicle chassis outer side.

[0016] This creates a commercial vehicle chassis in which the rear loading position of the payload, i.e. in particular of the container, can be placed closer to the last axle of the rear-end wheels, as a result of the compact design of the chassis frame rear end as a compact rear end. Nevertheless, the compact rear end is to be structurally designed such that the container can be loaded and unloaded flush with the rear end. Due to the placement of a container close to the last axle, the load distribution is also significantly improved in the case that the container can be loaded and unloaded at the rear, since the distance between the centre of gravity of the load (cargo) and the centre of the axle assembly is increased, which increases the fifth-wheel load.

[0017] In addition, only a small number of components is necessary. Therefore, this commercial vehicle chassis design according to the invention is significantly more cost effective and less susceptible to wear in comparison with movable chassis frames in general. This is of significant advantage in the field of container transport, since the stress on container chassis frames when loading containers onto different chassis frames, for example, is very high.

[0018] In spite of the design as a compact rear end, due to the provided central beam it is possible to observe the legal requirements for underrun protection, since the rear-end wheels of the last axle in the vehicle's longitudinal direction, in conjunction with the central beam, partially perform the function of

underrun protection. In order to also prevent underrunning in the region between the wheels in the event of an accident, the central beam is provided underneath the rear end transverse member, at a positional distance from the rear end transverse member.

[0019] The compact rear end is part of a compact rear end extension, which in its shortest position, i.e. the position in which the rear end transverse member is moved in the direction of the other transverse members of the chassis frame, is located in the position in which said compact rear end is located at least in regions above rear-end wheels and/or wheel covers associated with the rear-end wheels. Nevertheless, for the transport of containers larger than 20', the compact rear end extension can be pushed out of the rear-end central beam to the extent that, for example, 30', 40' or 45' containers, inter alia, can also be loaded, which containers are then also to be unloaded and loaded flush to the rear end. The chassis frame parts are not changed for this purpose, so that a large number of components can be dispensed with in a more cost-effective manner in comparison with conventional commercial vehicle chassis designs. The legal requirements for underrun protection are also to be performed by the central beam, which, for this purpose, is equipped with outer beams which can pivot outwards and, in the outwardly pivoted position thereof, overlap the rear-end wheels of the last wheel axle at a distance and interact with and reinforce outer plates, for example. This significantly increases the flexibility of the commercial vehicle chassis.

[0020] Further advantageous embodiments can be found in further dependent claims, the following description and the drawings, in which:

Fig. 1 shows an embodiment of a telescopic commercial vehicle chassis according to the invention, comprising a compact rear end having the rear end transverse member which, in the retracted state, is located above the rear wheels and above the rear wheel cover;

Fig. 2 shows the commercial vehicle chassis according to Fig. 1, comprising a retractable and extendable compact rear end having a rear end transverse member and a central beam and outer beams which can pivot outwards in the extended state;

Fig. 3 is a perspective plan view from behind of an alternative embodiment to Fig. 1 (not telescopic);

Fig. 4 is a perspective plan view from the front of the embodiment according to Fig. 3;

Fig. 5 is a perspective view from the side of the embodiment according to Fig. 3 (in part);

Fig. 6 is a perspective view obliquely from behind of the embodiment according to Fig. 3;

Fig. 7 shows the embodiment according to Fig. 1 and 2, comprising inwardly pivoted outer beams;

Fig. 8 is a side view of the embodiment and the position of the rear end extension according to Fig. 7;

Fig. 9 shows the embodiment according to Fig. 1 and 2 in an extended position of the compact rear end, and

Fig. 10 is a view of the compact rear end extension of the embodiment according to Fig. 2.

[0021] In the drawing, like parts are provided with like reference numerals.

[0022] In the drawings, a commercial vehicle chassis is generally denoted by 1, which commercial vehicle chassis in the shown embodiment has three wheel axles having associated wheels 2, a wheel cover 3 and transverse members 5, including a rear end transverse member 5.1. The transverse members 5, including the rear end transverse member 5.1, have locking elements 5.2. The embodiment of the commercial vehicle chassis according to Fig. 1 has a compact rear end 7 which is not rigid and is therefore movable. Fig. 1 shows that this compact rear end is designed such that, in the inserted state, it is arranged very close to the rear-end wheels 2 and is located in regions above the rear region of the rear-end wheels 2 or the rear-end wheel cover 3.

[0023] In the embodiment according to Fig. 2, the compact rear end is designed as a compact rear end extension comprising a retraction and extension beam 8. It can be seen in said figure that a central beam 9 having outer beams 9.1 is located at a distance underneath the rear end transverse member 5.1, which will be discussed in more detail. This central beam 9 extends at a positional distance underneath the rear end transverse member 5.1 and is supported by brackets 10. This central beam 9, together with the outer beams 9.1, provides underrun protection. Fig. 3 and 4 show an alternative embodiment according to Fig. 1 in different views.

[0024] Fig. 5 shows that, in the embodiment according to Fig. 1, the rear end transverse member 5.1 is located above the rear-end wheels 2 or the wheel cover 3 which is associated with the rear-end wheels 2. The central beam 9 is located far enough into the region of the chassis frame that the central beam 9 is located between the end region of the rear wheels 2 or of the rear-end wheel covers 3. This is also shown again in Fig. 6, in which outer plates 11 are also shown that are located entirely behind the rear-end wheels 2 or the rear splash guards 3, such that the rear wheels 2, together with the outer plates 11 and the central beam 9, provide the underrun protection.

