

(19)



(11)

EP 2 388 173 A2

(12)

EUROPEAN PATENT APPLICATION

(43) Date of publication:

23.11.2011 Bulletin 2011/47

(51) Int Cl.:

B61D 3/18 (2006.01)(21) Application number: **10461528.1**(22) Date of filing: **14.09.2010**

(84) Designated Contracting States:

**AL AT BE BG CH CY CZ DE DK EE ES FI FR GB
GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO
PL PT RO SE SI SK SM TR**

Designated Extension States:

BA ME RS(30) Priority: **19.05.2010 PL 39126910**

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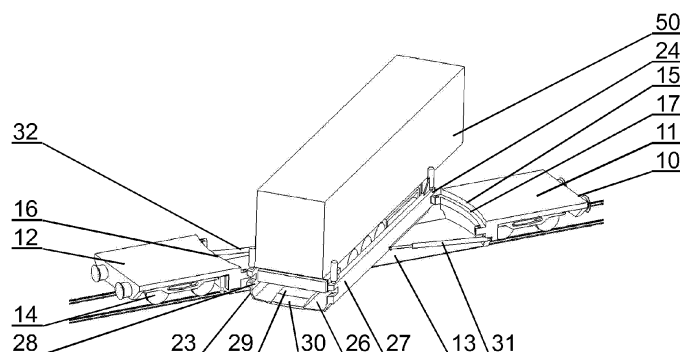
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(57) A railway wagon comprising a body (10) having end portions (11, 12) mounted on bogies (14) and a middle portion (13) recessed with respect to the end portions (11, 12) along recess walls (15, 16), a loading floor (21) horizontally rotatable above the body middle portion (13) between a transport configuration in which the longitudinal axis (Lf) of the loading floor (21) overlaps the longitudinal axis (Lb) of the body (10) and the shorter edges (22, 23) of the loading floor (21) are directed towards the recess walls (15, 16), and a loading configuration in which the longitudinal axis (Lf) of the loading floor (21) is inclined with respect to the longitudinal axis (Lb) of the body (10)

and the shorter edges (22, 23) of the loading floor (21) are directed towards the platform surface (51), wherein the shorter edges (22, 23) of the loading floor (21) comprise holders (24, 25) configured to support the loading floor (21) on the body (10) above the middle portion (13) in the transport configuration and to slide on guides (17, 18) formed along the recess walls (15, 16) of the body (10) during rotation between the transport configuration and the loading configuration, rollers (19) configured to support the loading floor (21) and to slide on a platform surface (51) during rotation between the transport configuration and the loading configuration.

**Fig. 2**

Description

[0001] The present invention relates to railway wagons with a rotatable loading floor, in particular flat wagons for transporting vehicles.

[0002] One of the main usability characteristics of flat wagons used for transporting vehicles is the ease of moving the vehicles between the wagon and the platform. Such wagons may have rotatable floors which can be turned towards the platform in order to allow the vehicles to directly drive between the platform and the floor of the wagon. Transportation of high vehicles on low railway gauges requires wagons having a low floor. For example, transportation of 4m high vehicles on a GB1 gauge, which is 4320mm high, requires the wagon floor to be situated at a maximum level of 320mm.

[0003] A US patent US4425064 presents a railway car comprising a rotatable loading floor supported on a recessed body bottom, wherein the floor is rotatable on a gear wheel located at the centre of the floor and rotatable via a pinion gear connected with two axles extending from the gear wheel along the longitudinal direction of the railway car. The rotating mechanism is placed between the recessed chassis bottom and the rotatable floor which limits the minimum height of the rotatable floor above the rails.

[0004] The aim of the present invention is to provide a flat wagon of a simple construction having a low rotatable floor.

[0005] The object of the invention is a railway wagon comprising a body having end portions mounted on bogies and a middle portion recessed with respect to the end portions along recess walls, a loading floor horizontally rotatable above the body middle portion between a transport configuration in which the longitudinal axis of the loading floor overlaps the longitudinal axis of the body and the shorter edges of the loading floor are directed towards the recess walls, and a loading configuration in which the longitudinal axis of the loading floor is inclined with respect to the longitudinal axis of the body and the shorter edges of the loading floor are directed towards the platform surface, wherein the shorter edges of the loading floor comprise holders configured to support the loading floor on the body above the middle portion in the transport configuration and to slide on guides formed along the recess walls of the body during rotation between the transport configuration and the loading configuration, rollers configured to support the loading floor and to slide on a platform surface during rotation between the transport configuration and the loading configuration.

