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## EUROPEAN PATENT SPECIFICATION

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⑤④ **An apparatus for the transportation of a fork-lift truck on a lorry.**

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**EP 0 204 363 B1**

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## Description

The invention is related to an apparatus as described in the preamble of claim 1.

Such an apparatus is known from WO 82/01 363. According to the known apparatus a fork-lift truck is stowed underneath the floor of a lorry or trailer by hoisting the truck by at least two winches mounted on the lorry or on the fork-lift truck. In its stowed position the fork-lift truck is suspended to lines.

The known apparatus does not suffice to safety requirements. As one of the lines breaks or if one of the winches goes out of function, the fork-lift truck will fall down giving raise of hazardous events. Moreover it is difficult to position the fork-lift truck under the lorry such that upon hoisting both lines have equal length when the truck is in its stowed position.

According to the invention these disadvantages are overcome by the features as mentioned in the characterizing part of claim 1.

In its stowed position the fork-lift truck according to the invention is safely supported by the loading ramp which is blocked in its raised position by mechanical means.

It is remarked that in DE-A 2 359 418 a ramp is disclosed for loading and stowing a fork-lift truck in a compartment behind a lorry.

The platform is pivotable around a horizontal shaft and the pivotable movement is caused by the vertical movement of the forks cooperating with a horizontal blocking bar. As alternative it is suggested that the loading ramp can be raised by hydraulic means or by a winch and cable. According to this arrangement the loading ramp is kept in its raised position by means such that upon failure of these means the ramp will pivot downwardly, giving rise to extreme hazardous circumstances.

According to the invention, the means for raising the loading ramp consist of a piston mounted on the fork-lift truck, there being applied to the loading ramp locking means which cooperate with the fork-lift truck. The raising means can also consist of a piston which is mounted on the loading ramp.

In accordance with another embodiment, the means for raising the loading ramp consist of a piston for pulling up the loading ramp which piston is mounted on the lorry.

The means for locking consist of a pivotable support, lockable by means of at least one pawl, applied to the lorry. Also, the means for locking can consist of a support which can be brought under the fork-lift truck.

The invention is further elucidated by reference to the drawings of an embodiment of the invention.

In the drawings:

Figures 1 to 3 inclusive show a rear view of part of a lorry and the respective positions of the fork-lift truck during positioning on the transportation apparatus, and

Figure 4 shows a perspective view of the embodiment according to figures 1 to 3.

Beneath the chassis of lorry 1, fork-lift truck 2 is transported on transportation apparatus 3.

Transportation apparatus 3 consists of a loading ramp 5, 5" rotatable around a substantial horizontal shaft 4. Shaft 4 is journalled in vertical supporting beams 6, 6", which are in turn are fastened to chassis members 7, 7" and 8. Loading ramp 5, 5" comprises connecting beam 9, disposed in the longitudinal direction of the lorry. On connecting beam 9 there is safety lip 10 fitted.

The fork-lift truck possesses a collapsible mast 21 which can be moved from the vertical position indicated by broken lines in figure 1 to a collapsed position, and vice versa, by means of hydraulic piston 22. With mast 21 in its collapsed position, fork-lift truck 2 is driven up loading ramp 5, 5", which for this purpose is placed in its lowered position, drawn with broken lines in figures 3 and 4. When the fork-lift truck has arrived in the position shown in figure 2 lifting jack 23 on the fork-lift truck is operated, whereby piston rod 24 moves downwards until it comes into contact with the ground. On further moving out of the piston rod, the fork-lift truck moves in an upwards direction, thereby also raising ramp 5 of transportation apparatus 3 as an inclined plate 26 engages the safety lip 10. After the fork-lift truck together with the transportation apparatus has been raised to the position shown in figure 3, supports 15 and 16 are placed in a horizontal position. Supports 15 and 16 are rotatable around shafts 11 and 12 respectively. Shafts 11 and 12 are journalled in lugs 13 and 14 which are welded to beams 7" and 7 respectively. Supports 15, 16 can be operated with the aid of grips 17, 18 respectively. Supports 15, 16 can be locked in the horizontal position with the aid of locking pins 19 and 20 respectively. It will be clear that lifting jack 23 can be situated on the transportation apparatus instead of on the transportable fork-lift truck. The loading and unloading of the fork-lift truck on the transportation apparatus remains principally the same.

