

United States Patent

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[54] HYDRAULIC LOADER UNIT
16 Claims, 9 Drawing Figs.

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		214/148
[51]	Int. Cl.....	B66f 9/00,
		B66f 9/10
[50]	Field of Search.....	214/139,
		146.5, 134, 131, 148

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ABSTRACT: A hydraulic loader vehicle having a liftable front bucket. The vehicle is driven by a gasoline or electric motor which drives a hydraulic pump, which, in turn, delivers pressure fluid to respective hydraulic motors connected to the vehicle wheels. The pump also delivers pressure fluid to respective front and rear wheel hydraulic motors, and to a hydraulic cylinder employed to raise and lower the bucket of the vehicle. The bucket-supporting arms are guided upwardly along vertical frame channels until the top rollers on the arms engage limiting abutments at the top ends of the frame channels, causing the arms and bucket to be swung outwardly and forwardly so as to be able to dump a load well forwardly of the vehicle. The vehicle has reversible positive drive at all four wheels and the wheels can be steered a full 180°, enabling the vehicle to be moved in any desired direction, or to be rotated in a very small area.

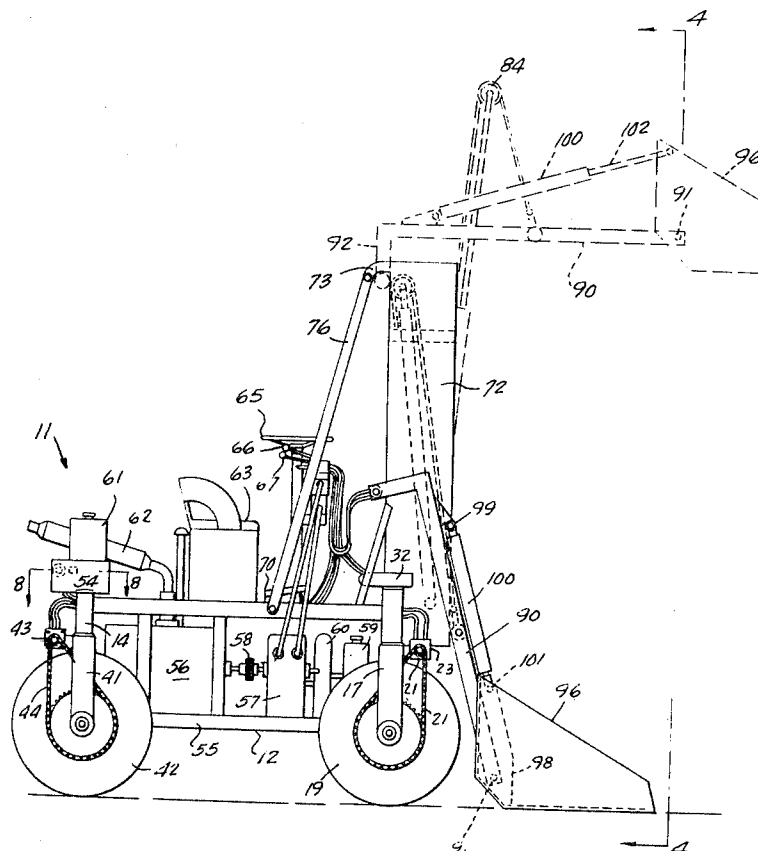
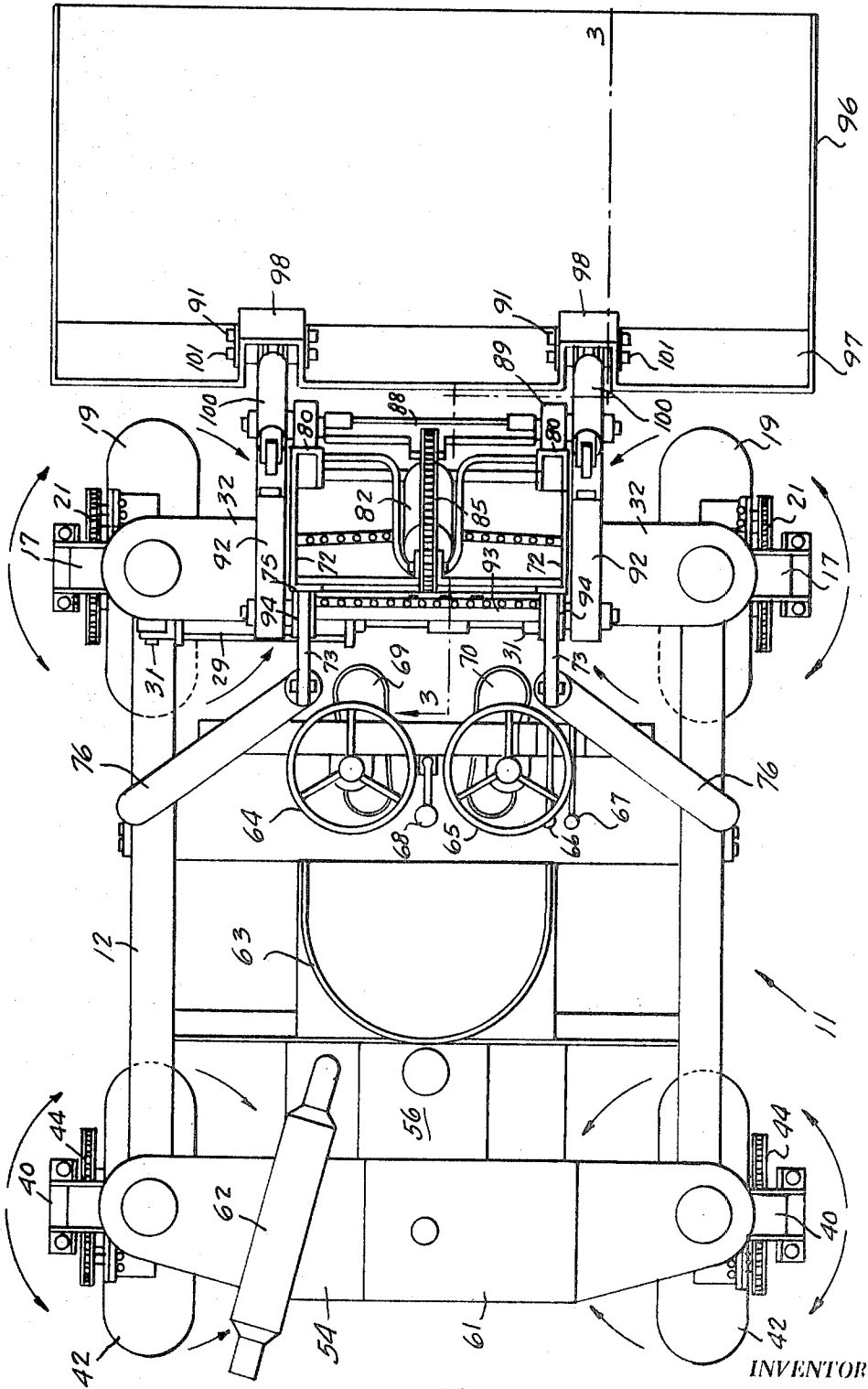
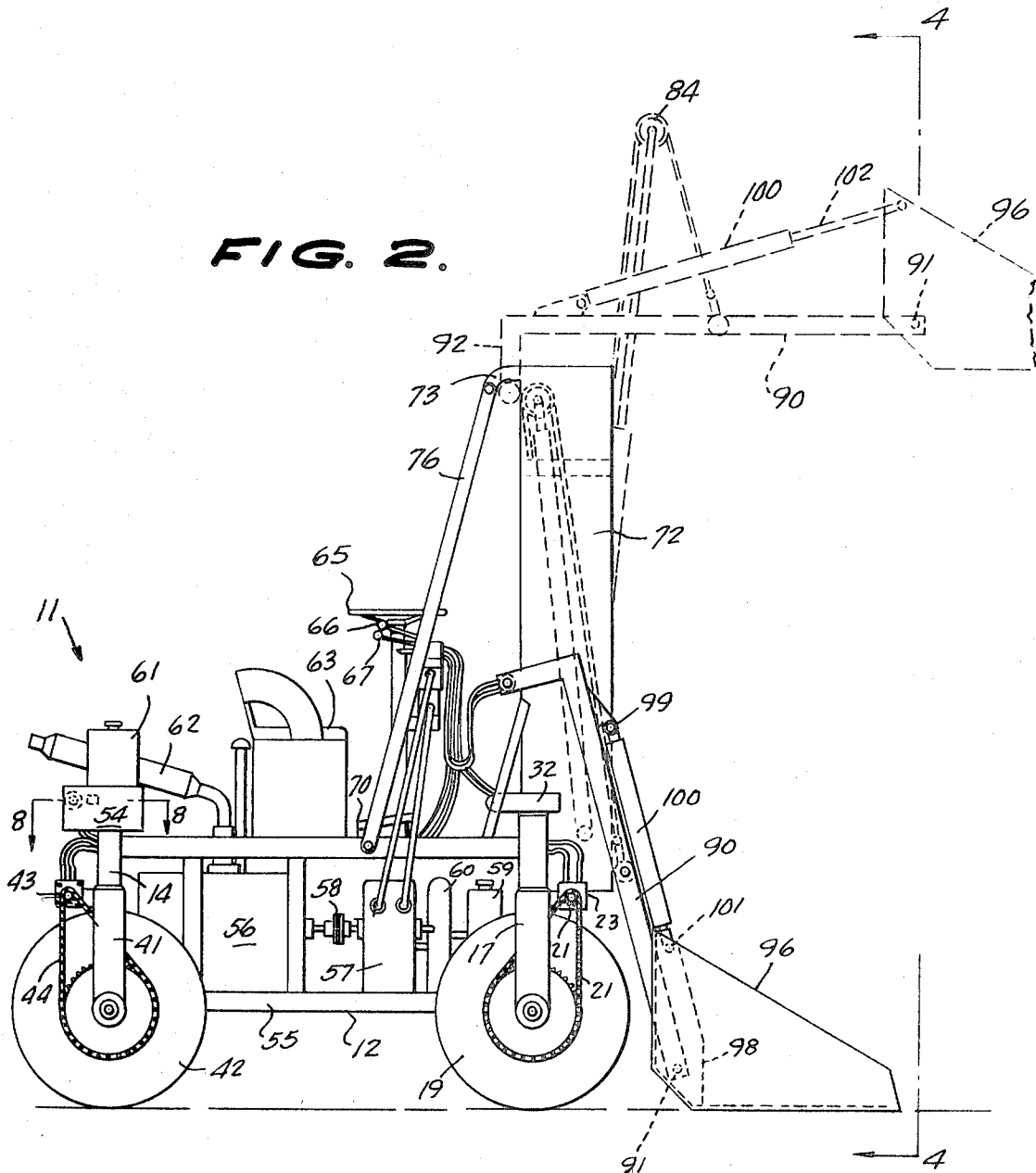


