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**CH - A - 560 647**  
**US - A - 3 656 643**

⑦③ Proprietor: **Bolderoff, Jack**  
**18 Hooke Road**  
**Elizabeth West, South Australia (AU)**

⑦② Inventor: **Bolderoff, Jack**  
**18 Hooke Road**  
**Elizabeth West, South Australia (AU)**

⑦④ Representative: **Rowe, Eric Nielsen et al,**  
**Edward Evans & Co. Chancery House 53-64**  
**Chancery Lane**  
**London WC2A 1SD (GB)**

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## Tipping device

This invention relates to a tipping load support adapted to be handled by the forks of a fork-lift truck.

Many goods, loads and materials are handled by a fork-lift truck, on a load support such as a bin or pallet and it is sometimes desirable to be able to tip the load carried by the support into another container such as a bulk transport vehicle.

In order to empty bins which are transported by a fork-lift truck, a special vehicle may be provided, for example a transport vehicle provided with forks which lift and tip the bins into a container carried by a transport vehicle. However, this vehicle can only empty the bins into its own container.

In an alternative solution, disclosed in Swiss Patent Specification No. 560 647, a load support for use with a fork-lift truck is provided with a base adapted to receive the forks of a fork-lift truck, a portion of said base pivoting relative to said load support so that, with the forks engaged in said portion, the load support may pivot relative thereto. However, to prevent unwanted tipping of the bin, the bin must be secured by a tie, such as a chain, and this tie must therefore be released whenever tipping is required.

It is an object of this invention to provide a tipping load support carried on the forks of a fork-lift truck, in which tipping is controlled by the operation of the fork-lift truck in an automatic or semi-automatic manner.

To achieve this objective, the base is divided into a forward portion and a rear portion pivoted to each other with said load support being integral with said forward portion, said portions being adapted to receive the forks with the forks passing firstly through said rear portion to pass into engagement with the forward portion, so that by withdrawing the forks from the forward portion into the rear portion the load support is adapted to tip forwardly.

In order to more fully understand the invention description will now be made of a preferred form of the invention utilizing a bin adapted to be carried and supported by the forks of a fork-lift truck, it being realized that instead of the bin there could be just a platform tray or pallet like structure which would operate in the same manner.

In the drawings:—

FIG. 1 shows the bin in the loading position,

FIG. 2 shows the bin in the tipping position, and

FIG. 3 shows the bin formed as a scoop.

In the preferred form of the invention bin 1 is provided with a base 2 having guides or slots therein for the reception of the forks of a fork-lift truck. The base 2 is divided into two portions, a forward portion 3 and a rear portion 4.

The forward portion 3 is situated on the bin

on the forward side of the bin, that is remote from the fork-lift truck. Pivoted to this forward portion 3 there is a rear base portion 4 also having guides and slots for the reception of the forks, preferably the pivot being generally centrally of the bin. The forward portion 3 can comprise a pair of channel members 5 fixed to the base of the bin 1.

The rear portion 4 comprises a pair of rectangular cross-section tubular or partially closed members 6 braced by cross members 7 to form the base, and which is pivoted by transverse pivots 8 to the forward portion 3.

Thus it will be seen that when the forks 9 of the fork-lift truck are inserted the full distance into the members 5 that they pass through the rear portion 4 and through the member 6 with the members 5 and 6 being aligned when the bin is resting on a surface, thus in effect locking the two portions together so that the pivoting cannot occur.

It will be realized that if the forks are then withdrawn to be engaged only in the rear portion 4, and that the forks do not extend past the pivot point, that on raising the forks that the bin will thus be caused to be tilted forwardly to discharge the contents of the bin.

In order to prevent the bin from inadvertently being removed from the forks of a fork-lift truck, a safety chain 14 is provided which is attached to the base portion 4 and to the fork-lift truck itself, this chain being adjusted so that the forks can only be withdrawn a distance to clear the pivot 8. As shown in the drawings the forks are withdrawn from the fully inserted position 10A to the withdrawn position 10B.

In order to limit the tipping and tilting, a further chain or like flexible member (not shown) may be attached to the bin, and also to the mast of the fork-lift truck or other movable or controllable member so that this chain limits the tilting of the bin.

This further chain also has the advantage of allowing the automatic resetting or moving the bin back to its upright position.

It will be realized that the bin can be operated at a height so that the bin will tip into a container or even a bulk transport vehicle, so that by elevating the bin, and resting the base portion of the bin on the edge of the container, withdrawing the forks until they pass the pivot point, that the bin if it does not automatically tilt and tip to its discharge position could be caused to do so by slight elevation of the forks themselves. With the bin then again resting on the edge of the container to prevent the bin moving forwardly, forward movement of the fork-lift truck will cause the forks to re-engage right through into the base portion of the container whereby the container can then be lifted and then removed to its next position to be re-loaded or the like.

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Alternatively the bin can be returned to its erect position by lowering the fork-lifts to the ground where the bin will be returned by slight rearward movement of the fork-lifts to its upright condition, and forward movement will re-engage the forks in the member 5.

In a further alternative as shown in FIG. 3, the bin can be shaped as a scoop 11 with a forward cutting edge 12 and an open front side 13 so that the unit can be used as a self loading scoop and emptied in a manner similar to the above description.

It will be realized that while the invention above described has been particularly described in relation to a container, that the invention could be applied to a flat pallet so that the loads stacked thereon can be readily tipped therefrom, or to pallets having cages or sides thereon, either open on one side or closed on all sides.

Alternatively instead of the rear and forward portions being formed with rectangular tubular or channel members, a base can comprise a framework having vertical studs to form the fork guides.

#### Claims

1. A tipping load support (1) for use with a fork-lift truck, said load support having a base (2) adapted to receive the forks (9) of a fork-lift truck, a portion (4) of said base (2) pivoting relative to said load support (1) so that with the forks (9) engaged in said portion (4), the load support (1) may pivot relative thereto characterized in that said base (2) is divided into a forward portion (3) and a rear portion (4) pivoted to each other with said load support (1) being integral with said forward portion (3), said portions being adapted to receive the forks (9) with the forks (9) passing firstly through said rear portion (4) to pass into engagement with the forward portion (3), so that by withdrawing the forks (9) from the forward portion (3) into the rear portion (4) the load support (1) is adapted to tip forwardly.

2. A tipping load support as defined in claim 1, characterized in that said rear portion (4) of the base (2) is provided with rectangular tubular members (6) adapted to receive the forks (9) of the fork lift truck, and the forward portions (3) are downwardly open channel-shaped members (5) in line with the tubular members (6).

#### Revendications

1. Un support basculant (1) à utiliser avec un chariot élévateur à fourche, ledit support de

charge possédant une base (2) destinée à recevoir les fourches (9) d'un chariot élévateur à fourche, une partie (4) de ladite base (2) pivotant par rapport audit support de charge (1) de telle sorte qu'avec les fourches (9) engagées dans ladite partie (4), le support de charge (1) peut pivoter par rapport à celle-ci, caractérisé en ce que ladite base (2) est divisée en une partie avant (3) et une partie arrière (4) articulées l'une sur l'autre avec ledit support de charge (1) en une pièce avec ladite partie avant (3), lesdites parties étant destinées à recevoir les fourches (9) avec les fourches (9) traversant d'abord ladite partie arrière (4) pour engager la partie avant (3), de telle sorte qu'en retirant les fourches (9) de la partie avant (3) dans la partie arrière (4), le support de charge (1) est adapté à un basculement vers l'avant.

2. Un support de charge basculant tel que défini dans la revendication 1, caractérisé en ce que ladite partie arrière (4) de la base (2) est dotée d'organes tubulaires rectangulaires (6) destinés à recevoir les fourches (9) du chariot élévateur à fourche, et les parties avant (3) sont des organes (5) en forme de U ouvert vers le bas alignés avec les organes tubulaires (6).

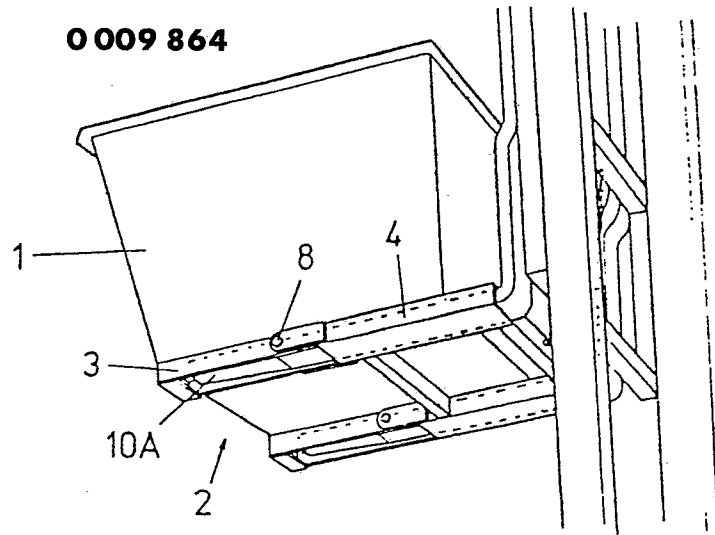
#### Patentansprüche

1. Kippbares Tragelement (1) für Lasten, insbesondere Palette, Behälter oder Schaufel, zur Verwendung bei einem Gabelstapler, mit einem zur Aufnahme der Gabel (9) des Gabelstaplers geeigneten Boden (2), von dem ein Teilstück relativ zum Tragelement (1) schwenkbar ist, so daß das Tragelement (1) gegenüber der Gabel (9) gekippt werden kann, wenn diese in das Teilstück des Bodens (2) gesteckt ist, dadurch gekennzeichnet, daß der Boden (2) in ein vorderes Teilstück (3) und ein hinteres Teilstück (4) geteilt ist, die relativ zueinander schwenkbar sind, und daß das vordere Teilstück (3) kraftschlüssig mit dem Tragelement (1) verbunden ist und die Gabel (9) aufnehmen kann, wobei die Gabel (9) zuerst durch das hintere Teilstück (4) gesteckt wird und dann in Eingriff mit dem vorderen Teilstück gelangt, so daß das Tragelement (1) beim Zurückziehen der Gabel aus dem vorderen Teilstück (3) in das hintere Teilstück (4) nach vorne kippen kann.

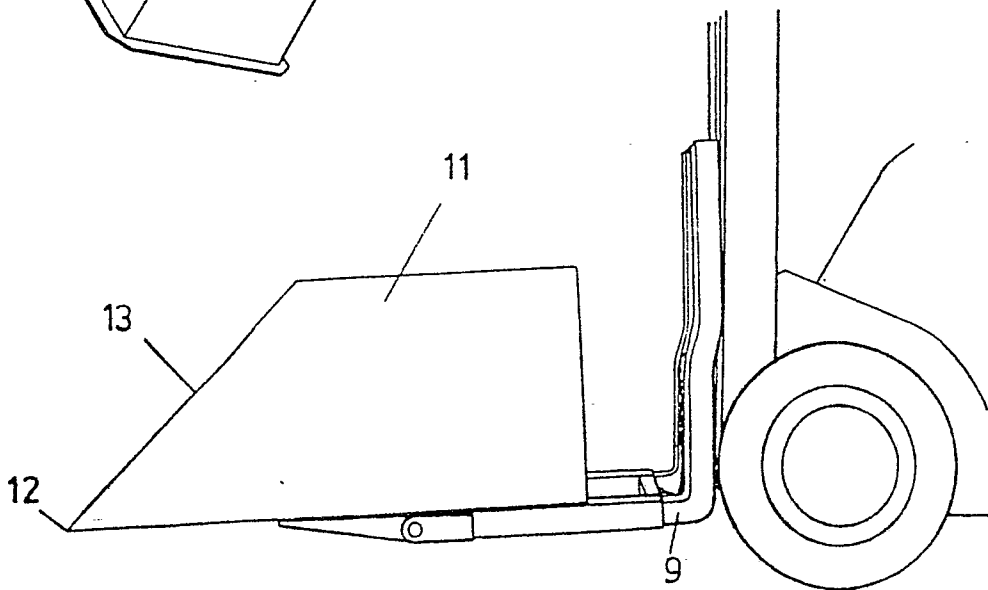
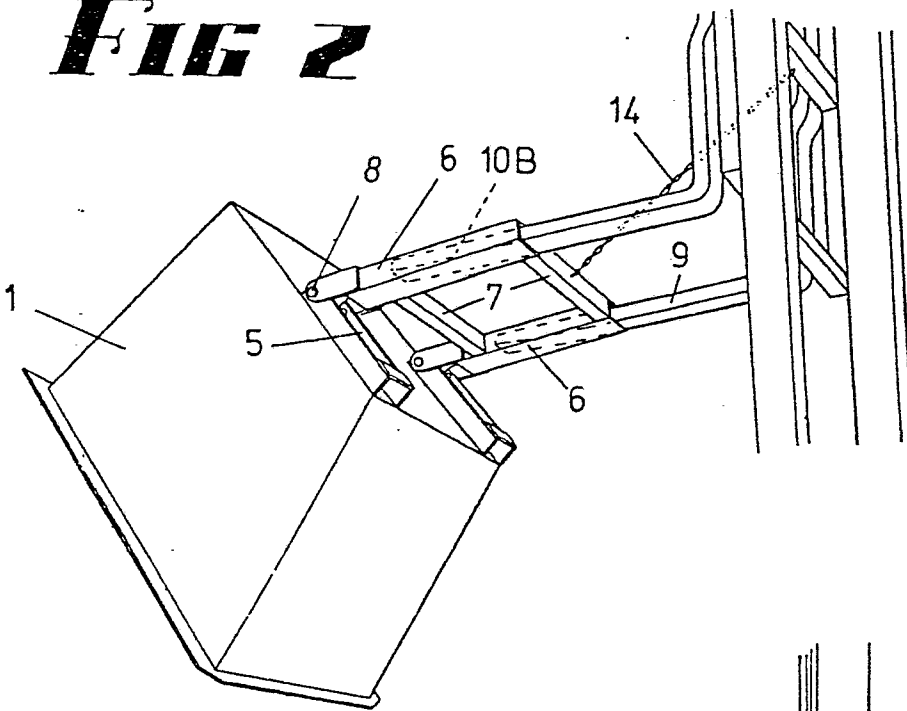
2. Tragelement nach Anspruch 1, dadurch gekennzeichnet, daß das hintere Teilstück (4) des Bodens (2) Rohre (6) mit rechteckförmigem Querschnitt zur Aufnahme der Gabel (9) und das vordere Teilstück (3) nach unten offene kanalförmige Schienen (5) in geradliniger Fortsetzung der Rohre (6) aufweist.

**FIG 1**

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**FIG 2**



**FIG 3**