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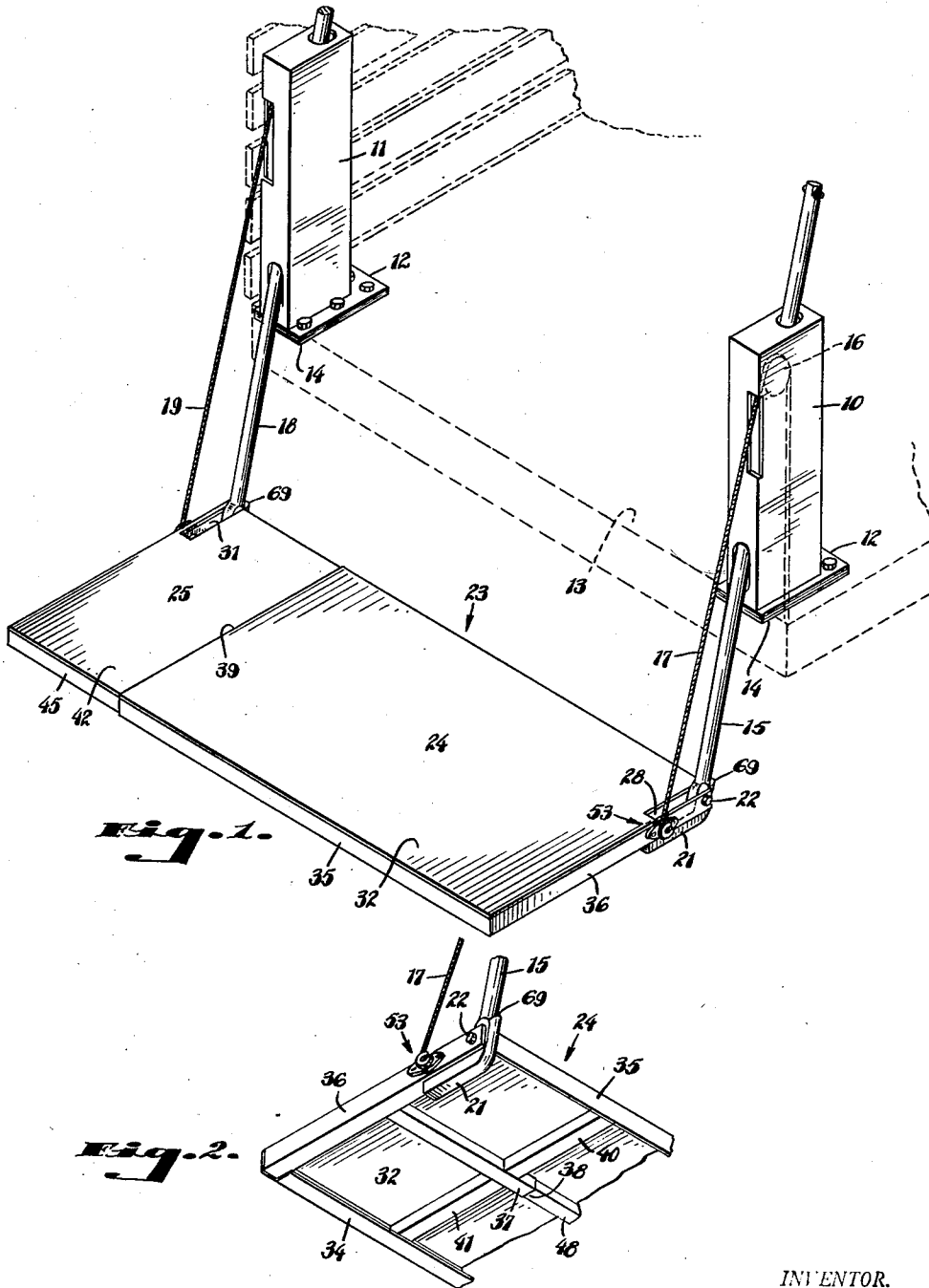
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2,590,591

ADJUSTABLE TAIL GATE LIFT ASSEMBLY

Filed March 28, 1950

3 Sheets-Sheet 1



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Fig. 3.

