

Description

The present invention concerns a method and apparatus for the transfer of a cargo container or an exchange platform onto a vehicle and off the vehicle, whereby a loading device is used which includes an L-shaped piece, the upper end of one arm of said L-shaped piece being provided with a grasping hook, and the rear end of the other arm being associated with a transverse pivot shaft, around which the L-shaped piece is pivoted by means of an actuator. The grasping hook pivots around a transverse shaft in relation to one (the vertical) arm of the L-shaped piece during the loading or unloading of the cargo container or exchange platform. The grasping hook is provided at the upper end of one (vertical) arm of the L-shaped piece. The transverse pivot shaft is provided at the rear end of the other (horizontal) arm. Also in one known apparatus, the grasping hook can be pivoted around a transverse shaft relative the said one arm of the L-shaped piece during transfer movement of the container or platform by the effect of a force applied to the grasping hook.

Various loading devices are known, which comprise an L-shaped piece which at one end has a grasping hook for interengagement with an attachment loop or bar on the cargo container or exchange platform. Such devices are described, e.g. in the Finnish Patent No. 63,350 and in the French Patent No. 2,109,109. In the device of the Finnish Patent 63,350 the horizontal shifting of the load before its lowering is produced by pivoting the L-piece. In the device of the French Patent 2,109,109, the corresponding movement is produced by shifting the L-piece telescopically.

Load handling devices are also known wherein the grasping hook can pivot around a transverse shaft relative the vertical arm of the L-piece. In the Finnish Patent No. 75,121, a device is described which has an L-shaped arm with a grasping hook at a free end of the L-shaped arm, the other end of the L-shaped arm being pivotally attached to a shaft so that said arm can be pivoted by an actuator around said shaft, the grasping hook itself being pivotable around a transverse shaft relative to the L-shaped arm during movement of the container or exchange platform.

From FR-A-2,397,304, a loading device is known wherein the grasping hook is attached to the upper end of the L-piece by means of two transverse pins. One of these pins is detachable. When this pin is detached, the grasping hook can pivot rearwards, so that the grasping hook can be detached from a cargo platform that has been raised to a horizontal position standing on its legs.

In the devices known in prior art, the transfer of the cargo onto and off the vehicle usually takes place when the grasping hook is rigidly attached to the vertical arm of the L-piece. When the L-piece in the de-

vice in accordance with the Finnish Patent No. 63,350 pivots around the shaft placed at the rear part of its horizontal arm, horizontal shifting of the load rearwards is obtained before the load starts being lowered off the vehicle. In order that the cargo container or exchange platform should move horizontally during this pivoting movement of the L-piece, a hook is required that is provided with a long cavity or gap, so that the attachment loop or bar of the container or platform can move in said gap relative to the hook. Both when the load is being pulled onto the vehicle and when it is being removed off the vehicle, the said loop or bar moves back and forth in the cavity, which results in undesirable abrasion of the hook and the bar.

When the hook part is fixed in relation to the L-piece (e.g., by means of pins or welding), the attachment bar of the container or platform and the hook pivot in relation to each other when the container or platform is being pulled onto the vehicle and unloaded from the vehicle. In such a case, the loop or bar and the hook tend to be worn because of the high surface pressure.

Moreover, in many arrangements, the hook part includes a safety lock pivoting around an articulation pin, which closes the gap of the hook and prevents detaching of the platform during pulling-on and lowering. As a rule, the safety lock operates automatically by the effect of gravity. It is a drawback of such a pivoting safety lock that it is readily made immobile by rust or is otherwise damaged. Moreover, in trailer operation the hook frame remains at such a high level that the safety lock is not opened automatically. This is why an actuator (e.g. a hydraulic or pneumatic cylinder) is needed to open the safety lock. Since the use of a trailer is becoming more and more common, this is a problem. On the other hand, the significance of a safety lock has become higher as a consequence of product liability laws and other safety legislation. Hence reliable operation of the safety lock is particularly important.

