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(54) Title: GRIPPING DEVICE FOR VEHICLE WHEELS

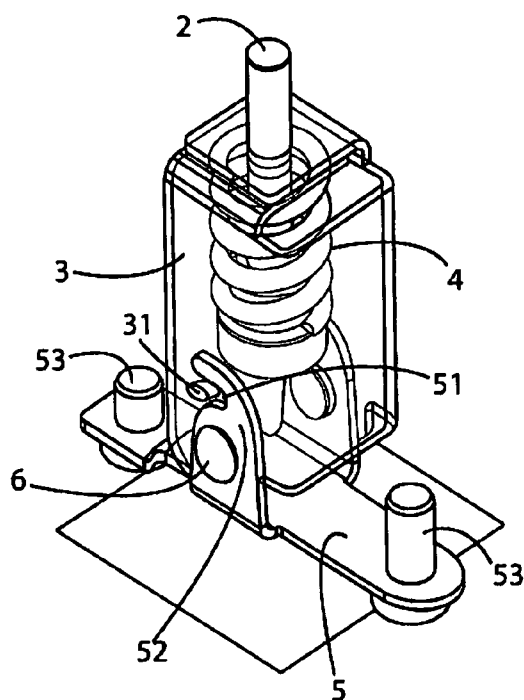


Fig. 1

(57) Abstract: A gripping device for wheels of vehicles, compris-
ing means for constraint (2) of the device to a hoisting cable, or in
general to the support in which the wheel is positioned once it has
been collected and engaged, and a lifting bracket (3) connected to
the constraint means. Said device comprises a bar for engagement
(5) of the wheel, constrained in an articulated way in its central
part to the bottom portion of the bracket.



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GRIPPING DEVICE FOR VEHICLE WHEELS

The present invention relates to a gripping and lifting device for wheels of vehicles, preferably but not exclusively for wheels of lorries, articulated lorries, trailer trucks, buses, etc., in general wheels of vehicles of considerable weight and dimensions that cannot be conveniently handled manually.

Normally, the spare wheels of said vehicles are positioned on the outside of the vehicle itself, for example underneath the body. Appropriate supports keep them in position and usually comprise a cable, generally of a cross section suitable to support the weight of the spare wheel, and an electrically or mechanically actuated winch, adapted to recall the cable. In addition, a gripping device, constrained to the end of the cable itself, engages the rim of the spare wheel, and via the winch it lifts it up to bring it into contact with the bottom part of the body, in a compartment purposely provided.

A supporting unit of this type is illustrated in the U.S. patent No. US 6,527,252.

A gripping device of said type is described, for example, in the patent application No. EP1577197, in which the device is illustrated in the form of a bell terminating in a lifting plate. The top of the bell is constrained to a cable operated by a winch.

In order for the bell and the plate to be constrained to the wheel, they are made to pass through the central hole of the wheel itself in an inclined position and then, once they have been passed through, when the cable is recalled by the winch, the bell inserts itself in said hole and the edges of the plate get into contact with the circumferential portion of the hole of the rim of the wheel. By recalling all the cable with the winch the wheel engaged to the gripping device

is then brought as far as into the compartment expressly made underneath the body of the vehicle.

The above types of devices present as main drawback the difficulty of carrying out centring of the rim, which must be positioned in the proximity of the purposely provided compartment, already aligned thereto. Therefore, if the gripping device is not able to guarantee a sufficient centring, the recalling operation may become problematical and require manual interventions of adjustment of the position of the rim. Sometimes it is also necessary to repeat the operation of positioning of the bell more than once in order to enable proper centring of the rim.

The present invention solves the aforesaid problems by providing a gripping device for vehicle wheels, in which the rim of the vehicle is engaged to a rocking supporting bracket, which prevents incorrect positioning of the rim once this is to be recalled and positioned in the purposely provided compartment for the spare wheel. It moreover enables use of rims with small central hole (e.g., alloy rims) without reducing the safety coefficient in so far as positioning occurs through the bolt holes irrespective of the diameter of the central hole.

One aspect of the present invention regards a gripping device for wheel of a vehicle having the characteristics set forth in the appended claim 1.

