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(54) Title: HEAVY DUTY LIFT BED TRAILER

(57) Abstract

A heavy duty lift bed trailer (20) adapted for implant or highway use to transport high tonnage loads (C) on pallet frame units (26) which can be picked up or dropped off quickly without the need for additional equipment or personnel. The trailer may be coupled to a tractor vehicle (21) by means of a fixed gooseneck (23) built to a conventional fifth wheel height. It includes a plurality of centrally located hinge panels (68, 69, 70) pivotally connected between the main frame (31) and the lift bed (59) for constraining the latter to move in parallel relation to the frame between a lowered loading position and a raised transport position; an improved lift bed locking mechanism (90) for transport; a heavy duty suspension (32) adapted to equalize the load on each axle (44, 45, 46); and is capable of handling eccentric as well as laterally centered loads.
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TITLE: HEAVY DUTY LIFT BED TRAILER

DESCRIPTION OF THE INVENTION

1. Technical Field
The present invention relates to heavy duty lift bed trailers adapted for transporting high tonnage loads on pallet frame units capable of being picked up or dropped off quickly without waiting for additional handling equipment or personnel. The combined use of lift bed trailer and detachable pallet frame units thus serves to maximize the availability of the trailer for transport rather than storage or demurrage.

2. Background Art
This invention represents an improvement over those disclosed in prior U.S. patent Nos. 4,061,353 and 4,060,145 issued on the applications of Kingman et al. In addition to the above patents, the following prior U.S. patents may be considered useful in connection with the searching and examination of this application:

2,395,640 - Pearson
3,362,552 - Thiele
3,784,162 - Channell et al.
3,809,268 - Lutz

3. Disclosure of Invention
One object of the invention is to provide a heavy duty lift bed trailer adapted to be coupled to a tractor vehicle and capable of
handling and transporting loads up to 60 tons mounted on pallet frame units either symmetrically or eccentrically with respect to the fore and aft axial plane of the trailer.

Another object is to provide a heavy duty lift bed trailer of the character set forth above adapted to be coupled to a tractor by means of a fixed gooseneck built to any one of several conventional fifth wheel heights.

A further object is to provide a lift bed trailer of the foregoing type having a combined positive stop and locking mechanism for securing the lift bed in raised transport position.

Another object of the invention is to provide a lift bed trailer of the above noted type wherein the lifting and locking mechanisms are protectively housed within a protected central area of the main frame and lift bed.

Still another object is to provide a lift bed trailer of the foregoing character having a plurality of axles and a suspension adapted to equalize the load on each axle.

Other objects and advantages will become apparent as the following description proceeds, taken together with the accompanying drawings, in which:

4. Brief Description of the Drawings

Figure 1 is a side elevational view of an illustrative lift bed trailer exemplifying the present invention with the lift bed in lowered position and a loaded ground supported pallet straddling same.
Fig. 2 is a side elevational view of the illustrative trailer with the lift bed in raised position holding the loaded pallet with its leg assembly clear of the ground for transport.

Fig. 3 is a plan view of the illustrative trailer as shown in Fig. 1 with the pallet frame indicated in dot-dash outline and a rearward portion of the lift bed broken away to facilitate illustration of the underlying structure.

Fig. 4 is a transverse sectional view through the trailer taken in the plane of the line 4-4 in Fig. 1.

Fig. 5 is a transverse sectional view through the trailer taken in the plane of the line 5-5 in Fig. 2.

Fig. 6 is an enlarged, fragmentary perspective view of the structure of the central hinge panel, locking mechanism, and fluid actuator lifting mechanism, with the lift bed in partially raised condition.

Fig. 7 is a further enlarged, fragmentary vertical sectional view taken in the fore and aft axial plane of the trailer as indicated by the line 7-7 in Fig. 6.

Fig. 8 is an enlarged vertical sectional view similar to Fig. 7 but showing the hinge panel and locking mechanism with the lift bed in fully raised and locked condition for transport.

Fig. 9 is an enlarged fragmentary side elevational view of the trailer suspension
structure with the wheels indicated in dot-dash outline.

Figs. 10 and 11 are transverse vertical sectional views taken respectively in the planes of the lines 10-10 and 11-11 in Fig. 9 to a slightly smaller scale.

5. Best Mode of Carrying Out the Invention

While the invention is susceptible of various modifications and alternative constructions, a certain illustrative embodiment has been shown in the drawings and will be described below in considerable detail. It should be understood, however, that there is no intention to limit the invention to the specific form described but, on the contrary, the intention is to cover all modifications, alternative constructions and equivalents falling within the scope of the appended claims.