According to one aspect of the present invention, there is provided a method for the transfer of cargo space onto and off a vehicle, wherein a loading device is used which includes a pivotally mounted L-shaped piece having first and second arms, the free end of the second arm being provided with a grasping hook, and an end of the first arm or of an extension of said first arm being provided with a transverse pivot shaft, around which the first arm or the extension is pivoted by means of an actuator, and the grasping hook being pivotable around a transverse shaft relative to the second arm during transfer of the cargo space, characterised in that the second arm or an extension thereof is provided with a projection, in relation to which the grasping hook moves when it pivots relative to the second arm, whereby, at a certain position of the grasping hook, the projection is positioned at least

partly in front of the open gap of the grasping hook and, when the grasping hook has been pivoted away from this position, said projection allows the open gap in the hook to remain at least substantially open.

According to another aspect of the invention there is provided equipment for the transfer of a cargo space onto a vehicle and off the vehicle, said equipment including an L-shaped piece, at which a grasping hook is provided at the upper end of the vertical arm of the L-shaped piece and a transverse pivot shaft is provided at the rear end of the horizontal arm or of its extension, whereby the L-shaped piece can be pivoted around said pivot shaft by means of an actuator, and whereby the grasping hook can be pivoted around a transverse shaft relative the vertical arm of the L-shaped piece during movement of transfer of the cargo space, characterised in that the vertical arm or an extension of the vertical arm of the L-shaped piece is provided with a projection, which is, at a certain position of the grasping hook, positioned at least partly in front of the open gap of the grasping hook and, when the grasping hook has been pivoted away from this position, the projection allows the open gap in the hook to remain at least substantially open.

In the equipment in accordance with an embodiment of the invention, the hook part is attached to the hook frame as pivotable around an articulated joint. In such a case, gravity or other external forces pivot the hook to its position in each particular case. This results in the advantage that the hook is turned very little in relation to the loop or bar of the platform, whereby the abrasion both of the hook and of the loop or bar are reduced. When the articulated joint in the hook is provided with a bearing, the joint withstands the pivoting movement without wear.

The stationary projection on the hook frame, e.g. a stationary plate fixed to the frame, acts as a safety lock, whereby the attachment loop or bar of the platform can come out of the hook only at one extreme position of the loading movement, that is, when the platform has been lowered off the vehicle.

A highly reliable operation of safety lock can thus be obtained. It is a further advantage that, in some cases, the power of pulling on is increased, because the hook hangs down in the situation concerned.

The invention will now be described in more detail with reference to the accompanying drawings, wherein

Figure 1 shows one example of a load handling system in accordance with the invention in different positions, and

Figure 2 shows the frame part and the hook part of the hook as detached from each other,

Figure 3 shows one embodiment of the invention with the hook part in two different positions, and

Figure 4 shows a second embodiment of the invention.

Fig. 1 shows the loading device in different positions. The loading device itself, with the exception of the grasping hook and of the frame part of the hook, is known in itself, e.g. it is similar to that described in Finnish Patent No. 63,350. The loading device comprises a rear frame 2, which pivots around a rearmost transverse articulation shaft 1, a middle frame 4, which is attached to the front end of the rear frame and is pivotable around a transverse articulation shaft 3, and an L-shaped piece 6, which is attached to the front end of the middle frame and is pivotable around a transverse articulation shaft 5. The articulation shaft 5 is fitted at the rear end of the horizontal arm 7 of the L-piece 6. The displacing of the parts around the articulated joints 1, 3 and 5 takes place by means of actuators, i.e. hydraulic cylinder-piston devices 8 and 9. The upper end of the vertical arm 10 of the L-piece is provided with a grasping hook 11.

The loading of an exchange platform 13 resting on the ground 12 onto a vehicle takes place so that the middle frame 4 with the L-piece 6 is pivoted around the shaft 3 rearwards, and the grasping hook 11 is fitted into the grasping loop or hook bar 14 placed at the upper part of the front edge of the platform 13. Hereupon the middle frame with the L-piece is pivoted back to the front. The path of movement of the grasping hook is denoted with the dashed-dotted line 15. At the front end of the path of movement there is a horizontal part, which is achieved by pivoting the L-piece around the shaft 5. The lowering of the platform off the vehicle onto the ground takes place in the reversed sequence.