[0025] Fig. 7 shows the inwardly pivoted outer beams 9.1 of the central beam 9 together with the associated outer plates 11. In said figure, the outer beams 9.1 are in the inwardly pivoted position above the central beam 9 and, by means of the pivot lever 12, can be pivoted inwards or outwards about a pivot axis which extends parallel to the longitudinal axis of the commercial vehicle chassis. The same is shown again in Fig. 8 in another perspective view. Fig. 9 shows the embodiment according to Fig. 2, comprising the extendable compact rear end 7 and the moving beam 8.

[0026] The compact rear end 7 is designed as a compact rear end extension, so that the rear end transverse member 5.1 is to be transferred into a set-back position by the extension beam 8, the rear end of a container structure is thus to be locked by means of the locking elements 5.2 with positional spacing, and said container structure is therefore to be loaded and unloaded flush with the rear.

[0027] The outer beams 9.1 have been transferred through the pivot angles 12 into their respective outwardly pivoted positions, such that said outer beams overlap the rear-end wheels 2 with positional spacing and reinforce the outer plates 11. Said outer beams are to be locked in this position. Fig. 9 and 10 are a perspective partial views of the positions of the parts as shown in Fig. 2 and 9.

P A T E N T K R A V

1. Erhvervsmotorkøretøjschassis (1) med en hjulaksel med tilhørende hjul (2), som omfatter chassisramme med langsgående traverser (4) og tværgående traverser (5, 5.1), hvoraf en tværgående bagendetravers (5.1), som lukker chassisrammen bagtil, er del af bagenden af en chassisramme, og den tværgående bagendetravers (5.1) og mindst én yderligere tværgående travers (5) har låseelementer (5.2) til at låse en nyttelast, især en container, hvor bagenden af chassisrammen, som omfatter den tværgående bagendetravers (5.1), er udformet som kompakt bagende (7) og indrettet med en midterbjælke (9), som er anbragt med en afstand nedenunder den tværgående bagendetravers (5.1) og som strækker sig mellem to baghjul (2) og/eller mellem to hjulskærme (3) af baghjulene (2), hvor den tværgående bagendetravers (5.1) i det mindste områdevis er placeret ovenover baghjulene (2) og/eller ovenover hjulskærmene (3) af baghjulene (2), hvor den kompakte bagende (7) sammen med den tværgående travers (5.1) og midterbjælken (9) er indrettet til at være forskydelig i længderetningen af erhvervsmotorkøretøjschassiset, og hvor midterbjælken (9) i sin position mellem baghjulene (2) eller i sin position mellem hjulskærmene (3) af baghjulene (2) kan overføres sammen med den tværgående bagendetravers (5.1) i deres position, som i det mindste områdevis er placeret ovenover baghjulene (2) eller ovenover hjulskærmene (3) af baghjulene (2), til en nulstillet position, og hvor den kompakte bagende (7) sammen med den tværgående bagendetravers (5.1) og den bagerste midterbjælke (9) er del af en kompakt bagendeudtrækning, **kendetegnet ved, at** en drejelig eller forskydelig ydre bjælke (9.1) er tilvejebragt på midterbjælken (9) på hver af dennes respektive ydersider af erhvervsmotorkøretøjschassiset.

2. Erhvervsmotorkøretøjchassis (1) ifølge krav 1, **kendetegnet ved, at** underkørbeskyttelseselementer (11), som overlapper med bagenden af baghjulene (2), er forbundet til ydersiden af midterbjælken (9).

3. Erhvervsmotorkøretøjchassis (1) ifølge krav 2, **kendetegnet ved, at** underkørbeskyttelseselementerne (11) er udformet som ydre plader.

4. Erhvervsmotorkøretøjchassis (1) ifølge ét hvilket som helst af kravene 1 til 3, **kendetegnet ved, at** midterbjælken (9) er monteret, ved hjælp af konsoller (10), på den tværgående bagendetravers (5.1) eller på langsgående traverser (4) med lodret positionsafstand til disse.

5. Erhvervsmotorkøretøjchassis (1) ifølge krav 1, **kendetegnet ved, at** de ydre bjælker (9.1) hver især kan drejes indad og udad omkring en parallel drejeaksel, som er parallel til længdeakslen af erhvervsmotorkøretøjschassiset, hvor den relevante ydre bjælke (9.1), i positionen hvor denne er drejet indad, er anbragt over midterbjælken (9), og hvor den relevante ydre bjælke (9.1) sammen med midterbjælken (9), i den indskubbede tilstand af bagendeudtrækning, kan overføres til positionen mellem baghjulene (2) eller positionen mellem hjulskærmene (3) af baghjulene (2).

6. Erhvervsmotorkøretøjchassis (1) ifølge krav 1, **kendetegnet ved, at** de ydre bjælker (9.1) hver især, i positionen hvor disse er drejet indad eller i deres indskubbede

position, strækker sig i området af og afstiver det tilhørende underkøringsbeskyttelseselement (11).

