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Description

[0001] The invention concerns a rail vehicle with bogie in accordance with the preamble of claim 1.

5 [0002] Known from EP 0 765 791 A1 is a single-axle bogie for a rail vehicle. The swing arm fits around the axle and is mounted to the vehicle body over nearly the whole of its width because the swing arm is supported at both ends on the vehicle body.

[0003] While such a broad swing arm mounting can enable particularly precise guidance of the wheels, in practice this arrangement can be problematical: If the wheels
10 always run along the rail track at precisely the same place, wear at precisely this place on the rails will be greater. For this reason so-called sinusoidal motion is preferred, where the wheels during their rolling movement swing slowly back and forth at right angles to the rail track, thus wearing away the rail as evenly as possible across its width and avoiding excessive wear on a narrow portion of the track profile.

15 [0004] Known from DE 43 09 324 C1 published in 1994 is a bogie of a rail vehicle that incorporates as its first component assembly a driven axle, secondly, a chain link suspension of the axle and, thirdly, a swing arm that is centrally mounted and together with the chain link suspension enables the axle to move freely or to be adjusted so that the axle can adjust to the configuration of the rails, for example, in bends, and therefore exert less force and so cause
20 little wear to the rail.

[0005] A chain link suspension of this kind for the axles of rail-borne vehicles has been known for decades, for example, from Fachwissen des Ingenieurs [Special Engineering Knowledge], Volume 8 ("Means of Transport") – VEB Fachbuchverlag Leipzig, 2nd Impression, 1981, p. 327.

25 [0006] Known from CH 390 980 A published in 1965 is a rail vehicle the bogie of which incorporates a swing arm to guide the axle. The swing arm is supported at the middle of the body of the rail vehicle.

[0007] Known from FR 876 206 A published in 1942 is a rail vehicle the bogie of which likewise incorporates a swing arm to guide the axle. The swing arm incorporates a transverse
30 member that extends parallel to the axle and is supported at the middle of the vehicle body.

[0008] The invention is based on the problem of improving a generic rail vehicle so as to enable the bogie to move sinusoidally.

[0009] This purpose is fulfilled by a rail vehicle in accordance with the characteristics of claim 1. An advantageous embodiment is described in the subclaim.

[0010] In other words the invention proposes supporting the swing arm on the vehicle body, not by its ends, that is, near the two sides of the vehicle body, but instead at the middle of the vehicle body. Such support at the middle of the vehicle body means that restriction of the sideways movement because of the constant play in the bearings enables the two wheels of the bogie to move on the rails sinusoidally.

[00011] At the same time according to the proposal the swing arm is supported by its middle portion at the middle of the vehicle body by means of a horizontally disposed push-pull rod so as to absorb forces acting along the rail vehicle in the longitudinal direction.

[00012] The swing arm is according to the proposal further supported against the vehicle body by its middle portion by means of a vertically disposed torque support member so as to be able to transmit perpendicular forces into the vehicle body.

[00013] Finally, according to the proposal a gearbox is disposed between the two wheels in order to transmit drive forces onto the axle, which together with the two wheels forms the so-called wheel set, for which reason the gearbox is also described as a wheel set gearbox. Likewise provided for for this wheel set gearbox is a horizontally disposed torque support member that, likewise supported at the middle of the vehicle body, transmits into the vehicle body forces that act in a longitudinal direction.

[00014] Collision-free guidance of the individual elements of the proposed bogie while still keeping the dimensions of the entire assembly as compact as possible can advantageously be achieved, if the torque support members of the swing arm, on the one hand, and those of the gearbox, on the other, are made to pass one through the other. For this purpose one of these two torque support members is provided with a hole through which the other of the two torque members extends.

[00015] One embodiment of the invention is explained in greater detail below with the aid of purely schematic illustrations. They show in

Fig. 1 a diagonal perspective view from above of the area of the wheel set and the associated swing arm and

Fig. 2 a diagonal perspective view from below of the bogie assembly of Fig. 1.