In Fig. 1, by means of the L-piece placed at the top in the figure, a dumping position is also shown, wherein the rear frame 2 and the middle frame 4 of the loading device are locked rigidly as extensions of one another.

In the equipment in accordance with the invention, the grasping hook 11 consists of a hook frame 16 and of a tip, i.e. the hook part 18 itself, attached to the hook frame as pivotable around a transverse articulated joint 17. As is seen from Fig. 1, when the L-piece pivots, the hook part 18 can pivot relative the hook frame by means of the articulated joint 17 rearwards and downwards by the effect of its own weight and/or of the weight of the exchange platform suspended on the hook. The hook frame 16 is attached rigidly, e.g. by means of two bolts, to the vertical arm 10 of the L-piece, or it may also be made of one piece with the vertical arm.

The more detailed constructions of the hook frame 16 and of the hook part 18 is seen out from Fig. 2. In the front part of the upper end of the hook frame 16 there is a hole 19 for an articulation pin. Behind the articulation point 19, there is a projection 24 on the hook frame. The hook part 18 consists of a massive tip part 21 and of two side plates 22 attached to the sides of the tip part. The space between the side

plates is free. At the upper end of the front part of the hook part 18 there is a corresponding hole 23, through which the articulation pin to be attached to the hole 19 in the hook frame is fitted. After the hook part 18 has been pivoted around its articulated joint rearwards and downwards, the projection 24 on the hook frame 16 is positioned between the side plates 22 of the hook facing the open gap in the hook, thereby closing the gap. Thereby the grasping loop on the platform remains stationary in the gap. This safety-lock area is denoted with the arc 25 in Fig. 2.

In the final stage of lowering, the L-piece 6 and the hook frame 16 have been pivoted upside down (the position shown at the extreme right in Fig. 1). In such a case the hook frame 16 has been pivoted relative the hook part 18, which hangs down free, so that the projection 24 leaves the gap in the hook open and the hook can be detached from the hook bar 14 on the platform.

At both of the extreme positions of the hook it is possible to provide limiters of the movement, said limiters permitting movement of the hook within a certain sector alone. Between the hook part 18 and the hook frame 16 a spring may be attached, which pushes the hook part towards the open position when the load of a weight does not act upon the hook. This facilitates the attaching to, and detaching from, the platform. The spring force is adequate to push an unloaded hook to an opened extreme position, but it is not strong enough to displace a loaded hook.

Such an embodiment is shown in Fig. 3, wherein a hook provided with a gas spring 25 is shown. The hook frame 16 consists of two side plates, between which there are both the hook part 18 and the spring 25. The projections 24 are fitted in the side plates of the hook frame 16.

The hook part 18 may also be provided with positively controlled movements by means of a hydraulic or pneumatic cylinder. Such an actuator may be arranged to pivot the hook either during the entire transfer movement or, alternatively, during part of the time, in which latter case a part of the movement of the hook takes place by the effect of gravity.

The pivoting of the hook may also be guided by means of the groove-pin combination shown in Fig. 4. In the side plate of the hook frame 16 there is a V-shaped recess or groove 26, into which the two pins 27 provided on the hook part 18 fit. This arrangement guarantees that the hook part is always turned to the open position when the force acting upon it is parallel to the hook frame 16.

Of course, such a guide groove may also be arranged in the opposite way, i.e. by fitting the groove in the hook part and the pins on the frame part. Besides being V-shaped, the shape of the groove may also be curved. In such a case the pins can be substituted for by a curved ridge fitting into the curved groove.

As the guide means it is also possible to use various linkage mechanisms, on which the hook is suspended. In such a case the hook is not pivoted around one pivot shaft 17 alone.

In the embodiment shown in Fig. 1, horizontal shifting of the load is produced by pivoting the L-piece 6 around the shaft 5. A corresponding movement of transfer can also be accomplished by shifting the L-piece telescopically in relation to the middle frame 4.

Besides being fixed to the hook frame stationarily, the safety-lock plate itself may also be pivoting, e.g., by means of gravity or by means of an actuator. In any case, it is essential that, when the hook part 18 pivots around the shaft 17, at the same time it pivots relative the safety lock.