## Claims

1. An apparatus for stowing a collapsible fork-lift truck (2) under a lorry or trailer (1) comprising raising means (23, 24) for raising said truck (2) to its stowed position underneath the floor of said lorry or said trailer (1) characterized by a loading ramp (5) hingeable transversely to the direction of travel around a substantially horizontal shaft (4) to support the truck (2) to be stowed and means (15, 16) for locking the raised loading ramp (5) in the raised position (5), said means (15, 16) consisting of a support engaging the truck (2) to be stowed.

2. A transportation apparatus as claimed in claim 1, characterized in that the means for raising the loading ramp (5) consist of a piston (23, 24) mounted on the fork-lift truck and that on the loading ramp (5) there are mounted locking means (10) which cooperate with the fork-lift truck (2).

3. A transportation apparatus as claimed in claim 1, characterized in that the means for raising the loading ramp consist of a piston pulling up the loading ramp, mounted on the lorry.

4. A transportation apparatus as claimed in claims 1-3, characterized in that the means for locking consist of at least one pivotable (11; 12) support (15; 16) lockable by means of a pawl (19; 20) to be mounted on the lorry (1).

5. A lorry provided with a stowing apparatus as claimed in claims 1-4.

### Patentansprüche

1. Vorrichtung zum Verstauen eines zusammenlegbaren Gabelstaplers (2) unter einem Lastkraftwagen oder Anhängfahrzeug (1), mit Hubelementen (23, 24) zum Anheben des Staplers (2) in seine Verstauposition unterhalb des Bodens des Lastkraftwagens oder Anhängfahrzeugs (1), gekennzeichnet durch eine Laderampe (5), die quer zur Fahrtrichtung um eine im wesentlichen horizontale Welle (4) schwenkbar ist, um den zu verstauenden Stapler (2) zu tragen, und durch Mittel (15, 16) zum Blockieren der angehobenen Laderampe (5) in der angehobenen Stellung (5), wobei die Mittel (15, 16) aus einem Halteglied bestehen, das an den zu verstauenden Stapler (2) angreift.

2. Transportvorrichtung nach Anspruch 1, dadurch gekennzeichnet, daß die Elemente zum Anheben der Laderampe (5) aus einem Hubkolben (23, 24) bestehen, der an dem Gabelstapler angebracht ist, und daß an der Laderampe (5) Sperrglieder (10) angebracht sind, die mit dem Gabelstapler (2) zusammenwirken (26).

3. Transportvorrichtung nach Anspruch 1, dadurch gekennzeichnet, daß die Elemente zum Anheben der Laderampe aus einem Hubkolben für die Laderampe bestehen, der an dem Lastkraftwagen angebracht ist.

4. Transportvorrichtung nach Anspruch 1 bis 3, dadurch gekennzeichnet, daß die Blockiermittel aus zumindest einem schwenkbaren (11; 12) Halteelement (15; 16) bestehen, das mittels eines Sperrbolzens (19; 20), der an dem Lastkraftwagen (1) angebracht wird, blockierbar ist.

5. Lastkraftwagen, der mit einer Verstauvorrichtung nach Anspruch 1 bis 4 versehen ist.

### Revendications

1. Appareil pour arrimer un chariot élévateur à fourche (2) du type abaissable, sous un camion ou une remorque (1), comprenant des moyens de levage (23, 24) pour lever ledit chariot (2) jusque dans sa position arrimée au-dessous du plancher dudit camion ou de ladite remorque (1), caractérisé par une rampe de chargement (5) articulée transversalement au sens de déplacement autour d'un arbre à peu près horizontal (4) pour soutenir le chariot (2) devant être arrimé, et des moyens (15, 16) pour verrouiller la rampe de chargement élevée (5) dans la position haute (5), lesdits moyens (15, 16) consistant en un support en contact avec le chariot (2) à arrimer.

2. Appareil de transport suivant la revendication 1, caractérisé en ce que les moyens pour lever la rampe de chargement (5) consistent en un vérin (23, 24) monté sur le chariot élévateur, et en ce que sur

la rampe de chargement (5) sont montés des moyens (10) de verrouillage qui coopèrent en (26) avec le chariot élévateur à fourche (2).

3. Appareil de transport suivant la revendication 1, caractérisé en ce que les moyens pour lever la rampe de chargement consistent en un vérin qui tire la rampe de chargement vers le haut, monté sur le camion.

