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(54) MECHANISM FOR LIFTING OF CAR-CARRYING WAGON BOARDING PLATES

MECHANISMUS ZUM HEBEN VON WAGENTRAGENDEN WAGENEINSTIEGSPLATTEN

MÉCANISME PERMETTANT DE SOULEVER DES PLAQUES D'EMBARQUEMENT SUR DES WAGONS DE TRANSPORT DE VÉHICULES

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Description

Field of technology

[0001] The technical solution relates to the mechanism for lifting of the boarding plates of railway wagons designed for transportation of cars. The mechanism enables loading and unloading of cars with small ground clearance without a risk of collision between the chassis and overhangs of cars and parts of wagon deck.

Actual state of the art

[0002] Known solution is lifting of the boarding flaps of railway freight wagons designed for transportation of cars by means of the mechanism consisting of four screw lifters located under the boarding plate and driven by a set of seven gear boxes.

[0003] In the document GB995136 A, published on 1965-06-16, a railway wagon is described with a frame, which is created as a wagon platform. At one frame end, a movable platform is mounted with connecting elements for connecting of the wagon with some other wagon, whereby the platform is rotary mounted at the frame end so that the platform is movable between the upper position and the lower position under the wagon floor. It is arranged so that in the lower position the connecting element is parallel with horizontal, or basically horizontal, plane.

[0004] In the document FR2473974 A1, published on 1981-07-24, a wagon is described that contains portable platforms for the manual manipulation with positioning projections for connecting of the wagon end. The platforms projects above the buffers in order to connect the platform at the wagon end or some other end freight wagon. The platforms are located slightly higher than the wagon floor and close to the container floor. The platform is fitted in the suspended attachment at the wagon end.

[0005] In the document EP0518750 A1, published on 1992-12-16, a wagon is described, the wagon having an end ramp, which is connected with the buffer and rotary around the lateral horizontal axis, whereby the ramp is equipped with rails for loading and unloading of chassis. The ramp is lifted or lowered by means of the motor pump with a hydraulic control system and a reversible engine, which leads through chain and cogged gear. The hydraulic system may include cylinders, which lift and lower the ramp.

In the document DE2447576 A1, published on 1976-04-08, a wagon is described, the wagon having a loading platform for freight wagons. The bearing platform is located between two adjacent freight wagons that stand one after another, and that are equipped, on their bottom side, with supporting bearings located above the buffer bearings, or they have the bearing sleeves, which interferes with the individual compensatory bush. This equipment provides a firm attachment of the loading platform between the two adjacent freight wagons so that it is possible to travel during loading or unloading operations. The bearings have the guiding plates on the ends heading to the lower side of the loading platform, which interfere with the sliding guiding elements attached to the platform.

In the document US2003110975 A1, published on 2003-06-19, a wagon is described, the wagon having a loading platform, in which the ramp control mechanism for the rolling stock has the first cylinder, the second cylinder and the clutch for reaching the movement into the lifted position.

The first double-acting cylinder makes the second double-acting to move the arm and the coupling to the lowered position, when the first cylinder moves the ramp to the opened position. The first cylinder makes the second cylinder to move the arm and the lifting device moves it to the lifted position when the first cylinder moves the ramp to the closed position. The device is used for loading and unloading of cargo, e.g. semi-trailer from the train. The mechanism reduces impacts of the ramp. It reduces the operating pressure necessary for lifting and lowering of the ramp, by which it reduced consumption of pressed air for one operation cycle.

[0006] The document GB 716260 A1 describes a loading platform of which a portion is pivotally supported on props for movement between a lower platform loading position and an upper position in which vehicles can be run off on to the upper floor. The platform is raised and lowered by a winch and cables, and is held in its raised position by catches actuated by handles.

[0007] All described solutions of the current state of the art contains several disadvantages - mainly difficult design and application of complicated parts or solutions, which cannot be controlled and they shall be manually placed to the required position.

Nature of the technical solution

[0008] Shortcomings specified in the current state of the art are removed by the utility model described in this application, whereby the nature of the technical solution is the mechanism for lifting of the boarding plates of the wagon designed for transportation of cars. The mechanism contains two direct drives and set of levers with stripes equipped with travelling pulleys. During turning of the input shaft, the direct drives push away the stripes with the travelling pulleys, and thus they cause change of the position of the set of levers, and thus the boarding plate, connected with the set of levers, is lifted.