The characteristics and advantages of the device according to the present invention will emerge more clearly from the ensuing description of one embodiment thereof, provided by way of non-limiting example, with reference to the attached drawings, in which:

-Figure 1 is a perspective view of the device according to the present invention; and

-Figures 2a, 2b and 2c represent the device of Figure 1

in a side view in the position of insertion, in an intermediate position, and in the open position, respectively.

With reference to the aforesaid figures, the gripping
5 device for wheels of vehicles according to the present invention comprises means for constraint 2 of the device to a hoisting cable or in general to the support in which the wheel is positioned once it has been collected and engaged. Said means are illustrated in a simplified way in the form of
10 a pin, but can equivalently comprise an eyelet, a hook, or equivalent means.

In addition, the device comprises a lifting bracket 3 connected to the constraint means, preferably via elastic means 4, for example constituted by a spring. Said elastic
15 means being adapted to determine a damping action and an action of recovery of the plays, when the wheel is engaged in the device and the constraint means are drawn by the support when the wheel is recalled, for example via a winch.

In the bottom portion of the lifting bracket, the device
20 comprises a bar for engagement 5 of the wheel constrained in an articulated way to the bracket in its central part, for example via a pin 6, so as that it can move between a first position of engagement of the wheel, in which the bracket and the bar are substantially perpendicular to one another, and a
25 second position of insertion in a hole of the wheel, in which the bracket and the bar are inclined with respect to one another, preferably until they are positioned parallel to one another.

In addition, means are provided for stopping the bar in
30 the first position, which comprise a projection 31 made on a wall of the bracket, adapted to be inserted in a seat 51 made in the bar so as to block the movement of rotation of the bar with respect to the bracket.

Preferably, said seat is made in a concave portion of a support 52 that is fixed substantially at the centre of the bar, in which pin 6 is constrained.

Preferably, provided at opposite ends of the bar is a pair of resting elements 53 for the rim of the wheel, which have a preferably cylindrical shape. Advantageously, said elements can rest on different circumferences of the rim so as to be able to assist the centring operation manually. In addition, for said purpose one of the two sides of the bar can present a step 54 with respect to the central point of constraint with the bracket.

The device operates in the way described as follows. To position the spare wheel of a vehicle in the purposely provided compartment underneath the body, the wheel has to be engaged via the device forming the subject of the present invention. For this purpose, the engagement bar is brought into the second position, in such a way that the bar and the bracket can pass within the central hole of the rim of the wheel. Next, once the insertion in the hole has been carried out, the bar is brought back into the first position and is blocked therein via the arrest means. When the winch, via the cable, pulls the bar towards the rim, resting elements 54 position themselves on the circumference of the rim in a pre-set position, blocking the rim in a stable position. When the device is set vertically, for example hanging from the cable of the winch, said position substantially coincides with the horizontal plane, in so far as the bracket comes to be set vertically by gravity, and consequently both the bar and the wheel come to be set substantially horizontally.

Starting from said position the rim can be conveniently inserted in the purposely provided compartment underneath the body of the vehicle.

CLAIMS

1. Gripping device for wheels of vehicles, comprising means for constraint (2) of the device to a cable, or in general to the support in which the wheel is positioned once it has been collected and engaged, and a lifting bracket (3), connected to the constraint means, said device being characterized in that it comprises a bar for engagement (5) of the wheel, constrained in an articulated way in its central part to the bottom portion of the bracket so as that it can move between a first position of engagement, in which the bracket and the bar are substantially perpendicular to one another, and a second position of insertion in a hole of the wheel, in which the bracket and the bar are inclined with respect to one another.
2. The device according to claim 1, wherein in the second position the bracket and the bar are substantially parallel to one another.
3. Device according to claim 1, comprising means for stopping the bar in the first position.
4. Device according to claim 3, wherein said stopping means comprise a projection (31) obtained on a wall of the bracket, adapted to be inserted in a seat (51) obtained in the bar so as to block the movement of rotation of the bar with respect to the bracket.
5. Device according to claim 4, wherein said seat is made in a concave portion of a support (52) that is fixed substantially at the centre of the bar.
6. Device according to claim 5, wherein the bracket and the bar are constrained to one another through a pin that inserts itself in said support (52).
7. Device according to claim 1, wherein, at opposite ends of the bar, a pair of resting elements (53) for the rim of the wheel are provided.