7. Erhvervsmotorkøretøjchassis (1) ifølge krav 1, **kendetegnet ved, at** de ydre bjælker (9.1), i positionen hvor disse er drejet indad eller i deres indskubbede position, kan låses på midterbjælken (9).
- 5

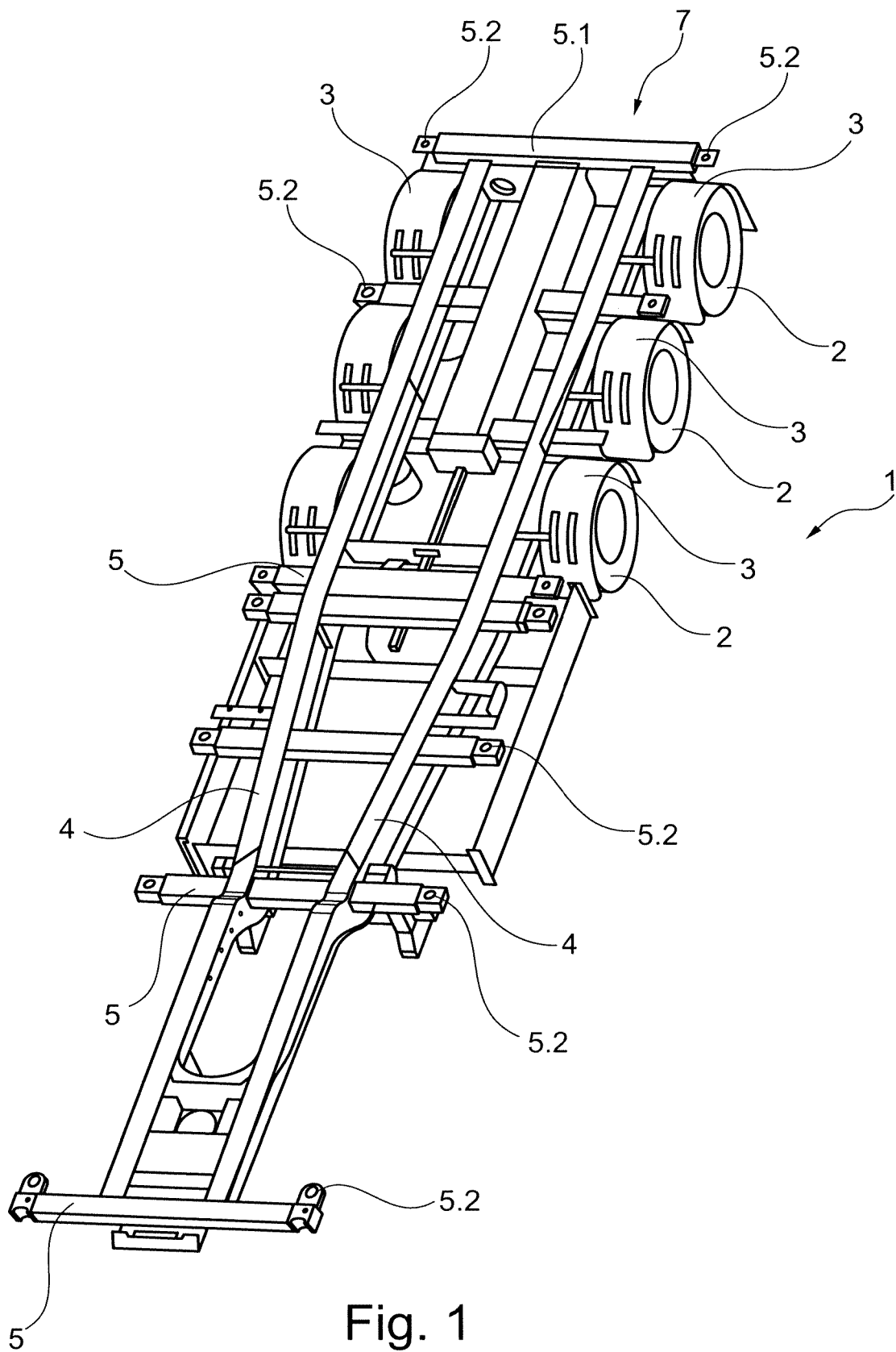


Fig. 1

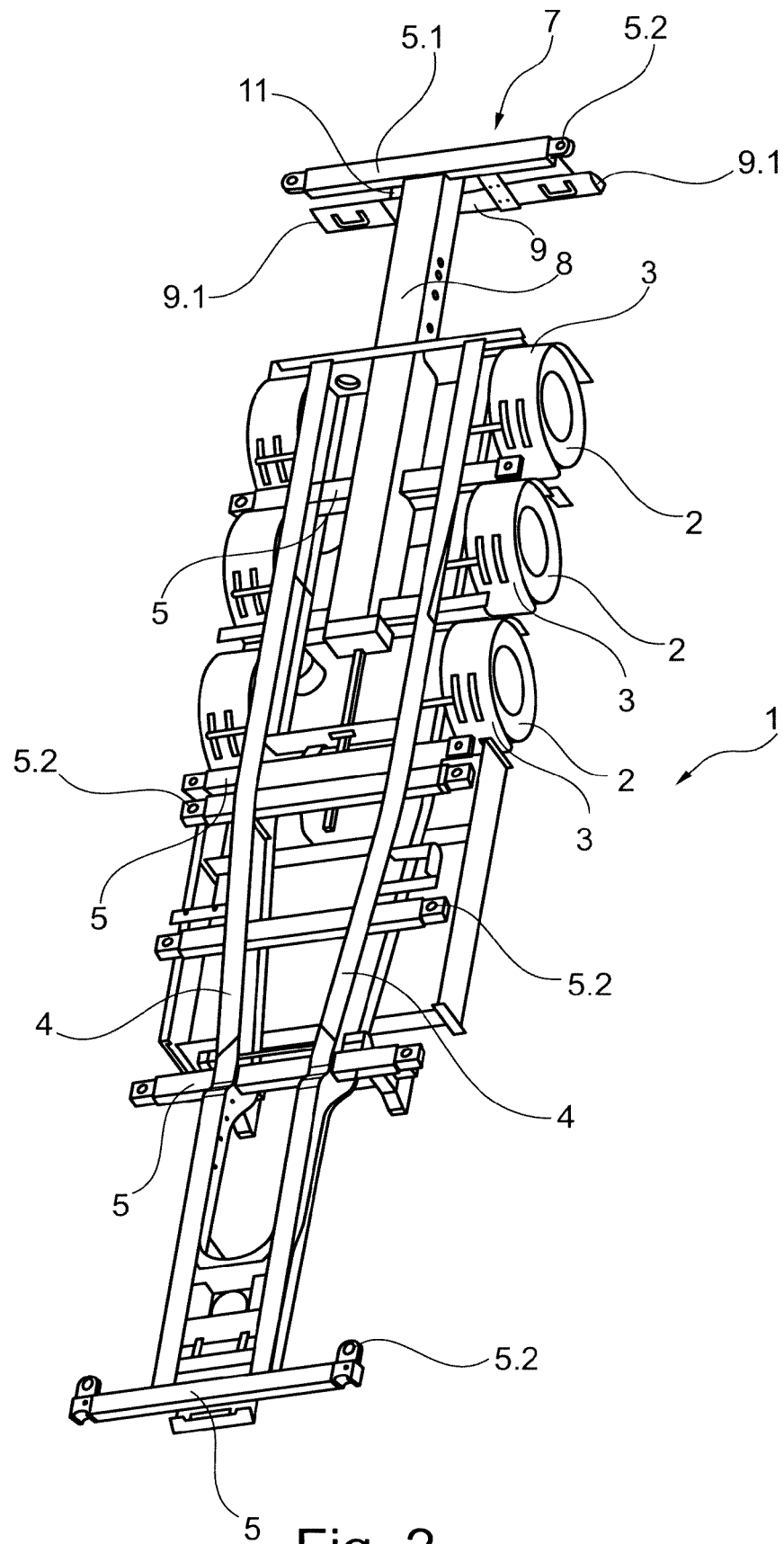


Fig. 2

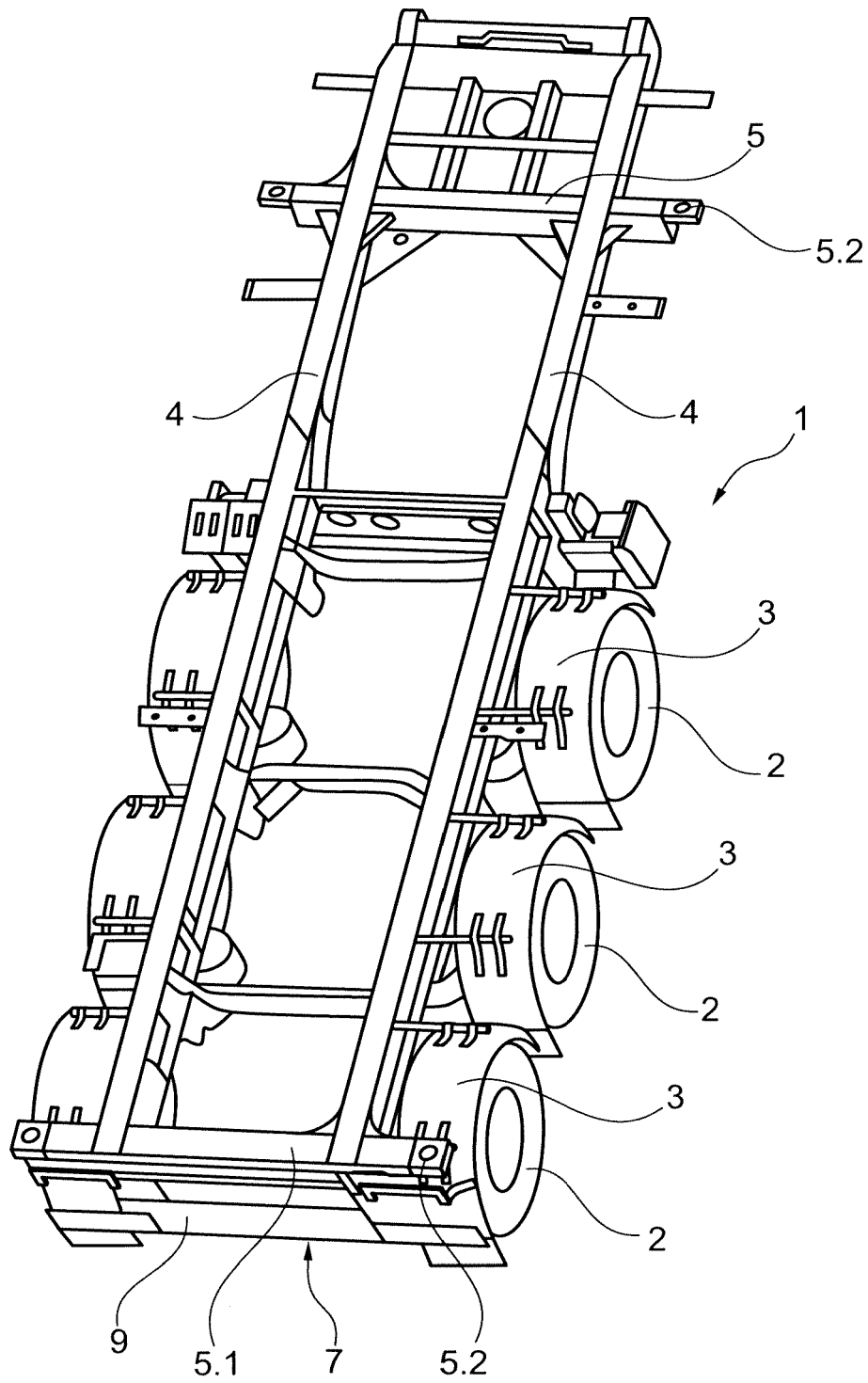