FIG. 1.



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FIG. 2.



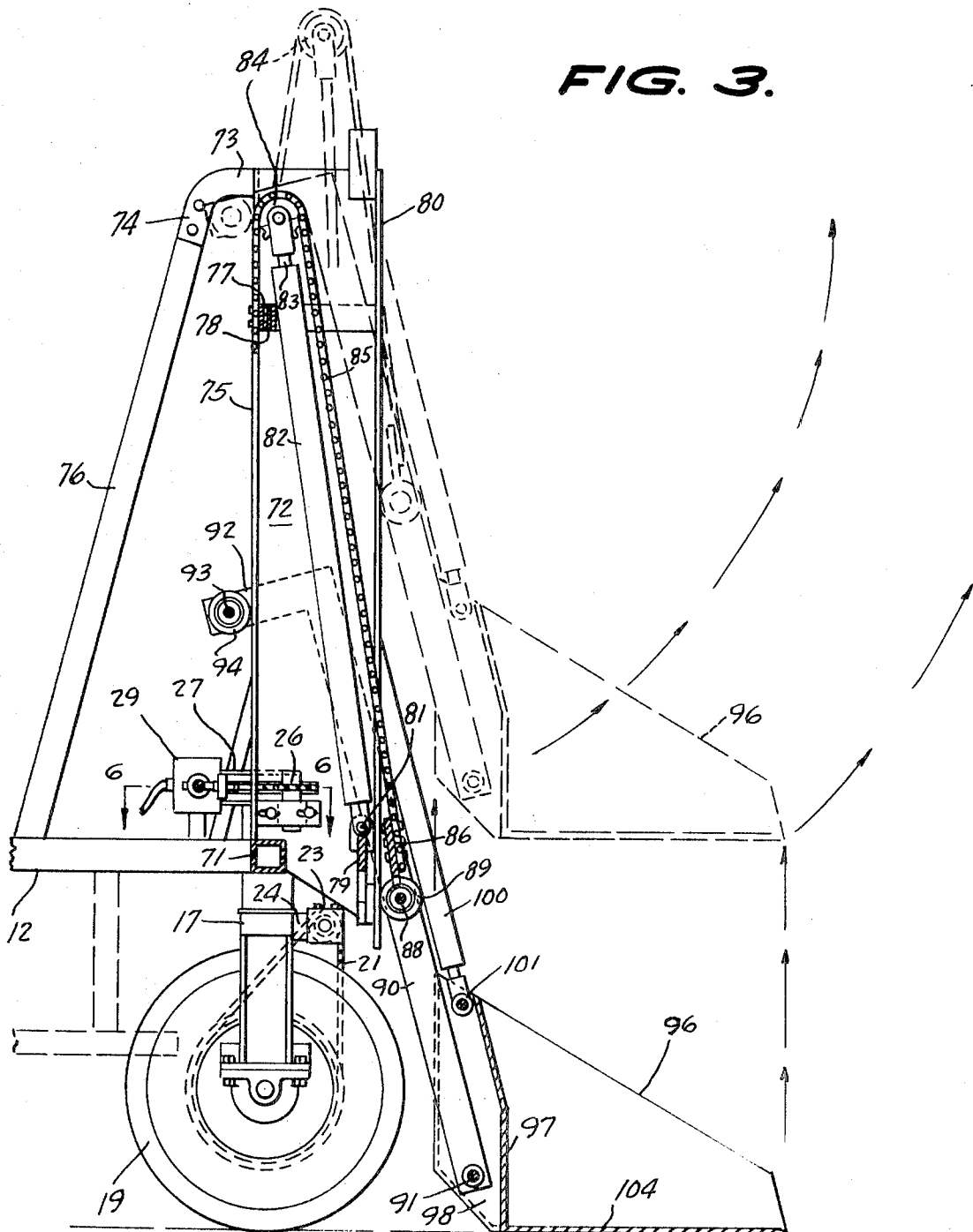
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FIG. 3.



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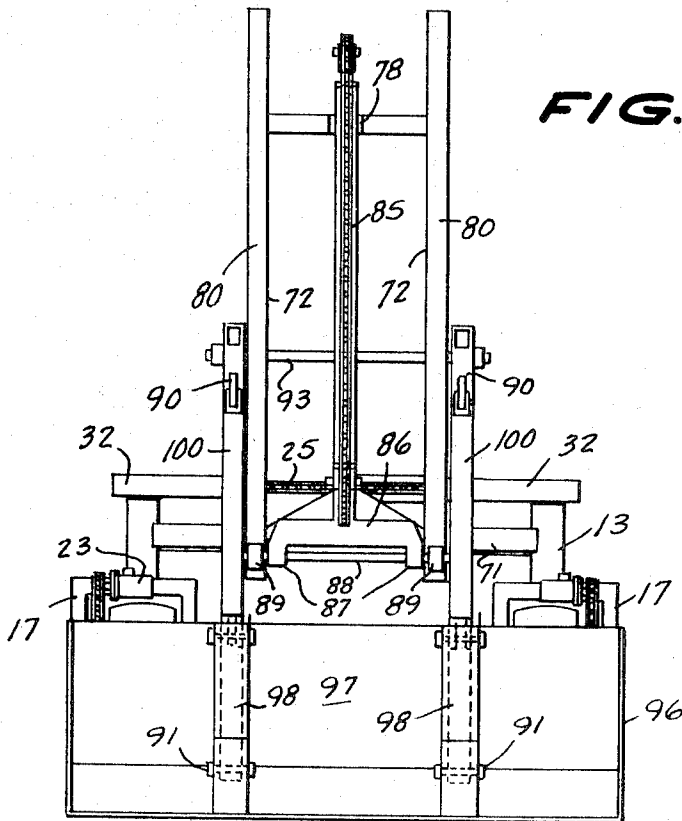


FIG. 4.

