June 14, 1960 G. F. QUAYLE 2,940,767

LIGHT DUTY HYDRAULIC TRUCK

Filed Oct. 4, 1955

5 Sheets-Sheet 1

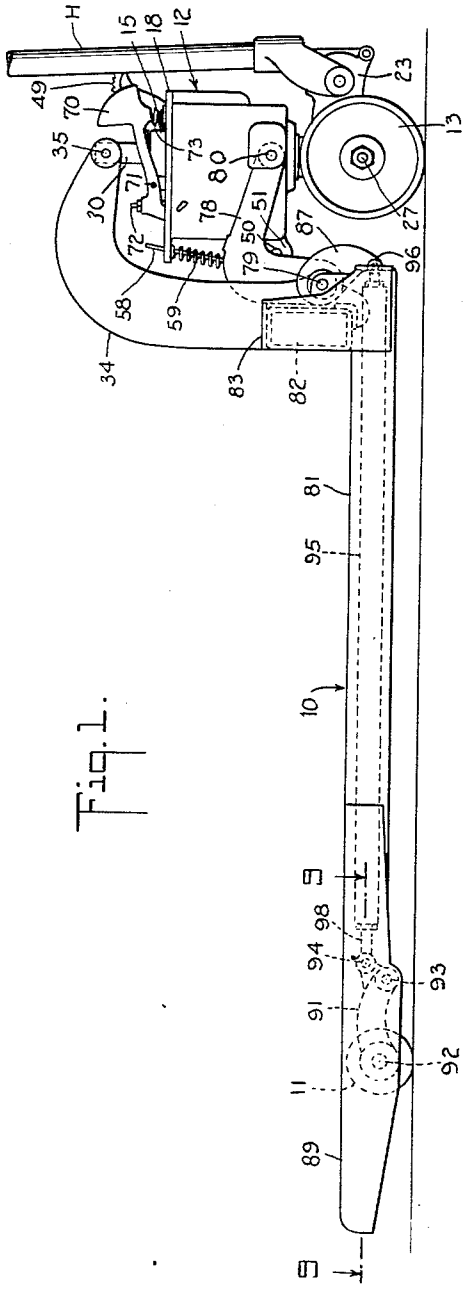

Fig. 1.

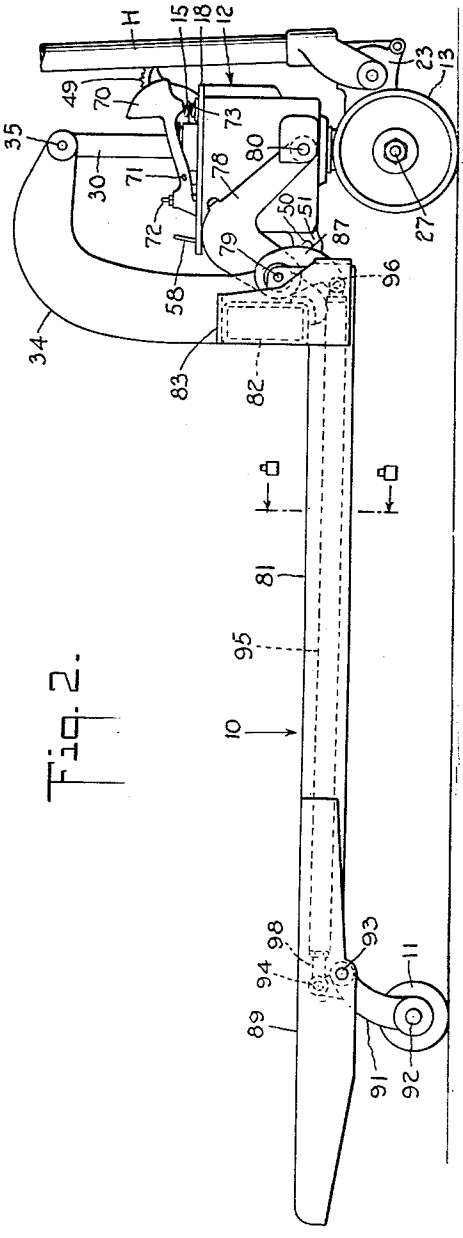

Fig. 2.

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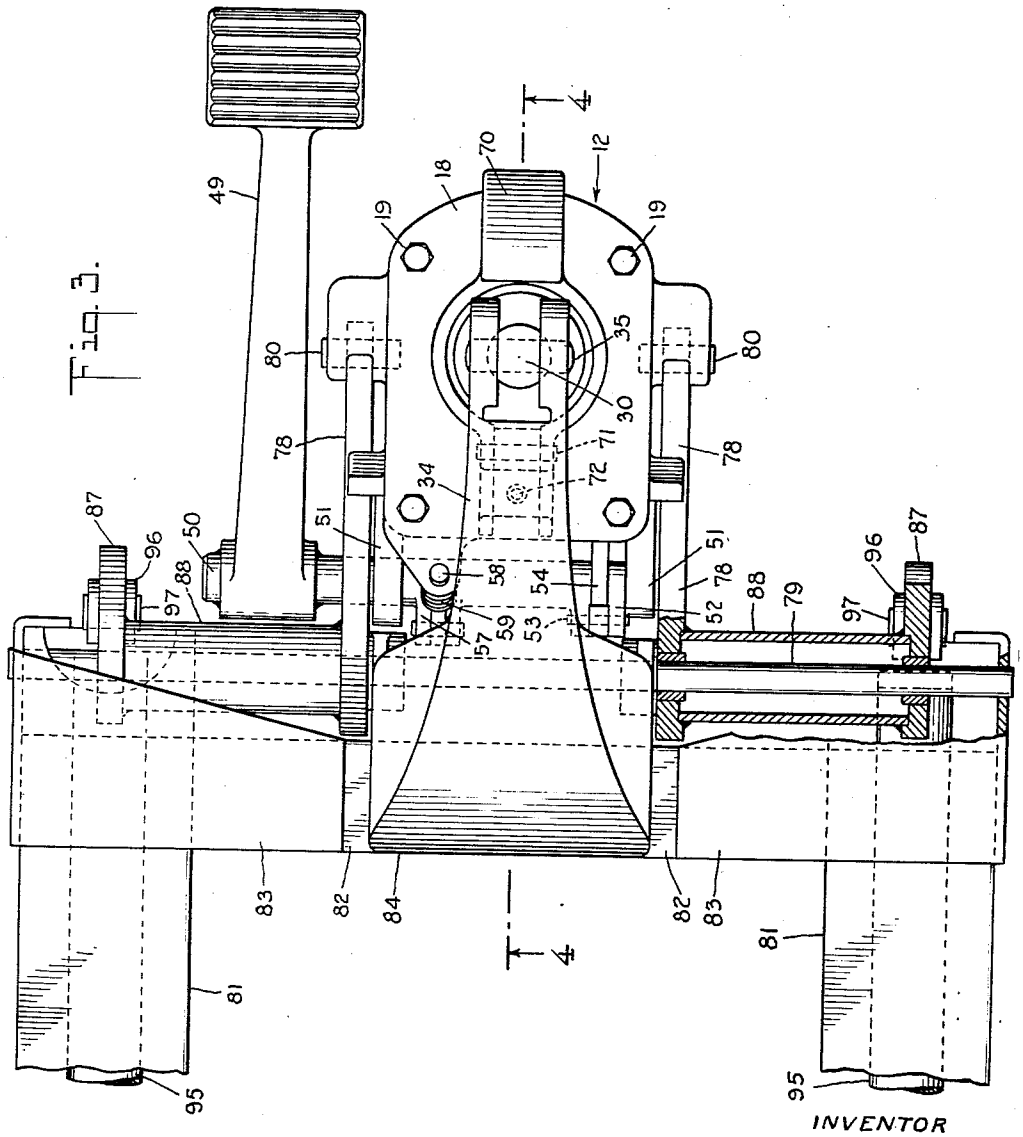
Filed Oct. 4, 1955 5 Sheets-Sheet 2

Fig. 3.



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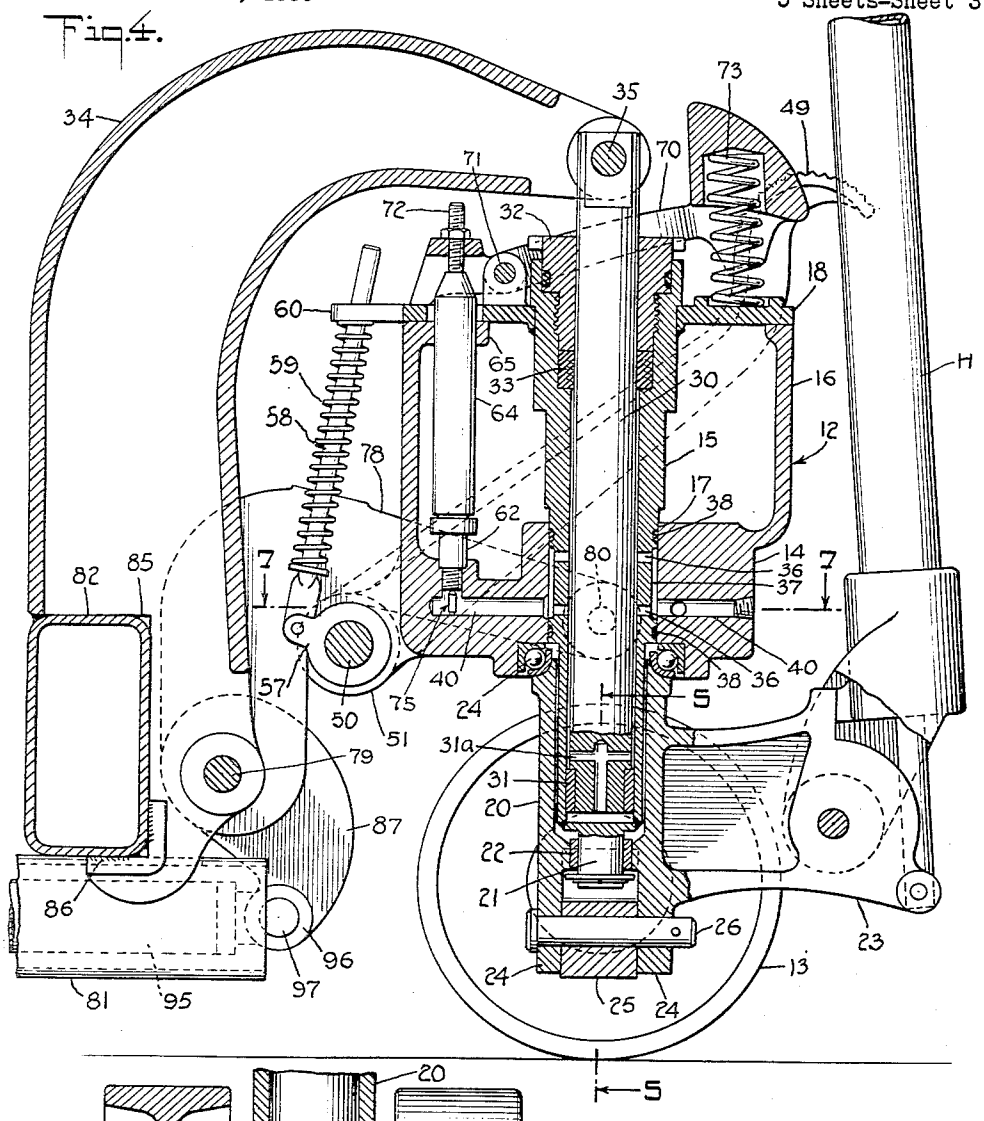
Filed Oct. 4, 1955 5 Sheets-Sheet 3

Fig. 4.



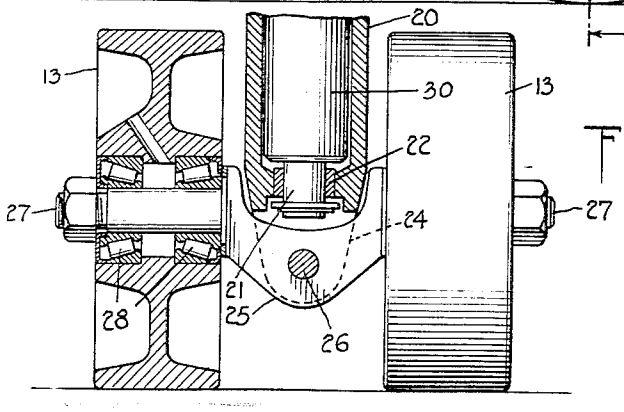


Fig. 5.

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Filed Oct. 4, 1955 5 Sheets-Sheet 4

Fig. 6.

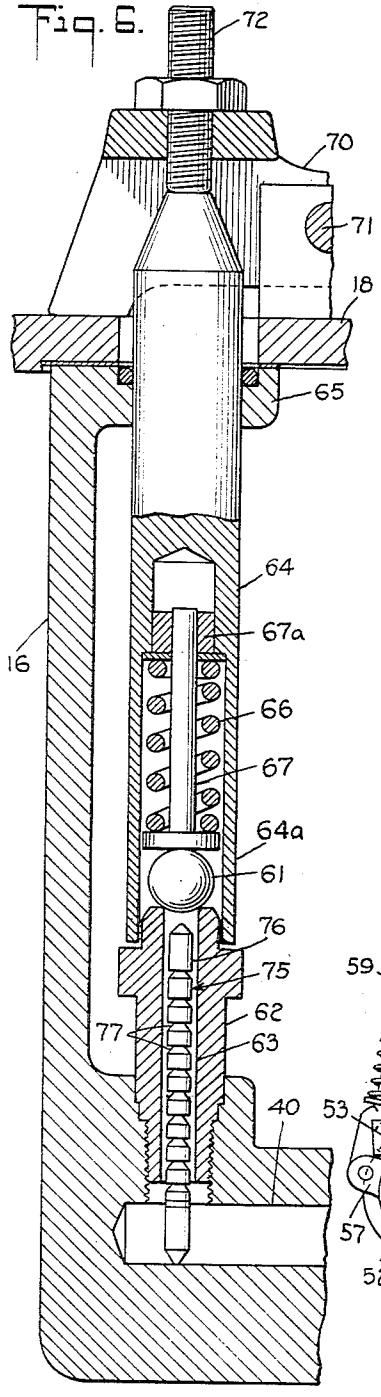


Fig. 7.

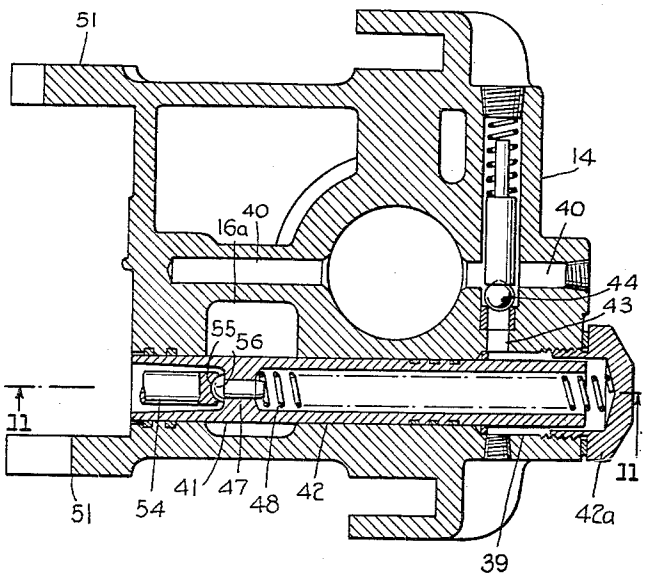
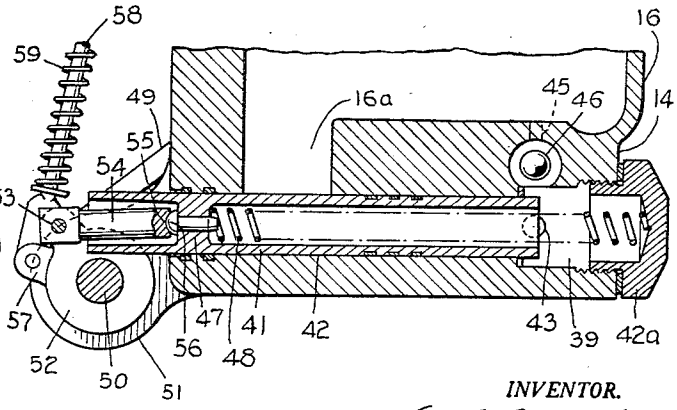


Fig. 11.



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Filed Oct. 4, 1955 5 Sheets-Sheet 5

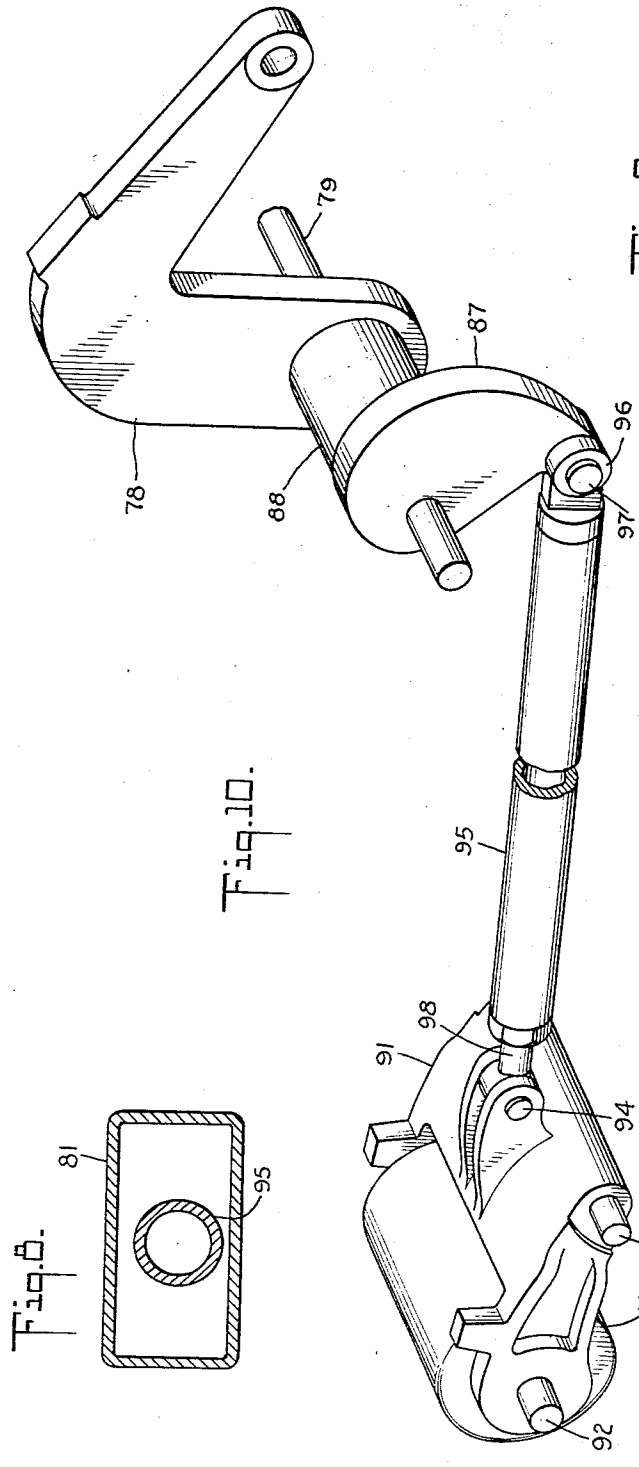

Fig. 10.

Fig. 8.

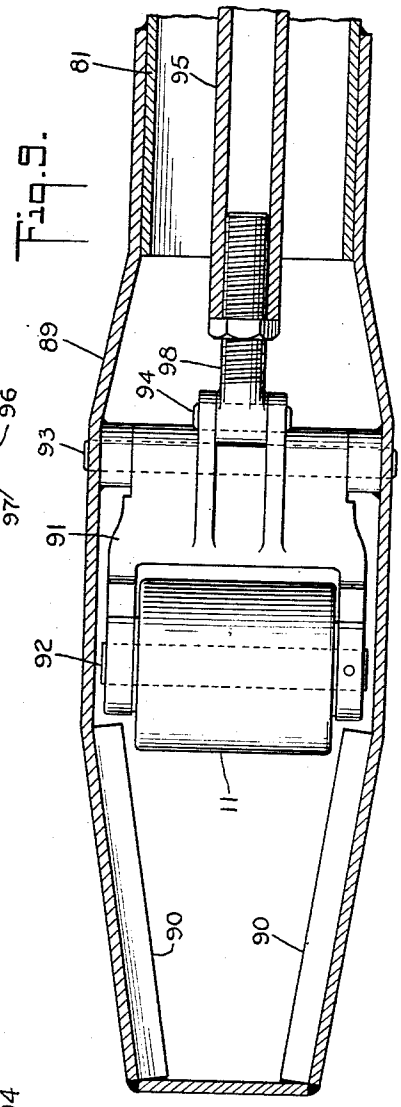

Fig. 9.

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LIGHT DUTY HYDRAULIC TRUCK

George F. Quayle, Philadelphia, Pa., assignor to The Yale & Towne Manufacturing Company, Stamford, Conn., a corporation of Connecticut

Filed Oct. 4, 1955, Ser. No. 538,360

11 Claims. (Cl. 280—43.12)

This invention relates to a hydraulic truck in which the lifting operation is performed through the actuation of a lever that in turn operates a pump. Trucks of the particular class are well known in the art and numerous patents have issued on various types of constructions. The truck of this application forms a considerable contribution over the prior art since it makes possible the application of lifting forces in a most ingenious and novel manner. Further, my truck makes possible the utilization of extremely simple hydraulic control means.

As a very important feature of the invention, a minimum of parts are utilized between the lifting mechanism and the elevating platform in order to eliminate, as fully as possible, the occurrence of flexing and deflection of the several parts incidental to the lifting of the load.

As a feature of my invention, I utilize a ram cylinder that accepts substantially directly the lifting stresses applied in one direction to the cylinder through the lifting of the elevating platform, the ram piston moving in the ram cylinder accepting directly the application of the forces in a reverse direction. As a more particular feature of this part of the invention, the ram cylinder is substantially an integral part of the lifting head of the truck, with the steering and rotating wheel supporting the lifting head through forces applied axially of the ram cylinder. As a further detailed feature of this part of the invention, the ram cylinder is formed as a part of one portion of the lifting head, this portion of the lifting head resting against the remainder of the lifting head, with the support wheel for the lifting head mounted for rotation about the ram cylinder and in bearing relation to the lifting head. The ram cylinder has moving therein a ram piston that bears directly against the elevating platform so that all stresses are axially of the cylinder and piston with a minimum of intermediate parts, and with said intermediate parts in direct bearing relation to one another. Those skilled in the art will fully appreciate after reading the specification, the nature of the contribution inherent in the construction I have set forth.

The elevating platform of the truck is adapted to bear directly against the ram piston as has been set forth, means being provided whereby the elevating movement of the platform through the operation of the ram piston effects lifting movement of wheels at the rear end of the elevating platform. These means also are arranged to apply directly to the ram those forces incidental to the movement of the rear wheels.

As a feature of the invention, the elevating platform of my truck utilizes fabricated tubular sections, and within those sections are mounted compression members extending from the forward end of the elevating platform to the rear load supporting wheels for moving the rear supporting wheels between lifting and lowering positions. It is an important feature of the invention that the compression members are mounted within the tubular portions of the elevating platform and move within said tubular portions at all times, thereby protecting the lifting mechanism through maintaining it completely unexposed

in all operating positions of the elevating platform. So far as I know, no truck of the particular class has fully enclosed lifting members extending between the forward end of the truck and the rear lifting wheels.

As a further feature of the invention, I utilize a single valve mechanism for controlling the hydraulic lifting and lowering mechanism, while simultaneously acting as a relief valve for preventing the application of undue forces through the hydraulic lifting mechanism. As a feature of the invention, I employ a foot treadle for effecting the positioning of the valve mechanism so that fluid will flow from below the ram piston to allow the downward movement of the ram piston and the lowering of the load. As a novel feature of this portion of the invention, I utilize a gravity device for normally holding a valve against its seat, the foot treadle pressing against the gravity device to hold the valve seated when lifting of the elevating platform is required. The movement of the treadle to a lowering position merely withdraws pressure from the gravity device so that the load may be lowered.

As a further feature of the invention, when the treadle is not depressed to effect lowering of the load, its pressure against the gravity device maintains spring pressure against a valve that in turn prevents the flow of fluid from beneath the ram piston. However, upon the application of undue forces, the spring will yield, allowing the movement of the valve away from its seat, so that there may be a bypassing of the ram cylinder, as those skilled in the art will fully appreciate.

As a further feature of my invention, I apply within the hydraulic system of my truck a turbulence creating device that is extremely effective to prevent unduly fast flow of fluid incidental to the lowering operation, thereby preventing too swift a lowering movement of the operation of the truck.

I have thus outlined rather broadly the more important features of my invention in order that the detailed description thereof that follows may be better understood, and in order that my contribution to the art may be better appreciated. There are, of course, additional features of my invention that will be described hereinafter and which will form the subject of the claims appended hereto. Those skilled in the art will appreciate that the conception on which my disclosure is based may readily be utilized as a basis for the designing of other structures for carrying out the several purposes of my invention. It is important, therefore, that the claims be regarded as including such equivalent constructions as do not depart from the spirit and scope of my invention, in order to prevent the appropriation of my invention by those skilled in the art.

Referring now to the drawings:

Fig. 1 is a side view of my novel hydraulic truck.

Fig. 2 is like Fig. 1 but shows the elevating platform lifted on the load wheels and lifting head.

Fig. 3 shows a plan view of the front end of the truck.

Fig. 4 is a vertical section on the line 4—4 in Fig. 3.

Fig. 5 is a section on the line 5—5 in Fig. 4.

Fig. 6 is a section showing my novel hydraulic valve.

Fig. 7 is a section on the line 7—7 in Fig. 4 showing the pump cylinder.

Fig. 8 is a section on the line 8—8 in Fig. 2.

Fig. 9 is a section on the line 9—9 of Fig. 1.

Fig. 10 shows in perspective a rear load wheel and its actuating mechanism.

Fig. 11 is a section on the line 11—11 in Fig. 7.

Referring now more particularly to Figs. 1 and 2 of the drawings, my novel truck has an elevating platform 10 that is supported at its rear end on load wheels 11 and at its front end on a lifting head 12. The lifting head is supported in turn on wheels 13 that have steering movement for steering the truck. As is usual in

trucks of the particular class, the lifting head **12** can lift the front end of the platform **10** while acting simultaneously to move the load wheels **11** for lifting the rear end of the platform. I shall describe the platform **10** and load wheels **11** in further detail, but my invention will be more readily understood if I describe first the novel structure of the lifting head **12** and the means through which it acts.

As is best seen in Fig. 4, I utilize as parts of the lifting head **12** a casing **14**, and a king post **15** that I form particularly as a hydraulic ram cylinder. In the construction that I prefer, and that I show in the drawings, the lifting head casing **14** has an upper portion **16** that forms a reservoir for hydraulic fluid. In the bottom of the casing **14** is a vertical opening **17** for the king post cylinder **15**, and a medial part of the cylinder fits in this opening **17** with the lower end of the cylinder positioned below the casing **14**. The upper part of king post cylinder **15** has upon it an integral portion **18**, formed preferably as a plate welded to the cylinder, that bears upon the sides of the upper portion **16** of the lifting head casing. Thereby the king post cylinder **15** is in direct bearing relation to the lifting head **12**, with the plate **18** acting further as a cover for the fluid reservoir. For holding the plate **18** in assembled position, I utilize screws **19** that are shown in Fig. 3.

I mount the steering wheels **13** for steering movement through a mounting bracket **20**, Figs. 4 and 5, that encircles the lower end portion of the king post cylinder **15**. The cylinder **15** has at its lower end a stub shaft **21**, and the wheel mounting bracket **20** has a bearing **22** coacting with stub shaft **21** whereby to rotate in the king post axis. Further, the upper portion of mounting bracket **20** rotates on ball bearings **24** that are seated in a circular recess on the lower side of the lifting head casing **14**. Thus, the mounting bracket **20** rotates on the stub shaft **21** in the axis of king post cylinder **15** for steering the truck, while in direct bearing relation to the lifting head through the ball bearings **24**. For rotating the mounting bracket **20** on its bearings, I show a steering handle H pivoted to an arm **23** on the bracket.

I further form the mounting bracket **20** with integral portions **24** that are in spaced relation at opposed sides of the king post axis below the bearing **22**. Between these portions **24** I pivot an axle **25** through a pin **26**. The axle **25** has opposed end portions **27**, Fig. 5, that are in the plane of the king post axis, and that are offset to lie in substantially aligned relation to the bearing **22** on which the wheel mounting member rotates relatively to the king post. Bearings **28** mount the steering wheels **13** to rotate on the axle ends **27**. Through the particular construction, the forces incidental to the movement of the truck will be applied in aligned relation to the bearing **22** on the king post, but with axle **25** rotating on pivot **26** when the truck moves over uneven ground.

It will be understood that the construction I have thus far described enables me to utilize a relatively long ram cylinder, since that cylinder lies in a position extending from an upper part of the lifting head to a point that is between the steering wheels **13**. I am, therefore, able to utilize in the king post cylinder **15** a relatively long ram piston **30**, well shown in Fig. 4. The piston **30** in itself is rather conventional, but it may be observed at this point that the piston is somewhat smaller than the bore of king post cylinder **15** whereby to leave a space around the piston, and that the piston has at its lower end a bearing sleeve **31** on which it slides. Passages **31***a* in the lower end of piston **30** enables fluid to flow past the sleeve **31** between hte sides and end of the piston. Piston **30** slides also on a packing nut **32** that retains a packing **33** in the upper end of king post cylinder **15**.

I construct the front end of the elevating platform **10** with a rigid neck **34**. The forward end of neck **34** is pivoted to the upper end of ram piston **30** through a pin **35**, thus placing the front end of the platform and the piston **30** in direct bearing relation to one another. It will be realized, therefore, that the king post cylinder **15** accepts directly the lifting stresses applied to it in one direction through the wheel mounting bracket **20**, while the ram piston **30** moving in the cylinder **15** accepts directly the application of the forces relatively to the rigid neck **34** on the platform.

Referring to Figs. 1, 2, 3, and 4, I utilize a pair of levers **78** for holding the lifting head **12** in aligned relation to the elevating platform **10**. During the lifting movements of platform **10**, levers **78** rotate on a shaft **79** on the front of the platform, with this rotating movement utilized for moving the rear load wheels **11** as I shall later describe. It is important here to observe that I pivot the front ends of levers **78** to opposed sides of the lifting head **12** through pivots **80** that I arrange particularly in the plane of the axis of king post cylinder **15**. This arrangement enables the cylinder **15** to accept directly through the lifting head casing **14** the forces that are incidental to the lifting of the rear end of platform **10** on the load wheels **11**, with those forces applied always on the ram center.

I shall now describe in detail the particular features of the lifting head whereby I apply fluid pressure to the king post cylinder **15** and piston **30**. It will be remembered that a medial portion of the king post cylinder **15** is assembled in the opening **17** in the lower part of the lifting head casing **14**, as shown in Fig. 4. In this medial part of cylinder **15**, I form a series of ports **36**, with an outer peripheral channel **37** in communication with those ports. Packing rings **38** at opposed sides of channel **37** prevent the seepage of fluid between the channel and the opposed ends of opening **17** in the casing. Communicating with the channel **37** at opposed sides of the cylinder **15** is a bore **40** formed in the lower part of casing **14**, this bore being well shown in Figs. 4 and 7.

Further, I equip the lifting head casing **14** with a pump piston **41**, Figs. 7 and 11, that is adapted to move in a cylinder **42** formed integrally in the casing. The cylinder **42** extends through casing **14**, but is formed at its right hand end, as viewed in Fig. 7, with a chamber **39** closed by a cap **42***a*. Chamber **39** communicates with the right hand portion of bore **40** through a passage **43**, Fig. 7, this passage having a spring pressed check valve **44** that will permit fluid to flow only in a direction toward the ram cylinder **15**. For supplying fluid from the reservoir **16** to the pump cylinder **42**, I show in Fig. 11 a passage **45** that is equipped with a check valve **46**. It will naturally be understood that the piston **41** will have power and return strokes in the cylinder **42**. During the power stroke, the right hand end of piston **41** will act against fluid in the chamber **39** for directing fluid pressure past check valve **44** toward the ram cylinder **15**. I prefer, incidentally, so to form the casing **14** that the fluid reservoir has a portion **16***a* communicating with a medial part of the pump cylinder **42**, as well shown in Figs. 7 and 11, so that any high pressure fluid seeping around piston **41** will be directed to the reservoir and will not leak out at the left hand end of the piston.

I utilize a rather novel construction for the pump piston **41** and its operating means. Referring to Figs. 7 and 11, I make the piston **41** tubular whereby to have hollow end portions, but with a medial wall **47** that closes the piston to fluid flow. This enables me to utilize within the piston a relatively long coil spring **48** that acts between the medial wall **47** and the cylinder cap **42***a* for effecting the return stroke of the piston. The piston **41** can itself be relatively long since it can move in the open cylinder end at the left in Fig. 7.

For the purpose of effecting the pumping stroke of piston 41, I utilize a pedal lever 49, Figs. 3, 4, and 11, on a shaft 50 that rotates on a pair of bearing portions 51 at the rear side of lifting head casing 14. As best seen in Fig. 11, the shaft 50 is quite close to the open end of pump cylinder 42 and has fixed upon it an arm 52 having a crank pivot 53 that moves in substantially aligned relation to the pump piston 41. Pivoted at one end to the crank 53 is a rod 54, this rod extending into the hollow piston 41 and having a curved surface 55 that is in bearing relation to a complementary surface 56 on the medial wall 47 of pump piston 41. Thus, the pedal lever 49 when depressed will effect a pumping stroke of piston 41, with the pump rod 54 coacting with the piston 41 at a medial point on the piston while moving angularly in the outer hollow end of the piston. The particular arrangement enables me to utilize a relatively long piston for the pump while arranging the pump and its operating means in a relatively small space on the lifting head 12.

For rotating the pedal lever 49 in a return direction, this rotation being upward, I equip the shaft 50 with a lug 57 to which I pivot a rod 58, with a coil spring 59 acting between this rod and a portion 60 on the reservoir cover 18. The rod 58 is guided in an opening in the cover position 60, and acts in turn to guide spring 59. During the return rotation of pedal 49, the piston spring 48 will act to press the piston bearing surface 56 toward contact with the surface 55 on rod 54.

It will be understood from the foregoing description that the pump piston 41 will apply fluid pressure through the passages 43 and 40 to the ports 36 in the king post cylinder 15 for moving the ram piston 30 upwardly in the cylinder. It will be obvious further that the fluid pressure will be applied through the peripheral channel 37 on cylinder 15 to the left hand portion of the bore 40, as viewed in Fig. 4. On the left hand portion of bore 40, I utilize a valve 61 positioned in the fluid reservoir, as best seen in Fig. 6, that is adapted to coact with a valve body 62 having a bore 63 communicating with the bore 40. I control valve 61 through a gravity member 64 that is adapted to slide vertically in a bracket portion 65 on fluid reservoir 16. This gravity member 64 has a hollow lower end portion 64*a* positioned about valve 61 and arranged in guide relation to the valve body 62, but with clearance whereby fluid can flow from valve 61 into the reservoir 16. In the hollow end portion 64*a* I utilize a coil spring 66 that presses a sliding plunger 67 toward the valve 61 for pressing the valve to seated position on valve body 62. For reasons that will appear, I equip the upper end of the plunger 67 with a stop portion 67*a* for limiting the movement of the plunger 67 and so arranged that spring 66 will not press the plunger substantially beyond the point that is necessary to seat the valve 61.

The pressure of spring 66 is such that it can hold the valve 61 seated until the fluid pressure in passage 40 develops to a predetermined point, and will yield when the pressure rises beyond that point. Thus, through the operation of pedal 49 and pump piston 41, the fluid pressure will move the ram piston 30 upwardly for lifting the truck platform, but, should the truck be overloaded, the fluid pressure will move the valve 61 from its seat whereby to relieve the pressure applied to the ram.

I effect a further control of the valve 61 through the gravity member 64, and I prefer to utilize for the purpose a treadle 70, shown in Figs. 4 and 6. This treadle 70 is pivoted to the reservoir cover 18 through a pivot 71, and has at one end a screw 72 that is aligned with the upper end of the gravity member 64. A coil spring 73 acts against the treadle 70 for pressing the screw 72 against the gravity member 64. The spring pressure that is thus applied to the gravity member 64 is sufficient to hold the member in a depressed position even when the pressure relief spring 66 yields. However, by moving the treadle 70, the truck operator can relieve the gravity

member 64 from the spring pressure that is applied through screw 72. This will relieve also the pressure of spring 66, since the plunger 67 limits the extension of that spring. The fluid pressure acting on valve 61 can then lift the valve, together with the gravity member 64. Thus, the treadle 70 when depressed will effect a discharge of fluid from the ram cylinder 15 to the fluid reservoir and will thereby effect a lowering movement of the truck platform 10.

I control automatically the speed at which the platform 10 is lowered, utilizing for that purpose an extremely novel flow limiting member 75, well shown in Fig. 6, that I prefer to position in the bore 63 of valve body 62. This member 75 is formed as a rod with its outer peripheral surface 76 maintaining a substantial clearance relatively to the inside of bore 63. Along the rod 75, I form the outer surface 76 with a series of angular grooves 77. When the truck platform is lowered with no load or a load that is relatively light, the fluid will be discharged rather freely through the clearance around rod surface 76, but the rate of flow will be moderate since the fluid will have relatively low pressure. If we assume, on the other hand, that the load is heavy, the rate of flow will increase somewhat and the grooves 77 will then cause the flow to be more turbulent, thereby absorbing a very considerable amount of energy and restricting the rate at which fluid will discharge from the ram. This arrangement will act when a heavy load is on the platform to prevent a lowering movement that is too fast, yet will not make the lowering movement unduly slow when the platform has little or no load.

To describe more particularly the platform 10 of my novel truck, I utilize as the load carrying part of the platform a pair of rearwardly extending tubular sections 81, Figs. 1, 2, and 8. These tubular sections 81 may, of course, form parts of a continuous wide load surface when that is desired, but for a pallet truck of the particular type the sections 81 extend separately from the front of the platform in spaced relation to one another, as shown in Fig. 3. At the front of the platform 10, the tubular sections 81 are welded to opposed ends of a transverse tubular section 82, Figs. 1 to 4, and to a reinforcing cap member 83 on each end of section 82. The neck 34 on platform 10 has a relatively wide lower end 84, Fig. 3, that is formed with a notch 85 and a seat 86 for the transverse section 82, as best seen in Fig. 4, and section 82 is welded to said notch and seat. Thereby the neck 34 is secured in very rigid relation to the rearwardly extending platform sections 81.

Referring particularlyto Fig. 3, I mount the shaft 79, on which the levers 78 rotate, on the sides of the lower neck portion 84 and on the ends of reinforcing members 83. Rotating integrally with each lever 78 on shaft 79 is an arm 87 that is in aligned relation to a corresponding platform section 81, and through which the lever acts for moving a load wheel 11. I assemble each lever 78 to its arm 87 through a welded tubular portion 88 that has a relatively large diameter, so that the lever and arm will be very rigid and will not deflect under load.

To the rear end of each tubular platform section 81 I weld a hollow end section 89, Figs. 1, 2, and 9, that is open at its lower side. Each end section 89 is rearwardly tapered and has inclined guide portions 90 whereby these sections will more readily enter a pallet. One of the load wheels 11 is mounted for lifting and lowering movement on each end section 89 through a mounting member 91, this member having at one end a shaft 92 for the wheel and being pivoted to the section 89 through a shaft 93. The mounting member 91 further is equipped with a pivot 94 in offset relation to the shaft 93.

To enable the lifting levers 87 to move the wheel mounting members 91 for lifting the rear end of the platform, I utilize particularly an operating rod 95 that acts in compression and that extends through the interior of each tubular platform section 81, as shown in Figs.

8 and 9. I prefer to make these operating rods 95 tubular, and the rods are therefore quite rigid. The front end of each rod 95 is equipped with an integral clevis 96, Fig. 10, that is pivoted to the corresponding lifting lever 87 through a pin 97. For connecting the rear end of each rod 95 to the pivot 94 on wheel mounting 91, I prefer to utilize a connector 98 that is threaded into the rod for purposes of adjustment. By this novel construction, I enable the lifting mechanism to move the load wheels through rods that extend rearwardly from the front end of the elevating platform, but with those rods enclosed by parts of the elevating platform. Thus, in all operating positions of the platform, the rods are completely protected against damage.

I believe that those skilled in the art will now understand that I have contributed an extremely novel hydraulic truck having very considerable advantages over the prior art. By utilizing a king post that forms a ram cylinder, I am able to place the lifting ram in rather direct bearing relation between the steering wheels and the elevating platform of the truck. Thus, the lifting ram can accept substantially directly those forces that are incidental to the lifting and steering of the truck platform. The platform itself is very rigid, and the lifting head can lift the platform with practically no flexing and deflection of any parts of the truck. This naturally is a very considerable advantage in a truck of the particular type, since it enables the truck operator to lift a load with less effort. In addition, I utilize for the hydraulic system of my truck a novel pump, together with a valve that acts as both a relief valve and a lowering valve while automatically controlling the lowering speed of the platform under different loads. Thereby I contribute a hydraulic system that is very efficient, but that enables me nevertheless to make the lifting head of the truck quite compact. All of these things I accomplish through a construction that is simple and that has a relatively small number of parts. I believe, therefore, that those skilled in the art will appreciate the very considerable value of my invention.

I now claim:

1. In a truck of the class described, an elevating platform, a lifting head having a king post and including means in direct bearing engagement with an upper portion of said king post, means pivoting said elevating platform to said lifting head for lifting movement relatively thereto, said king post forming a part of a hydraulic ram, an opposed part of the hydraulic ram in direct bearing engagement with the elevating platform and moving relatively to the king post for lifting the platform, a support wheel for the lifting head mounted for steering rotation about said king post, and a bearing arranged on a lower portion of the lifting head and through which the wheel supports the lifting head and king post.

2. In a truck of the class described, an elevating platform, a lifting head having a king post and including means in direct bearing engagement with an upper portion of said king post, means pivoting said elevating platform to said lifting head for lifting movement relatively thereto, said king post forming the cylinder of a hydraulic ram, a piston for said hydraulic ram in direct bearing engagement with the elevating platform and moving relatively to the king post cylinder for lifting the platform relatively to said king post, a support wheel for the lifting head, means mounting said wheel for steering rotation about said king post, and a bearing between said wheel mounting means and a lower portion of said lifting head through which the support wheel supports the lifting head.

3. In a truck of the class described having an elevating platform, a lifting head, means pivoting said elevating platform to said lifting head for lifting movement relatively thereto, a king post having an upper portion bearing vertically on said lifting head, said king post forming a part of a hydraulic ram, an opposed part of said hydraulic ram in direct bearing relation to the elevating platform and moving relatively to the king post for lifting the platform relatively to said king post, a support wheel for the lifting head, means mounting said wheel for steering rotation about said king post, and a bearing between said wheel mounting means and a lower portion of said lifting head through which the support wheel supports the lifting head and king post.

4. In a truck of the class described having an elevating platform, a lifting head forming a fluid reservoir, a king post forming a hydraulic ram cylinder, a cover for said fluid reservoir integral with the king post cylinder, said cylinder bearing vertically on the lifting head through said cover, a ram piston for said king post cylinder in direct bearing relation to the elevating platform and moving relatively to the cylinder for lifting the platform, a support wheel for the lifting head, means mounting said wheel for steering rotation on the king post cylinder, and a bearing between said wheel mounting means and said lifting head through which the support wheel supports the lifting head.

5. In a truck of the class described having an elevating platform, a lifting head forming a fluid reservoir, a king post forming a hydraulic ram cylinder, a cover for said fluid reservoir integral with the king post cylinder, said cylinder positioned in the reservoir and bearing vertically on the lifting head through said cover, a ram piston for said king post cylinder in direct bearing relation to the elevating platform and moving relatively to the cylinder for lifting the platform, a part of the king post positioned in an opening in the bottom of the fluid reservoir and extending below the reservoir, a support wheel for the lifting head, and means mounting said wheel for steering rotation on the said part of the king post.

6. In a truck of the class described, a lifting head, lifting means on the lifting head, an elevating platform having a front end portion adapted to be lifted on said lifting means, tubular platform sections extending rearwardly from the front end portion of the platform, a load wheel pivoted to each tubular platform section at its rear end, the tubular form of the platform sections rigidly supporting those sections between said wheels and the front end portion of the platform, an operating member for each load wheel lying within the corresponding tubular section whereby to be enclosed and protected at the top and bottom of the platform, levers pivoted at one end to the front portion of the platform and coacting at their opposed ends with the lifting head whereby to rotate upon lifting movement of the platform, and means through which said levers when rotating move the wheel operating members whereby to lift the rear end of the platform on the load wheels.

7. In a truck of the class described having an elevating platform, load wheels pivoted to the platform at its rear end, a lifting head having a vertical king post and including means in direct bearing engagement with an upper portion of said king post, said king post forming the cylinder of a hydraulic ram, a piston in said cylinder in direct bearing relation to the elevating platform and moving relatively to the king post for lifting the platform, levers pivoted at their rear ends to the elevating platform and at their front ends to the lifting head for moving the rear load wheels when the ram piston lifts the platform, the pivots between the levers and the lifting head lying with their centers substantially in the plane of the vertical axis of the king post cylinder, a support wheel for the lifting head mounted for steering rotation about said king post, and a bearing arranged on a lower portion of the lifting head and through which said wheel supports the lifting head and king post.

8. In a truck of the class described having an elevating platform, a lifting head for said platform, a king post on the lifting head, a mounting member encircling the lower end portion of the king post, a pair of steering wheels at

opposed sides of the king post, an axle having opposed end portions on which said wheels rotate, a bearing between the mounting member and king post whereby said member has steering rotation in the king post axis, a part of the mounting member extending downwardly beyond the king post and lying in spaced relation to the king post axis, and pivot means supporting the axle on the said part of the mounting member with the axle ends substantially in the plane of the king post axis and aligned relatively to the bearing between the member and king post.

9. In a truck of the class described having an elevating platform, a lifting head for said platform, a king post mounted vertically on the lifting head with a part thereof below the lifting head, a mounting member encircling the said part of the king post, a pair of steering wheels, an axle having end portions on which the wheels rotate at opposed sides of the king post, a bearing whereby the mounting member rotates on the king post, said mounting member bifurcated at its lower end to form portions spaced from one another at opposed sides of said king post bearing, and pivot means supporting said axle intermediate the bifurcated portions of the mounting member with the axle ends substantially aligned relatively to the king post bearing.

10. In a truck of the class described having an elevating platform, a lifting head forming a fluid reservoir, a king post forming a hydraulic ram cylinder bearing vertically on said lifting head, said king post and cylinder positioned in the reservoir with a part of said cylinder arranged in an opening in the bottom of the reservoir and extending below said lifting head, a ram piston in said cylinder in lifting relation to said elevating platform, a support wheel for the lifting head, means mounting said wheel for steering rotation on said king post, a pump cylinder and piston on said lifting head, and means through which said pump piston when moving in its cylinder applies fluid

pressure to the part of said ram cylinder that is below the lifting head for lifting said elevating platform on the ram piston.

11. In a truck of the class described having an elevating platform, a lifting head, a king post forming a hydraulic ram cylinder, said cylinder bearing vertically on said lifting head and having a part arranged below said lifting head, a ram piston in said cylinder in direct bearing relation to the elevating platform, a support wheel for said lifting head, means mounting said support wheel for steering rotation on the said part of the king post cylinder that is below the lifting head, a bearing between said wheel mounting means and said lifting head through which the wheel supports the lifting head, a pump cylinder on said lifting head and having a piston therein, and means through which said pump piston when moving in its cylinder applies fluid pressure to the said part of the king post cylinder that is below the lifting head whereby to actuate the ram piston.

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