[0006] The loading floor can be rotatable by a pair of linear actuators, connected pivotably at each longitudinal side of the body to the longitudinal side edge of the body and to the middle of the corresponding longitudinal side edge of the loading floor such that the loading floor is rotatable by mutual contraction of the linear actuators.

[0007] The holders and the guides may comprise openings configured to receive a locking pin to lock the

rotation of the loading floor with respect to the body.

[0008] The locking pins can be mounted on hydraulic actuators above the openings of the holders.

[0009] The loading floor can be further supported on the middle portion of the body at the axis of rotation via a support node.

[0010] The holders can be fork-shaped and comprise an upper arm configured to slide over the guide and a lower arm configured to slide under the guide.

[0011] The rollers can be mounted under a raised portion of the loading floor.

[0012] The rollers can be offset from the shorter edges of the loading floor and covered by a slanted wall.

[0013] The wagon may further comprise stabilizers mounted under the end portions of the body and configured to support the body on rails in the loading configuration.

[0014] The invention is shown by means of exemplary embodiments on a drawing in which:

Fig. 1 shows a side view of the railway wagon in a transport configuration,

Fig. 2 shows the railway wagon in a loading configuration,

Fig. 3 shows schematically the top view of the railway wagon at a platform in the loading configuration,

Fig. 4 shows the enlarged view of the loading floor edge with rollers,

Fig. 5 shows the enlarged view of a guide with openings,

Fig. 6 shows the enlarged view of holders with openings and locking pins,

Fig. 7 shows the enlarged view of an end portion of the wagon with stabilizers.

[0015] The railway wagon, as shown in Figs. 1 and 2, comprises a body 10 having end portions 11, 12 mounted on bogies 14 and a middle portion 13 recessed with respect to the end portions 11, 12 along recess walls 15, 16. A loading floor 21 for supporting a load such as a vehicle 50, is horizontally rotatable above the body middle portion 13 between a transport position as shown in Fig. 1, in which the longitudinal axis Lf of the loading floor 21 overlaps the longitudinal axis Lb of the body 10 and the shorter edges 21, 22 of the loading floor 21 are directed towards the recess walls 15, 16, and a loading position as shown in Fig. 3, in which the longitudinal axis Lf of the loading floor 21 is inclined with respect to the longitudinal axis Lb of the body 10 and the shorter edges 22, 23 of the loading floor are directed towards the platform surface 51. The shorter edges 22, 23 of the loading floor comprise holders 24, 25 configured to support the loading floor 21 on the body 10 above the middle portion 13 in the transport position and to slide on guides 17, 18 formed along the recess walls 15, 16 of the body 10 during rotation between the transport position and the loading position. Furthermore, the shorter edges 22, 23 of the loading floor comprise rollers 19, shown in details in Fig.

4, configured to support the loading floor 21 and to slide on a platform surface 51 during rotation between the transport position and the loading position. Preferably, the rollers 19 are mounted under a raised portion 29 of the loading floor 21, such as to limit the height difference between the platform surface 51 and the bottom 26 of the loading floor. The raised portion 29 may be offset from the shorter edge of the loading floor 21, as shown in Fig. 2, and have a slanted wall 30 covering the rollers 19 to protect them from damage.

[0016] Therefore, when the loading floor 21 is in the transport position, it is supported on the body 10 over the middle portion 13 via the holders 24, 25 resting on the guides 17, 18 formed along the recess walls 15, 16, while the rollers 19 are not loaded. During rotation, the holders 24, 25 slide on the guides 17, 18. After a certain angle of rotation, the rollers 19 start to engage with the surface of the platform 51 thereby supporting part of the loading floor weight. After rotation is completed, the loading floor 21 is supported via the rollers 19 at its shorter edges 22, 23 on the surface of the platform 51.

