United States Patent

Erlinder

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[54] LIFT HAVING SELF-FOLDING PLATFORM

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[21] Appl. No.: **53,872**

[52] **U.S. Cl.**.....**187/1,** 187/9, 187/95, 214/75 T

[51] **Int. Cl.**.....**B66b 9/00**

[58] **Field of Search**.....214/75 T, 75, 77 P, 85; 187/9, 187/95; 14/71, 72

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Assistant Examiner—Lawrence J. Oresky
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[57] **ABSTRACT**

A lift which contains a self-folding platform is disclosed. The rear of a truck may be equipped with the lift to provide a loading and unloading device as well as a tailgate for the truck.

6 Claims, 14 Drawing Figures

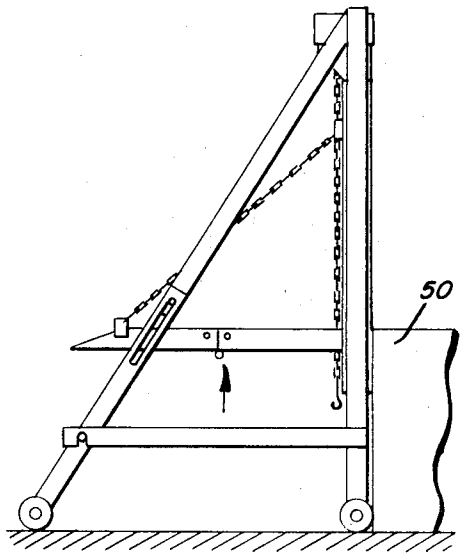


Fig. 1

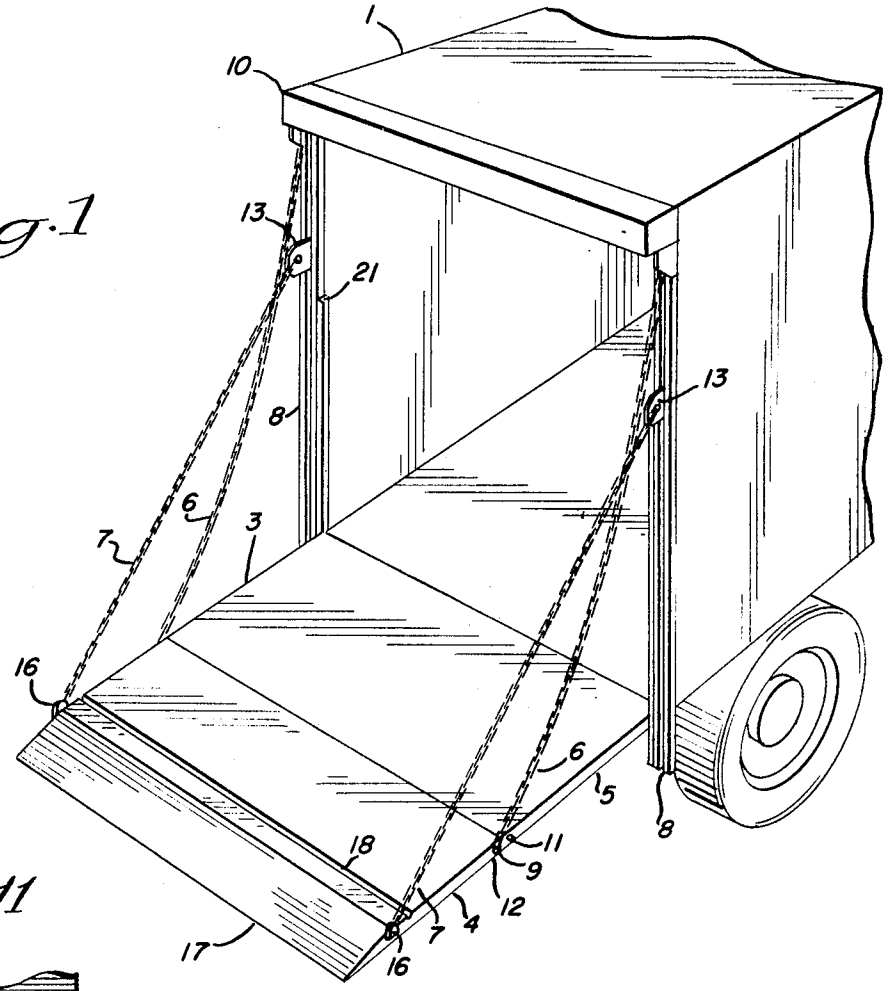
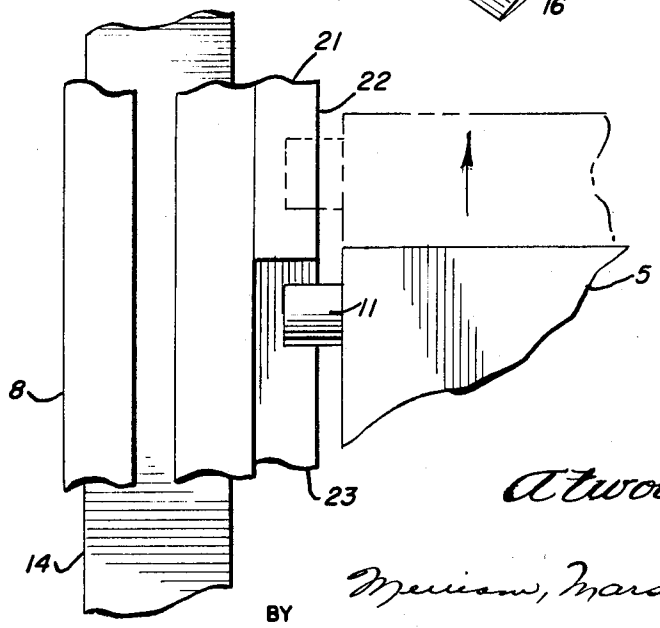