[00016] Indicated on the drawings by 1 is a complete bogie, which is disposed underneath a vehicle body 2 on a rail vehicle. The bogie 1 comprises, amongst other things, a wheel set in the form of an axle that carries two running wheels 3. Disposed between the running wheels 3 is a wheel set gearbox 4 that serves to drive the axle, which axle is not shown on the drawings in full but is indicated at 5. The two ends of the axle 5 are fixed in a

swing arm 6, which incorporates a transverse element 7 that extends parallel to the axle 5 and carries at each of its two ends a swing arm 8 that extends in the direction of the axle 5.

[00017] Shown in front of the gearbox 4 are two bearings 9 and 10. A push-pull rod 11 that is attached to the middle of and underneath the vehicle body 2 by means of a bracket not
5 shown on the drawing extends forwards from the lower bearing 10.

[00018] The upper bearing 9 serves to mount a torque support member 12 that extends perpendicularly, where the push-pull rod 11 and this perpendicular torque support member 12 serve to support the swing arm 6. Likewise the perpendicular torque support member 12 extends under the middle of the vehicle body 2, so that the swing arm 6 is supported at the
10 middle of the vehicle body 2 both by means of the push-pull rod 11 and by means of the torque support member 12 and accordingly enables the axle 5 to carry out slight oscillating movements that enable the running wheels 3 to move on the rails sinusoidally.

[00019] The perpendicular torque support member 12 forms a hole 14 through which extends a horizontally disposed torque support member 15 that is, on the one hand, hinged to
15 the wheel set gearbox 4 and, on the other, is supported at the middle of the vehicle body 2.

[00020] So all the bogie component assemblies that are shown in Figs. 1 and 2, are supported only near the middle axle on the vehicle body 2.

[00021] In the example embodiment shown the perpendicular torque support member 12 of the swing arm 6 incorporates a component part that is constructed as a single piece and frames the hole 14. As a variation from this, the perpendicular swing arm 6 could incorporate
20 two separate struts that can be set a distance apart, so serving as a hole 14 and enabling the horizontal torque support member 15 of the gearbox 4 to be extended through this hole 14.

[00022] Further, as a variant of the example embodiment shown, the hole 14 could be made in the horizontal torque support member 15 of the gearbox 4, so that the perpendicular
25 torque support member 12 of the swing arm 6 need not incorporate the hole 14 shown but would instead itself be extended through the hole in the horizontal torque support member 15.

[00023] Otherwise the construction of the bogie 1 shown in Figs. 1 and 2 essentially matches known designs, so this construction need not be further gone into in detail. Attention is drawn purely by way of example to the brake disks 16 disposed between the running wheels
30 3 and the wheel set gearbox 4 and to the chain link suspension 17 of the running wheels 3 and to the wheel set bearings 18 at the ends of the axle 5.

[00024] As part of the present proposal, the vehicle body 2 to which the bogie 1 is attached has been explained. Attachment of the torque support members 12 and 15 and of the push-pull rod 11 is by means of attachment plates 19 that are each attached to the vehicle

- body 2. The vehicle body 2 is typically fitted with a carrying frame. Attachment is then not to bodywork elements of the vehicle body 2 but instead to the frame of the respective rail vehicle. Through this construction of the rail vehicle very varied rail vehicles can be created by using the same or similar frames, so that the concept of the vehicle body very generally also includes
- 5 on the frame varied superstructures that need not necessarily be constructed in the form of a closed box.

P A T E N T K R A V

1. Skinnekøretøj med en vognkasse (2) og en bogie (1) med to bærehjul (3), som kan drejes om en fælles aksel (5), og en svingarm (6), som styrer akslen (5), hvor svingarmen (6) omfatter en parallelt med akslen (5) forløbende travers (7), og hvor svingarmen (6) er støttet midt på vognkassen (2), **kendetegnet ved, at** bærehjulene (3) er ophængt i en sjækkelophængning (17), svingarmen (6) i sit midterste område er støttet på vognkassen (2) via en liggende anbragt træk- og trykstang (11) og i sit midterste område er støttet på vognkassen (2) via en opret anbragt drejningsmomentstøtte (12), og **at** der mellem de to bærehjul (3) er anbragt en gearkasse (4), som overfører en drivkraft til akslen (5), hvor en liggende anbragt drejningsmomentstøtte (15) i gearkassen (4) er støttet midt på vognkassen (2).
2. Skinnekøretøj ifølge krav 1, **kendetegnet ved, at** drejningsmomentstøtterne (12, 15) i svingarmen (6) og gearkassen (4) er anbragt, så at de trænger gennem hinanden på en sådan måde, at en af de to drejningsmomentstøtter (12, 15) danner en åbning (14), hvorigennem den anden drejningsmomentstøtte (15) strækker sig.