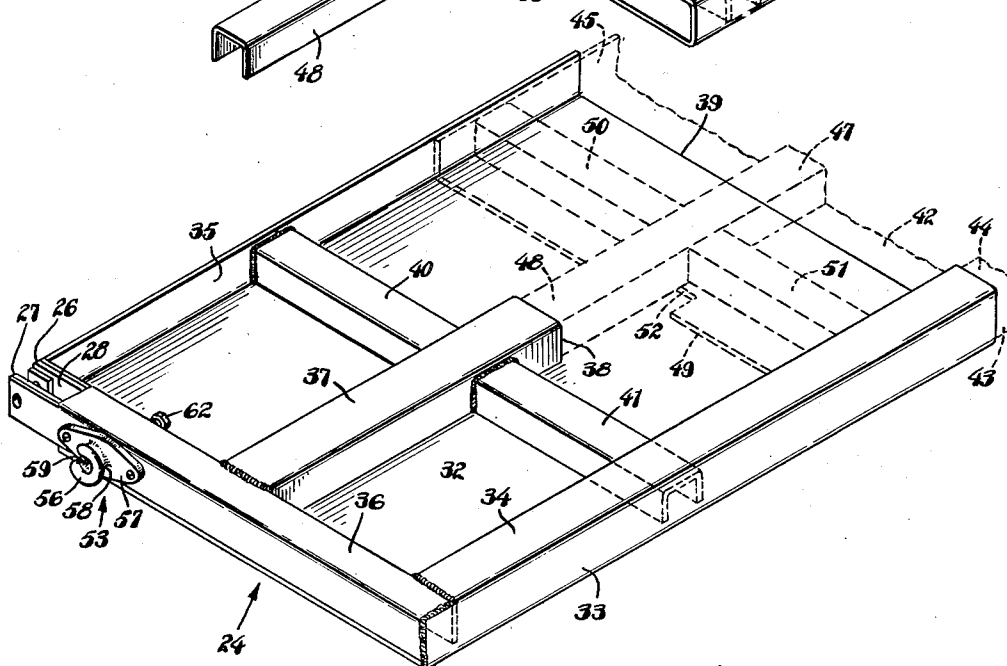
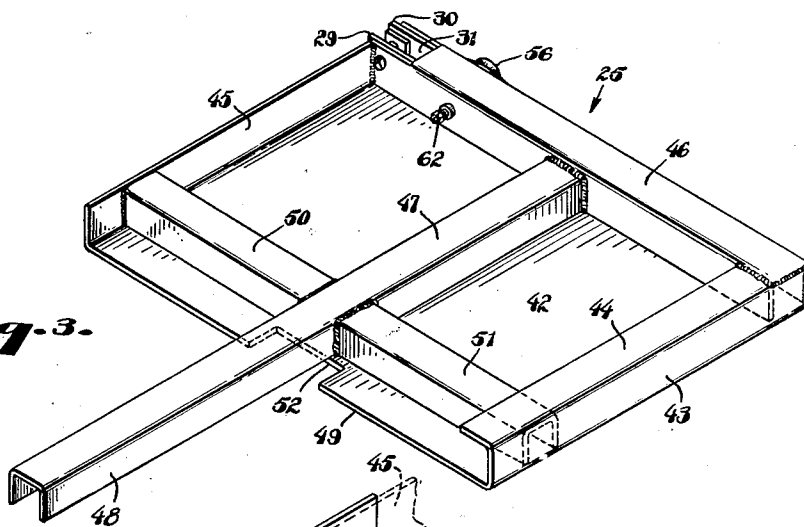


Fig. 4.