Fig. 11



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Fig. 2

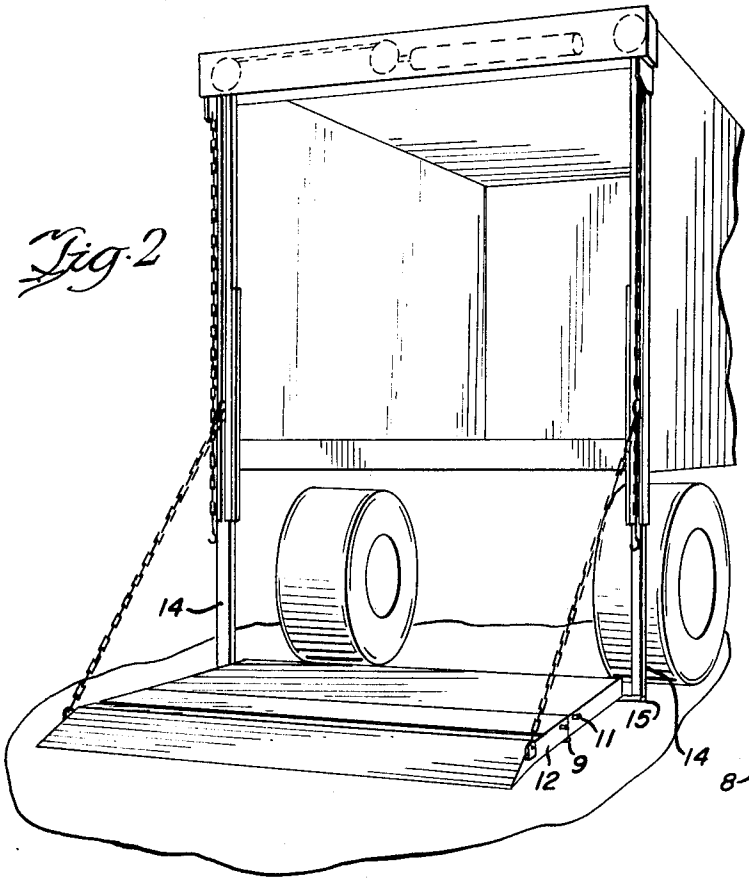


Fig. 9

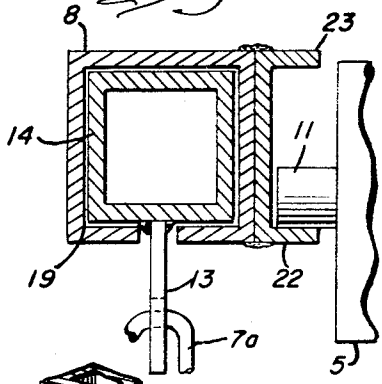


Fig. 10

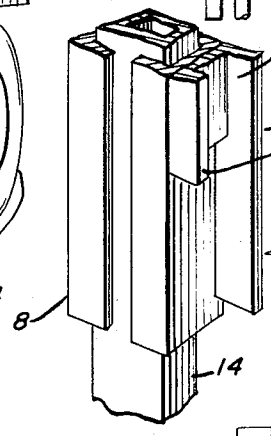


Fig. 8

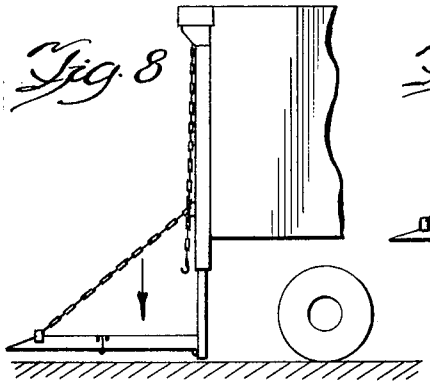