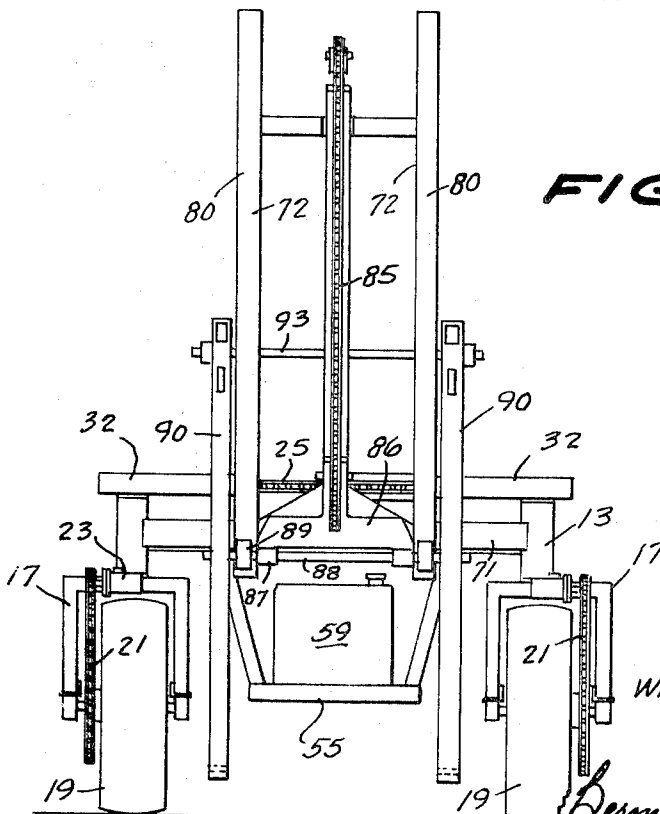


FIG. 5.

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FIG. 6.