[0017] The loading floor 21 is rotatable by a pair of linear actuators 31, 32, preferably hydraulic actuators, connected pivotably at each longitudinal side of the body to the longitudinal side edge of the body and to the middle of the corresponding longitudinal side edge of the loading floor 21 such that the loading floor 21 is rotatable by mutual contraction of the linear actuators. Therefore, in the transport configuration, the actuators 31, 32 are positioned along the longitudinal sides of the body 10. During rotation of the loading floor 21, the actuators move over the recessed middle portion 13. Such configuration of the actuators 31, 32 does not require additional space between the loading floor 21 and the middle portion 13, therefore the actuators 31, 32 do not increase the minimum height of the loading floor 21 over the rails.

[0018] As shown in details in Figs. 5 and 6, the holders 24, 25 and the guides 17, 18 may comprise openings 33, 34 configured to receive a locking pin 35 to lock the rotation of the loading floor 21 with respect to the body 10. Preferably, the openings 33, 34 are located at the sides of the wagon. The holders 24, 25 may be fork-shaped and comprise an upper arm 37 configured to slide over the guide 17 to support the loading floor 21 and a lower arm 38 configured to slide under the guide 17 to limit the upward displacement of the loading floor 21. The locking pins 35 can be mounted on hydraulic actuators 36 above the openings of the holders 24, in order to facilitate automatic locking and unlocking of the loading floor 21.

[0019] The loading floor 21 has a reinforced construction comprising a bottom 26 and sides 27, 28, in which the holders 24, 25 can be formed. As further shown in Fig. 5, the loading floor can be further supported on the middle portion 13 at the axis of rotation via a support node 39.

[0020] As shown in Fig. 7, stabilizers 41 can be mounted under the end portions 11, 12 of the body 10, configured to support the body 10 on rails in the loading con-

figuration. In the transport configuration, the stabilizers 41 can be lifted.

[0021] The railway wagon according to the invention can be used for transporting various types of vehicles, such as tractors, trucks, trailers, semitrailers, cargo containers, etc. The low floor construction allows quick and convenient loading and unloading of vehicles at low platforms. Moreover, such construction can be used for transporting high vehicles, up to 4m height, on low gauges, such as GB1 gauge. By supporting the loading floor on guides and stabilizing it with locking pins, the wagon keeps a stable and rigid configuration during the transport. The railway wagon can be used with various track types by exchanging the bogies.

Claims

1. A railway wagon comprising:

- a body (10) having end portions (11, 12) mounted on bogies (14) and a middle portion (13) recessed with respect to the end portions (11, 12) along recess walls (15, 16),
- a loading floor (21) horizontally rotatable above the body middle portion (13) between a transport configuration in which the longitudinal axis (Lf) of the loading floor (21) overlaps the longitudinal axis (Lb) of the body (10) and the shorter edges (22, 23) of the loading floor (21) are directed towards the recess walls (15, 16), and a loading configuration in which the longitudinal axis (Lf) of the loading floor (21) is inclined with respect to the longitudinal axis (Lb) of the body (10) and the shorter edges (22, 23) of the loading floor (21) are directed towards the platform surface (51),

characterized in that

- the shorter edges (22, 23) of the loading floor (21) comprise:
 - holders (24, 25) configured to support the loading floor (21) on the body (10) above the middle portion (13) in the transport configuration and to slide on guides (17, 18) formed along the recess walls (15, 16) of the body (10) during rotation between the transport configuration and the loading configuration,
 - rollers (19) configured to support the loading floor (21) and to slide on a platform surface (51) during rotation between the transport configuration and the loading configuration.