Fig. 7

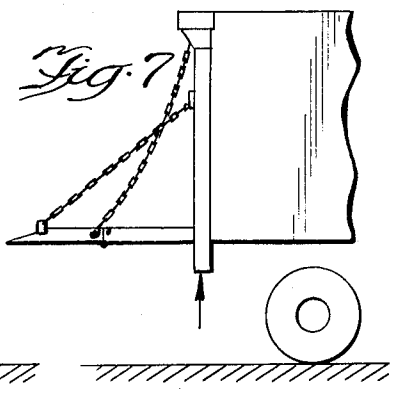


Fig. 6

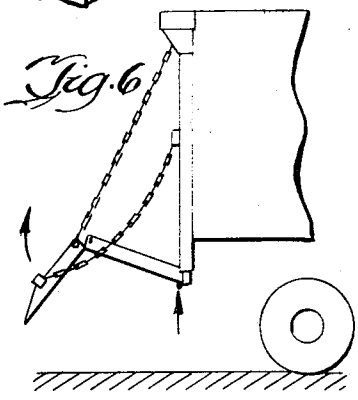


Fig. 5

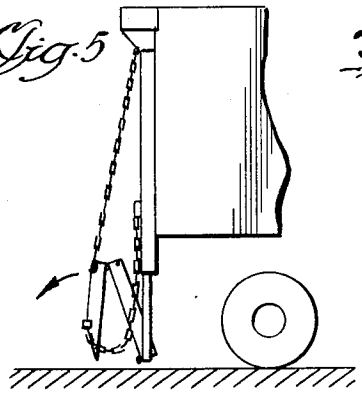


Fig. 4

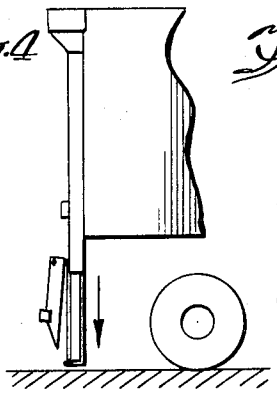
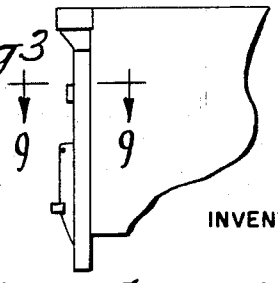


Fig. 3



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Fig. 12

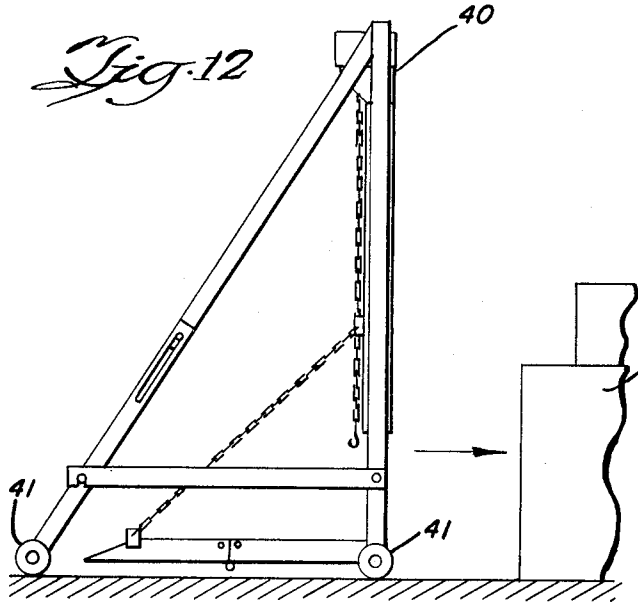


Fig. 13

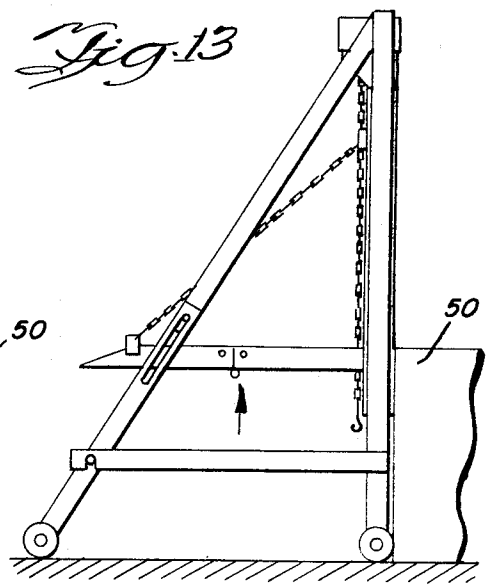
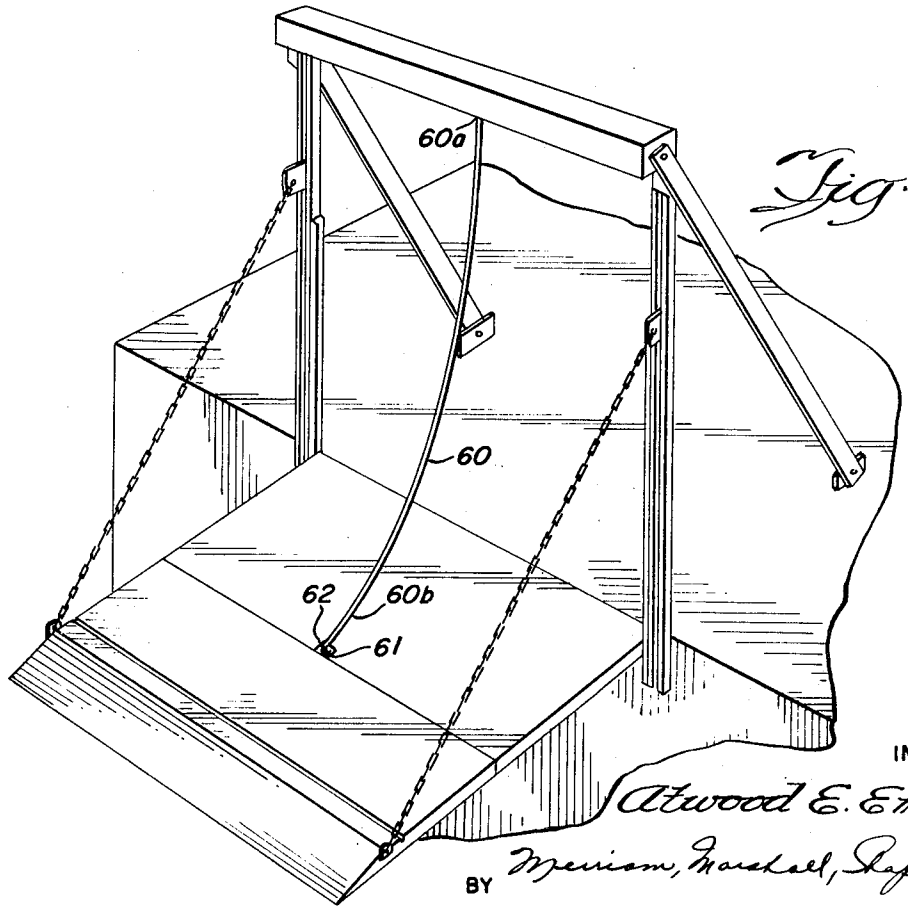