Fig. 3

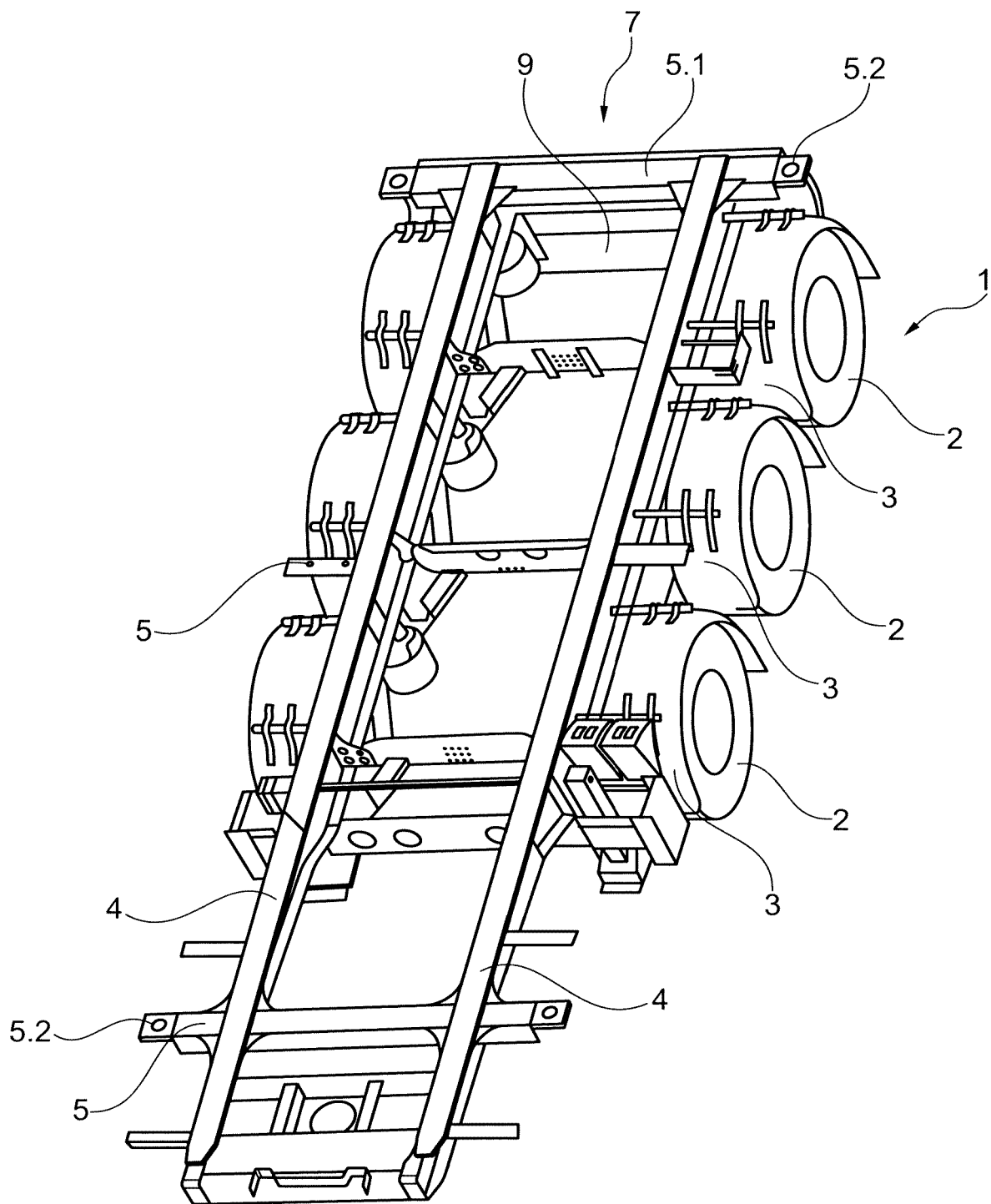


Fig. 4

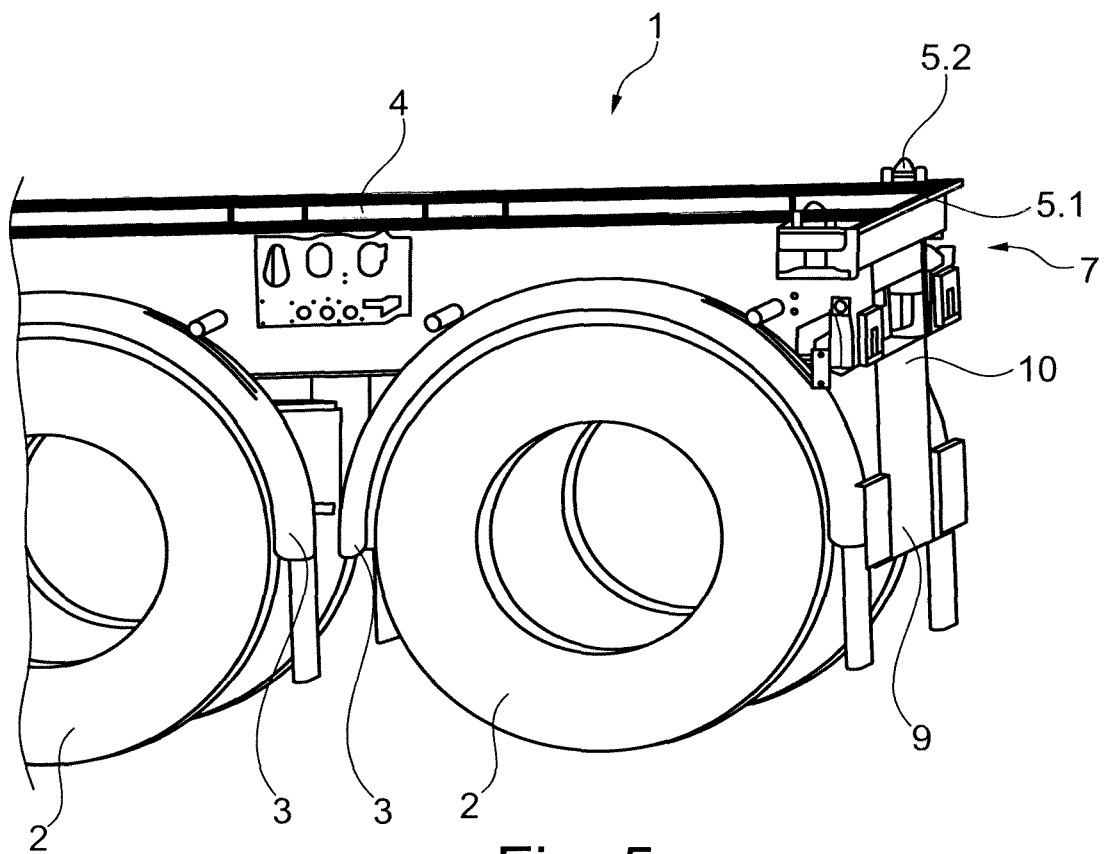