Referring more specifically to Figs. 1 and 2, the invention is there exemplified in an illustrative heavy duty lift bed trailer 20 coupled to a tractor 21 by means of the usual fifth wheel connection. In this instance, the tractor fifth wheel 22 happens to have a conventional height of 48 inches above the ground which is sufficient to hold the trailer approximately level. Prior to coupling to the tractor, the trailer 20 is stored on landing legs 24 and landing leg blocks 25 which hold the lower face of the gooseneck 23 an inch or two less than 48 inches from the ground. The
tractor is then coupled by backing it under the gooseneck. The inclined face of the fifth wheel 22 thereby exerts sufficient camming action to raise the gooseneck to 48 inches and permit the depending pin of the gooseneck to be engaged by the fifth wheel.

The trailer 20 (Figs. 1, 2, 4 and 5) is adapted to transport loads through the use of one or more pallet frame units 26 each comprising a raised platform 28 with depending legs 29 terminating in a ground engaging skid 30. The pallet frame unit 26 may be loaded with two large steel coils C held in place by means of appropriate chocks and tie down bands. The loaded unit 26 is adapted to straddle the trailer which freely moves under the platform 28 during loading. The trailer next raises the unit 26 and its load clear of the ground for transport to a destination. It then lowers the unit 26 until the skids 30 rest on the ground, whereupon the trailer freely moves out from under the platform 28 and is ready for another trip.

The trailer 20 comprises a relatively long main frame 31 of structural steel which may, for example, be approximately 48 feet in length. The frame 31 is supported at its forward end by the gooseneck 23 which engages the tractor fifth wheel 22, and at its rearward end by means of a multiple axle wheeled suspension 32. In this instance, the main frame 31 is a weldment comprising four laterally spaced, longitudinal stringers in
the form of I-beams secured together by transverse struts 34 placed at intervals along their length. The two inside I-beams will be referred to as the inboard stringers 35, 36, while the two outside I-beams will be referred to as the outboard stringers 38, 39.

From the gooseneck 23 rearwardly to the suspension 32 (Fig. 3), the main frame is of uniform width which may, for example, be 87 inches. This major portion of the main frame contains all four I-beam stringers 35, 36, 38, 39. A short distance forward of the suspension 32, the two outboard stringers 38, 39 terminate and are connected to the inboard stringers by appropriate transverse end channels 40, 41. The two inboard stringers 35, 36 continue on and terminate at an end channel 42 at the rear of the trailer. The rearward extension of the main frame 31 defined by the inboard stringers and the end channel 42 connects with the suspension 32 and nests between the wheels on either side.

In order to make certain that the exceptionally heavy load carried by the trailer 20 will be distributed equally on each axle of the suspension 32, the latter is attached to the main frame on a single transverse axis 43 passing through the rearwardly extended inboard frame stringers 35, 36 (Figs. 9-11). In the present instance, the suspension 32 has three axles 44, 45, 46, each journaling a pair of large tie bars 49 spaced laterally from each other and journaled on the axis 43 just inside.
the inboard frame stringers 35, 36. Each tie bar 49 has the general form of an inverted V with its rearward arm 50 extending about twice the length of its forward arm 51. The rearward arm 50 is connected to the rearmost axle 46 as by means of an axle bracket 52 welded or otherwise fixed to the axle. The bracket 52 terminates in a clevis pivotally attached to the end of the rearward arm 50. The forward arm 51 of the tie bar terminates in a pivotal connection 53 with an equalizer bar 54. At its opposite ends, the equalizer bar 54 is pivotally attached to the respective clevises of axle brackets 55, 56, similar to the bracket 52, and welded or otherwise fixed to the forward and middle axles 44 and 45, respectively. By reason of this arrangement, the load on the suspension is spread equally on each of the three axles, thus enhancing chances of keeping each axle load within the legal limit.

To offset the reaction torque resulting from application of the trailer brakes, each of the axles is equipped with the customary torque rod 57 and torque rod bracket 58 (Figs. 3 and 9). Each torque rod 57 is pivotally connected to its associated bracket 58 and to the main frame to accommodate the vertical floating movement of the axles.

If a different suspension were used and each of the axles were to be connected directly to the main frame, the axle loading would be unequal. In such event, the forward axle 44 would carry the greatest load due to the
deflection characteristics of the main frame. In the case of a 60 ton load, for example, the load on the forward axle 44 could well exceed the legal limit.