8. Device according to claim 7, wherein said resting elements have a cylindrical shape.

9. Device according to claim 1, wherein one of the two sides of the bar has a step (54) with respect to the central point
5 of constraint with the bracket.

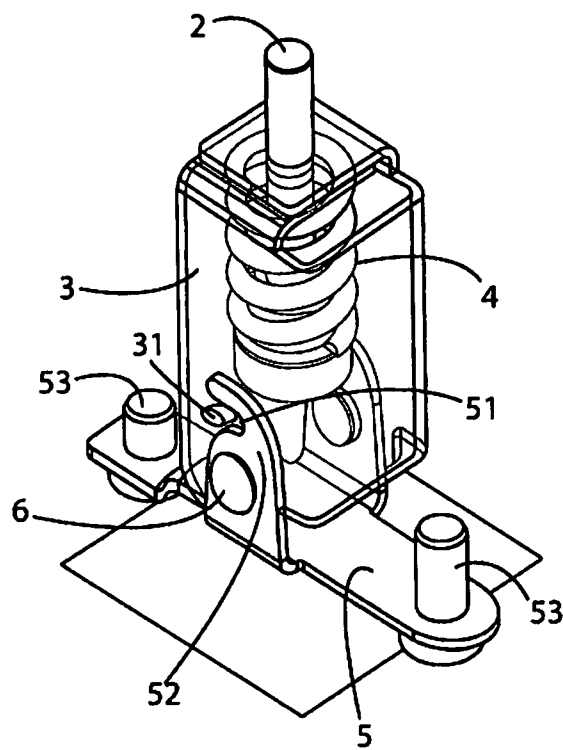


Fig. 1

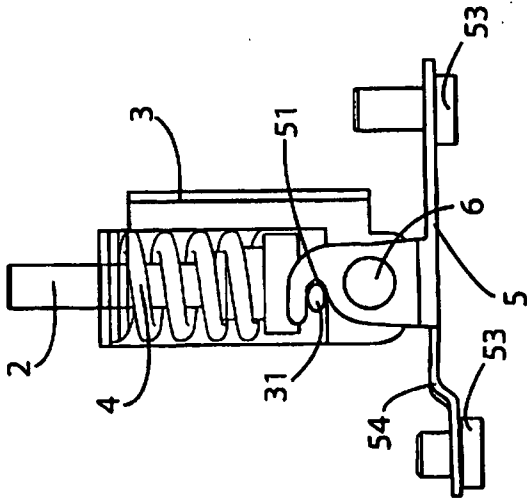


Fig. 2c

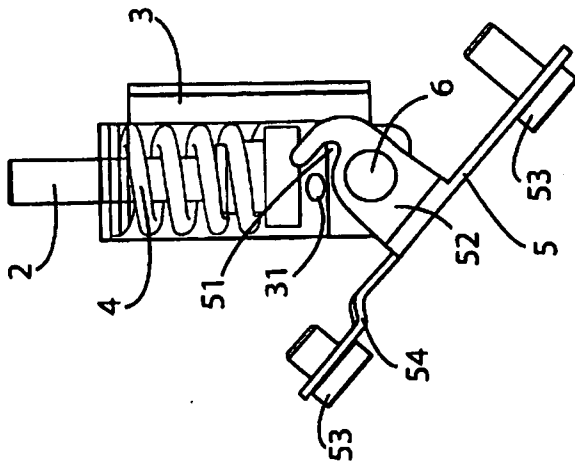


Fig. 2b

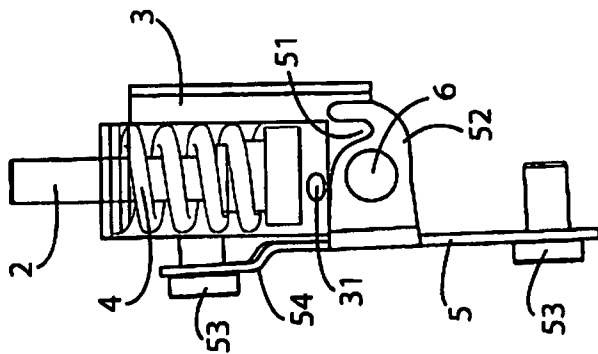


Fig. 2a