Fig. 14



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LIFT HAVING SELF-FOLDING PLATFORM

The present invention concerns an improved lift. In general, it relates to a lift having a foldable platform. More particularly, it concerns a lift which contains a foldable platform and means for folding and unfolding the platform. In a preferred embodiment of the present invention, the rear of a truck is equipped with the lift to provide a versatile device for loading and unloading the truck's cargo as well as to provide a tailgate for the truck.

In many instances where lifts of the horizontal platform type are employed, it is desirable that the platform be of a size sufficient to accomodate the cargo or freight when the lift is in use, and of a different, more compact, configuration when the lift is not in use. For example, when a lift of the platform type is employed as a loading and unloading device for a truck, it is desirable to have a horizontal platform which has a rectangular surface of sufficient size and shape to accommodate the truck's cargo. Often, the result is a platform which may be difficult to handle because of size, shape and/or weight. Moreover, such platforms present problems when the lift is being transported, or stored when not in use.

The present invention provides a lift which contains a self-folding platform which enables the lift to have a comparatively compact configuration when not in use.

The present invention also provides a lift containing a self-folding platform which is suitable for use as a device for loading and unloading a truck and also as a tailgate for the truck.

According to the present invention, there is provided an improved lift which contains a self-folding platform. As will be apparent from the drawings and the following description, the lift of the present invention employs chain, cable, or equivalent means to fold and unfold a sectioned platform.

A better understanding of the present invention will be had if reference is made to the accompanying drawings in which:

FIGS. 1 and 2 are perspective rear views of a truck equipped with a self-folding platform of the present invention; FIG. 1 showing the platform raised to a height which is level with the bed of the truck and FIG. 2 showing the platform lowered to the ground level;

FIGS. 3 – 8 inclusive are diagramatic side views of a truck equipped with a self-folding lift of the present invention. These figures show diagramatically the raising, lowering, folding and unfolding of the platform. FIG. 3 shows the platform completely folded, secured and raised to a position to enable it to function as a tailgate. FIG. 4 shows the platform substantially completely folded and lowered to a level below the level of the truck-bed. FIG. 5 shows the platform unfolding. FIG. 6 shows the platform substantially unfolded. FIG. 7 shows the platform completely unfolded and raised to a height which is level with the bed of the truck. FIG. 8 shows the platform completely unfolded and lowered to substantially ground level;

FIG. 9 is a fragmentary section taken along a line 9—9 in FIG. 3;

FIG. 10 is a fragmentary perspective view of the dual channel tracks employed in the lift of the present invention;

FIG. 11 shows details of the locking mechanism in both the locked and unlocked positions;

FIGS. 12 and 13 are diagramatic side views of an embodiment of the present invention wherein a self-folding platform lift is mounted on a collapsible frame provided with casters;

FIG. 14 is a perspective rear view of a self-folding platform lift of the present invention mounted to a wall, said lift employing a cable to fold and unfold the platform.