A lift bed 59 (Figs. 1-6) is mounted in overlying relation with the main frame 31 and its width corresponds to the maximum width of the main frame. The lift bed is also fashioned as a weldment which comprises four longitudinal stringers in the form of I-beams which may be of somewhat lesser depth than those of the main frame. The inside I-beams are the inboard stringers 60, 61 and the outside I-beams are the outboard stringers 62, 64. The I-beams of the bed are joined together at intervals by appropriate transverse members and the spaces in between are preferably filled in with expanded metal grating or other appropriate decking 63. The forward end 65 of the lift bed 59 is undercut at an appropriate angle to nest against the inclined portion of the gooseneck 23 when the lift bed is in its lowered position. The rearward end portion 66 of the lift bed is tapered downwardly and inwardly to facilitate entry of the trailer beneath a pallet frame unit 26 during a loading operation.

For the purpose of enabling the trailer 20 to transport heavily loaded pallets weighing, for example, something on the order of 60 tons, with the center of gravity of the load either in the central fore and aft plane of the trailer or laterally offset therefrom, a
particularly rigid connecting means is provided between the main frame 31 and the lift bed 59 (Figs. 4-8). This is accomplished by the use of a plurality of massive hinge panels 68, 69, 70, each journaled on a pair of heavy cross shafts 71, 72 connected between the inboard stringers of the main frame and the lift bed, respectively. In the present instance, the trailer 20 has three hinge panels but it should be noted that in some applications two would be sufficient. The cross shafts 71, 72 may, for example, have diameters on the order of 5 1/2 and 4 1/2 inches, respectively.

The forward hinge panel 68 and the rearward hinge panel 70 (Figs. 1-5) are each fashioned as a unitary structure in the form of a generally flat box tapering slightly from its lower end toward its upper end. It is defined by a pair of spaced apart parallel bearing sleeves 74, 75, secured together by means of a pair of opposed end walls 76 and a pair of opposed side walls 78. The end walls 76 are formed of relatively heavy steel plate which may, for example, be about 1 1/4 inches thick. The side walls 78 are formed of somewhat thinner plate which may be on the order of 1/2 inch thick reinforced with diagonal stiffener ribs 79, 80, on the inside. The bearing sleeve 74 at the lower end of the hinge panel is journaled on the cross shaft 71 connected between the inboard stringers of the main frame. The bearing sleeve 75 at the upper end of the hinge panel is journaled on the
cross shaft 72 connected between the inboard stringers of the lift bed.

The central hinge panel 69 (Figs. 1-3, 6-8) is similar in construction to each of the panels 68 and 70 but differs in the configuration of its upper end portion. The latter is formed with a pair of relatively large notches 82 between the upper bearing sleeve 81 and the end walls 84 of the hinge panel for accommodating the upper ends of the piston rods 85 of fluid actuators 86. The end walls 84 in this area are reinforced with an extra thickness of plate on their inner faces. Additional internal stiffener ribs 88 and 89 are situated on the inner faces of the side walls to afford additional strength in the vicinity of the actuator connections.

For the purpose of safely maintaining the lift bed in raised transport position, locking mechanisms 90 may be utilized in association with one or more of the hinge panels 68, 69, 70 (Figs. 6-8). In the present instance, such mechanisms are operatively associated with the first and the central hinge panels 68, 69 (Figs. 1-3). Starting first with the locking mechanism 90 associated with the central hinge panel 69, it will be noted that the mechanism 90 comprises a pair of spaced apart upstanding brackets 91 which may be formed from heavy plate stock fixed respectively to the inboard sides of the inboard stringers 35, 36 of the main frame. The brackets 91 extend vertically above the main frame and into the space between
the inboard stringers of the lift bed. Each bracket 91 in the present instance happens to be substantially coplanar with an end wall of the hinge panel 69 and has an adjacent upright surface defining a stop abutment 92 for the hinge panel 69. Each pair of brackets 91 is also formed with aligned circular locking apertures 93 which may be located adjacent its upper end. The hinge panel 69 has a tube 94 fixed transversely of its side wall adjacent to the locking brackets. The tube 94 is welded or otherwise rigidly fixed in position and reinforced as by means of inclined gusset plates 95. The parts are so proportioned that when the hinge panel has moved through its top dead center position and slightly beyond by an angle on the order of about 1 to 2 degrees from vertical as indicated in Fig. 8, the tapered side wall of the hinge panel 69 will be in solid abutting relation with the stop abutments 92 and the bore of the tube 94 will be aligned axially with the apertures 93 in the locking brackets. At this point, a transverse locking pin 96 with a shoulder 98 on one end and a retaining clip 99 on the other end may be manually inserted through the aligned apertures 93 and the bore of the tube 94. This serves to lock the hinge panel 69, and thus the lift bed 59, positively in raised position and with no moment tending to urge the lift bed toward its lowered position.