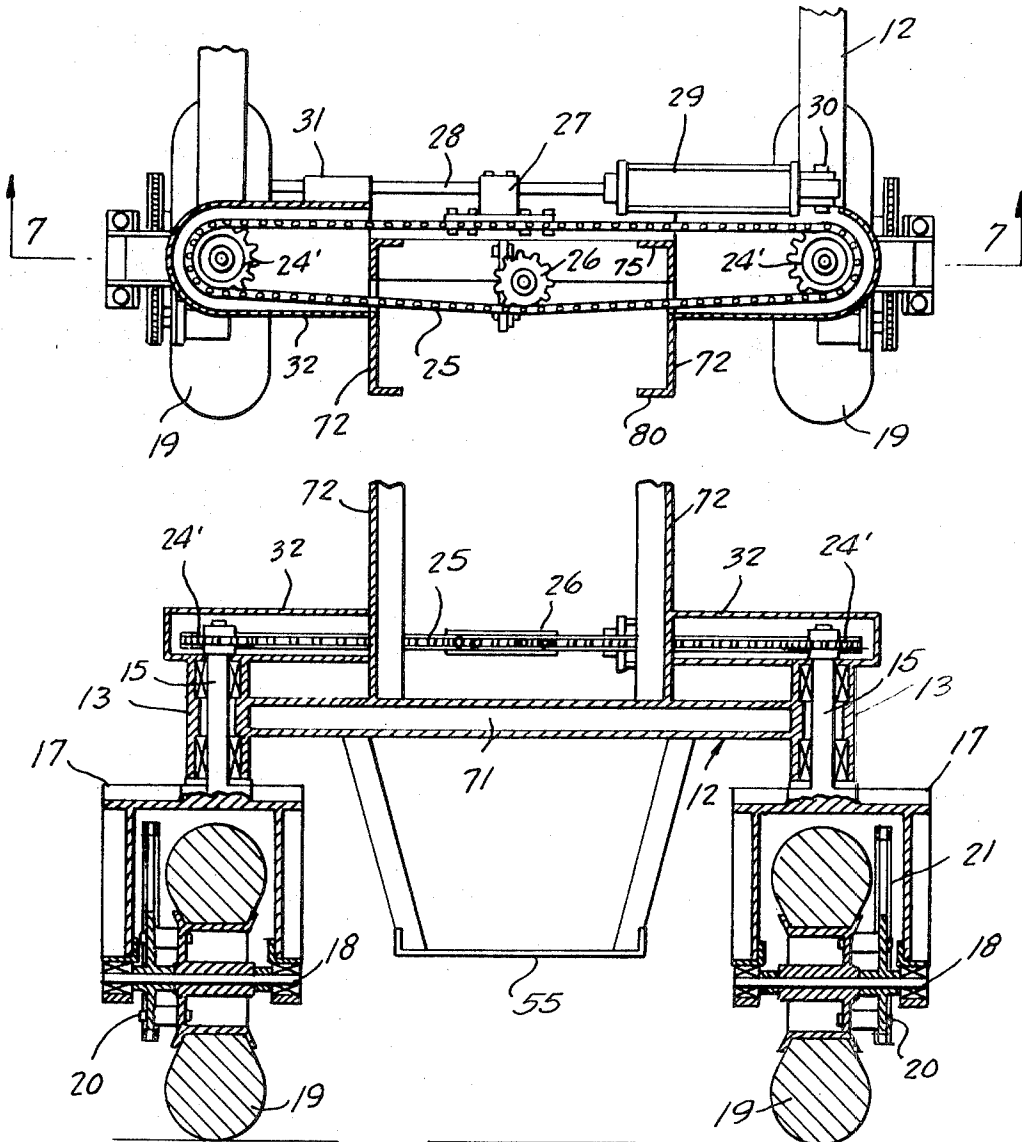


FIG. 7.

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FIG. 8.