FIGS. 1 and 2 show a truck 1 equipped with a lift 2 of the present invention. The lift 2 generally comprises a foldable hinged platform 3, a pair of dual channel tracks 8, a pair of dead chains 6, a pair of chains 7, and a lift mechanism 10.

The foldable hinged platform 3 comprises a first platform section 4 and a second platform section 5 which are joined together by hinge 9. Each end of platform section 5 is provided with a locking pin 11. The pair of locking pins 11 are adapted to removably engage a link of dead chain 6. Platform

section 4 is further provided with a pair of chain connectors 16. Connectors 16 are adapted to connect a link of chain 7 to platform section 4. Platform section 4 is preferably, but not necessarily, provided with a beveled edge 17 on the outside of the section 4 to facilitate the loading and unloading of the platform 3. Platform section 4 is also preferably, but not necessarily, further provided with a groove 18 designed to help facilitate securing rolling cargo to the platform 3.

Each dual channel track 8 is mounted at the rear of truck 1. A box-like channel 19 of each track 8 provides a passageway and guide for extendable leg 14. The lower extremity of each extendable leg 14 is connected by pivot connector 15 to platform section 5 so that platform section 5 will move up or down, respectively, as extendable legs 14 are retracted or extended with respect to channel 19. The upper extremity of each extendable leg 14 is provided with a flange connector 13 which provides a means for securing ends 7*a* of chains 7 to legs 14 so that the chains 7 will move up or down respectively, when legs 14 are retracted or extended. Each track 8 is further provided with generally U-shaped channel 21. Channels 21 function as guides for locking pins 11 when platform section 5 is locked into tracks 8.

Lift mechanism 10 provides the power necessary to operate (i.e., raise, lower, fold, unfold) lift 2. Lift mechanisms are known in the prior art and, per se, form no part of the present invention. A suitable lift mechanism may comprise an electrically powered hydraulic unit (not fully shown) which includes a system of pulleys and cables (not shown) which is arranged so that a pair of cable ends may be jointly raised or lowered in response to an electric signal generated when the truck driver, or other lift operator, trips a switch which causes the electric power supply to activate the hydraulic unit which in turn moves the cable and pulley system to jointly raise or jointly lower the pair of movable cable ends (not shown).

The movable pair of cable ends are positioned in box-like channels 19, so that one of each said movable cable ends is affixed near, or, preferably, to the top of extendable leg 14. The cable ends may be attached to extendable leg 14 in any suitable manner which does not interfere with the movement of legs 14 in channels 19.

FIGS. 9, 10 and 11 show details of the tracks 8 and the unlocking mechanism. Each track 8 is provided with a generally U-shaped channel 21 which receives locking pins 11 of platform section 5 when platform 3 is urged towards a substantially vertical position. Both U-shaped channels 21 are identical and each contains a front flange 22 and a rear flange 23. Front flange 22 is shorter in length than rear flange 23. The lower end of front flange 22 is positioned with respect to tract 8 at a vertical height from ground level just sufficient to enable locking pins 11 to clear front flange 22, and therefore disengaged or unlock from channel 21 when platform section 5 is in a substantially vertical position and extendable legs 14 have been extended from track 8 to a substantially ground level position. FIG. 11 shows details of the locking mechanism in both the locked and unlocked positions.

Typical operation of the self-folding platform lift of the present invention will now be described.

When the lift is not in use, the foldable hinged platform is in a folded position and locked to the tracks, for example as shown in FIG. 3.

When a truck driver or other lift operator desires to operate the lift, the folded lift is first unlocked by the operator tripping a switch to activate the lift mechanism to lower, i.e., extend, the legs 14 to substantially ground level, at which point the locking pins 11 clear front flanges 22 of U-shaped channels 21 causing platform 3 to be unlocked from tracks 8. When the platform 3 becomes unlocked, it pivots around to the connectors 15 in the general direction shown by the arrow in FIG. 5, causing the slack in the pair of dead chains 6 to be removed.