To provide an appropriate factor of safety, a second locking mechanism 90 identical to the
one just described is mounted adjacent, and operatively associated with, the forward hinge panel 68. The second locking mechanism 90 is operated in unison with the first one and is adapted to receive a similar locking pin 96.

It will be appreciated from the foregoing that operation of the trailer 20 may be carried on in a simple, straightforward manner. Once coupled to the tractor 21, the trailer, with lift bed 59 lowered as shown in Fig. 1, may readily be backed under a heavily loaded pallet frame unit 26, the tapered rearward end portion 66 of the bed 59 facilitating entry under the pallet frame. With the trailer in approximately the position shown in Fig. 1, the lift bed may be raised by actuation of the fluid control lever 100 on the gooseneck which causes the piston rods of the fluid actuators 86 to extend. This, in turn, imposes a lifting thrust on the lift bed via the upper cross shaft 72 associated with the central hinge panel 69, raising the lift bed and the loaded pallet frame unit to transport position as indicated in Fig. 2. In this position, the forward and central hinge panels 68, 69 are in solid engagement with the stop abutments of their respective locking mechanisms and their locking tubes are in precise alignment with the locking apertures of the brackets 91. In the present instance, the operator manually inserts the transverse locking pin 96 through the apertures and locking tube of each locking mechanism, the retaining clip on each locking
pin serving to preclude its accidental withdrawal. The loaded trailer may then be transported to its destination and the foregoing sequence reversed to unlock the lift bed and loaded pallet, lower the latter to the ground, lower the lift bed until it rests upon the main frame as shown in Fig. 1, and drive the trailer out from under the loaded pallet.

It will be noted further that the configuration of the gooseneck 23 defines a flat deck space on its upper surface having a width equal to the maximum width of the main frame. This deck space may, if desired, be covered partially with expanded metal decking such as the decking 63 used on the lift bed. The gooseneck deck is particularly advantageous for certain in-plant operations in a steel mill. For example, the trailer may be loaded in the manner described above by backing it under two pallet frame units each loaded with steel plates stacked four to five inches above the pallet deck and then raising the lift bed and pallet units to transport position. With the trailer in this position, a steel plate as long as 60 feet may then be placed by appropriate overhead cranes on top of the loaded pallets with the forward end of the plate overhanging the gooseneck deck and the rearward portion of the plate overhanging the rearward end of the lift bed. The trailer thus loaded may then be driven to another destination in the plant and the 60 foot steel plate unloaded with the pallet units simply by lowering the lift bed and driving the
trailer out from under the combined load including the 60 foot steel plate which remains on the pallet units.

The trailer 20 is also well adapted to handle eccentric loads, by which is meant loads having their center of gravity offset laterally from the fore and aft axial plane of the trailer. Such loads can occur in a number of ways as, for example, by stacking steel plate on a pallet unit so as to overhang on one side but not on the other. They can also occur as a result of loading irregularly shaped scrap metal on a pallet unit, or by loading a hopper on a pallet unit where the hopper is filled in a lopsided manner with heavy material such as grinding dust. When such loads occur, the trailer has sufficient strength and rigidity in the lift bed, main frame, and hinge panel connections to handle them effectively.

6. Industrial Applicability

The heavy duty lift bed trailer of the present invention is adapted to transport high tonnage loads on the order of 60 tons, for example, on pallet frame units which permit quick separation of the load from the trailer. This equipment is applicable to heavy industrial operations such as steel mills for transport of such loads both in-plant and over-the-road.
I claim as my invention:

1. A heavy duty lift bed trailer adapted for use with a tractor vehicle having a fifth wheel connection, said trailer having a fore and aft axial plane disposed vertically thereof and comprising, in combination,
   (a) a main frame having a forward end and a rearward end;
   (b) a fixed gooseneck at said forward end adapted for engagement with the fifth wheel of the tractor vehicle;
   (c) a multiple axle wheeled suspension connected to said main frame on a single transverse axis adjacent said rearward end;
   (d) a lift bed mounted on said main frame in overlying relation with same;
   (e) power means interposed between said main frame and said lift bed for raising and lowering same;
   (f) a plurality of hinge panels pivotally connected between said main frame and said lift bed for constraining the latter to move in parallel relation to the frame; and
   (g) said hinge panels being centered on the fore and aft axial plane of said trailer.
2. A heavy duty lift bed trailer adapted for use with a tractor vehicle having a fifth wheel connection, said trailer having a fore and aft axial plane disposed vertically thereof and comprising, in combination,
   (a) a main frame having a forward end and a rearward end;
   (b) a fixed gooseneck at said forward end adapted for engagement with the fifth wheel of the tractor, said gooseneck defining a flat deck extending laterally the full width of the main frame;
   (c) a multiple axle wheeled suspension situated adjacent said rearward end;
   (d) a lift bed mounted on said main frame in overlying relation with same;
   (e) power means interposed between said main frame and said lift bed for raising and lowering same;
   (f) a plurality of hinge panels pivotally connected between said main frame and said lift bed for constraining the latter to move in substantially parallel relation to the frame; and
   (g) means for locking said lift bed and said hinge panels in a raised transport position.

3. The combination set forth in claim 2, wherein said hinge panels are centered on the fore and aft axial plane of said trailer.
4. A heavy duty lift bed trailer adapted for use with a tractor having a fifth wheel connection, said trailer comprising, in combination,

(a) a main frame having a pair of laterally spaced inboard longitudinal stringers;
(b) a gooseneck at said forward end adapted for engagement with the fifth wheel of the tractor;
(c) a multiple axle wheeled suspension situated adjacent said rearward end;
(d) a lift bed mounted on said main frame in overlying relation with same and having a pair of laterally spaced inboard longitudinal stringers;
(e) said lift bed inboard stringers overlying said inboard stringers of said main frame;
(f) power means interposed between said main frame and said lift bed for raising and lowering the latter;
(g) a plurality of hinge panels pivotally connected between said main frame and said lift bed for constraining the latter to move in substantially parallel relation to the frame;
(h) a first cross shaft extending transversely between said inboard stringers of said main frame and through the lower end portion of each said hinge panel; and
(i) a second cross shaft extending transversely between said inboard stringers of said lift bed and through the upper end portion of each said hinge panel.
5. The combination set forth in claim 4, wherein each said hinge panel is provided with a lower bearing sleeve journaled on said first cross shaft, and an upper bearing sleeve journaled on said second cross shaft.

6. In a heavy duty lift bed trailer for use with a tractor vehicle, the combination comprising:

(a) a main frame having a pair of laterally spaced inboard longitudinal stringers;

(b) a lift bed having a pair of laterally spaced inboard longitudinal stringers overlying those of said main frame;

(c) a plurality of hinge panels pivotally connected between said main frame and said lift bed for constraining the latter to move in parallel relation to said frame;

(d) each said hinge panel being disposed to pivot between a lowered position defined by engagement of said lift bed with said main frame, and a raised transport position slightly past dead center defined by a positive stop abutment fixed to said main frame;

(e) and means for locking said lift bed and said hinge panel in said raised transport position.
7. In a heavy duty lift bed trailer for use with a tractor vehicle, the combination comprising:
   (a) a main frame having a pair of laterally spaced inboard longitudinal stringers;
   (b) a lift bed having a pair of laterally spaced inboard longitudinal stringers overlying those of said main frame;
   (c) a plurality of hinge panels pivotally connected between said main frame and said lift bed for constraining the latter to move in parallel relation to said frame between a lowered loading position and a raised transport position;
   (d) a pair of spaced apart locking brackets fixed respectively to the inboard sides of said main frame inboard stringers adjacent one said hinge panel;
   (e) a stop abutment on each said locking bracket disposed in position to intercept said one hinge panel in an upper limit position slightly past dead center when said lift bed is in said raised transport position;
   (f) and means for locking said lift bed and said hinge panel in raised transport position.

8. The combination set forth in claim 7, wherein one pair of said spaced apart locking brackets with said stop abutments is operatively associated with each of two said hinge panels.
9. The combination set forth in claim 7, wherein said one hinge panel is tapered toward its upper end.