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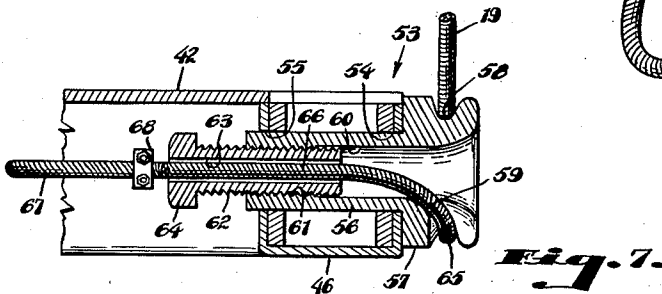
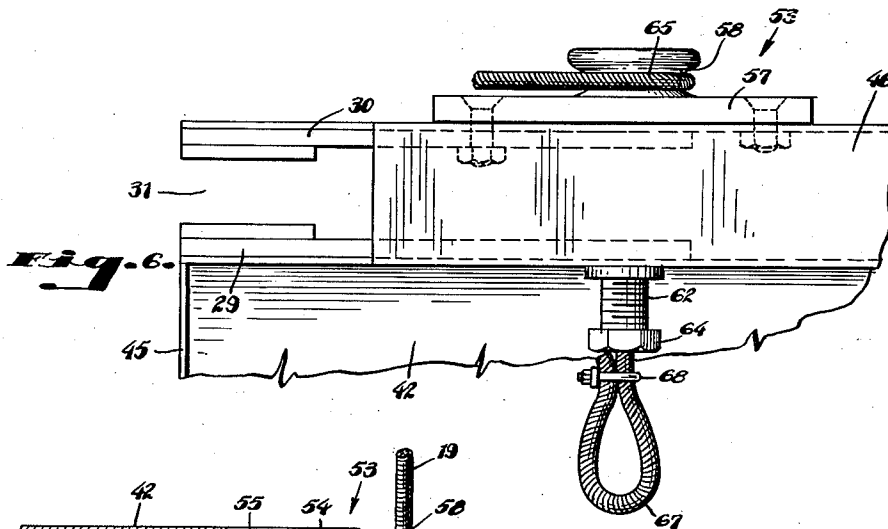
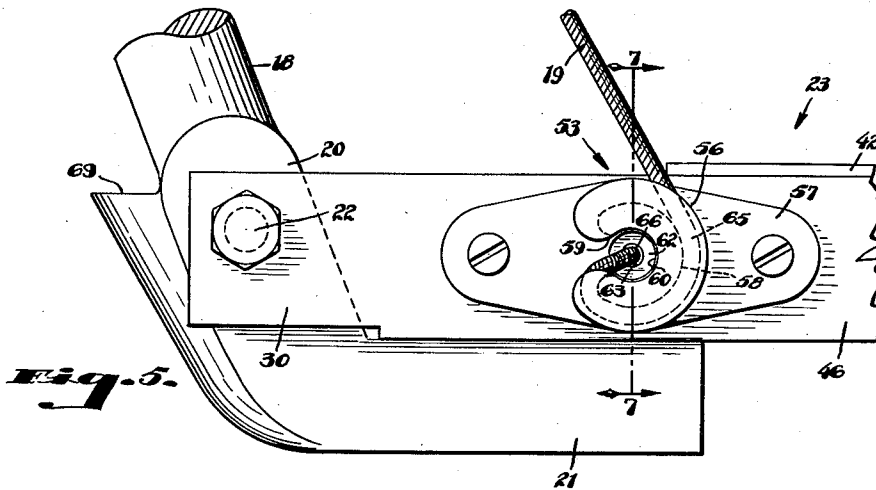
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3 Sheets-Sheet 3



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ADJUSTABLE TAIL GATE LIFT ASSEMBLY

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14 Claims. (Cl. 214—75)

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The present invention relates to an adjustable tail gate lift assembly; and finds its primary utility when mounted upon a truck or other motor vehicle to act as an elevator for transporting goods in either direction between the vehicle bed or floor and the ground, or such other surface, below the level of the vehicle bed, to or from which articles may require transportation. While the device of the present invention is primarily useful in that environment, and has been illustrated and will be described therein, it will be apparent that the lift assembly which comprises the present invention may be installed on any type of foundation, there to perform a similar function. In the environment in which the invention is herein described, the adjustable platform performs the dual function of supporting loads during transportation, and of closing a loading port of the vehicle body, at times; but it will be apparent that, in some installations, the latter function becomes unimportant.