2. The railway wagon according to claim 1, wherein the

loading floor (21) is rotatable by a pair of linear actuators (31, 32), connected pivotably at each longitudinal side of the body (10) to the longitudinal side edge of the body (10) and to the middle of the corresponding longitudinal side edge of the loading floor (21) such that the loading floor (21) is rotatable by mutual contraction of the linear actuators (31, 32). 5

3. The railway wagon according to any of previous claims, wherein the holders (24, 25) and the guides (17, 18) comprise openings (33, 34) configured to receive a locking pin (35) to lock the rotation of the loading floor (21) with respect to the body (10). 10
4. The railway wagon according to claim 3, wherein the locking pins (35) are mounted on hydraulic actuators (36) above the openings (33) of the holders (24, 25). 15
5. The railway wagon according to any of previous claims, wherein the loading floor (21) is further supported on the middle portion (13) of the body (10) at the axis of rotation via a support node (39). 20
6. The railway wagon according to any of previous claims, wherein the holders (24, 25) are fork-shaped and comprise an upper arm (37) configured to slide over the guide (17) and a lower arm (38) configured to slide under the guide (17). 25
7. The railway wagon according to any of previous claims, wherein the rollers (19) are mounted under a raised portion (29) of the loading floor (21). 30
8. The railway wagon according to claim 7, wherein the rollers (19) are offset from the shorter edges (22, 23) of the loading floor (21) and covered by a slanted wall (30). 35
9. The railway wagon according to claim 1, further comprising stabilizers (41) mounted under the end portions (11, 12) of the body (10) and configured to support the body (10) on rails in the loading configuration. 40

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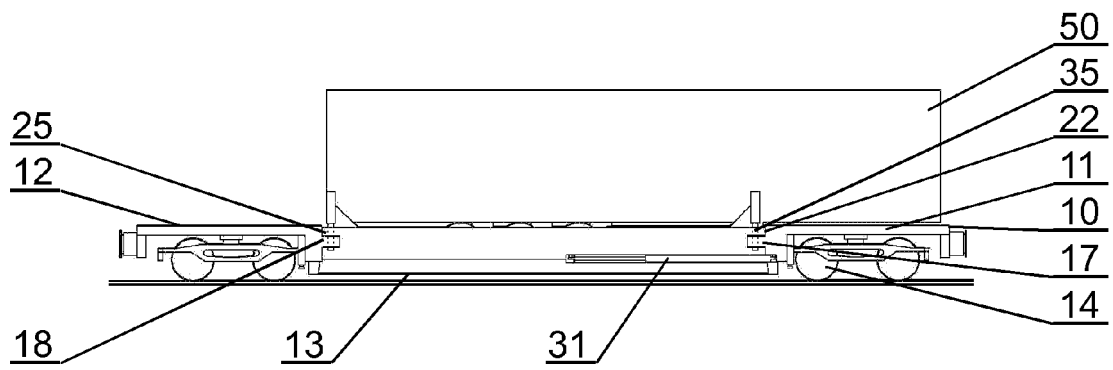