When the tip part 18 of the hook is pivoting, the arm 10 of the hook may also be made longer. In such a case, when the platform is engaged, the middle frame 4 does not have to be pivoted equally far towards the rear as in the prior-art equipment in use at present, and the pulling-on power is higher at the beginning of the lifting movement.

When the arm of the hook is longer, by means of the same device it is possible to handle platforms with different grasping levels. The provisions applicable in different countries in respect of the height of the grasping loop show a great deal of variation.

Above, the words front end / rear end, upper end / lower end, and vertical part / horizontal part have been used. These phrases refer to the positions of the parts concerned in the transportation position of the loading device, i.e. to the position of the L-piece shown at the extreme left in Fig. 1.

The closed position of the hook means such a position wherein the projection of the hook frame closes the gap of the hook part so that the open gap between the projection and the hook part is smaller than the thickness of the grasping loop on the cargo space. In a corresponding way, the open position of the hook refers to a position wherein this open gap is larger than the thickness of the grasping loop.

Claims

1. A method for the transfer of cargo space (13) onto and off a vehicle, wherein a loading device is used which includes a pivotally mounted L-shaped piece (6) having first and second arms (7, 10), the free end of the second arm (10) being provided with a grasping hook (11), and an end of the first arm (7) or or an extension (4) of said first arm being provided with a transverse pivot shaft (3), around which the first arm or the extension is pivoted by means of an actuator (8), and the grasping hook (11) being pivotable around a transverse shaft (17) relative to the second arm (10) during



plates is free. At the upper end of the front part of the hook part 18 there is a corresponding hole 23, through which the articulation pin to be attached to the hole 19 in the hook frame is fitted. After the hook part 18 has been pivoted around its articulated joint rearwards and downwards, the projection 24 on the hook frame 16 is positioned between the side plates 22 of the hook facing the open gap in the hook, thereby closing the gap. Thereby the grasping loop on the platform remains stationary in the gap. This safety-lock area is denoted with the arc 25 in Fig. 2.

In the final stage of lowering, the L-piece 6 and the hook frame 16 have been pivoted upside down (the position shown at the extreme right in Fig. 1). In such a case the hook frame 16 has been pivoted relative the hook part 18, which hangs down free, so that the projection 24 leaves the gap in the hook open and the hook can be detached from the hook bar 14 on the platform.

At both of the extreme positions of the hook it is possible to provide limiters of the movement, said limiters permitting movement of the hook within a certain sector alone. Between the hook part 18 and the hook frame 16 a spring may be attached, which pushes the hook part towards the open position when the load of a weight does not act upon the hook. This facilitates the attaching to, and detaching from, the platform. The spring force is adequate to push an unloaded hook to an opened extreme position, but it is not strong enough to displace a loaded hook.

Such an embodiment is shown in Fig. 3, wherein a hook provided with a gas spring 25 is shown. The hook frame 16 consists of two side plates, between which there are both the hook part 18 and the spring 25. The projections 24 are fitted in the side plates of the hook frame 16.

The hook part 18 may also be provided with positively controlled movements by means of a hydraulic or pneumatic cylinder. Such an actuator may be arranged to pivot the hook either during the entire transfer movement or, alternatively, during part of the time, in which latter case a part of the movement of the hook takes place by the effect of gravity.

The pivoting of the hook may also be guided by means of the groove-pin combination shown in Fig. 4. In the side plate of the hook frame 16 there is a V-shaped recess or groove 26, into which the two pins 27 provided on the hook part 18 fit. This arrangement guarantees that the hook part is always turned to the open position when the force acting upon it is parallel to the hook frame 16.

Of course, such a guide groove may also be arranged in the opposite way, i.e. by fitting the groove in the hook part and the pins on the frame part. Besides being V-shaped, the shape of the groove may also be curved. In such a case the pins can be substituted for by a curved ridge fitting into the curved groove.

As the guide means it is also possible to use various linkage mechanisms, on which the hook is suspended. In such a case the hook is not pivoted around one pivot shaft 17 alone.