Fig. 5

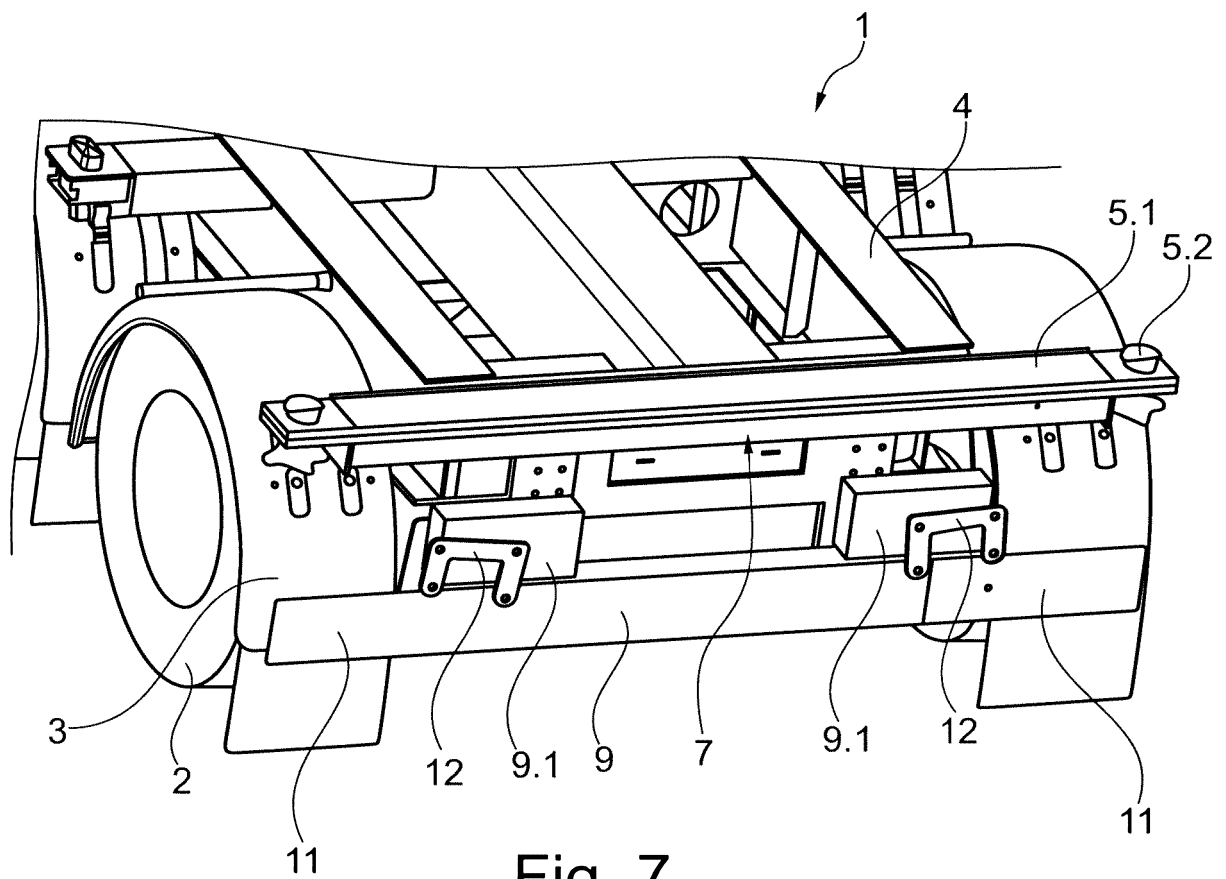


Fig. 7

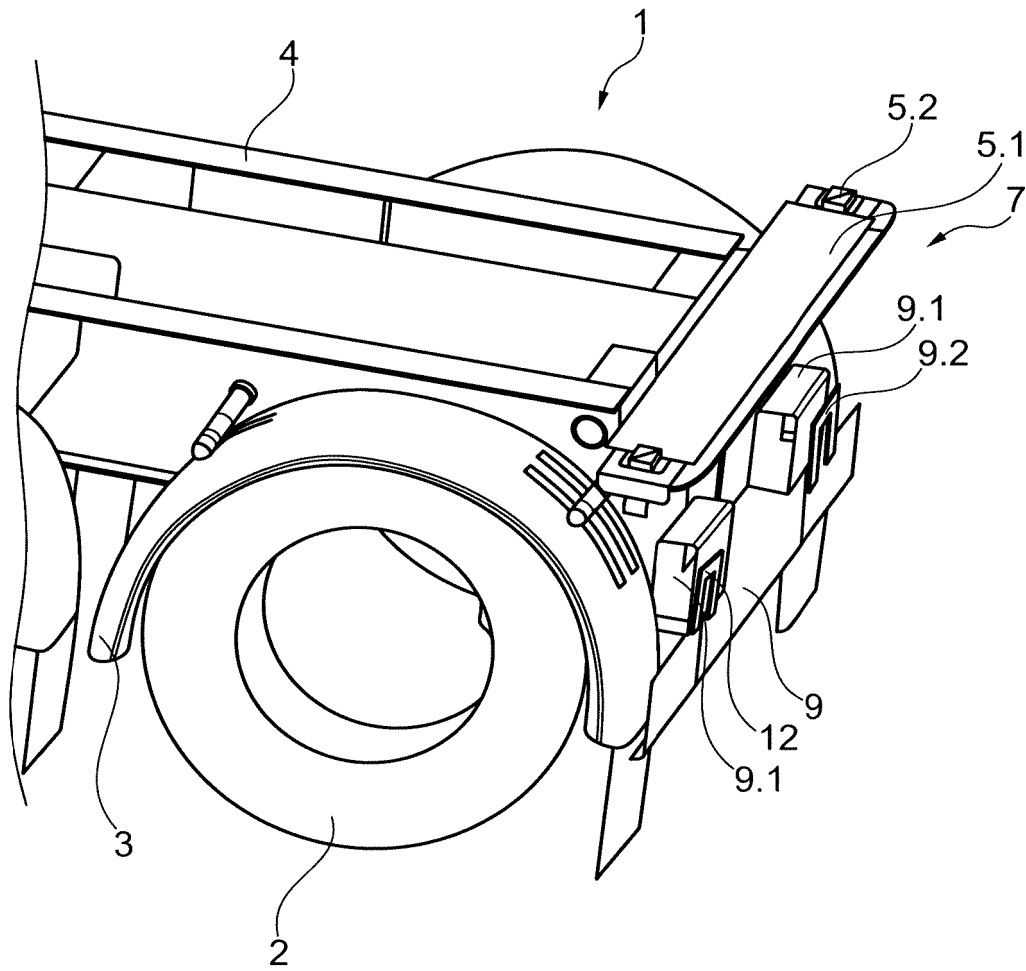