4. Appareil de transport suivant l'une quelconque des revendications 1 à 3, caractérisé en ce que les moyens de verrouillage consistent en au moins un support (15, 16) articulé (11, 12), verrouillable au moyen d'un cliquet (19, 20) devant être monté sur le camion (1).

5. Camion comportant un appareil d'arrimage suivant les revendications 1 à 4.

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FIG.1

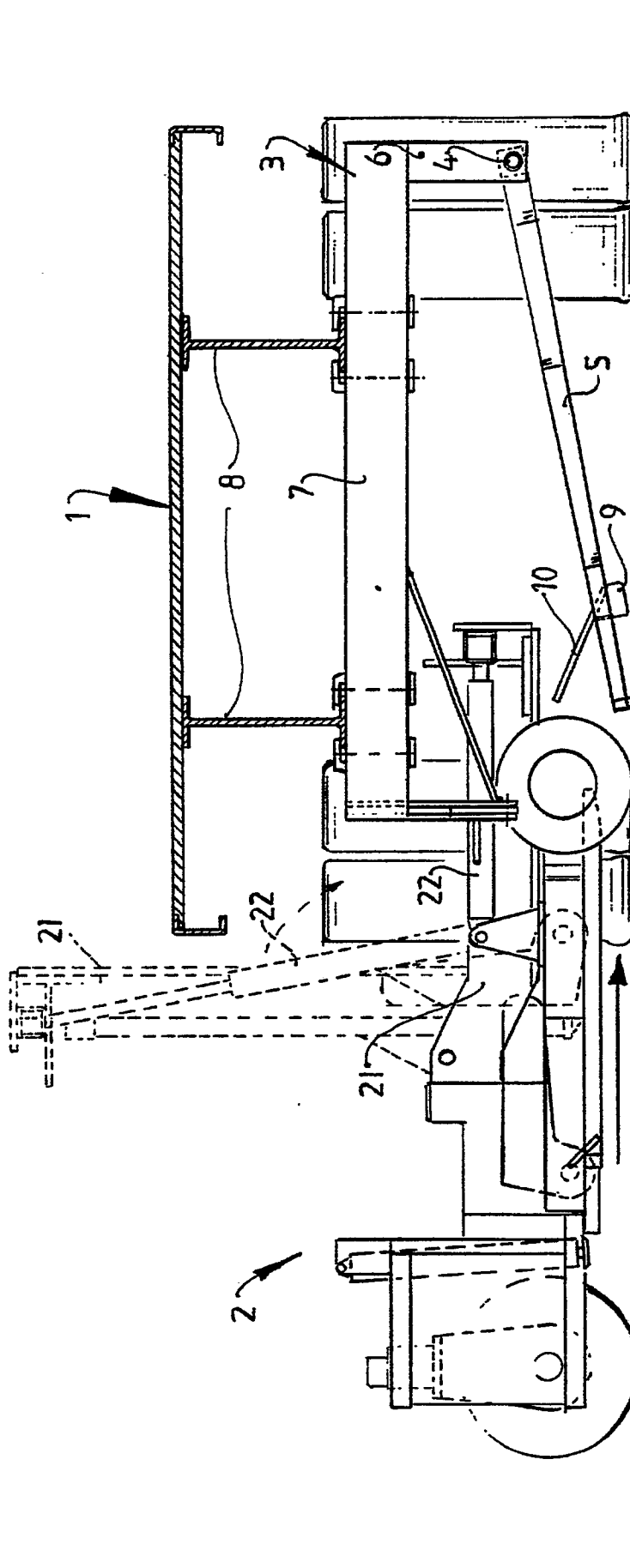


FIG. 2

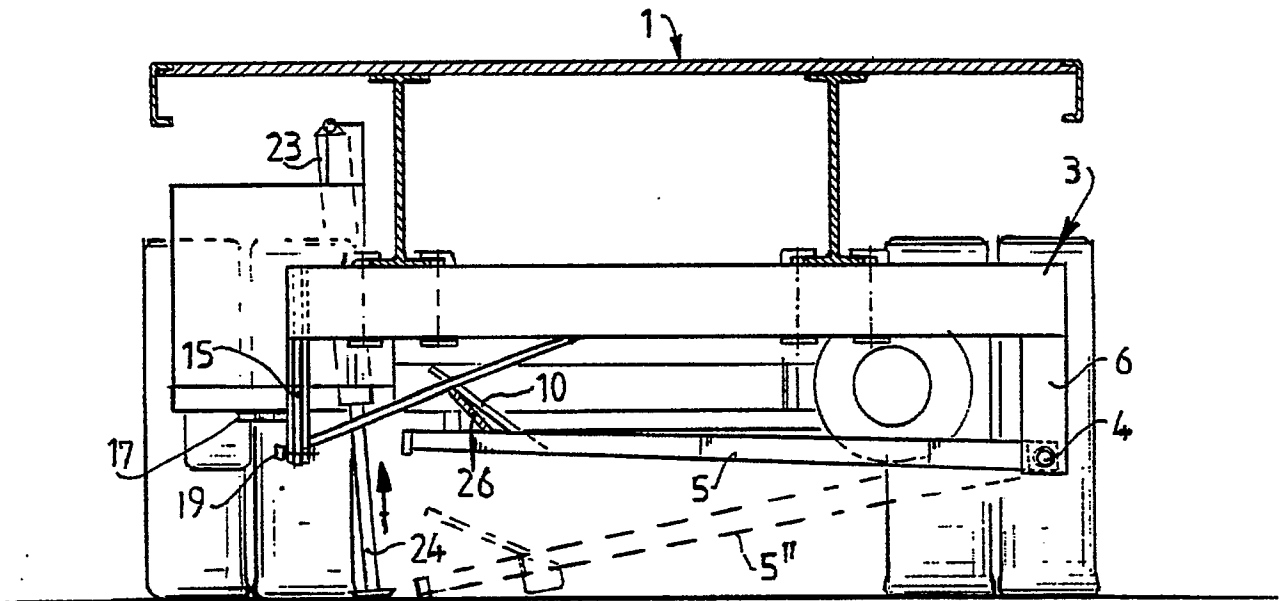
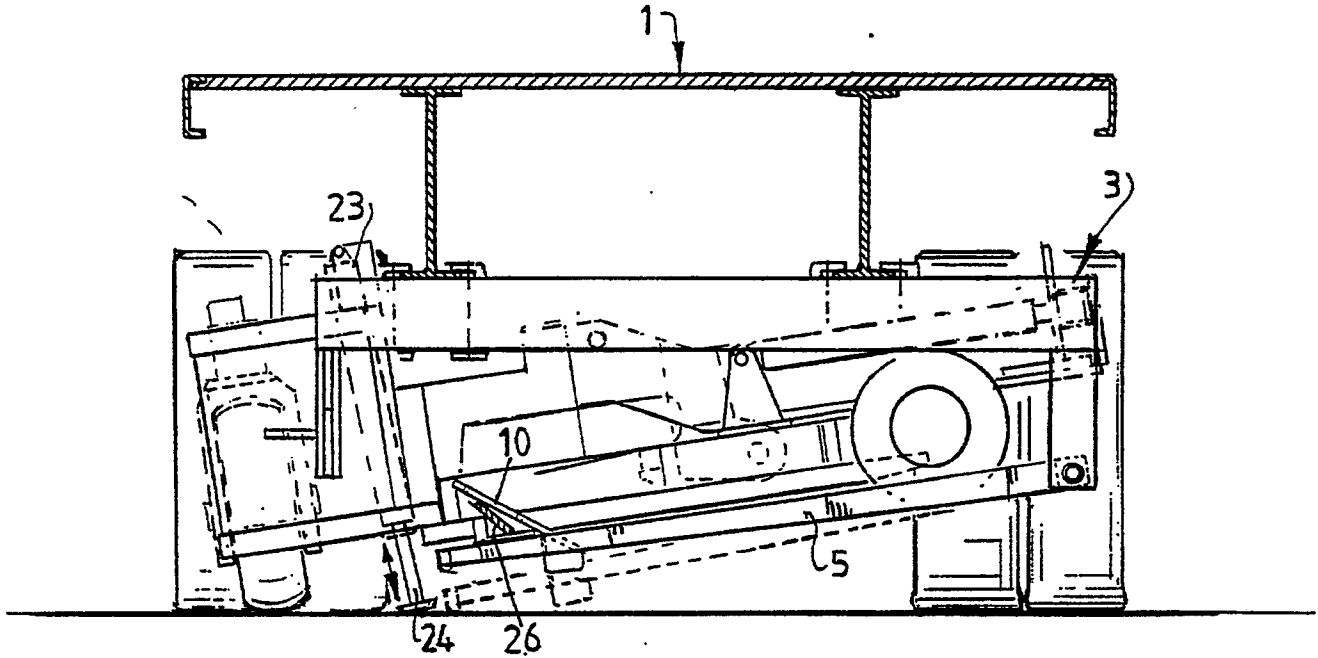


FIG. 3

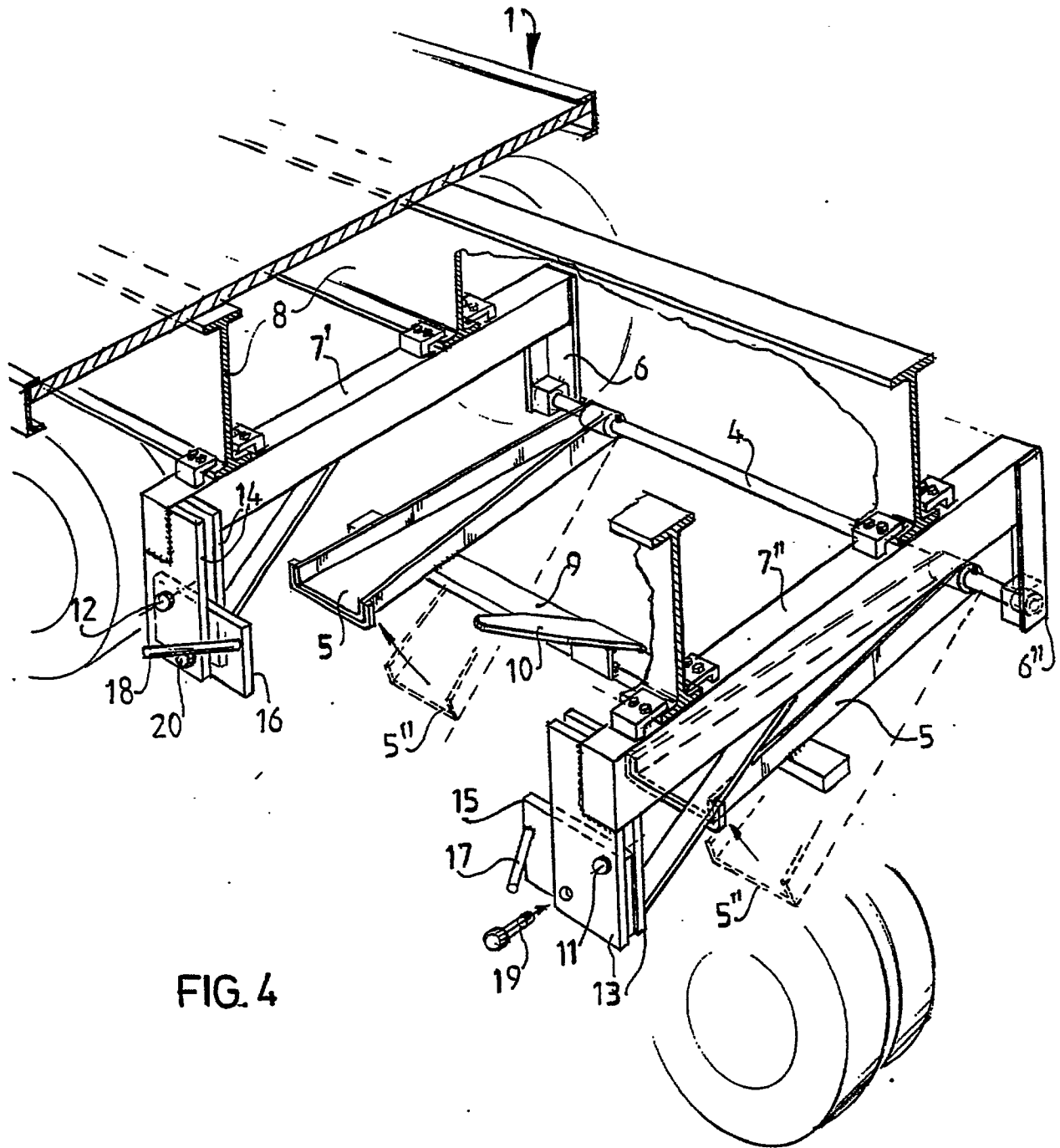


FIG. 4