It consists of the direct drives connected with the stripes equipped with the travelling pulleys. Sets of levers are rotary attached on the stripes, these levers support the boarding plate.

By rotating of the input shaft, the stripes equipped with the travelling pulleys are pushed away or pulled in, and thus an inclination of the set of the levers is changed, and thus height of the boarding plate is changed.

[0009] An advantage of this mechanism is application

of two direct drives instead of four screw lifters and seven gear boxes.

Summary of figures in the drawings

[0010]

Fig. 1 displays the direct drives.
Fig. 2 and 3 displays the boarding plate in the lower and in the upper position (without the wagon body).

Examples of embodiments of the technical solution

[0011] The mechanism for lifting of the boarding plate 4 of the wagon for transportation of cars contains at least two direct drives 1, which are connected to the input shaft 5. The direct drives 1 are connected to the travelling pulleys through the stripes 2.
The stripes 2 with the travelling pulleys are rotary connected with the set of levers 3. The sets of levers 3 are attached to the boarding plate 4. During rotation of the input shaft 5, the direct drives 1 push away the stripes 2 with the travelling pulleys, and thus they initiate change of position of the sets of levers 3, and thus the boarding plate 4, connected to the set of levers 3, is lifted.
By rotation of the input shaft 5, the stripes 2 with the travelling pulleys are pushed away or pulled in, and thus an inclination of the set of the levers 3 is changed, and thus height of the boarding plate 4 is adjusted.

Application in the industry

[0012] The mechanism for lifting of the wagon boarding plate is suitable for railway wagons designed for transportation of cars. The mechanism enables loading and unloading of cars with small ground clearance without a risk of collision of chassis and car overhangs with parts of the wagon platform.
The mechanism consisting of small number of parts is suitable also for wagons, which have only limited areas for placing of mechanisms for control of the boarding plate.

List of used reference marks

[0013]

1 Direct drive
2 Stripe equipped with travelling pulleys
3 Set of levers
4 Boarding plate
5 Input shaft

Claims

1. Assembly comprising a boarding plate (4) of a wagon for transportation of cars and a mechanism for lifting the boarding plate (4), this mechanism containing:

- a rotatable input shaft (5),
- at least two direct drives (1) driven by the rotatable input shaft (5),
- at least two sets of levers (3) connected to and supporting the boarding plate (4), and
- at least two stripes (2) equipped with travelling pullies and rotatably attached to the sets of levers (3),

whereby the stripes (2) equipped with travelling pullies are also connected to the direct drives (1) in such a way that rotating the rotatable input shaft (5) causes the direct drives (1) to push away or pull in the stripes (2) equipped with travelling pullies, thereby changing the inclination of the sets of levers (3) and thus the height of the boarding plate (4).

Patentansprüche

1. Baugruppe, umfassend eine Einlassklappe (4) eines Wagens zum Transportieren von Autos und einen Mechanismus zum Anheben der Einlassklappe (4), wobei der Mechanismus umfasst:

- rotierende Eingangswelle (5),
- mindestens zwei geradlinige Mechanismen (1), die von einer rotierenden Eingangswelle (5) angetrieben werden,
- mindestens zwei Hebelsystemen (3), die mit der Einlassklappe (4) verbunden sind und diese tragen, und
- mindestens zwei Schienen (2), die mit Rollen ausgestattet und schwenkbar mit dem Hebelsystem (3) verbunden sind,

wobei die mit den Rollen ausgestatteten Schienen (2) auch so mit den geradlinigen Mechanismen (1) verbunden sind, dass sie durch Drehen der drehbaren Eingangswelle (5) bewirken, dass die geradlinigen Mechanismen (1) die Schienen (2), die sind mit den Rollen ausgestattet, ziehen oder drücken, und dadurch verändern die Neigung der Hebelsysteme (3) und damit die Höhe der Einlassklappe (4).