Fig. 1

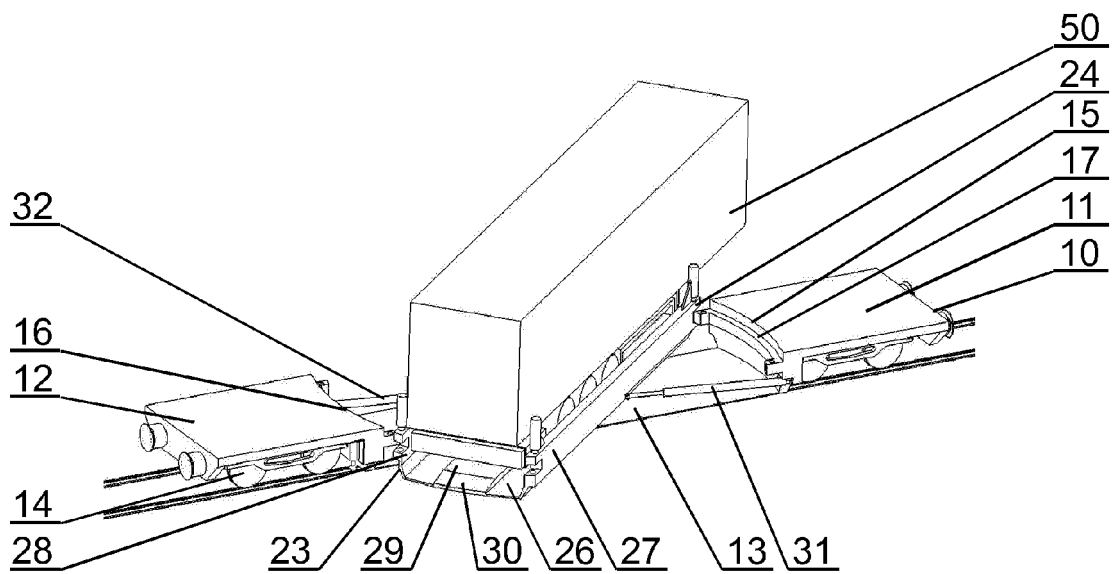


Fig. 2

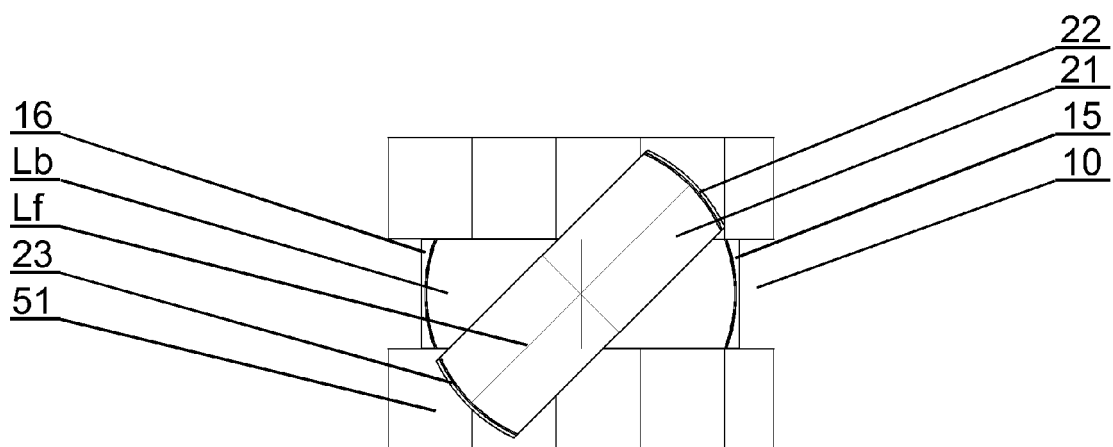


Fig. 3

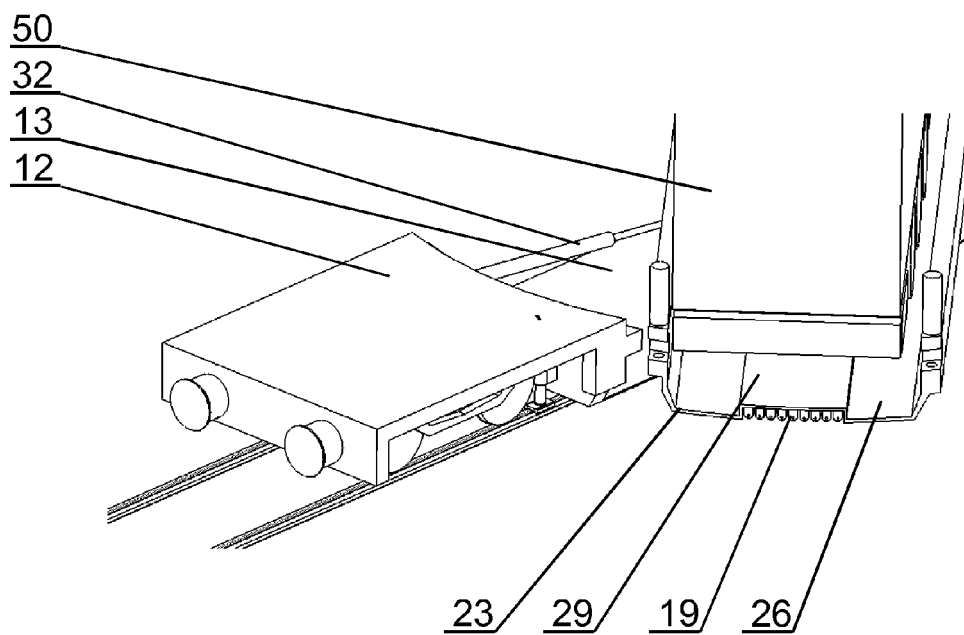


Fig. 4

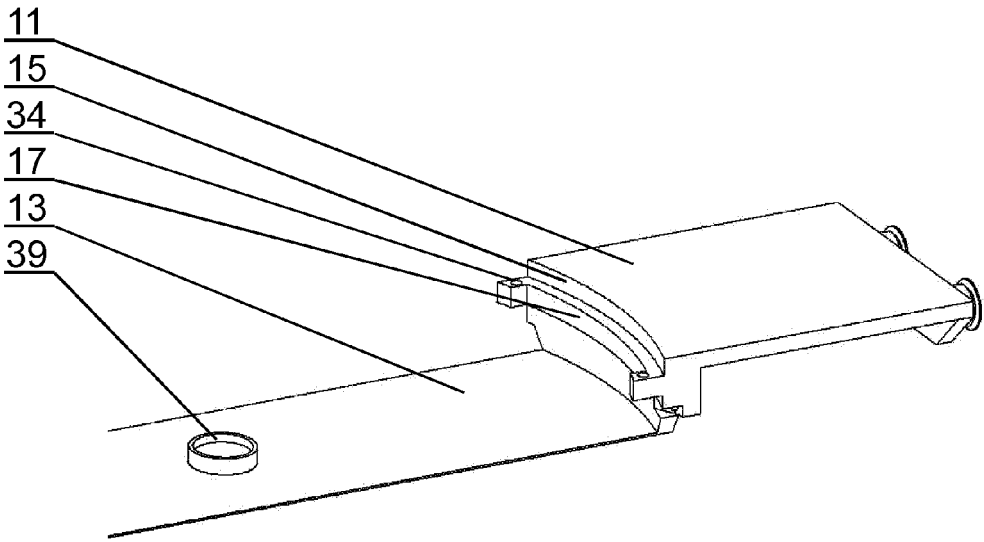