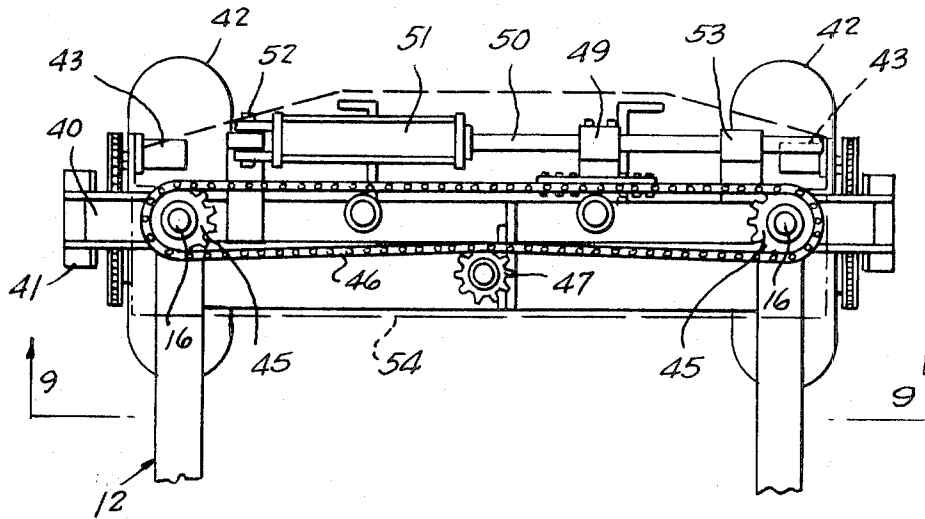
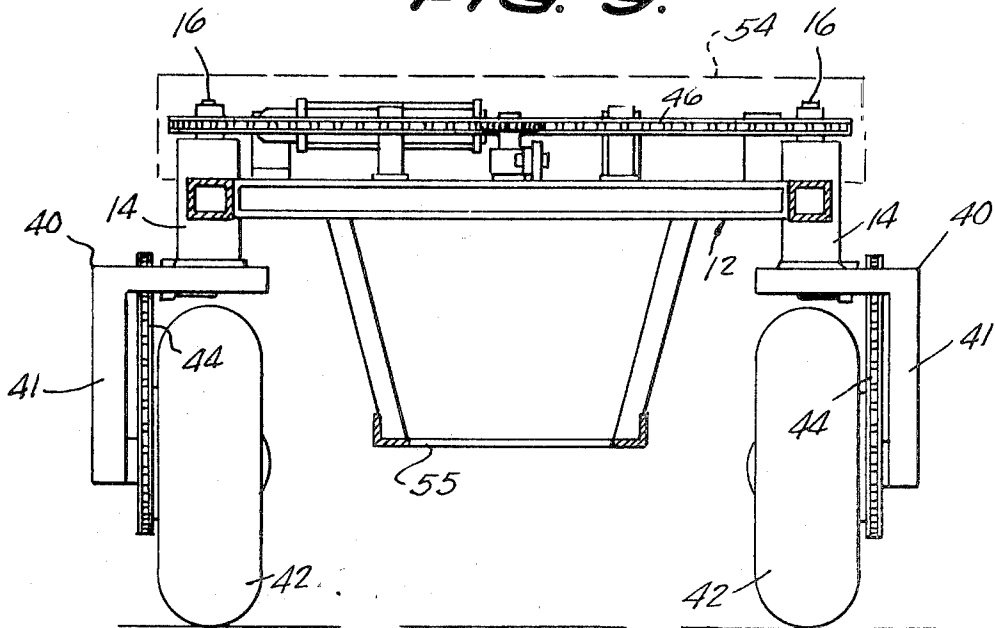


FIG. 9.



