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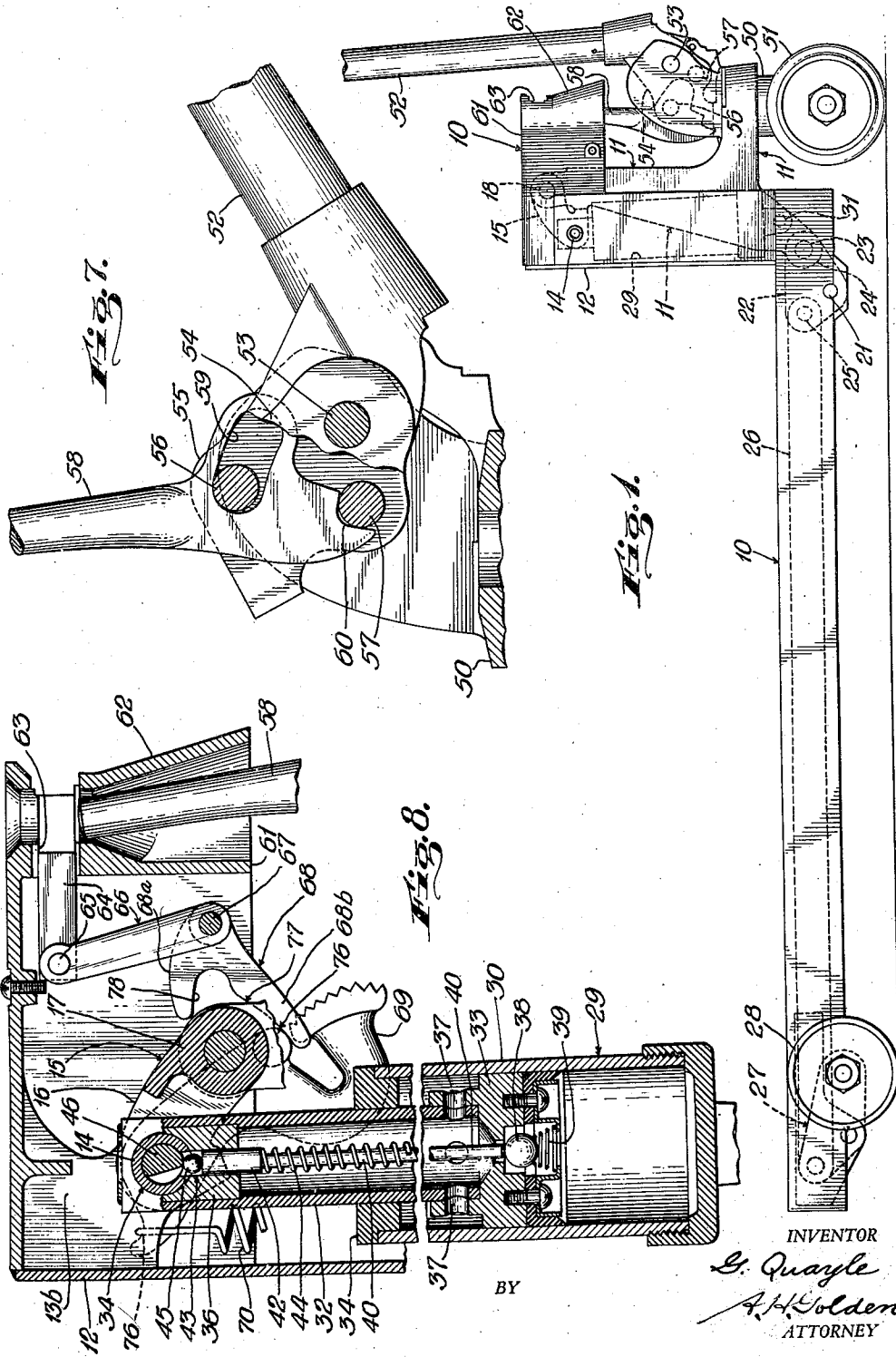
G. QUAYLE

2,369,854

HAND LIFT TRUCK

Filed July 9, 1943

5 Sheets-Sheet 1



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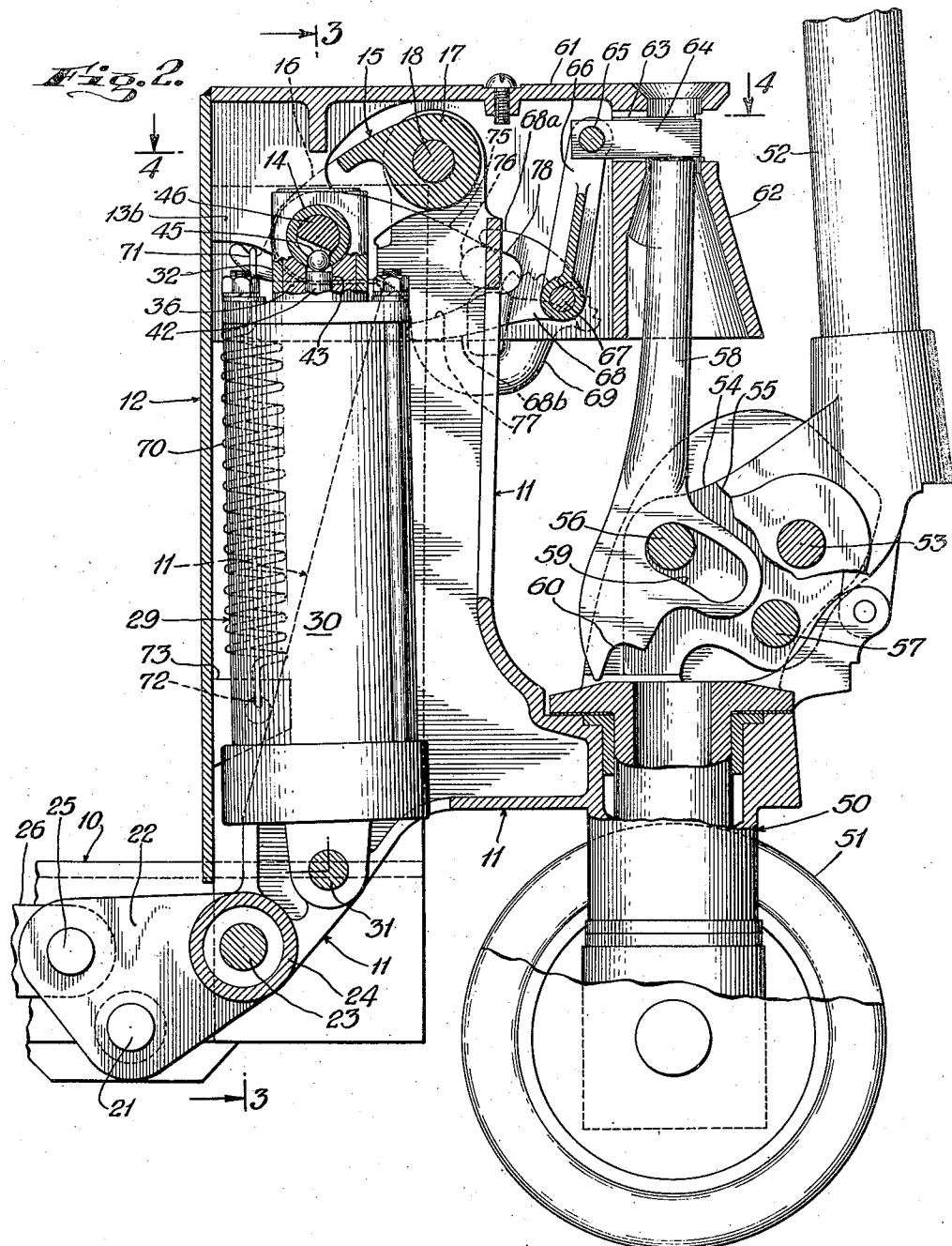
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5 Sheets-Sheet 2



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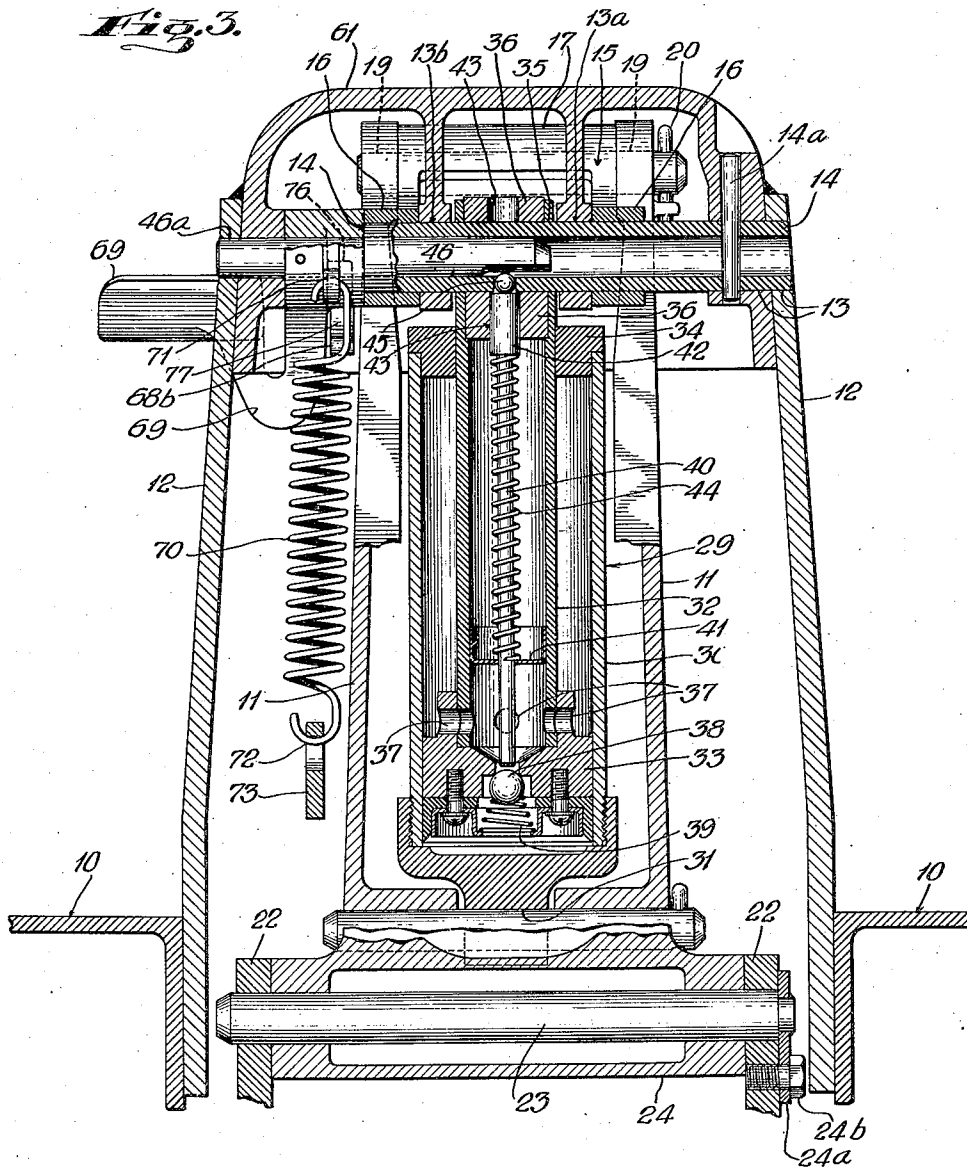
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5 Sheets-Sheet 3



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5 Sheets-Sheet 4

Fig. 4.

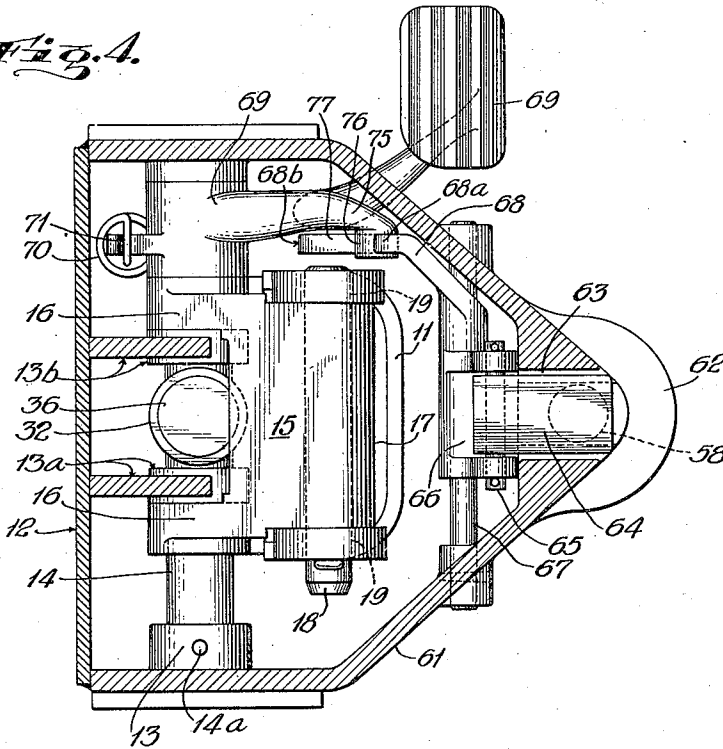
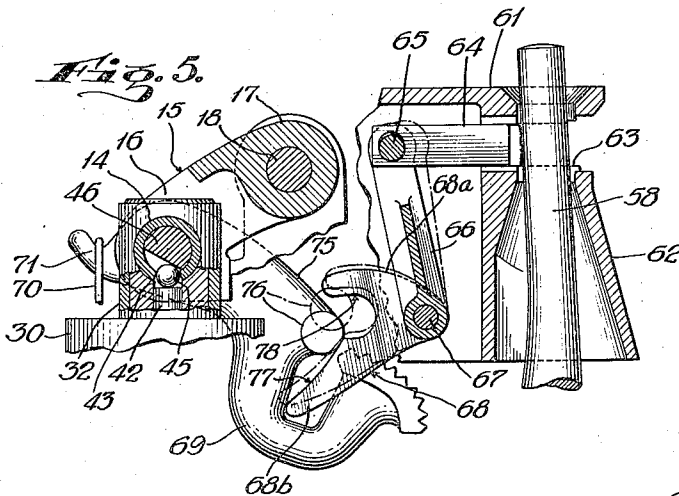


Fig. 5.



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2,369,854

HAND LIFT TRUCK

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Application July 9, 1943, Serial No. 493,970

48 Claims. (Cl. 254—2)

This invention relates to an industrial truck of the type in which an elevating platform is lifted relatively to a lifting head or main frame by lifting means actuated relatively to the lifting head. More particularly, my invention relates to a truck of the class described in which the lifting mechanism comprises mechanically actuated means carried on the lifting head and adapted to apply lifting effort to the elevating platform whereby to raise that platform relatively to the lifting head. In setting forth my invention I shall describe it as applied to an elevating truck of the single frame type; that is, a truck in which the elevating platform is mounted at its forward end relatively to a lifting head so that the forward end of the platform is lifted relatively to the lifting head by means on the lifting head, while the rear end of the elevating platform is raised through load wheels pivotally supported at that rear end and actuated through suitable mechanism extending toward the lifting head. In my Patent No. 2,274,164 I illustrate a single frame truck of the class described.

The invention of this application resides particularly in a new type of lifting mechanism and means for controlling that lifting mechanism. My invention resides also in the arrangement of mechanism for maintaining the elevating platform in any one of a series of lifted positions relatively to the lifting head, and to control mechanism for controlling the lowering movement of the platform. A further feature of my invention resides in means for controlling in desired sequence the lifting mechanism and the devices controlling the lowering movement of the elevating platform.

One important feature of my invention whereby the general results thereof are obtained resides in a novel form of lifting mechanism embodying a lifting member movable relatively to the lifting head, preferably by the usual lifting and steering lever, and adapted for free movement relatively to its actuating means so that while lifting thrust may be imparted to said lifting member by the lifting lever, its direction of motion is not necessarily controlled by said lifting lever. Suitable guide mechanism is provided, as a feature of this portion of my invention, for guiding the lifting member relatively to a surface on the elevating platform against which it operates to effect the lifting of the elevating platform. In the prior art a somewhat similar type of lifting member has been utilized, but it has been necessary to place the lifting member

in contact with a surface secured to the elevating platform, and to maintain pressure between the lifting member and said surface in order to guide the lifting member. It is a feature of my invention that the lifting member is guided in all positions thereof so as to be available at all times to lift the elevating platform without further manipulation of the parts.

As a further feature of this portion of my invention, means are provided on the elevating platform so that the lifting member may have free movement relatively thereto at any time that it is not desired to lift the elevating platform, thus contributing what is termed in the art a free lifting and steering handle. It is still a further feature of this portion of my invention that when the lifting member and the lifting lever handle are in a free position, the mere movement upwardly of the lifting lever handle and the consequent movement of the lifting member, will effect an engagement of the lifting member with the surfaces against which lifting pressure is applied. This automatic engagement of the lifting member relatively to the elevating platform is exceedingly important in that it makes it unnecessary for the operator to perform an operation when he desires to lift the platform. In the construction of my invention, a further contribution is inherent and resides in the feature that this automatic engagement may take place in any one of a series of lifted positions of the elevating platform.

As a further feature of my invention, once the elevating platform is raised to a particular lifted position, the lifting member and the lifting lever handle will have free movement within a zone extending from the extreme initial vertical position of the lifting handle down to a position corresponding to the lifted position of the elevating platform. To obtain a free movement of the lever handle beyond the said position it is only necessary to move control means for allowing the lifting member to move freely relatively to the elevating platform.

A further feature of my invention resides in that construction whereby the lifting lever handle may contribute compound lifting movement to the lifting member. Thus, the initial lifting movement imparted to the lifting member is directly applied thereto by the lifting lever through one thrust surface during the first part of the lifting movement. Thereafter, a second thrust surface on the lifting lever handle contributes the final lifting movement. While compound lifting movement has been obtained

earlier in the art, it has never been obtained through direct contact of a lifting member with a surface formed as an integral part of the lifting lever.

As a further feature of my invention, the lifting member may take the form of a strut mounted for movement in the steering axis of the steering head of the lifting head, so as to be operable in all positions of the steering head. It is a further feature of my invention that the strut is rotatable with the lifting lever while freely pivoted relatively thereto so that in all rotated positions of the steering head the compound lifting movement previously described may be imparted to the lifting strut.

A still further feature of my invention resides in a hydraulic mechanism and its mounting and control, whereby the elevating platform is maintained in any lifted position, and whereby its lowering movement is controlled. As a particular feature of this portion of my invention, the means whereby a treadle may control a valve mechanism of the hydraulic holding means is of special importance. A still further feature of my invention resides in the sequential control of the lifting mechanism and the hydraulic holding mechanism whereby to yield a free lifting lever handle prior to lowering movement of the elevating platform.

I have thus described generally the main features of my invention in order that a better understanding of the relation of my invention to the prior art may be had. There are of course additional valuable features inherent in my invention that I have not, up to this point, outlined, because those features will best be understood from the specific disclosure that follows. Naturally, I consider my contribution to the art to be of considerable breadth, and I shall solicit for the grant of patent claims that will prevent the appropriation of my invention by those skilled in the art in forms varying mechanically from the particular form of my invention hereinafter set forth.

For a detailed description of my invention I shall refer to the drawings wherein Fig. 1 is a general elevation of a truck to which my invention is shown applied. Fig. 2 is a vertical partial section through the front end of the truck showing the elevating platform lowered. Fig. 3 is a section substantially along lines 3—3 of Fig. 2. Fig. 4 is a section along lines 4—4 of Fig. 2. Fig. 5 is a view of parts of Fig. 2 illustrating the automatic engagement of the lifting strut with the latch. Fig. 6 illustrates the parts of Fig. 2 when the elevating platform has been raised by operation of the lifting mechanism. Fig. 7 illustrates the relation of the lifting member or strut relatively to the lifting lever when the second thrust surface of the lifting lever is about to undertake the further actuation of the lifting strut. Fig. 8 is a partial view illustrating the relation of the parts for controlling the lifting mechanism and the hydraulic dash pot when the lifting mechanism is released and the hydraulic holding mechanism is conditioned to allow lowering of the elevating platform.

I shall now refer more particularly to the drawings to describe the specific structure of the truck therein shown as embodying my invention. In describing the structure of the truck I shall refer to the parts by the specific names I have chosen for them, rather than by generic terms, but those skilled in the art will readily appreciate that the parts of my invention may

be varied widely while operating to yield the action that is the contribution of my invention.

Referring first to Fig. 1, I show there a single frame truck comprising an elevating platform 10 and a lifting head designated generally by reference numeral 11, there being several reference numerals 11 applied to the lifting head in order to indicate better its outline. The forward end of the elevating platform 10 is formed with a vertical standard 12 as is well shown in Figs. 2 and 3, the standard being welded to the elevating platform or otherwise secured as manufacturing technique may make desirable. The upper end of the standard 12 has bearings 15 at 13, 13a and 13b for holding a sleeve 14, and a link member 15 is formed with bored arms 16 whereby it is pivoted about the sleeve 14. A pin 14a holds the sleeve 14 secured to the standard 12 and within bearings 13, 13a and 13b. The link 15 also has a bored portion 17 for the passage of a shaft 18 whereby said link 15 is pivoted to the lifting head 11, the shaft 18 traversing bores 19 on the said lifting head and being held in position by a suitable pin 20 well illustrated in Fig. 3. In this manner, the elevating platform 10 may be said to be pivoted at the upper end of its standard 12 relatively to the lifting head through the link 15, the shaft 18 and the sleeve 14.

The lower end of the elevating platform immediately to the rear of the forward standard 12 is pivoted about shaft 21 to opposed links 22 that are in turn pivoted on a shaft 23 carried by the lower portion 24 of the lifting head 11 as best seen in Figs. 2 and 3. Through pins 25 the links 22 are pivoted to rods 26 that extend rearwardly to rear wheel supporting links 27, the said links 27 carrying the rear lifting wheels 28 of the elevating platform 10. A plate 24a (Fig. 3) is held by a stud 24b in secured relation to link 22 and serves to hold shaft 23 in its proper position. As will be apparent, the upward movement of the elevating platform relatively to the lifting head about lower links 22 and the upper link 15 from the position of Fig. 2 to the position of Fig. 6, in a manner to be described hereinafter, effects not only an elevating of the forward end of the elevating platform, but also the downward movement of the rear wheels 28 to lift the rear end of the elevating platform 10. The particular construction of the parts so far described, with the exception of the utilization of the sleeve 14 is old in the art. The use of the sleeve 14 rather than a shaft is extremely novel and allows for the novel control of the hydraulic dashpot of my truck as will appear presently.

The hydraulic dashpot or hydraulic holding mechanism is designated generally by reference numeral 29 in Figs. 2, 3 and 8, and comprises a cylinder 30 that is pivoted at shaft 31 to the lifting head 11. A sleeve like piston 32 forms the ram of the dashpot and carries a piston head 33 that slides within cylinder 30. The piston or ram 32 extends outwardly of the cylinder 30 through a closing block 34 and is transversely bored at 35 so that it may be secured about the sleeve 14. The upper end of the ram fitting about the sleeve 14 may be fitted with a cylindrical reinforcing member 36, a feature that I have found desirable. It is now quite apparent that as the elevating platform is moved from the position of Fig. 2 to the position of Fig. 6 by means hereinafter to be set forth, the sleeve 14 will effect an upward movement of the ram 32 from the

position of Figs. 2 and 3 to the position of Figs. 6 and 8.

It will be quite apparent that as the ram 32 moves upwardly incidental to the upward movement of the sleeve 14 and the elevating platform 10, fluid will flow from in back of the piston head 33 through the passages 37, and past the spring pressed ball valve 38 into the chamber below the piston head 33. The manner of mounting the spring 39 that presses the ball valve 38 into its position of Fig. 3, and the particular sealing means of the piston head 33 are not stressed as part of my invention. In order to allow lowering motion of the elevating platform, it is obvious that fluid must be allowed to flow from below the piston head 33 to the upper side of the said piston head 33 in a direction reverse to that just indicated.

Such flow of fluid is possible when the ball valve 38 is pressed downwardly against the pressure of its spring 39 by a valve rod 40. This valve rod 40 is guided for vertical movement relatively to the sleeve ram 32 by a guide cap 41 secured within the ram 32 and by the reinforcing member 36, the upper end of the rod 40 being formed with an enlarged portion 42 fitting within a bore 43 in the member 36. A spring 44 presses at its lower end against the cap 41 and at its upper end against the enlarged portion 42 pressing the valve rod 40 upwardly. A small ball 45 lies between the upper end of the portion 42 of the valve rod 40 and a rotary control cam 46 housed within the sleeve 14. It is obvious of course, that rotation of the control cam 46 to the position of Fig. 8 will effect the depression of the valve rod 40 and the movement of the ball 38 from its seat to allow a flow of fluid from the lower side of the piston head 33 to its upper side.

A valuable feature of this portion of my invention resides in the comparative simplicity of the control of the hydraulic mechanism through utilization of the sleeve 14 as the mounting member for the control cam 46. A further important feature of this portion of my invention resides in the use of the ball 38 as the means for permitting upward flow of fluid through the piston head 33. Because the surface of the ball valve 38 is comparatively small, it will require very little force to move it from its seat to permit lowering movement of the elevating platform. I shall hereinafter describe the mechanism whereby the control cam 46 is operated and whereby the elevating platform is raised.

Referring now to Figs. 1, 2, 6 and 7, the forward end of my lifting head is formed with a bearing for the rotation of what I term a steering head 50. This steering head is of the usual form well known in the art and rotates relatively to the lifting head 11, carrying with it the forward steering wheel 51. A lifting and steering lever 52 is pivoted at 53 on the steering head for downward vertical movement, and of course rotates the steering head. The construction of the lifting head and the lifting lever, insofar as they have been set forth is quite well known in the art, being shown in my earlier patent applications and patents and it is therefore not thought necessary to describe it here.

For the purpose of understanding my present invention it is merely necessary to note that the lower end of the lever handle 52 is bifurcated to form a pair of side plates 54 and 55 between which is carrier a first pin 56 and a second pin 57 (Figs. 6 and 7). A lifting strut 58 fits between the plates 54 and 55 of the bifurcated lever handle 52 and is slotted at 59 so that it may be mounted about the

pin 56. The lower end of the lifting strut 58 is formed with a surface 60 adapted for contact with the second pin 57 as will hereinafter be set forth.

The standard 12 of the elevating platform 10 is formed with an over-extending portion 61 on which is formed a guide member 62 for the upper end of the strut 58. This guide member 62 is sleeve-like in form, and may be said to have the shape of a cone. It is slotted at 63 for the lateral movement of a latch member 64 that is pivoted through shaft 65 to a control lever 66 (Fig. 4). This control lever 66 is itself pivoted through shaft 67 for pivotal movement on the part 61 of the lifting head standard as is probably best illustrated in Figs. 2, 4, 5 and 6. A downwardly extending offset portion 68 is formed as an integral part of control lever 66 and is utilized as will appear below.

A foot treadle 69 is formed integrally with the control cam 46 earlier described, so that the foot treadle and cam are rotated as a unit. The treadle 69 is supported at its left end in Fig. 3 through the control cam 46 mounted in bearing 46a formed on the standard 12 of the elevating platform. At its other end, the foot treadle 69 is supported by control cam 46 through its mounting within sleeve 14. A spring 70 is secured at 71 to the foot treadle 69 and at 72 to a bracket 73 forming a part of the elevating frame. It is the function of the spring 70 to urge the foot treadle 69 into its position of Figs. 2 and 3, in which position the valve 38 of the hydraulic mechanism is set to allow for lifting movement of the elevating platform and a holding of the elevating platform in each of its lifted positions.

The body of the treadle 69 is formed with an offset portion 75 that terminates in pin 76 and this pin 76 lies between surfaces 77 and 78 of the spaced arms 68a and 68b of the portion 68 of control lever 66. In the position of the parts in Fig. 2, the pin 76 presses against the surface 78 of the arm 68a of control lever 66 so as to urge control lever 66 to maintain the latch 64 in its position over the lifting strut 58. This urging of control lever 66 is through the spring 70 operating against treadle 69. In the particular position of the parts described, should the lifting lever handle 52 be swung vertically downward about its pivot 53, the pins 56, 57 would of course apply vertical thrust to the strut 58 and latch 64 as hereinafter described, to raise the elevating platform from the position of Fig. 2 to any elevated position, illustrated in Fig. 6.

On the other hand, with the parts in the position of Fig. 2, should it be desired to move the truck without lifting the elevating platform, the operator needs only to depress the treadle 69 to the position of Fig. 5. The pin 76 of arm 75 of treadle 69 will then press against the surface 77 of the arm 68b of control lever 66 so as to move the latch 64 into the full line position of Fig. 5. The strut 58 may then bypass the latch 64, whereupon the release of the foot treadle 69 will allow the latch 64 to press yieldingly against the strut 58 as illustrated in dash and dot lines in Fig. 5. If, after moving the truck the operator wishes to lift the elevating platform, he has only to lift the lever handle 52 back to the position of Fig. 2. This will bring the upper end of the strut 58 below the latch 64 so that the latch 54 is released to spring back into the position of Fig. 2 to accept application of lifting pressure thereto by the strut when desired. It should be noted that the control cam 46 in Fig. 5 has not moved

ball 45 nor valve rod 40, so that the hydraulic holding mechanism still holds the elevating platform in its fully lifted position.

If the operator wishes to lift the elevating platform to its position of Fig. 6, he swings the lifting lever handle 52 downwardly, lifting pressure then being applied through the first pin 56 to the strut 58 until the parts reach the position of Fig. 7. In the position of the parts in Fig. 7 the second pin 57 now contacts the surface 60 of the lifting strut 58 and it is through this second pin 57 and surface 60 that the elevating platform is raised to the final position of Fig. 6. During this last movement of the parts, the first pin 56 will move relatively to the slot 59 from the position of Fig. 7 to its position shown in Fig. 6.

It will be appreciated that the first pin 56 is further displaced from the shaft 53 about which the lever handle rotates than is the pin 57. Therefore the initial lifting movement of the truck will be swifter than the final lifting movement, but the mechanical lifting advantage will be greater during the final lifting movement when the operator is not in as good a lifting position as during the first part of the lifting movement. It should also be appreciated that the compound lift action described is effective in all steering positions of the steering head. I believe that the value of this compound lift mechanism, outlined first in the preliminary portion of the specification and herein explained in detail, will now be fully appreciated.

The elevating platform will of course be held in the particular position shown in Fig. 6 until it is desired to lower the load. Naturally, the lifting handle 52 will thereafter have free movement from its vertical position of Fig. 2 to the particular position illustrated in Fig. 6. It is interesting to note that the elevating platform will be held in any position intermediate of Figs. 2 and 6, and that in all positions the lifting strut is effective to continue the lifting operation unless the latch 64 is withdrawn to the position of the Fig. 5.

If it be desired to release the elevating platform for lowering movement, the treadle 69 is depressed from its position of Fig. 6 into its lowering position of Fig. 8, in which figure the valve rod 40 is shown depressed by control cam 46 and with the ball 38 lowered from its seat. Naturally, fluid will now flow freely from one side to the other of the piston head 33 to allow lowering of the elevating platform. It is important to consider that before the foot treadle 69 may position the valve 38 for lowering movement of the elevating platform, it must first retract the latch 64 so that downward movement of the elevating platform will not through contact of the latch 64 with lifting strut 58 effect an upward swinging of the lifting lever handle 52. Unless such safety means are provided, a swift lowering of the elevating platform may effect what is known in the art as a flying handle, the cause of numerous injuries to truck operators.

It is well to note that the foot treadle 69 is pivotally carried on the elevating platform and that it moves downwardly with the platform as the platform is lowered. Therefore, the operator must always follow the platform downwardly with his foot, any relief of pressure on the treadle allowing the spring 70 to restore the treadle and its control cam 46.

It may be well to review one complete operation of my truck. With the platform 10 in its

fully lowered position of Figs. 1 and 2, the lifting lever handle 52 may be swung downwardly to lift the platform. This lifting is accomplished by pressure of strut 58 against latch 64. No actuation of any parts is required as a requisite for the beginning of the lifting operation.

During lifting of the elevating platform the hydraulic dashpot assembly 29 will hold the platform against lowering movement from any elevated position thereof. In the fully elevated position of platform 10, the dashpot assembly will hold the said platform elevated until the treadle 69 is depressed. Treadle 69 just withdraws latch 64 through contact of its pin part 76 with surface 77 of arm 68b of part 68 of lever 66; thus contributing a free handle. Further movement of treadle 69 moves valve rod 40 to actuate ball valve 38 and allow flow of fluid past piston head 33. The operator's foot must follow treadle 69 in order to maintain that pressure necessary to hold ball valve 38 off its seat to continue the lowering movement of the platform 10.

With the parts in the position of Fig. 2, the operator may wish to move the truck without lifting the load. He then need only depress treadle 69 to its position of Fig. 5 to move latch 64 to its full line position in that figure. The lever handle 52 may then be depressed to bring strut 58 past the latch 64 as in Fig. 5. If treadle 69 is now released, the spring 70 will act through pin 76 of the treadle to press the latch 64 into its dash and dotted line position of Fig. 5 and against strut 58. If at any time thereafter the lifting handle 52 is moved into its vertical position of Fig. 2, the strut 58 will move below latch 64 allowing latch 64 to move into its lifting position of Fig. 2. The platform may now be lifted by handle 52 in the usual way without further manipulation of any of the parts.

I believe that the construction and mode of operation of my invention will now be fully understood.

I now claim:

1. In a truck of the class described, a lifting head, an elevating platform mounted for lifting movement relatively to said lifting head, a lifting member mounted for movement relatively to said lifting head and movable relatively thereto to impart lifting movement to said elevating platform, means on said elevating platform movable into position to have movement imparted thereto and said elevating platform by said lifting member, a spring pressing said means into said position, and control means for moving the means on said elevating platform out of said position so that movement of said lifting member does not actuate said first named means.

2. In a truck of the class described, a lifting head, an elevating platform mounted for lifting movement relatively to said lifting head, a lifting member, means mounting said lifting member for movement relatively to said lifting head to impart lifting movement to said elevating platform, means guiding said lifting member for movement on its mounting means in a predetermined path, and means on said elevating platform movable into and out of said path whereby when said means are in said path said lifting member will move said means and elevating platform to impart lifting movement to said platform.

3. In a truck of the class described, a lifting head, an elevating platform mounted for lifting movement relatively to said lifting head, a lifting member pivotally mounted for movement relatively to said lifting head, means for imparting

thrust to said lifting member through its pivotal mounting whereby to impart lifting movement to said elevating platform, means guiding said lifting member on its pivotal mounting for movement in a predetermined path, and means on said elevating platform movable into and out of said path whereby when said means are in said path said lifting member will move said means and elevating platform to impart lifting movement to said platform.

4. In a truck of the class described, a lifting head, an elevating platform mounted for lifting movement relatively to said lifting head, a lifting member mounted for movement relatively to said lifting head and movable relatively thereto to impart lifting movement to said elevating platform, means on said elevating platform guiding said lifting member for movement in a predetermined path relatively to said platform, and means on said elevating platform movable into and out of said path whereby when said means are in said path said lifting means will move said means and elevating platform to impart lifting movement to said platform.

5. In a truck of the class described, a lifting head, an elevating platform mounted for lifting movement relatively to said lifting head, a lifting member mounted for movement relatively to said lifting head and movable relatively thereto to impart lifting movement to said elevating platform, guide means on said elevating platform guiding said lifting member for movement in a predetermined path relatively to said platform, and means on said elevating platform movable into and out of said path whereby when said means are in said path said lifting means will move said means and elevating platform to impart lifting movement to said platform while when said means are not in said path said lifting member will move freely relatively to said guide means of said elevating platform.

6. In a truck of the class described, a lifting head, an elevating platform mounted for lifting movement relatively to said lifting head, a lifting member pivotally mounted for movement relatively to said lifting head, means for imparting thrust to said lifting member through its pivotal mounting whereby to impart lifting movement to said elevating platform, means guiding said lifting member on its pivotal mounting for movement in a predetermined path, and means on said elevating platform movable into and out of said path whereby when said means are in said path said lifting member will move said means and elevating platform to impart lifting movement to said platform while when said means are not in said path said lifting member will move freely of said elevating platform.

7. In a truck of the class described, a lifting head, an elevating platform mounted for lifting movement relatively to said lifting head, a lifting member, means mounting said lifting member for movement relatively to said lifting head to impart lifting movement to said elevating platform, means guiding said lifting member for movement on its mounting means in a predetermined path, and means on said elevating platform movable into and out of said path whereby when said means are in said path said lifting member will move said means and elevating platform to impart lifting movement to said platform while when said means are not in said path said lifting member will move freely of said elevating platform.

8. In a truck of the class described, a lifting

head, an elevating platform, a lifting lever mounted on said lifting head, a lifting strut pivoted for free pivotal movement on said lifting lever whereby vertical lifting movement is imparted to said lifting strut by said lifting lever, means guiding said strut on its pivotal mounting for movement in a predetermined path, and means on said elevating platform movable into said path to have movement imparted thereto and said elevating platform by said lifting strut.

9. In a truck of the class described, a lifting head, an elevating platform, a lifting lever mounted on said lifting head, a lifting strut, means whereby vertical lifting movement is imparted to said strut by said lifting lever while leaving said strut for movement relatively to said lifting lever, means guiding said strut for movement relatively to said lifting lever in a substantially vertical path relatively to said platform, and means on said elevating platform other than said guide means cooperable with said strut to impart lifting movement to said elevating platform.

10. In a truck of the class described, a lifting head, an elevating platform, a lifting lever mounted on said lifting head, a lifting strut, means whereby vertical lifting movement is imparted to said strut by said lifting lever while leaving said strut free for movement relatively to said lifting lever, means on said elevating platform guiding said strut for movement relatively to said lifting lever in a substantially vertical path relatively to said platform, and means on said elevating platform movable into and out of said path whereby when said means are in said path said strut will move said means to impart lifting movement to said elevating platform, while when said means are not in said path said lifting strut will move freely of said elevating platform.

11. In a truck of the class described, a lifting head, an elevating platform, a lifting lever mounted on said lifting head, a lifting strut, means whereby vertical lifting movement is imparted to said strut by said lifting lever while leaving said strut free for movement relatively to said lifting lever, means guiding said strut for movement relatively to said lifting lever in a substantially vertical path relatively to said platform, and means on said elevating platform movable into and out of said path whereby when said means are in said path said strut will move said means to impart lifting movement to said elevating platform, while when said means are not in said path said lifting strut will move freely of said elevating platform.

12. In a truck of the class described, a lifting head, an elevating platform mounted for lifting movement relatively to said lifting head, a steering head rotatable on said lifting head, a steering and lifting lever pivoted on said steering head, a lifting strut mounted for vertical movement in the steering axis of said steering head by downward vertical swinging of said steering and lifting lever, guide means on said elevating platform guiding said strut for movement in a path substantially in said steering axis, and means on said elevating platform movable into and out of said path whereby when said means are in said path said strut will move said means to impart lifting movement to said elevating platform, while when said means are not in said path said lifting strut will move freely of said elevating platform.

13. In a truck of the class described, a lifting head, an elevating platform mounted for lift-

ing movement relatively to said lifting head, a steering head rotatable on said lifting head, a steering and lifting lever pivoted on said steering head, a lifting strut mounted for vertical movement in the steering axis of said steering head by downward vertical swinging of said steering and lifting lever, an inverted cone on said elevating platform guiding said strut for movement in a path substantially in said steering axis, and means on said elevating platform movable into and out of said path whereby when said means are in said path said strut will move said means to impart lifting movement to said elevating platform, while when said means are not in said path said lifting strut will move freely of said elevating platform.

14. In a truck of the class described, a lifting head, an elevating platform mounted for lifting movement relatively to said lifting head, a steering head rotatable on said lifting head, a steering and lifting lever pivoted on said steering head, a lifting strut pivoted at its lower end on said steering and lifting lever for vertical movement in the steering axis of said steering head by downward vertical swinging of said steering and lifting lever, guide means on said elevating platform guiding the upper end of said strut for movement in a path substantially in said steering axis, and means on said elevating platform actuated by said strut to lift said elevating platform.

15. In a truck of the class described, a lifting head, an elevating platform mounted for lifting movement relatively to said lifting head, a lifting member mounted for movement relatively to said lifting head and movable relatively thereto to impart lifting movement to said elevating platform, guide means guiding said lifting member in a predetermined path, a latch on said elevating platform movable into and out of said path whereby when said latch is maintained in said path said lifting member will impart lifting movement thereto and to said elevating platform, means for moving said latch out of said path whereupon said lifting member will move past said latch and said platform will not be lifted thereby, and a spring normally pressing said latch into said path.

16. In a truck of the class described, a lifting head, an elevating platform mounted for lifting movement relatively to said lifting head, a lifting member mounted for movement relatively to said lifting head and movable relatively thereto to impart lifting movement to said elevating platform, guide means guiding said lifting member in a predetermined path, a latch on said elevating platform movable into and out of said path whereby when said latch is maintained in said path said lifting member will impart lifting movement thereto and to said elevating platform, means for moving said latch out of said path whereupon said lifting member will move past said latch and said platform will not be lifted thereby, and a spring normally pressing said latch into said path and against said lifting member when said lifting member is once moved past said latch when said latch is retracted, said latch moving under the pressure of said spring into said path once said lifting member is returned into a position below said latch.

17. In a truck of the class described, a lifting head, an elevating platform mounted for lifting movement relatively to said lifting head, a lifting member mounted for movement relatively to said lifting head and movable relatively thereto to impart lifting movement to said elevating plat-

form, a latch on said elevating platform movable into and out of the path of movement of said lifting member whereby when said latch is maintained in said path said lifting member will impart lifting movement thereto and to said elevating platform, means for moving said latch out of said path whereupon said lifting member will move past said latch and said platform will not be lifted thereby, and a spring normally pressing said latch into said path and against said lifting member when said lifting member is once moved past said latch when said latch is retracted, said latch moving under the pressure of said spring into said path once said lifting member is returned into a position below said latch.

18. In a truck of the class described, a lifting head, an elevating platform mounted for lifting movement relatively to said lifting head, a lifting member mounted for movement relatively to said lifting head and movable relatively thereto to impart lifting movement to said elevating platform, a latch movably mounted on said elevating platform and adapted to receive lifting thrust from said lifting member when said latch is held in the path of movement of said lifting member, said latch moving to one side to allow for movement of said lifting member relatively thereto and said elevating platform, and means biasing said latch toward receiving the thrust of said lifting member.

19. In a truck of the class described, a lifting head, an elevating platform, a lifting lever mounted on said lifting head, a lifting strut, means whereby vertical lifting movement is imparted to said strut by said lifting lever, a latch movable on said elevating platform into and out of the lifting path of said strut and adapted when in said path to receive lifting thrust from said strut to lift said platform while when out of said path to allow by-passing thereof by said strut, a spring urging said latch into the path of said strut and adapted to press said latch against said strut when said strut has bypassed said latch whereby upon return of said strut by upward swinging of said lifting lever said latch is pressed into said position in the path of said strut.

20. In a truck of the class described, a lifting head, an elevating platform, a lifting lever mounted on said lifting head, a lifting strut, means whereby vertical lifting movement is imparted thereto by said lifting lever, a latch movable on said elevating platform into and out of the lifting path of said strut and adapted when in said path to receive lifting thrust from said strut to lift said platform while when out of said path to allow by-passing thereof by said strut, a spring urging said latch into the path of said strut and adapted to press said latch against said strut when said strut has by-passed said latch whereby upon return of said strut by upward swinging of said lifting lever said latch is pressed into said position in the path of said strut, and manually operated means for moving said latch out of the path of said strut to allow by-passing of said latch by said strut to yield a free lifting lever.

21. In a truck of the class described, a lifting head, an elevating platform, a lifting lever mounted on said lifting head, a lifting strut, means whereby vertical lifting movement is imparted thereto by downward swinging of said lifting lever, a latch movable on said elevating platform into and out of the lifting path of said strut and adapted when in said path to receive lifting thrust from said strut to lift said plat-

form while when out of said path to allow by-passing thereof by said strut, a spring urging said latch into the path of said strut and adapted to press said latch against said strut when said strut has by-passed said latch whereby upon return of said strut by upward swinging of said lifting lever said latch is pressed into said position in the path of said strut, means for holding said elevating platform in a lifted position whereupon said lifting lever and strut will have free movement between a position corresponding to contact of said latch by said strut and the full upward position of said lifting lever.

22. In a truck of the class described, a lifting head, an elevating platform, a lifting lever mounted on said lifting head, a lifting strut, means whereby vertical lifting movement is imparted thereto by said lifting lever, a latch movable on said elevating platform into and out of the lifting path of said strut and adapted when in said path to receive lifting thrust from said strut to lift said platform while when out of said path to allow by-passing thereof by said strut, a spring urging said latch into the path of said strut and adapted to press said latch against said strut when said strut has by-passed said latch whereby upon return of said strut by upward swinging of said lifting lever said latch is pressed into said position in the path of said strut, means holding said elevating platform in a lifted position, and manually operated means for moving said latch out of the path of said strut to allow by-passing of said latch by said strut to yield a free lifting lever and for thereafter actuating said holding means to allow lowering of said elevating platform.

23. In a truck of the class described, a lifting head, an elevating platform, a lifting lever mounted on said lifting head, a lifting strut, means whereby vertical lifting movement is imparted thereto by downward swinging movement of said lifting lever, means guiding said strut for movement in a predetermined lifting path when it is actuated by said lifting lever, a latch movable on said elevating platform into and out of the lifting path of said strut and adapted when in said path to receive lifting thrust from said strut to lift said platform while when out of said path to allow by-passing thereof by said strut, a spring urging said latch into the path of said strut, means for holding said elevating platform in any lifted position to which it is moved by said strut whereupon said lifting lever and strut will have free movement between a position corresponding to contact of said latch by said strut and the full upward position of said lifting lever.

24. In a lifting truck of the class described, a lifting head, an elevating platform mounted for upward lifting movement relatively to said lifting head, a lifting member mounted for movement relatively to said lifting head and movable relatively thereto to impart lifting movement to said elevating platform, a ring fixed on said elevating platform and in which said lifting member is guided for free movement inwardly and outwardly relatively to said sleeve, a latch extending across the inner bore of said sleeve whereby to obstruct the movement of said lifting member inwardly of said sleeve, and means for moving said latch relatively to said sleeve.

25. In a lifting truck of the class described, a lifting head, an elevating platform mounted for upward lifting movement relatively to said lifting head, a lifting member mounted for movement

relatively to said lifting head, and movable relatively thereto to impart lifting movement to said elevating platform, a ring fixed on said elevating platform and in which said lifting member is guided for free movement inwardly and outwardly relatively to said sleeve and a latch adapted to move relatively to said ring into blocking relation to said lifting member whereby to receive lifting thrust from said lifting member to lift said elevating platform.

26. In a truck of the class described, a lifting head, an elevating platform mounted for lifting movement relatively to said lifting head, a steering head rotatable on said lifting head, a steering and lifting lever pivoted on said steering head, a lifting strut mounted for vertical movement in the steering axis of said steering head by downward vertical swinging of said steering and lifting lever, a sleeve-like member fixed on said elevating platform and within which reciprocates said strut, said sleeve-like member lying with its axis substantially in the steering axis of said steering head in all lifted positions of said elevating platform, and a latch adapted to move relatively to said sleeve-like member into blocking relation to said strut whereby to receive lifting thrust from said strut to lift said elevating platform.

27. In a lifting truck of the class described, a lifting head, an elevating platform mounted for upward lifting movement relatively to said lifting head, a lifting member mounted for movement relatively to said lifting head and movable relatively thereto to impart lifting movement to said elevating platform, a sleeve-like member fixed on said elevating platform and in which said lifting member is guided for free movement back and forth, and a latch movable on said sleeve-like member to receive the thrust of said lifting member.

28. In a truck of the class described, a lifting head, an elevating platform mounted for lifting movement relatively to said lifting head, a steering head rotatable on said lifting head, a steering and lifting lever pivoted on said steering head, a lifting strut mounted for vertical movement in the steering axis of said steering head by downward vertical swinging of said steering and lifting lever, a sleeve-like member fixed on said elevating platform and within which reciprocates said strut, said sleeve-like member lying with its axis substantially in the steering axis of said steering head in all lifted positions of said elevating platform, and a latch movable on said sleeve-like member to receive the thrust of said strut.

29. In a lifting truck of the class described, a lifting head, an elevating platform mounted for upward lifting movement relatively to said lifting head, a lifting member mounted for movement relatively to said lifting head and movable relatively thereto to impart lifting movement to said elevating platform, a sleeve-like member fixed on said elevating platform and in which said lifting member is guided for free movement back and forth, a latch movable relatively to said sleeve-like member into and out of the path of said lifting member and adapted when in said path to receive lifting thrust from said lifting member to lift said platform while when out of said path to allow by-passing thereof by said lifting member, a spring urging said latch into the path of said lifting member and adapted to press said latch against said lifting member when said lifting member has by-passed said latch whereby

upon return of said lifting member by upward swinging of said lifting lever said latch is pressed into said position in the path of said lifting member.

30. In a truck of the class described, a lifting head, an elevating platform mounted for lifting movement relatively to said lifting head, a steering head rotatable on said lifting head, a lifting strut mounted for vertical movement in the steering axis of said steering head by downward vertical swinging of said steering and lifting lever, a sleeve-like member fixed on said elevating platform and within which reciprocates said strut, said sleeve-like member lying with its axis substantially in the steering axis of said steering head in all lifted positions of said elevating platform, a latch movable relatively to said sleeve-like member into and out of the lifting path of said strut and adapted when in said path to receive lifting thrust from said strut to lift said platform while when out of said path to allow by-passing thereof by said strut, a spring urging said latch into the path of said strut and adapted to press said latch against said strut when said strut has by-passed said latch whereby upon return of said strut by upward swinging of said lifting lever said latch is pressed into said position in the path of said strut.

31. In a lifting truck of the class described, a lifting head, an elevating platform mounted for lifting movement relatively to said lifting head, a steering head rotatable on said lifting head, a steering and lifting lever pivoted for vertical swinging movement on said steering head and rotatable with said steering head, a strut pivoted at its lower end relatively to said steering and lifting lever whereby to be moved by vertical swinging of said steering and lifting lever, said strut swinging freely on its pivotal mounting when so moved unless guided, a circular guide member fixed on said elevating platform and through which said strut passes for guiding said strut for movement in a generally vertical path, and means on said elevating platform contacted by said strut when moved in said path for lifting said elevating platform.

32. In a lifting truck of the class described, a lifting head, an elevating platform mounted for lifting movement relatively to said lifting head, a steering head rotatable on said lifting head, a steering and lifting lever pivoted for vertical swinging movement on said steering head and rotatable with said steering head, a strut pivoted at its lower end relatively to said steering and lifting lever whereby to be moved by vertical swinging of said steering and lifting lever, said strut swinging freely on its pivotal mounting unless guided, a circular guide member fixed on said elevating platform with its central axis substantially aligned with the steering axis of said steering head, said strut lying at least partially in said circular guide member in all positions thereof so as to be guided thereby for movement in a generally vertical path, and means on said elevating platform contacted by said strut when moved in said path for lifting said elevating platform.

33. In a truck of the class described, a lifting head, an elevating platform mounted for lifting movement relatively to said lifting head, a lifting lever pivoted on said lifting head, a lifting member bearing at a part thereof against a thrust surface on said lifting lever whereby downward vertical swinging movement of said lifting lever moves said lifting member in a lifting direction,

and a second thrust surface on said lifting lever adapted to contact a second part of said lifting member upon continued vertical swinging movement of said lifting lever, after which said first thrust surface leaves said first part of the lifting member and said second thrust surface completes the lifting movement.

34. In a truck of the class described, a lifting head, an elevating platform mounted for lifting movement relatively to said lifting head, a lifting lever pivoted on said lifting head, a lifting member bearing at a part thereof against a thrust surface on said lifting lever whereby downward vertical swinging movement of said lifting lever moves said lifting member in a lifting direction, and a second thrust surface on said lifting lever adapted to contact a second part of said lifting member upon continued vertical swinging movement of said lifting lever, said second thrust surface being nearer the pivot axis of said lifting lever than said first thrust surface.

35. In a truck of the class described, a lifting head, an elevating platform mounted for lifting movement relatively to said lifting head, a lifting lever pivoted on said lifting head, a lifting member having a pin and slot connection with said lifting lever through which the lifting lever imparts initial movement to said lifting member as said lifting lever swings downwardly, the pin being then at one end of the said slot, and a thrust surface on said lifting lever adapted to contact a surface of said lifting member upon continued vertical swinging movement of said lifting lever for thereafter actuating said lifting member to complete the lifting movement while said pin moves toward the opposite end of said slot.