In the embodiment shown in Fig. 1, horizontal shifting of the load is produced by pivoting the L-piece 6 around the shaft 5. A corresponding movement of transfer can also be accomplished by shifting the L-piece telescopically in relation to the middle frame 4.

Besides being fixed to the hook frame stationarily, the safety-lock plate itself may also be pivoting, e.g., by means of gravity or by means of an actuator. In any case, it is essential that, when the hook part 18 pivots around the shaft 17, at the same time it pivots relative the safety lock.

When the tip part 18 of the hook is pivoting, the arm 10 of the hook may also be made longer. In such a case, when the platform is engaged, the middle frame 4 does not have to be pivoted equally far towards the rear as in the prior-art equipment in use at present, and the pulling-on power is higher at the beginning of the lifting movement.

When the arm of the hook is longer, by means of the same device it is possible to handle platforms with different grasping levels. The provisions applicable in different countries in respect of the height of the grasping loop show a great deal of variation.

Above, the words front end / rear end, upper end / lower end, and vertical part / horizontal part have been used. These phrases refer to the positions of the parts concerned in the transportation position of the loading device, i.e. to the position of the L-piece shown at the extreme left in Fig. 1.

The closed position of the hook means such a position wherein the projection of the hook frame closes the gap of the hook part so that the open gap between the projection and the hook part is smaller than the thickness of the grasping loop on the cargo space. In a corresponding way, the open position of the hook refers to a position wherein this open gap is larger than the thickness of the grasping loop.

Claims

1. A method for the transfer of cargo space (13) onto and off a vehicle, wherein a loading device is used which includes a pivotally mounted L-shaped piece (6) having first and second arms (7, 10), the free end of the second arm (10) being provided with a grasping hook (11), and an end of the first arm (7) or or an extension (4) of said first arm being provided with a transverse pivot shaft (3), around which the first arm or the extension is pivoted by means of an actuator (8), and the grasping hook (11) being pivotable around a transverse shaft (17) relative to the second arm (10) during



- transfer of the cargo space (13), characterised in that the second arm (10) or an extension thereof is provided with a projection (24), in relation to which the grasping hook (11) moves when it pivots relative to the second arm (10), whereby, at a certain position of the grasping hook (11), the projection (24) is positioned at least partly in front of the open gap of the grasping hook (11) and, when the grasping hook (11) has been pivoted away from this position, said projection allows the open gap in the hook to remain at least substantially open.
2. Method as claimed in claim 1, characterised in that the grasping hook (11) pivots during the movement of transfer of the cargo space by the effect of its own weight and/or by the effect of the force applied by the weight of the cargo space (13) to the grasping hook (11).
 3. Method as claimed in claim 1, characterised in that the grasping hook (11) is pivoted during the movement of transfer of the cargo space (13) by means an actuator (25).
 4. Equipment for the transfer of a cargo space (13) onto a vehicle and off the vehicle, said equipment including an L-shaped piece (6), at which a grasping hook (11) is provided at the upper end of the vertical arm (10) of the L-shaped piece and a transverse pivot shaft (3) is provided at the rear end of the horizontal arm (7) of the L-shaped piece or of its extension (4), whereby the L-shaped piece can be pivoted around said pivot shaft by means of an actuator (8), and whereby the grasping hook (11) can be pivoted around a transverse shaft (17) relative the vertical arm (10) of the L-shaped piece (6) during movement of transfer of the cargo space (13), characterised in that the vertical arm (10) or an extension (16) of the vertical arm of the L-shaped piece (6) is provided with a projection (24), which is, at a certain position of the grasping hook (11), positioned at least partly in front of the open gap of the grasping hook (11) and, when the grasping hook (11) has been pivoted away from this position, the projection allows the open gap in the hook to remain at least substantially open.
 5. Equipment as claimed in claim 4, characterised in that the projection (24) on the vertical arm (10) or on an extension (16) of the vertical arm of the L-shaped piece (6) is positioned at least partly in front of the open gap of the grasping hook (11) when the vertical arm (10) or the L-shaped piece (6) is in the transportation position, and allows the gap of the grasping hook to remain at least substantially open when the L-shaped piece (6) has been pivoted rearwards and the upper end of its vertical arm (10) has been pivoted downwards for the purpose of grasping the cargo space (13) and for the purpose of detaching from the cargo space.
 6. Equipment as claimed in claim 5, characterised in that the projection (24) on the vertical arm (10) or on the extension (16) of the vertical arm of the L-shaped piece (6) projects rearwards and upwards from the transverse shaft (17) between the vertical arm (10) or its extension (16) and the grasping hook (11) when the vertical arm (10) of the L-shaped piece (6) is in a vertical position with the grasping hook (11) up.
 7. Equipment for transferring cargo space according to claim 1, wherein said transverse shaft (17) is a pivot shaft around which said hook (11) pivots relative to both said projection (24) and said second arm (10).
 8. Equipment as claimed in claim 4, in which equipment the projection (24) is pivotable in relation to the hook part (18) of the grasping hook (11), the transverse shaft (17) between the hook part (18) and the projection being positioned in that leg of the hook part which is joined to the vertical arm (10) or to the extension (16) of the vertical arm and in relation to the projection (24) in such a way that in the open position, the point of the projection is below the pivoting shaft (17), characterised in that the hook part (18) of the grasping hook is pivotable only simultaneously in relation both to the vertical arm (10) of the L-shaped piece (6) and to the projection (24) in the vertical arm (10) or in the extension (16) of the vertical arm.

Patentansprüche

1. Verfahren zum Transfer von Frachtraum (13) auf ein oder von einem Fahrzeug, bei dem ein Frachtgerät verwendet wird, mit einem schwenkbar befestigten L-förmiges Stück (6) mit ersten und zweiten Armen (7, 10), wobei das freie Ende des zweiten Armes (10) mit einem Greifhaken (11) versehen ist und ein Ende des ersten Armes (7) oder einer Verlängerung (4) des ersten Armes mit einer transversen Schwenkachse (3) versehen ist, um welche der erste Arm oder die Verlängerung durch Betätigungsmittel (8) geschwenkt wird, und mit dem Greifhaken (11) der während des Transfers des Frachtraumes (13) relativ zu dem zweiten Arm (10) um eine transverse Achse (17) schwenkbar ist, dadurch gekennzeichnet, daß der zweite Arm



- (10) oder eine Verlängerung davon mit einem Ansatz (24) versehen ist, zu welchem der Greifhaken (11) sich relativ bewegt, wenn er relativ zu dem zweiten Arm (10) schwenkt, wobei in einer bestimmten Position des Greifhakens (11) der Ansatz (24) mindestens teilweise vor dem offenen Spalt des Greifhakens (11) positioniert ist und, wenn der Greifhaken (11) aus dieser Position herausgeschwenkt ist, den offenen Spalt in dem Haken im wesentlichen offen läßt.
2. Verfahren nach Anspruch 1, dadurch gekennzeichnet, daß der Greifhaken (11) während der Transferbewegung des Frachtraumes durch die Wirkung seines eigenen Gewichtes und/oder durch die Wirkung der durch das Gewicht des Frachtraumes (13) auf den Greifhaken (11) einwirkenden Kraft schwenkt.
3. Verfahren nach Anspruch 1, dadurch gekennzeichnet, daß der Greifhaken (11) während der Transferbewegung des Frachtraumes (13) durch Betätigungsmittel (25) geschwenkt wird.
4. Ausrüstung für den Transfer von Frachtraum (13) auf ein Fahrzeug und von einem Fahrzeug, mit einem L-förmigen Stück (6), an welchem ein Greifhaken (11) an dem oberen Ende des vertikalen Armes (10) des L-förmigen Stückes vorgesehen ist und eine transverse Schwenkachse (3) an dem hinteren Ende des horizontalen Armes (7) des L-förmigen Stückes oder seiner Verlängerung (4) vorgesehen ist, wobei das L-förmige Stück um die Schwenkachse durch Betätigungsmittel (8) geschwenkt werden kann und wobei der Greifhaken (11) während der Transferbewegung des Frachtraumes (13) relativ zu dem vertikalen Arm (10) des L-förmigen Stückes (6) um eine transverse Achse (17) geschwenkt werden kann, dadurch gekennzeichnet, daß der vertikale Arm (10) oder eine Verlängerung (16) des vertikalen Armes des L-förmigen Stückes (6) mit einem Ansatz (24) versehen ist, welcher in einer bestimmten Position des Greifhakens (11) mindestens teilweise vor dem offenen Spalt des Greifhakens positioniert ist, und, wenn der Greifhaken (11) aus dieser Position herausgeschwenkt ist, den offenen Spalt in dem Haken im wesentlichen offen läßt.
5. Ausrüstung nach Anspruch 4, dadurch gekennzeichnet, daß der Ansatz (24) an dem vertikalen Arm (10) oder an einer Verlängerung (16) des vertikalen Armes des L-förmigen Stückes (6) mindestens teilweise vor dem offenen Spalt des Greifhakens (11) positioniert ist, wenn der vertikale Arm (10) des L-förmigen Stückes (6) in der Transportposition ist, und den Spalt des Greifhakens im wesentlichen offen läßt, wenn das L-förmige Stück (6) rückwärts geschwenkt hat und das obere Ende seines vertikalen Armes (10) abwärts geschwenkt wurde, um den Frachtraum zu Greifen oder zum Lösen von dem Frachtraum.
6. Ausrüstung nach Anspruch 5, dadurch gekennzeichnet, daß der Ansatz (24) des vertikalen Armes (10) oder der Verlängerung (16) des vertikalen Armes des L-förmigen Stückes (6) sich rückwärts und aufwärts von der transversen Achse (17) zwischen dem vertikalen Arm (10) oder seiner Verlängerung (16) und dem Greifhaken (11) erstreckt, wenn der vertikale Arm (10) des L-förmigen Stückes (6) in einer vertikalen Position mit angehobenem Greifhaken ist.
7. Ausrüstung zum Transfer von Frachtraum nach Anspruch 1, bei dem die transverse Achse (17) eine Schwenkachse ist, um welche der Haken (11) relativ zu dem Ansatz (24) und dem zweiten Arm (10) schwenkt.
8. Ausrüstung nach Anspruch 4, bei welcher der Ansatz (24) relativ zu dem Hakenteil (18) des Greifhakens (11) schwenkbar ist, die transverse Achse (17) zwischen dem Hakenteil (18) und dem Ansatz an dem Schenkel des Hakenteiles positioniert ist, welcher mit dem vertikalen Arm (10) oder der Verlängerung (16) des vertikalen Armes und relativ zu dem Ansatz (24) derart verbunden ist, daß in der geöffneten Position der Punkt des Ansatzes unterhalb der Schwenkachse (17) ist, dadurch gekennzeichnet, daß der Hakenteil (18) des Greifhakens nur gleichzeitig relativ zu dem vertikalen Arm (10) des L-förmigen Stückes (6) und zu dem Ansatz (24) an dem vertikalen Arm (10) oder an der Verlängerung (16) des vertikalen Armes schwenkbar ist.
- ### Revendications
1. Procédé pour le transfert d'un espace de chargement (13) sur et d'un véhicule, dans lequel un dispositif de chargement est utilisé qui comprend une pièce (6) configurée en L montée de façon pivotante possédant des premier et deuxième bras (7, 10), l'extrémité libre du deuxième bras (10) étant pourvue d'un crochet de saisie (11), et une extrémité du premier bras (7) ou une extension (4) dudit premier bras étant pourvue d'un boulon d'articulation transversal (3) autour duquel le premier bras ou l'extension pivote au moyen d'un actionneur (8), et le crochet de saisie (11) pouvant pivoter autour d'un arbre transversal (17) relative-



- ment au deuxième bras (10) pendant le transfert de l'espace de chargement (13), caractérisé en ce que le deuxième bras (10) ou une extension de celui-ci est pourvu d'une saillie (24), relativement à laquelle se déplace le crochet de saisie (11) lorsqu'il pivote relativement au deuxième bras (10), par quoi, à une certaine position du crochet de saisie (11), la saillie (24) est positionnée au moins partiellement devant l'espace ouvert du crochet de saisie (11) et, lorsque le crochet de saisie (11) a été pivoté au loin de cette position, ladite saillie permet que l'espace ouvert dans le crochet reste au moins sensiblement ouverte.
2. Procédé selon la revendication 1, caractérisé en ce que le crochet de saisie (11) pivote pendant le mouvement de transfert de l'espace de chargement sous l'effet de son propre poids et/ou sous l'effet de la force appliquée par le poids de l'espace de chargement (13) au crochet de saisie (11).
3. Procédé selon la revendication 1, caractérisé en ce qu'on fait pivoter le crochet de saisie (11) pendant le mouvement de transfert de l'espace de chargement (13) au moyen d'un actionneur (25).
4. Equipement pour le transfert d'un espace de chargement (13) sur un véhicule et d'un véhicule, ledit équipement comprenant une pièce en forme de L (6) à laquelle un crochet de saisie (11) est prévu à l'extrémité supérieure du bras vertical (10) de la pièce en forme de L, et un boulon d'articulation transversal (3) est prévu à l'extrémité arrière du bras horizontal (7) de la pièce en forme de L ou de son extension (4), par quoi on peut faire pivoter la pièce en forme de L autour dudit boulon d'articulation au moyen d'un actionneur (8), et par quoi on peut faire pivoter le crochet de saisie (11) autour d'un arbre transversal (17) relativement au bras vertical (10) de la pièce en forme de L (6) pendant le mouvement de transfert de l'espace de chargement (13), caractérisé en ce que le bras vertical (10) ou une extension (16) du bras vertical de la pièce (6) en forme de L est pourvu d'une saillie (24) qui est positionnée, à une certaine position du crochet de saisie (11), au moins partiellement devant l'espace ouvert du crochet de saisie (11) et, lorsqu'on a fait pivoter le crochet de saisie (11) au loin de cette position, la saillie permet que l'espace ouvert dans le crochet reste au moins sensiblement ouvert.
5. Equipement selon la revendication 4, caractérisé en ce que la saillie (24) sur le bras vertical (10) ou une extension (16) du bras vertical de la pièce (6) en forme de L est positionnée au moins partiellement devant l'espace ouvert du crochet de saillie (11) lorsque le bras vertical (10) de la pièce en forme de L (6) est dans la position de transport, et permet que l'espace du crochet de saisie reste au moins sensiblement ouvert lorsque la pièce en forme de L (6) a été pivotée vers l'arrière et que l'extrémité supérieure de son bras vertical (10) a été pivotée vers le bas afin de saisir l'espace de chargement (13) et afin de se détacher de l'espace de chargement.
6. Equipement selon la revendication 5, caractérisé en ce que la saillie (24) sur le bras vertical (10) ou une extension (16) du bras vertical de la pièce en forme de L (6) fait saillie vers l'arrière et vers le haut depuis l'arbre transversal (17) entre le bras vertical (10) ou son extension (16) et le crochet de saisie (11) lorsque le bras vertical (10) de la pièce en forme de L (6) est dans une position verticale avec le crochet de saisie (11) en haut.
7. Equipement pour transférer un espace de chargement selon la revendication 1, dans lequel ledit arbre transversal (17) est un boulon d'articulation autour duquel ledit crochet (11) pivote à la fois relativement à ladite saillie (24) et audit deuxième bras (10).
8. Equipement selon la revendication 4, dans lequel la saillie (24) peut pivoter relativement à la partie de crochet (18) du crochet de saisie (11), l'arbre transversal (17) entre la partie de crochet (18) et la saillie étant positionné dans cette branche de la partie de crochet qui est reliée au bras vertical (10) ou à l'extension (16) du bras vertical et en relation à la saillie (24) de telle manière que dans la position ouverte, le point de saillie se situe en-dessous du boulon d'articulation (17), caractérisé en ce que la partie de crochet (18) du crochet de saisie peut pivoter seulement simultanément à la fois en relation au bras vertical (10) de la pièce (6) en forme de L et à la saillie (24) dans le bras vertical (10) ou dans l'extension (16) du bras vertical.