Fig. 8

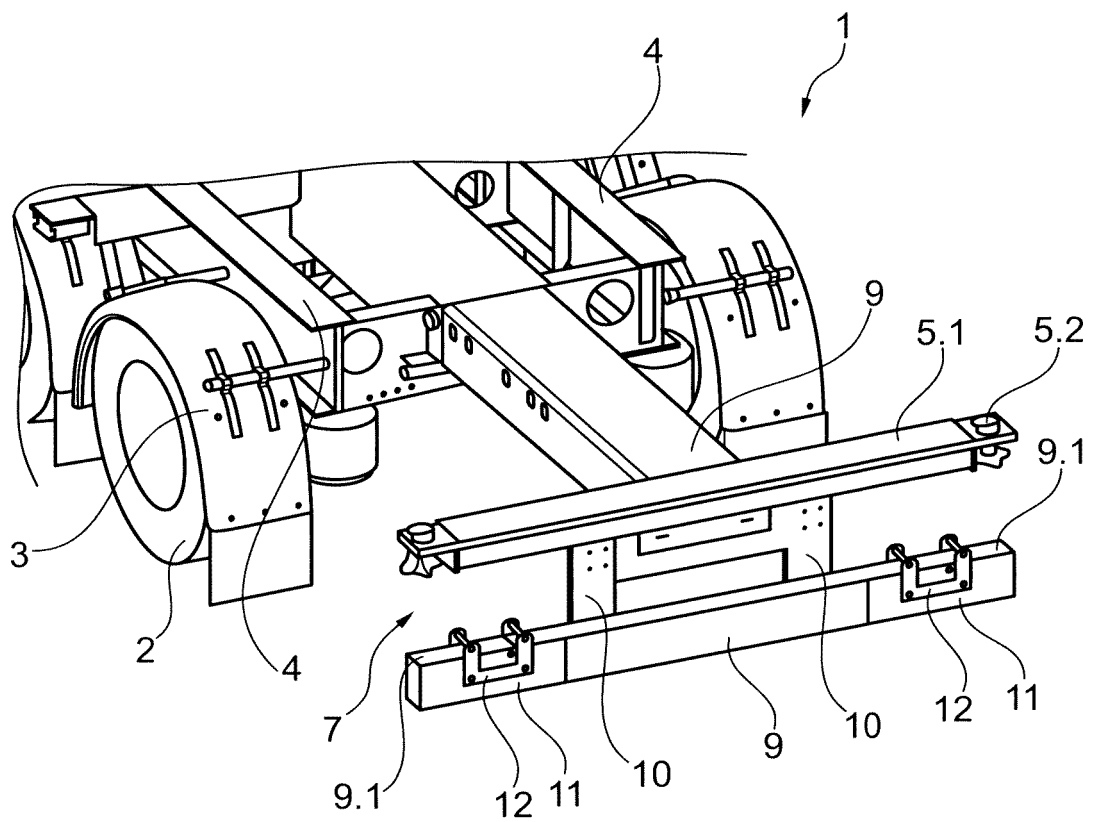


Fig. 9

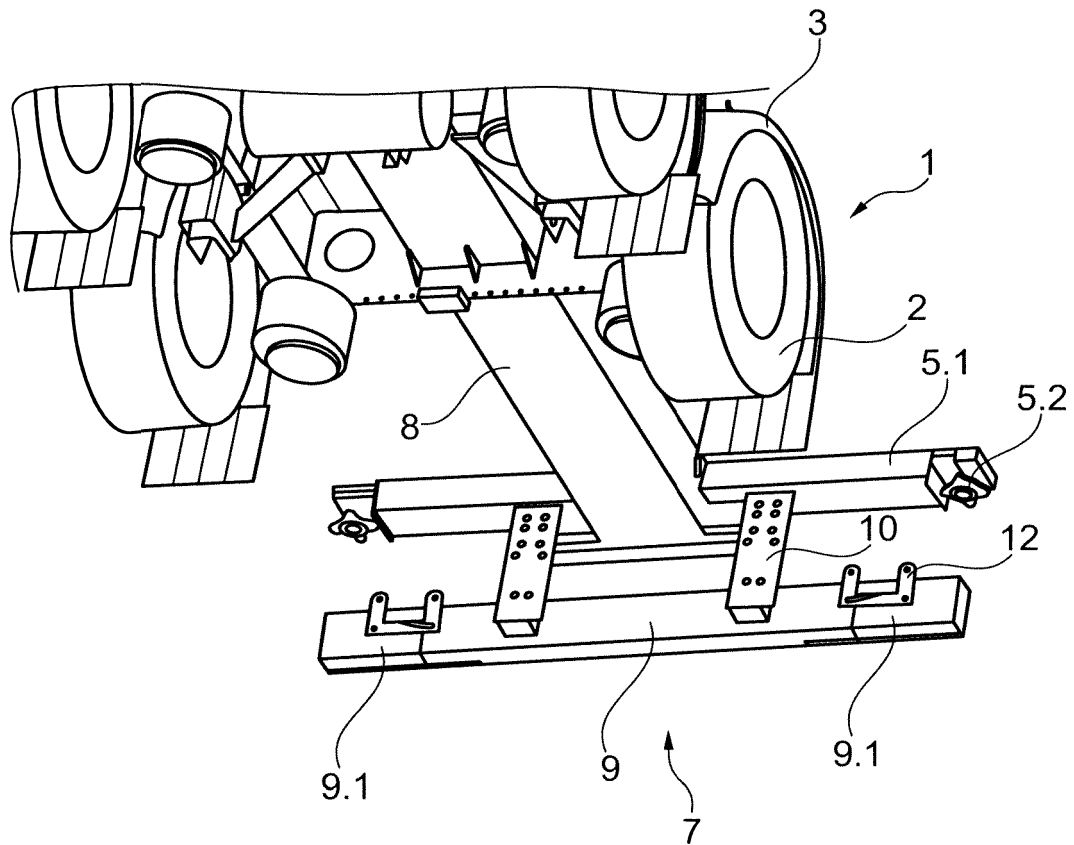


Fig. 10