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HYDRAULIC LOADER UNIT

This invention relates to material-handling apparatus, and more particularly to hydraulic vehicles of the type having forwardly extending load-lifting elements.

A main object of the invention is to provide a novel and improved material-lifting and handling vehicle which is relatively simple in construction, which is easy to operate, and which is highly maneuverable.

A further object of the invention is to provide an improved hydraulic loader vehicle of the type having a liftable forwardly extending material-engaging element, such as a bucket, or the like, the vehicle being relatively compact in size, being steerable at both its front and rear wheels, and being reversible at its respective wheels so that the vehicle may be driven either in a forward direction, reverse direction, or may be merely rotated in a small confined area.

A further object of the invention is to provide an improved hydraulic loader vehicle of the type having a liftable front bucket, the vehicle being provided with hydraulic cylinder means for raising and lowering the bucket, and being further provided with means for moving it forwardly and outwardly responsive to the elevation of the bucket-lifting mechanism to a predetermined height, whereby material carried by the bucket may be dumped well forwardly of the vehicle.

Further objects and advantages of the invention will become apparent from the following description and claims, and from the accompanying drawings, wherein:

FIG. 1 is a top plan view of an improved hydraulic loader vehicle constructed in accordance with the present invention.

FIG. 2 is a side elevational view, to a reduced scale, of the vehicle shown in FIG. 1.

FIG. 3 is a fragmentary vertical cross-sectional view taken substantially on the line 3-3 of FIG. 1.

FIG. 4 is an elevational view taken substantially on the line 4-4 of FIG. 2.

FIG. 5 is an elevational view, similar to FIG. 4, but with the bucket of the vehicle removed.

FIG. 6 is a fragmentary horizontal cross-sectional view taken substantially on the line 6-6 of FIG. 3.

FIG. 7 is a transverse vertical cross-sectional view taken substantially on the line 7-7 of FIG. 6.

FIG. 8 is an enlarged fragmentary horizontal cross-sectional view taken substantially on the line 8-8 of FIG. 2, with the steering mechanism housing removed and merely shown diagrammatically in dotted view.

FIG. 9 is a transverse vertical cross-sectional view taken substantially on the line 9-9 of FIG. 8.

Referring to the drawings, 11 generally designates an improved hydraulically operated loader vehicle constructed in accordance with the present invention. The vehicle 11 comprises a main frame 12 of generally rectangular shape including the vertical front corner posts 13, 13 and corresponding vertical rear corner posts 14, 14. Journaled in the front corner posts 13, 13 are respective vertical axles 15, 15, and similarly journaled in the vertical rear corner posts are the respective vertical axles 16, 16.

The vehicle axles 15 project upwardly from respective inverted U-shaped yoke assemblies 17, 17 having the respective horizontal wheel shafts 18, 18 journaled in the lower end portions of their vertical side arms. Respective front-supporting wheels 19, 19 are rigidly secured on the wheel shafts 18, 18. Coaxially secured to each of the wheels 19, 19 is a sprocket wheel 20 which is drivingly coupled by a sprocket chain 21 to the output sprocket 22 of a respective hydraulic motor 23 mounted on the horizontal top bight arm of the associated yoke structure 17. As shown in FIGS. 2 and 3, the motors 23 are rigidly secured to and project forwardly from the horizontal bight portions of the yoke structures 17 and are carried on suitable fastening brackets 24.

Secured on the top ends of the vertical shafts 15, 15 are respective sprocket wheels 24', 24' which are drivingly cou-

pled together by a sprocket chain 25, as shown in FIGS. 6 and 7.