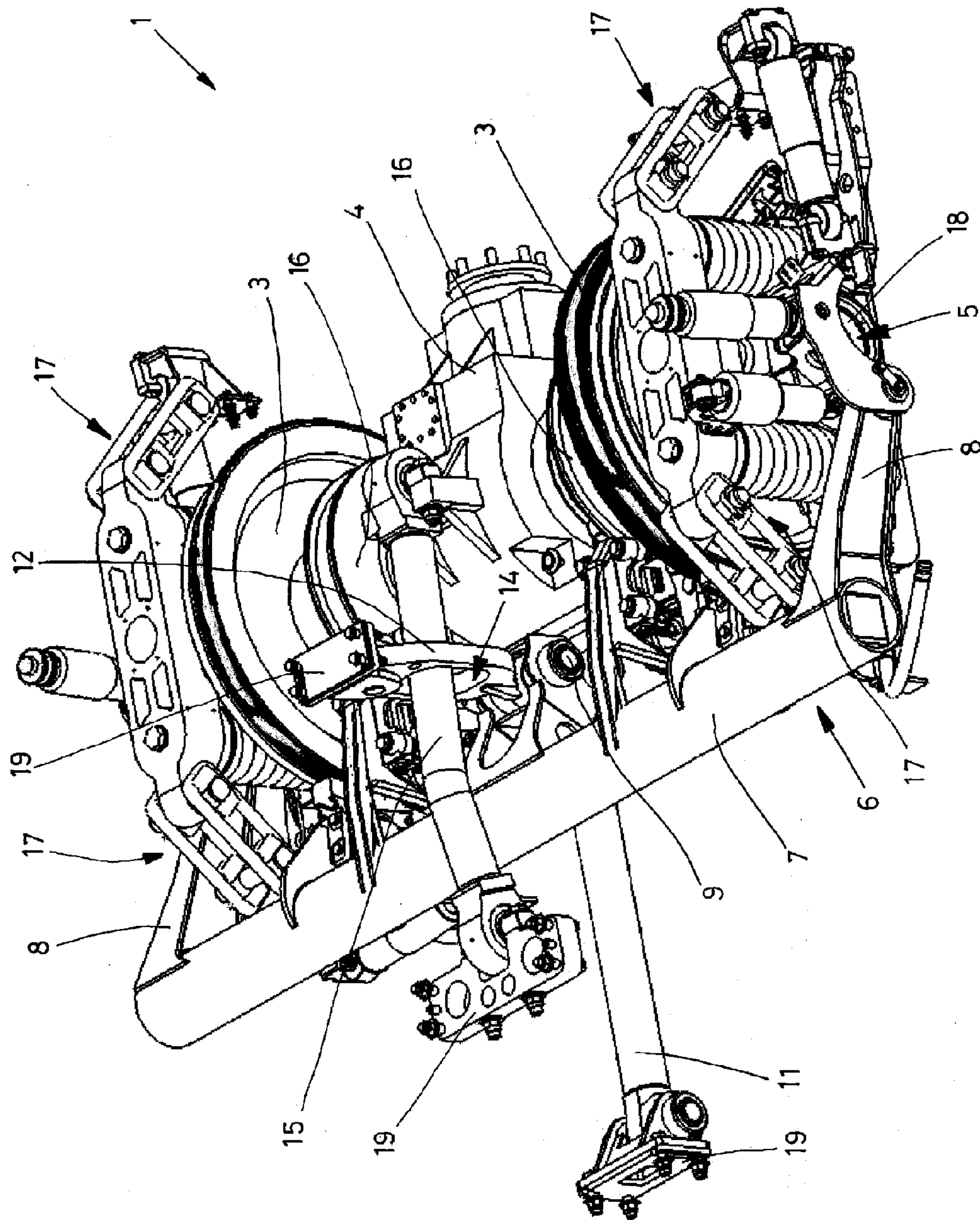


FIG.1

FIG.2