Revendications

1. L'ensemble comprenant une rampe d'embarquement (4) du wagon porte-automobile et un mécanisme de levage de la rampe d'embarquement (4), ce mécanisme étant composé de :

- Un arbre rotatif d'entrée (5),
- Deux simples mécanismes (1) au minimum, actionnés par l'arbre rotatif d'entrée (5),

- Au minimum, deux systèmes de leviers (3) liés et supportant la rampe d'embarquement (4), et
- De deux baguettes (2) au minimum, équipées de poulies de roulettes et liées de manière pivotante au système de leviers (3),

Étant donné que les baguettes (2) équipées de poulies de roulettes sont liées par mécanismes rectilignes (1) de manière qu'en faisant tourner l'arbre d'entrée rotatif (5), elles amènent les mécanismes rectilignes (1) à tirer ou à pousser les baguettes (2) équipés des poulies de roulettes, ainsi modifier l'inclinaison des systèmes de leviers (3) et donc la hauteur de la rampe (4).

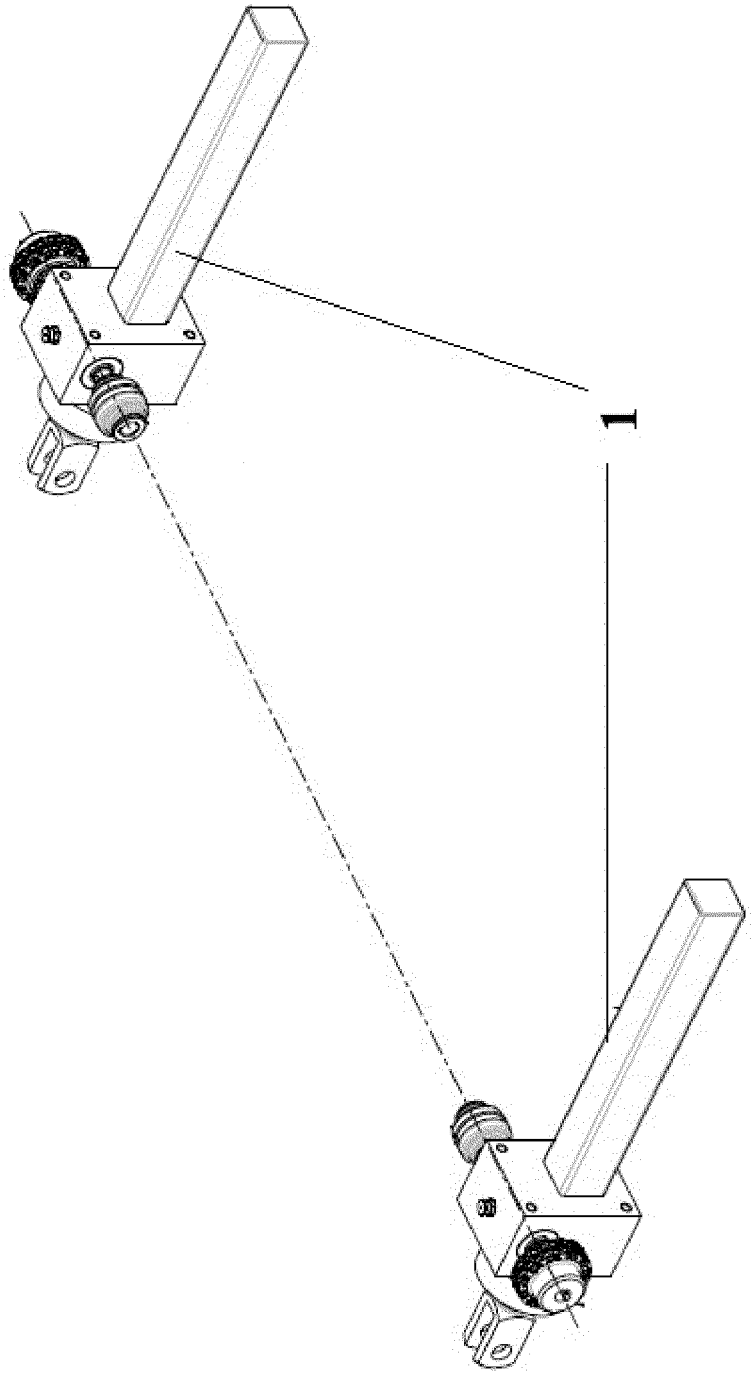

Fig. 1

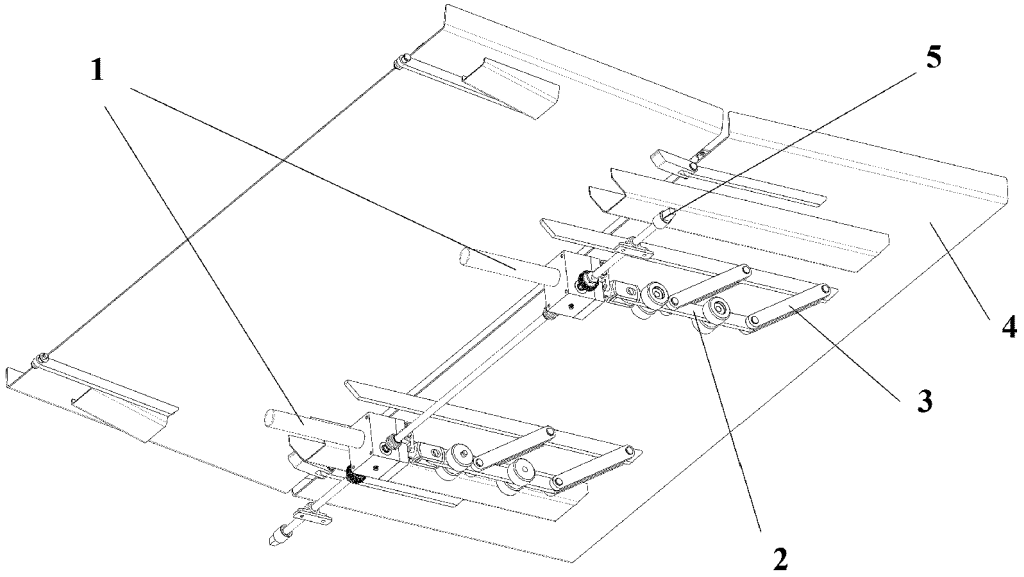

Fig. 2

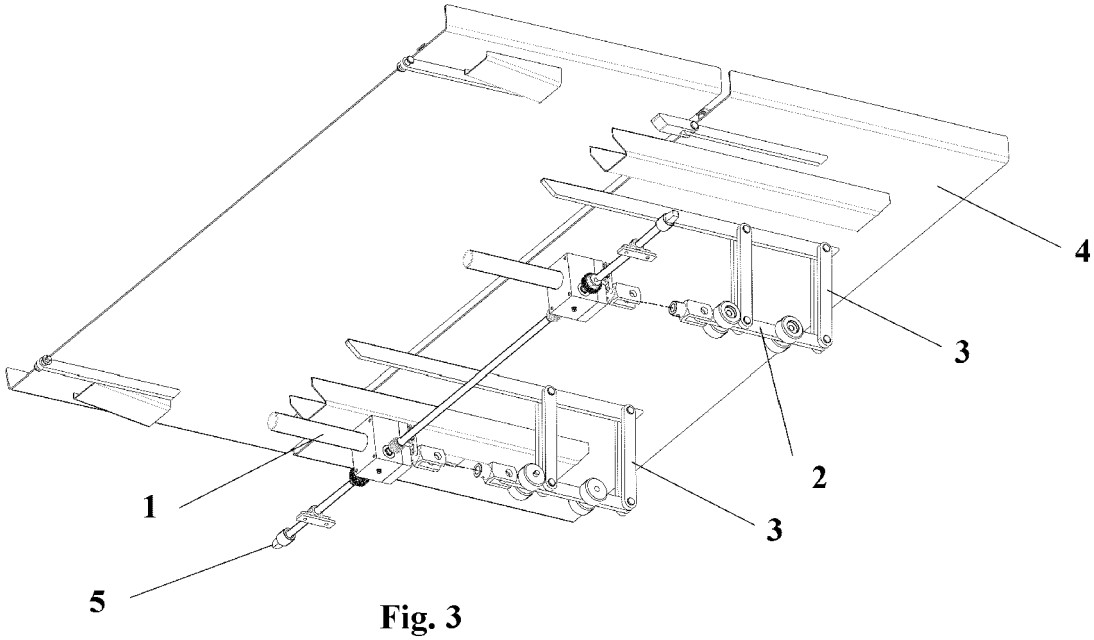

Fig. 3

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- GB 995136 A **[0003]**
- FR 2473974 A1 **[0004]**
- EP 0518750 A1 **[0005]**
- DE 2447576 A1 **[0005]**
- US 2003110975 A1 **[0005]**
- GB 716260 A1 **[0006]**