To complete the unfolding of the platform 3, the operator of the lift trips the switch which activates the lift mechanism to retract extendable legs 14 which results in the platform unfolding as shown in FIG. 6. At the point where the platform 3

is completely unfolded, as shown in FIG. 7, the pair of dead chains 6 become slack and the pair of chains 7 become taut. At this point the operator of the lift removes the dead chains 6 from the ears 12 which disengages the platform 3 from the dead chains 6. The completely unfolded platform 3 is then in a position to be raised or lowered by activating the lift mechanism. FIG. 8 shows the dead chains disengaged and the unfolded lift in a substantially ground level position.

While the self-folding platform lift of the present invention has been described primarily in conjunction with its mounting on the rear of a truck, it is apparent that the lift will have utility in other applications. For example, in FIGS. 12 and 13, the lift of the present invention is shown mounted on a collapsible mobile frame 40 which contains casters 41 for moving the lift, for example, from one position in a building to another. FIG. 12 shows the lift being moved towards a loading dock 50. FIG. 13 shows the lift in a position abutting the loading dock 50. In such an application, the self-folding platform of the present invention provides a lift which may become relatively compact and portable. As is apparent from FIGS. 12 and 13, in addition to the platform of the lift being adapted for folding when not in use, the collapsible mobile frame 40 may also be readily collapsed and made more compact when not in use.

FIG. 14 shows still another embodiment of the present invention wherein a lift having a self-folding platform is permanently mounted to a wall. The platform can be folded when the lift is not in use, thereby making available additional floor space.

In the embodiment shown in FIG. 14, the folding means employed comprises (instead of a pair of dead chains 6) a single cable 60. One end 60a of cable 60 is fixed at a point above the platform, and preferably, centered between the ends of the platform. The other end 60*b* of cable 60 is provided with a hook 61 or other means for selectively engaging cable connector 62 which may comprise, for example, a ring imbedded in the platform at a point centered between the ends of the platform.

As described above and illustrated in the accompanying drawings, the lift mechanism has been positioned above the tracks of the lift. It is apparent, however, that the lift mechanism could be placed in other positions with respect to the tracks by suitable rearrangement of the cable and pulley system; in such a manner the lift could be modified to enable the platform to raise to a height substantially above truck-bed level.

It will be apparent to those skilled in the art that variations may be made in the details of construction without departing from the spirit and scope of this invention as defined in the pending claims.

What is claimed is:

1. A platform-type lift comprising a lift mechanism; a self-folding hinged platform having an inner platform section and an outer platform section pivoted to each other; track means for supporting said platform, and adapted to guide said platform; carriage means mounted in said track means for verticle motion; said inner platform section being pivoted at its inner end to said carriage means about a horizontal axis; means connected between said carriage means and said platform for maintaining both said platform sections horizontal during load lifting and lowering operations; and means for collapsing said platform, including means removably anchoring the inner end of said outer platform section to at least one stationary point above said platform, so that as the inner end of said inner platform section is lowered the underside of said outer platform section becomes faced with the underside of said inner platform section so that when said platform is completely folded the two platform sections are vertically extending and parallel to each other.

2. The lift of claim 1, wherein said outer platform section is provided with a beveled outer edge and said inner platform section is provided with locking pins adapted to permit holding said platform sections in a substantially vertical position.

3. The lift of claim 1, wherein said two platform sections are substantially identical with respect to the length and width of said sections.

4. A lift as defined in claim 1, wherein said track means comprise a pair of dual channel tracks.

5. A lift as defined by claim 1, wherein one channel on each of said dual channel tracks is adapted to provide locking and unlocking means for securing said platform, in a substantially vertical position, to said track means.

6. A lift as defined by claim 1, wherein said means for collapsing comprise a pair of chains adapted to be taut during the folding and unfolding of said platform and slack during the raising and lowering of the folded and unfolded platform.

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