10. In a heavy duty lift bed trailer for use with a tractor vehicle, the combination comprising:
   (a) a main frame having a pair of laterally spaced inboard longitudinal stringers;
   (b) a lift bed having a pair of laterally spaced inboard longitudinal stringers overlying those of said main frame;
   (c) a plurality of hinge panels pivotally connected between said main frame and said lift bed for constraining the latter to move in parallel relation to said frame between a lowered loading position and a raised transport position;
   (d) a pair of spaced apart locking brackets fixed respectively to the inboard sides of said main frame inboard stringers adjacent one said hinge panel;
   (e) a stop abutment on each said locking bracket disposed in position to intercept said one hinge panel in an upper limit position slightly past dead center when said lift bed is in said raised transport position;
   (f) means defining a first locking aperture in each said locking bracket;
   (g) means defining a second locking aperture in said one hinge panel; and
   (h) a locking pin adapted to engage said first and second apertures for positively
securing said lift bed and said one hinge panel in raised transport position.

11. The combination set forth in claim 9, wherein at least two said hinge panels are operatively associated with a respective pair of locking brackets and stop abutments.

12. In a heavy duty lift bed trailer for use with a tractor vehicle, the combination comprising:

(a) a main frame having a pair of laterally spaced inboard longitudinal stringers;
(b) a lift bed having a pair of laterally spaced inboard longitudinal stringers overlying those of said main frame;
(c) a plurality of hinge panels pivotally connected between said main frame and said lift bed for constraining the latter to move in parallel relation to said frame between a lowered loading position and a raised transport position;
(d) a pair of spaced apart locking brackets fixed respectively to the inboard sides of said main frame inboard stringers adjacent one said hinge panel;
(e) a stop abutment on each said locking bracket disposed in position to intercept said one hinge panel in an upper limit position slightly past dead center when said lift bed is in said raised transport position;
(f) means defining a first locking aperture in each said locking bracket;
(g) a tubular member fixed to the side wall of said one hinge panel transversely thereof, said tubular member defining a second locking aperture adapted to register with said first locking apertures when said hinge panel engages said locking bracket stop abutments; and

(h) a locking pin adapted to engage said first and second apertures for positively securing said lift bed and said one hinge panel in raised transport position.

13. In a heavy duty lift bed trailer for use with a tractor vehicle, the combination comprising:

(a) a main frame having a pair of laterally spaced inboard longitudinal stringers;
(b) a lift bed having a pair of laterally spaced inboard longitudinal stringers overlying those of said main frame;
(c) a plurality of hinge panels pivotally connected between said main frame and said lift bed for constraining the latter to move in parallel relation to said frame between a lowered loading position and a raised transport position;
(d) a first cross shaft extending between said inboard stringers of said main frame and through the lower end portion of one said hinge panel;
(e) a second cross shaft extending between said inboard stringers of said lift bed and through the upper end portion of said one hinge panel;
(f) a third cross shaft extending between said inboard stringers of said main frame and spaced from said first cross shaft;

(g) a pair of laterally spaced fluid actuators pivotally connected respectively between said third cross shaft and said second cross shaft;

(h) and means for locking said lift bed and said hinge panel in said raised transport position.

14. The combination set forth in claim 13, wherein said one hinge panel is relieved at its upper end to accommodate the pivotal connections of said actuator to said second cross shaft.

15. The combination set forth in claim 13, wherein said locking means further comprises:

(i) a pair of spaced apart locking brackets fixed respectively to the inboard sides of said main frame inboard stringers adjacent said one hinge panel;

(j) a stop abutment on each said locking bracket disposed in position to intercept said one hinge panel in an upper limit position slightly past dead center when said lift bed is in said raised transport position;

(k) means defining a first locking aperture in each said locking bracket;

(l) means defining a second locking aperture in said one hinge panel; and
(m) a locking pin adapted to engage said first and second apertures for positively securing said lift bed and said one hinge panel in raised transport position.

16. The combination set forth in claim 15, wherein said means defining a second locking aperture comprises a tubular member fixed to the side wall of said one hinge panel transversely thereof, said tubular member defining a second locking aperture adapted to register with said first locking apertures when said hinge panel engages said locking bracket stop abutments.
# INTERNATIONAL SEARCH REPORT

**International Application No:** PCT/US81/00063

## I. CLASSIFICATION OF SUBJECT MATTER

According to International Patent Classification (IPC) or to both National Classification and IPC:

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## III. DOCUMENTS CONSIDERED TO BE RELEVANT

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<td>US, A, 4,060,145, Published 29 November 1977, Kingman et al.</td>
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<td>US, A, 3,809,268, Published 07 May 1974, Lutz.</td>
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**Special categories of cited documents:**

**A** document defining the general state of the art  
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## IV. CERTIFICATION

<table>
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<th>Date of Mailing of this International Search Report</th>
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<td>24 APR 1981</td>
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International Searching Authority: ISA/US  

Signatures of Authorized Officer: