Feb. 20, 1923.

1,445,838.

R. M. LOVEJOY.

ELEVATING TRUCK.

FILED SEPT 16, 1916.

2 SHEETS—SHEET 1.

Fig. 1.

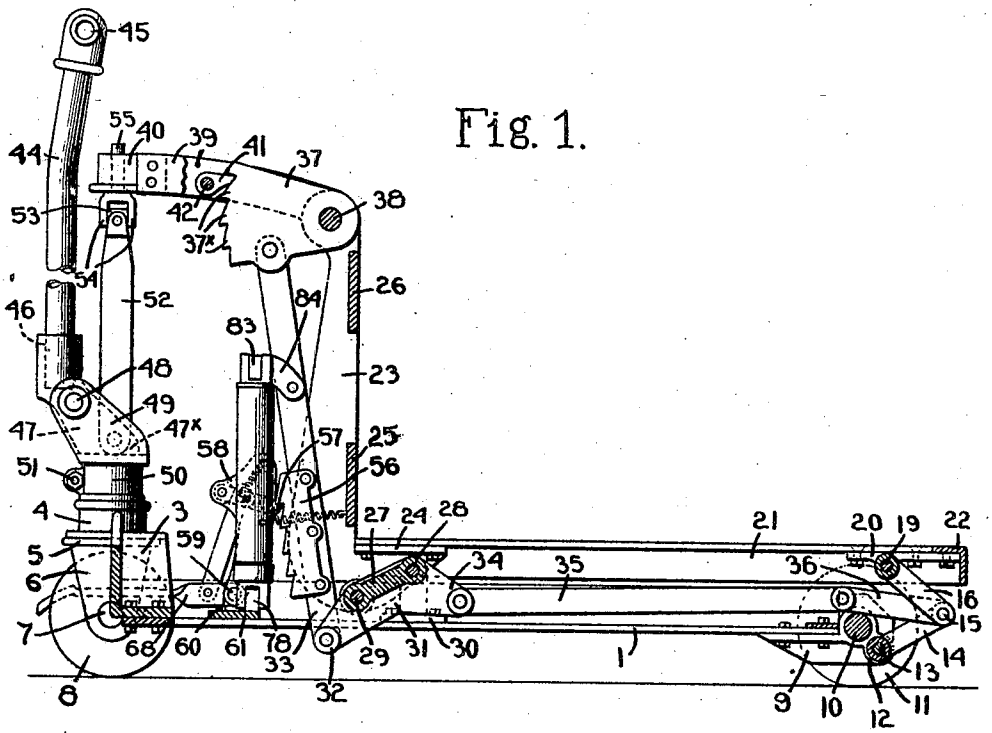
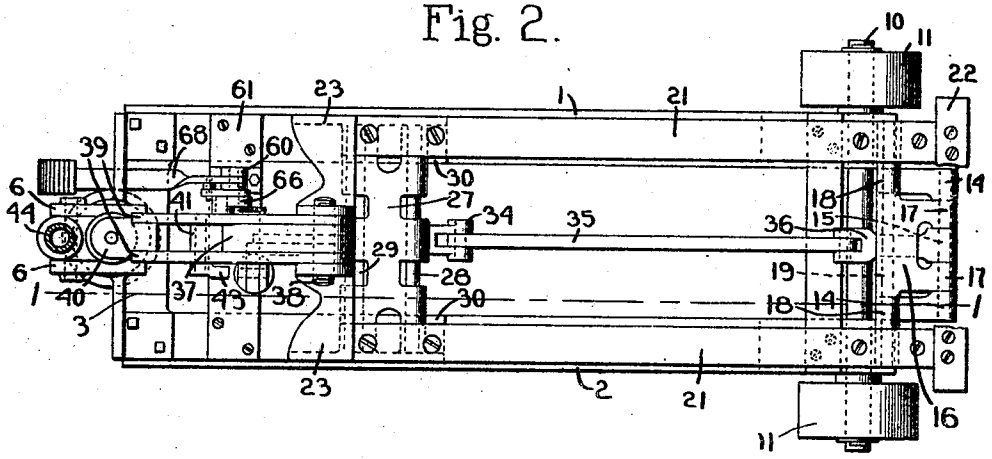


Fig. 2.



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2 SHEETS—SHEET 2.

Fig. 3.

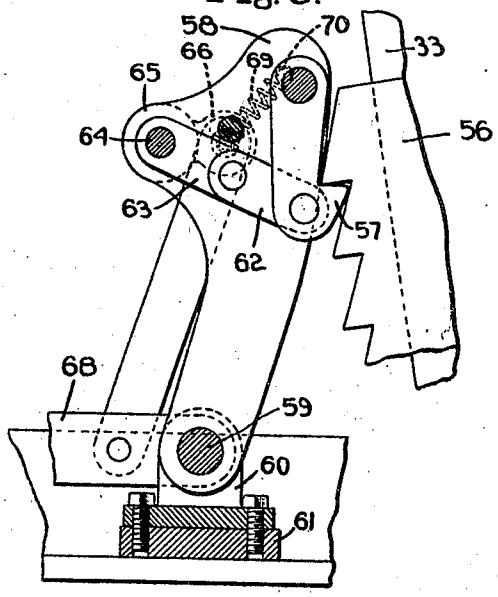
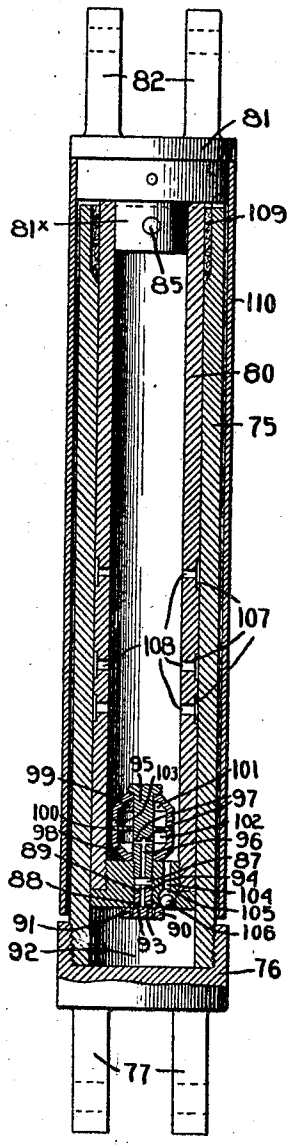


Fig. 4.



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UNITED STATES PATENT OFFICE.

RALPH M. LOVEJOY, OF MEREDITH, NEW HAMPSHIRE, ASSIGNOR TO LEWIS-SHEPARD COMPANY, OF BOSTON, MASSACHUSETTS, A CORPORATION OF MASSACHUSETTS.

ELEVATING TRUCK.

Application filed September 16, 1916. Serial No. 120,557.

To all whom it may concern:

Be it known that I, RALPH M. LOVEJOY, a citizen of the United States, and resident of Meredith, county of Belknap, State of New Hampshire, have invented an Improvement in Elevating Trucks, of which the following description, in connection with the accompanying drawing, is a specification, like characters on the drawing representing like parts.

This invention relates to improvements in elevating trucks in which the platform is raised from the main frame by depressing the steering handle, and particularly of the type in which the load is raised or "jacked" up step by step.

The principal object of the invention is to provide mechanism for elevating the platform, of such a character that the truck may be made in any desirable length or size without other substantial changes than in the length of the frame and platform and such structural modifications as may be desirable to adapt the truck to the maximum load to be handled.

Another object of the invention is to provide an improved elevating mechanism which will be adapted to raise heavy loads more easily and to a greater height from the floor than is customary.

Another object of the invention is to provide a simplified form of elevating mechanism which can be easily constructed, which will withstand hard usage without breakage and which may be operated to raise the platform step by step with the tongue in any steering position.

In the drawings;

Fig. 1 is a vertical sectional view of an elevating truck embodying my invention, taken on lines 1—1 Fig. 2,

Fig. 2 is a plan view of the same, the steering handle being shown in section,

Fig. 3 is an enlarged detail view of the platform locking mechanism and the means for releasing the same, and,

Fig. 4 is an enlarged detail view of the dash pot, showing the same mainly in vertical longitudinal section.

The elevating truck disclosed herein is of the same general type as that which is described in my prior Patent No. 1,307,687, granted June 24, 1919. In that construction the elevating mechanism comprised a scale beam mechanism which required levers of different lengths for different sizes of trucks.

The present invention contemplates the use of standard elevating mechanism which may be used in the manufacture of trucks of different lengths with the mere introduction of a link of the required length, thus enabling a greater number of standard sizes to be made economically and orders for special sizes to be filled promptly and without substantial additional expense.

In order to accomplish this purpose the front end of the truck, where the main elevating means is located is provided with a lever which is operated by the raising and lowering of the tongue. The rear end of the load supporting means or platform is carried by a separate elevating mechanism which is connected to said lever by a link or other suitable tension or compression member which may be constructed in the different lengths required for different sizes or styles of trucks.

The preferred form of truck illustrated herein comprises the usual main frame having a front steering wheel, a pair of rear wheels, and a platform movable substantially vertically in respect to the main frame. The front end of the platform preferably is directly supported upon a lever mechanism which is operated by a "lifting" instrumentality operated in a manner analogous to a lifting jack, while the rear end of the truck is independently supported by a toggle or cam preferably operable by the lever which supports the front end, the lever and toggle being connected by a link which may be varied to suit the desired length of truck.

The truck frame comprises the usual side rails 1, 2 which preferably are angle plates of rolled steel or malleable castings connected together at the front end by an arched girder 3 having a central cylindrical boss 4 to receive a post 5 extending upwardly from the steering wheel and which is provided

with downwardly extending arms 6 having journals for the axle 7 of the steering wheel 8. Brackets 9 bolted or riveted to the rear ends of the rails 1, 2 form journals for the axle 10 upon which the rear wheels 11 are mounted. The axle 10 desirably is rotatable in the journals in the brackets 9 and the wheels 11 are rotatably mounted upon the axles 10. By this construction the rotation of the axle in its bearings prevents the wearing of the axle upon one side which would occur if the axle were rigidly secured to the brackets 9.

The brackets 9 have downward and rearward extensions 12 which provide journals for a shaft 13 which supports toggle links 14 having at their opposite ends apertures to receive a shaft or pintle 15. A co-operating toggle member 16 which is pivoted upon the shaft 15 and supports the rear end of the platform preferably comprises a web recessed centrally to accommodate the operating link and providing members 17 which are pivoted upon the shaft 15. The toggle member 16 preferably has cylindrical integral extensions 18 which are apertured axially to receive a shaft 19 which is secured to, or journalled in, brackets 20, bolted to the side bars 21 of the platform.

The platform, as illustrated herein is of a skeleton construction comprising the side bars 21, preferably angle irons of rolled steel or malleable castings, a connecting rear end plate 22, and front standards 23 having extensions 24 connected to the under sides of the side bars 21 and joined by cross bars 25, 26.

The front end of the platform is supported by lever mechanism preferably in the form of a lever 27 having a flat web-like construction with longitudinal apertures adjacent to and parallel with its edges to receive pivotal shafts 28, 29, one of said shafts, 28 being journalled in brackets or stands 30 which are supported upon and secured to the side rails 1, 2 of the main frame, and the other shaft 29 pivoted in suitable bearings in a depending web of the extension 24 of the platform standard 23.

The lever member 27 has a central transverse, downwardly projecting web 31 which extends both forwardly and rearwardly, the forward extension 32 being pivotally connected to an elevating link 33 and the rearward extension 34 to a link 35 which is pivotally joined to the front end of another link 36 which is pivoted at its rear end upon the shaft 15 between the extensions 17 of the toggle member 16.

By reason of this construction the elevation of the link 33, by the jacking mechanism hereinafter described, or by other suitable means, will oscillate the lever 27 about its fulcrum 28, thus raising the front end of the platform while the opposite oscillation of the rearward extension 34 of said lever will draw the link 35 forward and by straightening the toggle members 14, 16 will raise the rear end of the platform.

When the link 33 is elevated and its pivotal connection 29 is raised through the arc of a circle it causes the platform to be moved forward during preferably the first half of the elevating movement thereby moving the toggle members 14 and 16 into a more effective position. Upon the remaining upward movement of the lever 27 the platform is moved backward thus further assisting in straightening the toggle links and so positioning the platform that there is no substantial resultant relative longitudinal movement between it and the frame.

The link 36 desirably may be so disposed as to rest upon the rear axle 10, extending angularly downward therefrom when the platform is lowered so that a lifting leverage will be exerted upon the toggle during the initial movement of the links 35, 36 which will facilitate their movement in starting to raise the load when the toggles are in the most unfavorable position.

Inasmuch as the lever mechanism which elevates the front end of the platform and the toggle mechanism which raises its rear end are separate mechanisms conjointly operable through the links 35, 36 they may be used in the manufacture of trucks of any length by varying the length of the link 35 as is necessary to conform to the desired length of truck. This feature is very important in the commercial manufacture of trucks as the various users demand trucks of lengths suited to their peculiar needs.

Any suitable mechanism may be utilized for actuating the elevating mechanism, such as the step by step elevating mechanism disclosed in my prior application aforesaid which comprises interengaging means connected respectively to the tongue and the platform operable by the vertical movement of the tongue to elevate the platform, means being provided for locking the platform at each step of elevation. In the present improved construction the interengaging means are so constructed that they may be disengaged by the action of gravity when the platform is locked in elevated position, by merely raising the tongue a short distance. By thus disengaging the interengaging means the tongue is freed to steer the truck and furthermore the load may be dropped by releasing the locking mechanism without causing the tongue to fly up.

It will be readily appreciated that by thus automatically releasing the interengaging members when the loaded platform has been elevated considerable time is saved and the possibility of injury to the employee by a flying tongue occasioned by accidental unlocking of the platform is avoided. As

shown in the accompaning drawing the elevating link 33 is pivotally connected at its upper end to a toothed sector 37 which is pivoted upon a pin 38 which passes through ears upon the upper ends of the standard sections 23.

The sector 37 is actuated by a lever comrising two parallel arms 39 which are pivoted at one end upon the pin 38 and are connected at the other to a block 40 which is engaged by suitable means adapted to be operated by raising and lowering the steering tongue. A pawl 41 rigidly secured to a rock shaft 42 journalled in the arms 39 engages the teeth 37× of the sector 37 so that the raising and lowering of the lever arms 39 serves to raise the sector 37 step by step and with it the elevating link 33, suitable means being provided to retain the link 33 at each step of elevation. A weighted arm 43 (see Fig. 2) fixedly secured to the rock shaft 42 normally holds the pawl 41 in engagement with the teeth of the sector and also serves to rotate the pawl out of engagement with the sector when the latter is raised beyond the last tooth, so that the sector is freed to permit the descent of the platform upon release of its locking mechanism.

The lever arms 39 preferably are actuated by means operable by the steering tongue when the latter is in any steering position. As illustrated herein the tongue 44, having the usual handles 45, is seated in a socket 46 in a lever 47 having trunnions 48 journalled in ears 49 extending upwardly and forwardly from a split sleeve 50 securely clamped upon the post of the steering wheel by a bolt 51 passing through ears extending from said sleeve. The lever 47 has an extension 47× which is pivotally connected to the lower end of a strut 52 which extends vertically upward in line with the axis of the post of the steering wheel and is pivoted at its upper end to a block 53 which in turn is pivoted in ears 54 of a coupling having a stem 55 journalled in the block 41 which connects the free ends of the lever arms 39. By this construction a universal joint is formed which will enable the lever arms 39 to be operated with the tongue in any steering position. Furthermore the universal joint will not only permit the steering wheel to be positioned as desired but will also allow the arcuate movement of the end of the arms 39 without binding.

The extension 47× of the lever 47 preferably has a flat end adapted to engage the upper end of the steering post and collar 50 so that the truck can be pushed when the tongue is in vertical position. This feature is important as it is frequently necessary to push the truck, in a restricted space, beneath the articles to be moved, or to position the truck for unloading. It is also found that the truck can be pushed more easily than pulled, and, as the steering wheel can be turned by the operator when pushing the truck as well as when pulling it, this construction is found to be very advantageous.

Any suitable means may be used in connection with the elevating mechanism for locking the platform or load supporting means against descent after it has been raised by the elevating mechanism. Where usual rigid interengaging members are used for such purpose the weight of the load upon such members holds them so securely in place that it is customary to raise the load by the elevating means in order to release the locking means, or the locking means are so constructed that a great leverage may be applied to one of the members to disengage it from the other. In such instances the interengaging portions of the locking members are quickly worn and frequently are broken. The present invention contemplates the employment of a locking mechanism which includes a toggle the members of which when straightened so that the pivotal axes of the links of the toggle are in substantial alinement will form a rigid strut which will hold the interengaging members in locking position. This toggle however, may be easily broken to permit the interengaging members to separate and the load to descend. By the use of such mechanism the elevating means may be operated to raise the platform step by step, said locking means operating at each step of elevation so that when the platform has reached a predetermined elevation the elevating mechanism may be disconnected and the platform supported upon the locking means. When it is desired to permit the platform to descend it is merely necessary to break the toggle to free the interengaging members and the platform will descend freely.

A suitable cushioning device such as that hereinafter described may be used to gradually arrest the descent of the platform.

The preferred mechanism which is illustrated herein for locking the elevating mechanism as it is raised step by step comprises a ratchet plate 56 which is riveted or bolted to the elevating link 33 (see Figs 1 and 3) and is engaged by a pawl 57 which depends from the upper end of a link 58 which is pivoted at its lower end upon a shaft 59 mounted in a bracket 60 which is bolted upon a cross girder 61 connecting the side plates 1, 2 of the main frame.

The pawl 57 preferably is actuated by an elbow joint connection or toggle-like construction comprising a link 62 pivotally connected at one end to the pawl 57 and at its opposite end to an arm 63 fixed upon a rock shaft 64 which is journalled in an ear 65 extending laterally from the link 58. The opposite end of said rock shaft has a crank

arm 66 which is connected by a link to a foot lever 68 which is fulcrumed upon the shaft 59. A spring 69 connected at one end to the crank arm 66 and at its opposite end to a pin 70 on the link 58 normally tends to straighten the toggle members 62, 63 and force the pawl 57 into locking engagement with the teeth of the ratchet plate 56. A stud 63× projecting from the sides of the link 58 serves to limit the movement of the links to locking position.

In order to elevate the platform, the steering handle is alternately raised and lowered to cause the lever arms 39 and dog 41 to raise the sector and with it the elevating link 33 thereby actuating the lever 32 to raise the front end of the platform while its rear end is simultaneously elevated by the toggle 14—16. At each step the elevating link is locked against descent by the engagement of the pawl 57 with the teeth of the ratchet plate 56.

The relation and proportions of the tongue extension 47×, the link 52, the arm 39, the toothed sector 37, the link 33, the ratchet 56 and the proportions of the sector teeth 37× and the teeth of the ratchet 56 are such that the lifting movement for each step of elevation can be accomplished only during the swinging movement of the tongue from substantially the vertical position illustrated in Fig. 1 through an arc located above the effective hauling position of the tongue.

In the present embodiment of the invention the teeth of the ratchet 56 are of such length that when the tongue is swung from a vertical position through a predetermined arc above the normal steering position of the tongue, the locking pawl 57 will engage the next tooth of the ratchet, but further downward movement of the tongue cannot cause the ratchet to be raised sufficiently to cause the locking dog 57 to engage the next lower tooth. Consequently, the weight of the load will remain upon the tongue if the tongue is swung below said predetermined arc until the tongue is raised sufficiently to enable the pawl to engage the tooth which it has passed in the downward swinging movement.

This construction requires the operator to release the lifting pawl 41 from engagement with the sector teeth 37× in order that the weight may be removed from the tongue when the latter is moved to an effective steering position and is utilized to pull the truck. By thus requiring the pawl 41 to be released from engagement with the sector teeth 37× during the normal hauling of the truck accidental tripping of the locking mechanism can never cause the tongue to fly up and injure the operator or a bystander.

When the sector has reached its highest position the weighted pawl 41 falls away from the teeth 37× of the sector so that the sector may be returned without obstruction to its initial position. When the loaded platform is thus elevated the truck is pulled or pushed to its destination. The operator thereupon depresses the foot lever 68 thereby actuating the crank 66 of the rock shaft 64 to break the locking toggle 62, 63, thus releasing the pawl 57 from its engagement with the teeth of the ratchet plate 56 and permitting the link 33, and the platform which it sustains, to descend.

The descent of the platform may be cushioned by any suitable means. I have however devised a special form of dash-pot particularly adapted for use with loads of different weight which will be properly responsive to all requirements.

In usual types of dash-pots those designed to cushion a heavy load work too slowly when used with a light load, while those designed for light loads are insufficient to cushion the descent of heavy loads. By my novel construction means are provided which offers greater resistance to the descent of heavy loads than to that of light loads or the empty platform so that the platform is permitted to descend with substantially equal speed under all conditions. This is accomplished by providing means for causing the fluid of the dash pot to follow an extended irregular path with baffles so interposed as to offer greater resistance to the flow of the fluid substantially in proportion to the pressure of the fluid.

The preferred form of dash pot illustrated herein comprises a cylinder 75 of brass or steel tubing having a cap 76 screw threaded thereon, the cap being provided with ears 77 which are pivotally mounted upon a lug or bracket 78 on the transverse girder 61, and a tubular piston 80 telescopically fitting the cylinder 75 and having at its upper end a cap 81 provided with ears 82 which are pivotally connected to the offset end 83 of an arm 84 which in turn is pivoted to the elevating link 33.

The piston cap 81 desirably is formed integrally of sections having different diameter, the intermediate section being very slightly larger than the outer diameter of the cylinder 75 while the lower section or boss 81× fits tightly within the bore of the tubular piston 80. The upper end of the piston 80 abuts against the lower face of the intermediate portion of said cap and is secured to the boss 81 by a pin 85 thus forming a very rigid construction.

The lower end of the tubular piston is provided with a head 86 having the same diameter as the tubular piston and preferably having an integral boss adapted to be screwed into the lower end of the piston 80.

The piston head 86 is provided with a central aperture 87 having screw threaded walls and also with a countersunk portion form-

ing an annular recess 88 adjacent the lower mouth of said aperture. A nut or plug having a threaded stem 89 is seated in said aperture, the head 90 of said plug being larger in diameter than that of the annular recess 88. Small holes or ducts 91 lead from the cylinder chamber 92 to the annular recess 88 and ducts 93 lead from said recess to a central outlet 94 in the stem 89 of the plug, thus providing an irregular course for the fluid in the dash pot adapted to retard its flow as the piston is moved in said cylinder.

In order to impose still further resistance to the flow of the fluid a second plug 95 may be screwed into the upper end of the aperture 87, said plug being provided with a central passage 96 having lateral outlets 97. The plug 95 preferably is surrounded by a two part casing comprising complementary hollow members 98, 99 which clamp between them a disk 100 which divides the space enclosed by said hollow members into two chambers 101, 102, the disk 100 having a central recess of sufficiently larger diameter than that of the plug to permit the fluid to flow slowly from the chamber 101 to the chamber 102. Outlet orifices 103 lead from the chamber 101 to the interior of the tubular piston. By providing the upper end of the plug 95 with an enlarged square or hexagonal head the casing members 98, 99 and disk 100 may be clamped firmly in place by the plug when it is screwed into the aperture 87. By this construction considerable additional resistance is presented to the flow of the fluid, since after it issues from the outlet 94 of the piston head it passes into the aperture 87 thence through the orifice 96 and its angularly disposed outlets 97 to the chamber 102 where it flows against the walls of the chamber. Thence the fluid flows through the central recess in the disk 100 into the chamber 101 and finally from said chamber through the outlets 103 into the hollow piston. By thus causing the fluid alternately to pass through an irregular course of small ducts into relatively large chambers the fluid is enabled to flow relatively freely when the piston is moved slowly or under light load but is caused to eddy and to offer greatly increased resistance as the pressure upon the piston is increased so that the dash pot operates properly to cushion loads of any desired weight with substantially the same piston speed.

In order to permit the piston to be raised without resistance the head 86 is provided with a large orifice 104 and a communicating countersunk portion 105, the walls of which form a seat for a ball valve 106. The countersink 105 may be so located that the head 90 of the lower plug overlies a portion of the same and serves to retain the ball valve in its chamber.

As there is a tendency of the fluid in the cylinder to work up between the piston and cylinder during the operation of the device the piston is provided at a distance from its head, with a plurality of external annular grooves 107 which communicate with the interior of the piston through orifices 108 so that the fluid which creeps up between the piston and cylinder will be returned to the body of fluid and will be prevented from working out of the top of the cylinder. A felt packing 109 may be provided to absorb any of the fluid which may work beyond the grooves 107 and to exclude dust.

The piston also desirably is provided with a cylindrical dust guard or apron 110 which is connected to the intermediate portion of the cap 81 and fits loosely around the cylinder and extends practically its entire length when the piston is in depressed position.

It is to be understood that the embodiment of my invention disclosed herein is illustrative and not restrictive and that various changes in the mechanism and substitution of equivalent instrumentalities may be made within the meaning and scope of the following claims.

Having thus described my invention what I claim as new and desire to secure by Letters Patent is;

1. In an elevating truck comprising steering mechanism, a tongue mounted to swing vertically, load supporting means, a lever at the front end of said truck operable by the vertical movement of said tongue when in any steering position, elevating means for supporting the rear end of said load supporting means, and means including a link connecting the rear elevating means to said lever operable by the movement of said lever simultaneously to elevate the rear end of said load supporting means.

2. In an elevating truck comprising a rear axle and having steering mechanism including a tongue mounted to swing vertically, a load supporting means, a lever at the front end of said truck operable by the vertical movement of said tongue when in any steering position, elevating means connected to the rear axle and to said load supporting means and means including a link connecting said rear elevating means and said lever operable by the movement of said lever simultaneously to elevate the rear end of said load supporting means.

3. In an elevating truck comprising steering mechanism including a tongue mounted to swing vertically, load supporting means, means for elevating the front end of said load supporting means step by step including a lever pivotally connected to the front end of said load supporting means operable by the vertical movement of said tongue, means for locking the load supporting means

against descent at each step of elevation, elevating means for supporting the rear end of said load supporting means and means including a link connecting the same to said lever and operable by the movement of said lever simultaneously to elevate the rear end of said load supporting means.

4. In an elevating truck comprising steering mechanism including a tongue mounted to swing vertically, load supporting means, means connected to and supporting the front end of said load supporting means operable by the vertical movement of said tongue to elevate the front end of said load supporting means, and means including a toggle supporting the rear end of said load supporting means, means operable by the elevating movement of the front elevating means simultaneously to actuate said toggle including a link and supplemental means for giving an initial movement to said toggle.

5. In an elevating truck comprising steering mechanism including a tongue mounted to swing vertically, load supporting means, means connected to and supporting the front end of said load supporting means operable by the vertical movement of said tongue to elevate the front end of said load supporting means, means including a toggle supporting the rear end of said load supporting means, means operable by the elevating movement of the front elevating means simultaneously to actuate said toggle including a lever connected to the joint of said toggle and to said link for giving initial movement to said toggle.

6. In an elevating truck comprising a frame having a front supporting wheel and a vertically swinging tongue mounted thereon, a platform, a lever fulcrumed upon said frame and pivotally connected to and supporting the front end of said platform, jack lifting means for actuating said lever step by step to effect the raising of its pivotal connection with the platform, toggle mechanism supporting the rear end of said platform and means connecting said lever and said toggle mechanism adapted upon actuation of said lever simultaneously to operate said toggle mechanism whereby both ends of said platform will be elevated vertically in respect to said frame without substantial relative longitudinal movement.

7. An elevating truck comprising a load supporting means, wheels, a steering mechanism including a tongue mounted to swing vertically, a member pivotally mounted upon said load supporting means, a co-operating member operable by the vertical swinging movement of said tongue, having pawl and ratchet interengagement with said pivotally mounted member, a lever lying beneath and pivotally connected to said load supporting means, means connecting said lever to said pivotally mounted member, elevating means for the rear end of said platform and a link connecting the same to said lever operable by the movement of said lever to actuate said rear end elevating means.

8. An elevating truck comprising a load supporting means, wheels, a steering mechanism including a tongue mounted to swing vertically, a member pivotally mounted upon said load supporting means and movable therewith, a co-operating member operable by the vertical swinging movement of said tongue, having pawl and ratchet interengagement with said pivotally mounted member, a lever lying beneath and pivotally connected to said load supporting means, means connecting said lever to said pivotally mounted member, elevating means for the rear end of said platform, a link connecting the same to said lever operable by the movement of said lever to actuate said rear end elevating means, and a pawl and ratchet mechanism acting upon said pivotally mounted member to lock the same at each step of elevation whereby one of said co-operating interengaging members may be moved relatively to the other to permit engagement of said pawl with successive teeth upon said ratchet.

9. In an elevating truck comprising a frame having rear wheels, a front steering wheel and tongue and a relatively movable platform; lever mechanism fulcrumed upon said frame supporting the front end of said platform, toggle mechanism supporting the rear end of said platform, means operatively connecting said lever mechanism and said toggle mechanism and rack and pawl mechanisms operable by raising and lowering said tongue adapted to actuate said lever mechanism to raise said platform vertically step by step.

10. In an elevating truck comprising a frame having rear wheels, a front steering wheel and tongue and a platform; lever mechanism fulcrumed upon said frame supporting the front end of said platform, toggle mechanism supporting the rear end of said platform, means operatively connecting said lever mechanism and said toggle mechanism, a standard, a toothed sector pivotally mounted upon said standard, a link connecting the same to said lever mechanism, means for raising said sector step by step to elevate said platform and means for locking the platform against descent at each step of elevation.

11. In an elevating truck comprising a frame having rear wheels, a front steering wheel and tongue and a platform; a standard, lever mechanism fulcrumed upon said frame supporting the front end of said platform, toggle mechanism supporting the rear end of said platform, means operatively connecting said lever mechanism and said toggle mechanism, a toothed sector pivotally

mounted upon said standard, a link connecting the same to said lever mechanism, means operable by raising and lowering said tongue for raising said sector step by step to elevate said platform, means for locking said platform against descent, comprising a ratchet upon said link, a pawl pivotally supported by said frame, means for locking said pawl in engagement with said ratchet and means for releasing said pawl.

12. In an elevating truck comprising a frame having rear wheels, a front steering wheel and tongue and a platform; a standard, lever mechanism fulcrumed upon said frame supporting the front end of said platform, toggle mechanism supporting the rear end of said platform, means operatively connecting said lever mechanism and said toggle mechanism, a toothed sector pivotally mounted upon said standard, a link connecting the same to said lever mechanism, means for raising said sector step by step, comprising a lever pivoted on said standard having a pawl engaging said sector, means operable by said tongue when in any steering position to reciprocate said lever to raise the platform step by step and means for locking the platform at each step of elevation comprising a ratchet upon said link, a pawl pivotally supported by said frame, a spring actuated means normally locking said pawl in engagement with said ratchet and means for breaking said locking means.

13. In an elevating truck comprising a frame having rear wheels, a front steering wheel and tongue and a platform; lever mechanism fulcrumed upon said frame supporting the front end of said platform, toggle mechanism supporting the rear end of said platform, means operatively connecting said lever mechanism and said toggle mechanism, a standard on said platform, a toothed sector pivotally mounted upon said platform standard, a link connecting the same to said lever mechanism, means for raising said sector step by step, means for locking said platform against descent comprising a ratchet upon said link, a pawl pivotally supported by said frame, means for locking said pawl in engagement with said ratchet and cushioning means pivotally supported by said frame and pivotally connected to said link.

14. In an elevating truck comprising a main frame and a relatively movable platform, means for elevating said platform and releasable means for locking the same in elevated position; a fluid containing dash pot, operatively connected to said frame and platform, comprising a cylinder and a piston reciprocable therein and means for causing the fluid to exert a resistance to the descent of the platform substantially proportionate to the weight of the load whereby the platform will descend at substantially the same rate of speed under different loads.

15. In an elevating truck comprising a main frame and a relatively movable platform, means for elevating said platform and releasable means for locking the same in elevated position; a fluid containing dash pot, operatively connected to said frame and platform, comprising a cylinder and a piston reciprocable therein having a head apertured to permit the fluid to flow through the same and means for impeding the flow of the fluid through said piston to cause said fluid to offer a resistance to the descent of the piston substantially proportionate to the weight of the load whereby the platform will descend at substantially the same rate of speed under different loads.

16. In an elevating truck comprising a main frame and a relatively movable platform, means for elevating said platform and releasable means for locking the same in elevated position; a fluid containing dash pot, operatively connected to said frame and platform, comprising a cylinder and a hollow piston reciprocable therein having a head apertured to permit the fluid to flow through the same, means for impeding the free flow of said fluid and for causing the same to follow an irregular and eddying course during the descent of the piston and thereby to cause said fluid to offer a resistance to the descent of the piston substantially proportionate to the weight of the load whereby the platform will descend at substantially the same rate of speed under different loads and a valve in said piston head adapted to permit free downward flow of said fluid during the elevation of said piston.

17. In an elevating truck comprising a main frame and a relatively movable platform, means for elevating said platform and releasable means for locking the same in elevated position; a fluid containing dash pot, operatively connected to said frame and platform, comprising a cylinder and a hollow piston reciprocable therein having a head apertured to permit the fluid to flow through the same, a plug in said aperture having a central duct and a lateral outlet branch, and a casing enclosing said plug having outlets so disposed as to cause the fluid to follow an irregular and eddying course whereby said fluid is caused to offer greater resistance to the descent of the piston under heavy than under light loads upon said piston and a valve in said piston head adapted to permit free downward flow of said fluid during the elevation of said piston.

18. In an elevating truck comprising a main frame and a relatively movable platform, means for elevating said platform and releasable means for locking the same in elevated position; a fluid containing dash

pot, operatively connected to said frame and platform, comprising a cylinder and a hollow piston reciprocable therein having a head apertured to permit the fluid to flow through the same, a plug in said aperture having a central duct and lateral outlet branches, a casing comprising complementary hollow members enclosing said plug and clamped together between the head of said plug and said piston head, and outlets leading from the chamber formed by said hollow members so disposed as to cause the fluid to follow an irregular and eddying course whereby said fluid is caused to offer greater resistance to the descent of the piston under heavy than under light loads upon said piston and a valve in said piston head adapted to permit free downward flow of said fluid during the elevation of said piston.

19. In an elevating truck comprising a main frame and a relatively movable platform, means for elevating said platform and releasable means for locking the same in elevated position; a fluid containing dash pot, operatively connected to said frame and platform, comprising a cylinder and a hollow piston reciprocable therein having a head apertured to permit the fluid to flow through the same, a plug in said aperture having a central duct, a casing comprising complementary hollow members enclosing said plug and having an apertured plate therebetween to form two chambers in said casing, the hollow casing members and baffle plate being clamped together between the head of said plug and the head of said piston, outlets leading from the duct in said plug into the lower chamber and outlets leading from the upper chamber so disposed as to cause the fluid upon the descent of the piston to follow an irregular eddying course, and a valve in said head adapted to permit free downward flow of the fluid during the elevation of the piston.

20. In an elevating truck, comprising a main frame and a relatively movable platform, means for elevating said platform and releasable means for locking the same in elevated position; a fluid containing dash pot, operatively connected to said frame and platform, comprising a cylinder and a hollow piston reciprocable therein having a head apertured to permit the fluid to flow through the same and means communicating with said aperture, including alternating ducts of restricted area and relatively large chambers adapted to impede the flow of the fluid and to cause eddying thereof whereby said fluid will offer a greater resistance to the descent of the pistons under heavy than under light loads and a valve in said piston head adapted to permit free downward flow of said fluid during the elevation of said piston.

21. In an elevating truck comprising a main frame, steering mechanism including a tongue mounted to swing vertically and a platform, interengaging means connected to said tongue and platform operable by the depression of said tongue to elevate the platform step by step, means for locking the platform in elevated position, said interengaging means being adapted to be disengaged by gravity upon raising the tongue when the platform is locked in a predetermined elevated position.

22. In an elevating truck comprising a frame, steering mechanism including a tongue mounted to swing vertically and a platform, elevating means for said platform including interengaging pivotally mounted members one of which is connected to said platform and the other movable by depression of said tongue, having interengaging means operable to raise the platform step by step upon repeated vertical swinging movements of said tongue, means for locking the platform in elevated position, one of said interengaging members being capable of swinging by gravity about its pivot and out of engagement with the other member when the platform is locked in elevated position and the tongue raised.

23. In an elevating truck comprising a frame, a platform having a standard, a toothed sector pivotally mounted upon said standard, means connected to said sector operable by raising the latter to elevate said platform relative to said frame, steering mechanism including a tongue mounted to swing vertically, a dog normally engaging the teeth of said sector operable by the vertical movement of the tongue to raise said sector step by step, means for locking the platform at each step of elevation and means for supporting said dog to permit the same to fall out of engagement with said sector upon raising the tongue after the dog has engaged the lowest tooth upon said sector and the load has been locked in elevated position.

24. In an elevating truck comprising load supporting means and means for elevating the same, means for locking said load supporting means against descent including a dog receiving member and a pivotally supported dog tending normally to swing away from engagement with said dog receiving member, means including a toggle for locking said dog in engagement with said dog receiving member and means for breaking said toggle whereby said dog will be permitted to withdraw from engagement with the co-operating dog receiving member and the load supporting means allowed to descend.

25. In an elevating truck comprising a load supporting means and means for raising said load supporting means, means for

locking the load supporting means against descent including a ratchet and a pivotally supported dog tending normally to swing away from engagement with said ratchet, means for locking the dog in engagement with the ratchet including a toggle and means for breaking said toggle whereby said dog will be permitted to withdraw from engagement with said ratchet and the load supporting means allowed to descend.

26. In an elevating truck comprising load supporting means, and elevating means for raising said load supporting means, means for locking said load supporting means against descent including a ratchet and a co-operating member pivotally supported at one end and having at its opposite end a pivotally mounted dog adapted to engage the teeth of said ratchet, a toggle and means for actuating the same, means acting normally to straighten the links of said toggle to lock said dog in engagement with the ratchet and means operable to break the toggle and thereby to release said dog from engagement with the ratchet.

27. In an elevating truck comprising a load supporting means and means for elevating said load supporting means, means for locking said load supporting means including a toggle having means acting normally to hold the axes of the links of said toggle in alinement and the toggle in locking position and means for breaking the toggle to permit the locking means to be easily released while sustaining the load.

28. In an elevating truck comprising a load supporting means and means for elevating said load supporting means, means for locking said load supporting means, including a ratchet carried by said load supporting means, a pawl mechanism co-operating therewith including a toggle, a spring normally holding the axes of the links of said toggle in alinement and the toggle in locking position and means for breaking the toggle to permit the locking means to be easily released while sustaining the load.

29. An elevating truck comprising steering mechanism including a tongue mounted to swing vertically, load supporting means having a front standard, a member pivotally mounted on said standard, means operable by the vertical swinging movement of said tongue when in any steering position, having pawl and ratchet connection with the end of said pivotally mounted member, a lever lying beneath and pivotally connected to said load supporting means, means connecting said lever to said pivotally mounted member intermediate of the ends of the latter, means for elevating the rear end of said platform and a link connecting the same to said lever operable by the movement of said lever to actuate said rear end elevating means.

30. An elevating truck comprising steering mechanism including a tongue mounted to swing vertically, load supporting means having a front standard, a member pivotally mounted on said standard, means operable by the vertical swinging movement of said tongue when in any steering position, having pawl and ratchet connection with the end of said pivotally mounted member, a lever lying beneath and pivotally connected to said load supporting means, means connecting said lever to said pivotally mounted member intermediate of the ends of the latter, means for elevating the rear end of said platform, a link connecting the same to said lever operable by the movement of said lever to actuate said rear end elevating means, a pawl and ratchet mechanism acting upon said pivotally mounted member at a distance from its pivot for locking the same at each step of elevation whereby the pawl and ratchet connection between the pivotally mounted member and its actuating means and the pawl and ratchet locking mechanism move through a greater distance than that through which the load supporting means moves thereby enabling the use of relatively large ratchet teeth.

31. In an elevating truck comprising a load supporting means, means for elevating said load supporting means and means for locking the same in elevated position, means for cushioning the descent of the load supporting means including a dash pot having a liquid containing cylinder and a piston reciprocable therein and means for causing the liquid to exert a resistance to the descent of the platform proportional to the weight of the load, whereby the platform will descend at substantially the same speed under different loads.

32. An elevating truck comprising steering mechanism including a tongue mounted to swing vertically, load supporting means, releasable interengaging members connecting said tongue to said load supporting means operable by said swinging movement of the tongue through an arc located above the effective hauling position of the tongue to elevate the load supporting means step by step and locking means operable to lock said load supporting means only when said tongue is above said effective hauling position whereby disengagement of said interengaging members will be required in order to permit the tongue to be freed from the weight of the load when moved to hauling position.

33. An elevating truck comprising steering mechanism including a tongue mounted to swing vertically, load supporting means, means for elevating the load supporting means including a lever pivotally connected to the front end of said load supporting means, pawl and ratchet mechanism operable

by the downward movement of the tongue through an arc located above the effective hauling position of the tongue to elevate said load supporting means step by step, a pawl and ratchet operable to lock said load supporting means only when said tongue is above its effective hauling position whereby disengagement of the lifting pawl and ratchet will be required in order to permit the tongue to be freed from the weight of the load when moved to hauling position.

In testimony whereof, I have signed my name to this specification.

RALPH M. LOVEJOY.