The primary object of the invention is to provide a lift assembly kit comprising parts which, when assembled, may be installed in any one of a wide variety of locations, certain of the parts being adjustable so that the transverse dimension of the installed assembly may be adapted to the specific location in which the lift is to be used. More specifically, I have provided a kit which may be assembled selectively with trucks of varying floor or body widths, within a predetermined range; the kit including a pair of control towers to be independently mounted upon the vehicle bed, a slide element for each control tower, adapted to be mounted in such towers and therein to be guided for movement, a load-supporting platform, adjustable as to its transverse dimension to conform to any selected spacing between the towers, within a given range, and adapted to be supported upon the two slide elements, and halyard means including sheave means, supported above the uppermost position of the platform, and preferably upon the towers, the halyard means being connected to the platform, passing over the sheave means, and being controlled by suitable means to act upon the platform to shift the slide means in their guides provided by the towers.

Further objects of the invention will appear as the description proceeds.

To the accomplishment of the above and related objects, my invention may be embodied in the form illustrated in the accompanying drawings, attention being called to the fact, however, that the drawings are illustrative only, and that

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change may be made in the specific construction illustrated and described, so long as the scope of the appended claims is not violated.

Fig. 1 is a perspective view of a lift assembly constructed in accordance with my invention, and shown in association with a vehicle body suggested in dotted lines;

Fig. 2 is a fragmental perspective view from beneath one end of the assembly;

Fig. 3 is an inverted perspective view of one section of a sectional platform comprising an element of my invention;

Fig. 4 is a similar view of the other section of such a platform, the section of Fig. 3 being fragmentarily suggested in assembled relation with said other section;

Fig. 5 is an enlarged end elevation of a fragment of the assembly illustrated in Fig. 1, and looking from the left-hand end of Fig. 1;

Fig. 6 is a fragmentary bottom plan showing the cable anchorage means; and

Fig. 7 is a broken sectional view taken substantially on the line 7, 7 of Fig. 5.

Referring more particularly to the drawings, it will be seen that I have illustrated a pair of towers 10 and 11. Since the two towers are identical in construction, only one will be described in detail. Each such tower comprises a base plate 12 adapted to be secured to the top surface of the floor or bed 13 of a vehicle; and it will be clearly apparent from a consideration of the drawings, that the two towers are entirely independent of each other and may be secured to the bed 13 in any selected relation of lateral separation. Preferably, each tower will be secured to the vehicle bed at a point closely adjacent one lateral edge thereof; and it will be noted that the base plate 12 of each tower has an extension 14 which projects outwardly beyond the edge of the vehicle bed for a reason which will later become apparent.

Each tower 10 and 11 provides, within itself, a guideway which, in the preferred embodiment of the invention, will be inclined slightly from the vertical. The details of the guide means are unimportant to the present invention; and any conventional means for slidably mounting a slide element may be adopted for such use. A rod 15 is freely slidably mounted in the guide means of the tower 10; and a sheave or pulley 16 is mounted upon a fixed axis in the tower, a cable 17 or other suitable halyard means passing over said sheave and leading to winch means (not shown). A similar slide rod 18 is similarly mounted in the tower 11, and halyard means 19 passes over a

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similar sheave in the tower 11 and thence extends to the winch means.

Near its lower end, each slide rod is transversely flattened as at 20 (Fig. 5), and is provided with a foot 21 projecting substantially horizontally away from the associated tower. A pivot pin 22 preferably traverses the flattened section 20 of each slide rod for the purpose of pivotally mounting upon the slide rods a load-supporting platform indicated generally by the reference numeral 23.

In order that the towers 10 and 11 may be mounted selectively at various distances from each other, to accommodate the lift kit to various sizes of trunks, the platform 23 must, of course, be adjustable in transverse dimension; and to that end, I make the platform in two relatively movable sections 24 and 25, the details of which are clearly illustrated in Figs. 3 and 4.

At its outer, forward corner, the section 24 is formed to provide two spaced walls 26 and 27 defining a slot 28, opening through the top and bottom surfaces, and through the forward edge, of said section. At its corresponding corner, the section 25 is formed to provide spaced walls 29 and 30 defining a similar slot 31. The slots 28 and 31 are respectively designed to receive the flattened portions 20 of the slide rods 15 and 18, the pivot pins 22 being seated in suitable perforations in said walls 26, 27, 29 and 30, whereby the platform 23 is pivotally connected to the lower ends of the rods 15 and 18, upon a common axis.

The section 24 comprises a quadrilateral load-supporting panel 32 whose rear edge is preferably channeled by turning a section 33 thereof downwardly and turning a section 34 thereof forwardly, as clearly illustrated in Fig. 4. The forward edge of the panel 32 is defined by a simple flange 35 turned downwardly from the plane of said panel. The outer end of the panel is defined by flange means 36 which may preferably be a separate channel element welded in place as shown; but which may be formed, if desired, by suitably turning a terminal section of the panel 32.

The fourth side 39 of the panel is left open, as shown.

A tubular spine element 37, which may be a channel welded to the under surface of the panel 32, extends from the flange 35 toward the open end 39 of the section 24, lying parallel to the flanges 33 and 35 and preferably being medially located therebetween. The open mouth 38 of the spine element 37 is located a substantial distance short of the open end 39 of the section 24. Bracing members or ribs 40 and 41 extend between the spine 37 and the flanges 35 and 33, respectively, at a point near the mouth 38 of the spine element, but spaced somewhat therefrom in the direction of the flange 35.

The section 25 comprises a quadrilateral load-supporting panel 42 whose rear edge is channeled as at 43, 44 to fit snugly within the channeled edge 33, 34 of the section 24. The forward edge of the panel 42 is flanged as at 45, the arrangement being such that, when the section 25 is assembled with the section 24, the flange 45 will slidably engage the inner surface of the flange 35. One end of the panel 42 is defined by a channeled flange 46 similar to the flange 36; and a spine element 47, lying parallel to the edges 43 and 45, extends from the flange 46 in the direction of the open end 49 of the section 25; said spine element 47 having a sub-

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stantial projection 48 beyond said open end 49 of the panel. The spine element 47, or at least its projection 48, is proportioned and designed to fit snugly within the tubular spine element 37 of the section 24. Bracing ribs 50 and 51 extend from the spine element 47 respectively to the flanges 45 and 43.

The open edge 49 of the panel 42 is formed with a notch 52 proportioned and designed to receive that portion of the spine element 37 which projects beyond the ribs 40 and 41 toward the end 39 of the section 24; and the longitudinal depth of the notch 52 will preferably be substantially equal to the degree of projection of the spine element 37 beyond said ribs 40 and 41. The ribs 50 and 51 will preferably be located substantially at the base of the notch 52.

It will be seen that the two sections 24 and 25 may be telescopically associated by entering the extremity of the projection 48 of the spine element 47 in the open mouth 38 of the spine element 37, concurrently entering the channeled flange 43, 44 in the channel flange 33, 34, whereupon the flange 45 will slidably engage the flange 35. The two sections can be telescopically collapsed to a point at which the end 49 of the panel 42 will engage the ribs 40 and 41, the extremity of the element 37 entering the notch 52. Primarily because of the projection 48, the sections may be expanded until the ends 49 and 39 of the two sections are almost in registry, without destroying the stiffness of the assembly.

In installing a kit constructed in accordance with the present invention, the two towers 10 and 11 will be fixed to the foundation 13 at a selected degree of lateral spacing. The slide rods 15 and 18 will be assembled in their guideways in the respective towers, and then the platform 23 will be mounted upon said slide rods through the medium of the pins 22, the sections 24 and 25 being relatively adjusted to bring their slots 28 and 31 into accurate registry with the flattened portions 20 of the respective slide rods. After such adjustment, and either before or after actual assembly of the sections with the slide rods, suitable perforations may be drilled in the flanges 33, 34, 43, 44 and 35 and 45, to receive bolts or rivets for securing the sections in adjusted positions. Alternatively, the flanges may be welded in place after adjustment; but I presently prefer to use removable bolts so that, if desired, the entire assembly may be removed from one truck and applied to another of different dimensions at some future date.

As has been stated, the cables 17 and 19 will be suitably anchored on the opposite ends of the platform 23; and I have illustrated, and will now describe, a preferred form of anchorage means for said cables. Such a preferred form is indicated generally by the reference numeral 53, and identical devices will be used at opposite ends of the platform 23.

The flange 46, for instance, is provided with suitable aligned perforations 54 and 55 in which is received a tubular element 56 preferably provided with an integral escutcheon plate 57 which may be secured to the outer surface of the flange 46 by any suitable means such as the illustrated screws. At its outer end, the tubular element is formed to provide an outwardly open, peripheral channel 58 which communicates, through a substantially radial port 59, with the interior 60 of said element 56.

At its opposite end, the element 55 is interiorly threaded as at 61 for the adjustable reception of a bolt 62 having an axial passage 63 extending completely therethrough; said bolt preferably being provided with a manipulating head 64 at its outer end. A portion 65 of the cable 19 is seated in the channel 58, while a portion 66 thereof is threaded through the port 59 into and through the interior 60 of the element 56 and through and beyond the bore 63 of the bolt 62. The projecting terminal portion 67 of the cable 19 is rebent upon itself, as is most clearly shown in Fig. 6, and clamping means 68 is applied to the rebent portion of the cable to hold sections thereof in abutting relation. Thus, an abutment, engaging the bolt head 64, is provided on the cable to prevent movement of the cable relative to the bolt in a direction toward the outer end of the element 55. It will be clear that threaded adjustment of the bolt 62 toward the left as viewed in Fig. 7 will pull the cable 19, thus shortening the distance between the sheave in the tower 11 and the anchorage point on the platform 23; while adjustment of that bolt toward the right as viewed in Fig. 7 will relax the cable to increase that distance.

When the parts are in the relative positions illustrative in Fig. 1, it will be seen that the cables 17 and 19 act upon the platform 23 to sustain the lift assembly in the illustrated intermediate position between the ground level and the level of the vehicle bed 13. If the winch (not shown) is actuated to pay out the cables 17 and 19, the entire assembly will descend until the feet 21, which lie in a common horizontal plane and upon the upper surfaces of which the platform 23 rests during such operation, reach the ground.

When the winch is operated to wind in the cables 17 and 19, the entire assembly will move upwardly in a direction determined by the guide means within the towers 10 and 11 acting upon the slide rods 15 and 18, until spurs 69, located upon the heels of the slide rods 15 and 18 (see Figs. 1 and 5) come into engagement with the projections 14 of the base plates 12. The parts are so proportioned and designed that, at this instant, the load-supporting panels 24 and 25 will be disposed substantially in the plane of the vehicle floor 13.

If the winch continues to operate to wind in the cables 17 and 19, the platform 23 will begin to rotate, in a clockwise direction as viewed from the right-hand end of Fig. 1, and, through such winding action, the platform 23 may be drawn into a substantially vertical position, in which it will close tightly against the towers 10 and 11 (and/or against the rear ends of the vehicle body walls) to act as a tail gate. To facilitate this function, the axes of the sheaves 16 must be located, above the base plates 12, a distance greater than the distance from the pivot pins 22 to the cable anchorage 53.

I claim as my invention:

1. A load-lifting kit comprising a pair of towers, means for securing said towers independently to a selected foundation in laterally-spaced relation at a selected distance from each other, each tower providing guide means, a slide element for each tower freely reciprocally mounted in the guide means of its tower, said slide elements being guided for reciprocation along parallel, generally vertical paths, a platform comprising a plurality of joined sections relatively adjustable in the direction of spacing between said towers and having a range of adjustment

covering such selected distance, means providing a pivotal connection between one of said sections and one of said slide elements adjacent the lower end of the latter, means providing a pivotal connection between another of said sections and the other of said slide elements adjacent the lower end of the latter, said pivotal connections being established upon a common axis substantially at a common edge of said platform adjacent said towers, said platform spanning said slide elements and projecting therefrom, at times, away from said towers, halyard means operatively connected to said platform adjacent each of said pivotal connections but spaced from said towers beyond said pivotal connections, and means for controlling said halyard means to control reciprocation of said slide means and the adjusted position of said platform about said pivotal connections relative to said towers.

2. The kit of claim 1 including cooperating means on said towers and on said slide elements for limiting upward movement of said slide elements, and sheave means for said halyard means supported above said movement-limiting means, the distance between said sheave means and the movement-limiting means on said towers exceeding the distance between the points of connection of said halyard means to said platform and said pivotal connections.

3. The kit of claim 2 in which said sheave means includes a sheave element supported upon each of said towers.

4. The kit of claim 2 in which said foundation is a vehicle floor or bed and in which the means on each tower cooperating with means on its associated slide to limit slide movement is a plate adapted to be secured to such a vehicle floor to project, toward said platform, beyond an edge of said floor or bed.

5. The kit of claim 4 in which each such plate is a base plate for its tower and is located in the plane of said floor or bed.

6. The kit of claim 1 in which each of said pivotal connections comprises laterally spaced walls on a platform section defining a slot opening through top and bottom walls and through an edge wall of such section, the lower end portion of each slide element being received in one of such slots and between the spaced walls thereof, and hinge pin means projecting from each slide element and seated in sockets in the associated walls.

7. The kit of claim 1 in which said halyard means comprises a cable section for each end of said platform and means for securing each cable section to its platform end comprising a tubular element fixed to a platform section and formed to provide a peripheral channel opening at one end into the interior of said tubular element, and a tubular bolt adjustably threadedly mounted in said tubular element, such cable section having a portion seated in said channel, and a portion threaded from said channel through said tubular element and said tubular bolt, said cable section having abutment means, beyond that end of said bolt remote from said channel, engageable by said bolt end to exert a tensile stress on said cable section.

8. A sectional lift platform comprising a section formed to provide a forwardly-opening channelled rear edge, a flanged front edge, a load-supporting panel spanning said edges, a tubular spine paralleling said front and rear edges, disposed therebetween, and open at one end, and a reinforcing rib joining said spine with said front

and rear edges; and a mating section formed to provide a rear edge shaped to fit snugly and telescopically in the channeled rear edge of said first-named section, a flanged front edge slidably engageable with the front edge of said first-named section, a load supporting panel spanning said front and rear edges, and a spine paralleling said front and rear edges, the spine of said mating section projecting beyond an end of said panel and being snugly telescopically receivable in said tubular spine of said first-named section.

9. A sectional lift platform comprising a section providing a quadrilateral load-supporting panel and flange means associated with said panel and defining three sides thereof, a tubular spine parallel with two of said sides, fixed to said panel and extending from the third of said sides toward the fourth side of said panel, and a second section providing a quadrilateral load-supporting panel and flange means associated therewith and defining three sides thereof, a spine parallel with two of said sides of said second section, fixed to said panel of said second section and extending from the third of said sides of said second section beyond the fourth side of said second section, said spine of said second section being proportioned and designed for telescopic association with said spine of said first section, and said two sides of said first section and said two sides of said second section being proportioned and designed for telescopic association with each other.

10. The platform of claim 9 in which the spine of said first-named section terminates short of said fourth side of said first section.

11. The platform of claim 10 in which the fourth side of the panel of said second section is provided with an open notch registrable with, and positioned to receive, the adjacent end of the spine of said first section when said sections are telescopically associated.

12. The platform of claim 10 including bracing means secured to the panel of said first section and extending from each of said two sides into engagement with said first section spine at points nearer to said third side than is the remote end of said spine.

13. The platform of claim 12 in which the fourth side of the panel of said second section is provided with an open notch registrable with, and positioned to receive, the adjacent end of the spine of said first section when said sections are telescopically associated, the depth of said notch, in the direction of length of said spine, being at least equal to the distance from said bracing means to said remote end of said spine.

14. The platform of claim 13 including bracing means secured to the panel of said second section and extending from each of said two sides thereof into engagement with said second-section spine, said last-mentioned bracing means being spaced from said fourth side of said second section a distance substantially equal to the depth of said notch.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,903,431	Abbe	Apr. 11, 1933
2,151,338	Shonnard	Mar. 21, 1939
2,193,407	Hagen	Mar. 12, 1940
2,236,317	Howland	Mar. 25, 1941
2,418,494	Anthony et al.	Apr. 8, 1947
2,421,788	Henry	June 10, 1947
2,497,474	Snow	Feb. 14, 1950