Fig. 5

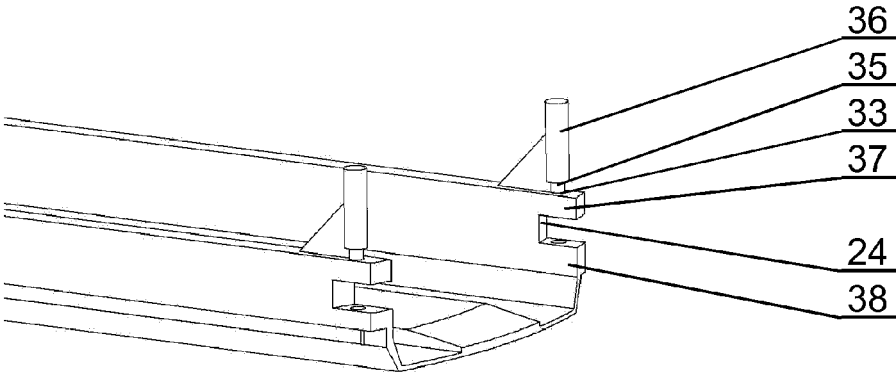


Fig. 6

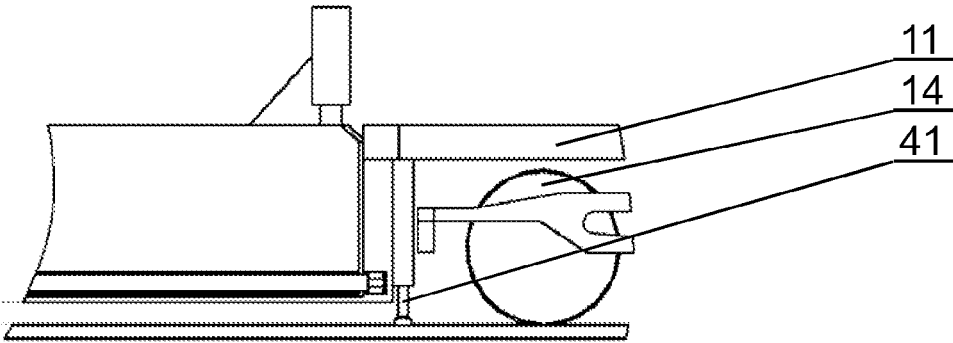


Fig. 7

REFERENCES CITED IN THE DESCRIPTION

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