36. In a truck of the class described, a lifting head, an elevating platform mounted for lifting movement relatively to said lifting head, a lifting lever pivoted on said lifting head, a lifting surface on said elevating platform, a lifting member bearing at its upper end against said lifting surface and at one part of its lower end against a thrust surface on said lifting lever whereby downward vertical swinging movement of said lifting lever moves said lifting member in a lifting direction, and a second thrust surface on said lifting lever adapted to contact a second part of the lower end of said lifting member upon continued vertical swinging movement of said lifting lever, after which said first thrust surface leaves said first part of the lower end of said lifting member.

37. In a truck of the class described, a lifting head, an elevating platform mounted for lifting movement relatively to said lifting head, a lifting lever pivoted on said lifting head, a lifting surface on said elevating platform, a lifting member bearing at its upper end against said lifting surface and slotted at its lower end for engagement with a pin on said lifting lever whereby downward vertical swinging movement of said lifting lever moves said lifting member to apply lifting pressure to said lifting surface, and a thrust portion of said lifting lever adapted to contact a thrust surface of said lifting member upon continued downward vertical swinging movement of said lifting lever to complete the lifting movement while said pin moves in said slot.

38. In a truck of the class described, a lifting head, an elevating platform, means supporting said elevating platform for lifting movement relatively to said main frame, a steering head rotatable on said lifting head, a steering and

lifting lever pivoted on said steering head for vertical swinging movement relatively thereto and adapted to rotate said steering head, a strut bearing at its lower end against a thrust surface integral with said steering and lifting lever whereby downward vertical swinging movement of said steering and lifting lever applies lifting pressure to said strut, means whereby said strut is maintained for rotation with said steering lever while movable relatively to said thrust surface, and a second thrust surface on said steering and lifting lever adapted to contact said strut to apply lifting pressure thereto after predetermined downward swinging movement of said steering and lifting lever.

39. In a truck of the class described, a lifting head, an elevating platform, means supporting said elevating platform for lifting movement relatively to said main frame, a steering head rotatable on said lifting head, a steering and lifting lever pivoted on said steering head for vertical swinging movement relatively thereto and adapted to rotate said steering head, a strut bearing at its lower end against a thrust surface integral with said steering and lifting lever whereby downward vertical swinging movement of said steering and lifting lever applies lifting pressure to said strut, means whereby said strut is maintained for rotation with said steering lever while movable relatively to said thrust surface, a second thrust surface on said steering and lifting lever adapted to contact said strut to apply lifting pressure thereto after predetermined downward swinging movement of said steering and lifting lever, and guide means on said elevating platform for guiding said strut in its lifting movement.

40. In a truck of the class described, a lifting head, an elevating platform adapted for lifting and lowering movement relatively to said lifting head, a hydraulic assembly for controlling the lowering movement of said elevating platform relatively to said lifting head and including a cylinder and a ram in said cylinder, means pivoting the lower end of said cylinder to said lifting head, a bored sleeve carried by said elevating platform, said ram having a bore through which said sleeve passes whereby said ram is secured to said sleeve so that upward movement of said elevating platform is simultaneous with the movement of said ram upwardly in said cylinder, valve controlling means for said hydraulic assembly extending into communication with the bore of said sleeve, and means movable in said sleeve for actuating said valve controlling means.

41. In a truck of the class described, a lifting head, an elevating platform adapted for lifting and lowering movement relatively to said lifting head, a hydraulic assembly for controlling the lowering movement of said elevating platform relatively to said lifting head and including a cylinder and a ram in said cylinder, means pivoting the lower end of said cylinder to said lifting head, a bored sleeve carried by said elevating platform, said ram having a bore through which said sleeve passes whereby said ram is secured to said sleeve so that upward movement of said elevating platform is simultaneous with the movement of said ram upwardly in said cylinder, valve controlling means for said hydraulic assembly extending through said ram into communication with the bore of said sleeve, and means movable in said sleeve for actuating said valve controlling means.

42. In a truck of the class described, a lifting

head, an elevating platform adapted for lifting and lowering movement relatively to said lifting head, a hydraulic assembly for controlling the lowering movement of said elevating platform relatively to said lifting head and including a cylinder and a ram in said cylinder, means pivoting the lower end of said cylinder to said lifting head, a bored sleeve carried by said elevating platform, said ram being secured to said sleeve so that upward movement of said elevating platform is simultaneous with the movement of said ram upwardly in said cylinder, valve controlling means for said hydraulic assembly extending into communication with the bore of said sleeve, and means movable in said sleeve for actuating said valve controlling means.

43. In a truck of the class described, a lifting head, an elevating platform, means mounting said platform for upward lifting movement relatively to said lifting head, mechanical lifting means extending between said lifting head and elevating platform operable to lift said elevating platform on its mounting means, a hydraulic dashpot assembly comprising a ram and cylinder positioned between said lifting head and said elevating platform for holding said elevating platform in all positions to which it is lifted by said lifting means, valve mechanism in said dashpot assembly whereby said dashpot is controlled to hold said elevating platform in elevated positions relatively to said lifting head and to release said elevating platform for lowering movement relatively to said lifting head, control mechanism for said lifting means whereby to condition said lifting means so that they are inoperative to lift said elevating platform, and a single device for sequentially operating said control mechanism and said valve mechanism.

44. In a truck of the class described, a lifting head, an elevating platform adapted for lifting and lowering movement relatively to said lifting head, mechanical lifting means extending between said lifting head and elevating platform operable to lift said elevating platform, a treadle for rendering said mechanical lifting means inoperative to lift said elevating platform, a hydraulic assembly for controlling the lowering movement of said elevating platform relatively to said lifting head and including a cylinder and a ram in said cylinder, means pivoting the lower end of said cylinder to said lifting head, a bored sleeve carried by said elevating platform, said ram having a bore through which said sleeve passes whereby said ram is secured to said sleeve so that upward movement of said elevating platform is simultaneous with the movement of said ram upwardly in said cylinder, valve controlling means for said hydraulic assembly extending into communication with the bore of said sleeve, and a valve controlling cam movable with said treadle and mounted in said sleeve for actuating said valve controlling means.

45. In a truck of the class described, a lifting head, an elevating platform, means mounting said elevating platform for lifting and lowering movement relatively to said lifting head, a hydraulic dashpot assembly comprising a ram and cylinder extending between said elevating platform and said lifting head, means securing said cylinder to said lifting head and said ram to said elevating platform so that said ram moves in said cylinder as said elevating platform moves relatively to said lifting head, a valve for controlling the movement of fluid in said hydraulic dashpot assembly, and means extending through said ram

for operation outwardly of said ram for moving said valve.

46. In a truck of the class described, a lifting head, an elevating platform, means supporting said elevating platform for lifting movement relatively to said main frame, a steering head rotatable on said lifting head, a steering and lifting lever pivoted on said steering head for vertical swinging movement relatively thereto and adapted to rotate said steering head, a strut bearing at its lower end against a thrust surface integral with said steering and lifting lever whereby downward vertical swinging movement of said steering and lifting lever applies lifting pressure to said strut, an inverted cone-like member in which the upper end of said strut slides in all positions thereof, said cone-like member being formed as a part of said elevating platform and lying with its cone-like opening substantially over the axis of said steering head, and a latch slidable rela-

tively to the said cone-like opening to accept the thrust of said strut as said strut is directed toward said latch by said cone-like member.

47. In a truck of the class described, a lifting head, an elevating platform mounted for lifting movement relatively to said lifting head, a lifting member, a hollow cone-like guide for said lifting member and within which said lifting member reciprocates, and a latch mounted for movement relatively to said cone-like guide and extending into blocking relation to said lifting member.

48. In a truck of the class described, a lifting head, an elevating platform mounted for lifting movement relatively to said lifting head, a lifting member mounted for movement on said lifting head, and a hollow cone-like guide for said lifting member mounted on said elevating platform and within which said lifting member reciprocates when moved relatively to said lifting head.

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