Thus, as shown in FIG. 6, the sprocket chain 25 is in the form of an endless horizontal loop, engaging around the sprocket wheels 24', 24' and being meshingly engaged at the intermediate portion of its lower run by an idler sprocket wheel 26. Secured to the intermediate portion of its upper run, as shown in FIG. 6, is an upstanding connecting bracket 27 which projects rearwardly therefrom, namely, to the left, as viewed in FIG. 3, and which is secured to the piston rod 28 of a transversely extending steering control cylinder 29 pivotally connected to one side portion of frame 12, at 30, as shown in FIG. 6. The portion of piston rod 28 remote from the connecting bracket 27 is slidably supported in a suitable bearing sleeve 31 fixed with respect to frame 12. Respective housing segments 32, 32 cover the opposite end portions of sprocket chain 25 and the sprockets 24' associated therewith, as shown in FIGS. 1, 6 and 7.

From the above, it will be apparent that the wheels 19, 19 are driven by their respective hydraulic motors 23, 23 and may be driven independently of each other, as will be presently described. It will be further apparent that the front wheels 19, 19 are steered by the operation of cylinder 29, in a manner presently to be described, which extends, or retracts, its piston rod 28 and thus moves sprocket chain 25 clockwise, or counterclockwise, in accordance with the desired direction of steering movement of the front wheels 19, 19.

Rigidly secured to the lower ends of the rear vertical axles 16, 16 are respective right-angled bracket members 40, 40 having the depending vertical arms 41, 41. The lower ends of the arms 41, 41 are provided with horizontal shafts on which are journaled respective rear wheels 42, 42, said rear wheels being driven by individual hydraulic motors 43, 43 fastened to the upper portions of members 40, 40. The rear wheels 42 are driven from their hydraulic motors by sprocket chain transmissions similar to those employed for the front wheels and including the driving sprocket chains 44, 44. Secured on the top ends of the shafts 16 are steering sprocket wheels 45, 45 which are drivingly coupled together by a sprocket chain 46 extending transversely across the rear portion of the vehicle and being engaged by an idler sprocket 47 journaled to frame 12, as shown in FIG. 8. Secured to the rear run of the endless sprocket chain 46 is a steering bracket 49 which is connected to the piston rod 50 associated with the piston of a steering cylinder 51 pivotally connected at 52 to frame 12, the cylinder 51 and piston 50 extending transversely of frame 12, namely, parallel to the sprocket chain 46. The remote portion of the piston rod 50 is slidably supported in a suitable bracket sleeve member 53 fixed to frame 12. It will thus be seen that the rear wheels 42, 42 are independently driven by their associated hydraulic motors 43, 43 and that the rear wheels are steerable independently of the front wheels by the action of the hydraulic cylinder 51.

The rear steering assembly including sprocket chain 46 and the sprocket wheels 45, 45 are normally covered by a protective housing 54 extending transversely over and secured on the rear portion of frame 12.

The frame 12 includes a lower deck 55 on which is mounted a conventional internal combustion engine 56, which serves as the main prime mover for the vehicle. Also mounted on the suspended lower deck 55 is a hydraulic pump 57, driven from the engine 56 through a conventional coupling assembly 58. Hydraulic liquid is supplied to the pump 57 from a reservoir 59 and a surge chamber 60 mounted on the lower deck 55.

The engine 56 is supplied with fuel from a fuel tank 61 mounted on the top wall of the housing 54. The products of combustion from engine 56 are exhausted to the atmosphere through a conventional muffler 62 extending rearwardly and overlying housing 54, as is clearly shown in FIGS. 1 and 2.

Mounted on the top portion of frame 12 is a driver's seat 63 located within convenient access to the various operating control devices associated with the vehicle, presently to be described, and consisting of a pair of side-by-side steering

wheels 64 and 65 and various valve-control levers, shown at 66 and 67.

The vehicle is provided with a conventional speed-changing transmission assembly controlled by a hand lever 68, and is likewise provided with a conventional hand lever clutch. Thus, the power transmission ratio between engine 56 and pump 57 may be changed as required for different operating, or loading conditions, by changing the gear ratio between the engine 56 and the pump 57, utilizing the conventional speed-change mechanisms controlled by the hand clutch lever and gear shift lever 68. The pivoted foot pedals 69 and 70 provided forwardly of the driver's seat 63 control the forward and reverse for the hydraulic motors on drive wheels on left and right side respectively through control valves, and thus the forward or reverse motion, as well as braking is controlled by these pedals 69 and 70.

The forward end portion of frame 12 comprises a transverse frame bar 71 on which is rigidly secured a pair of opposing inwardly facing, vertical channel bars 72, 72 provided at their top ends with rearwardly directed arcuately curved abutment arms 73, 73, whose rear end portions are inclined outwardly and rearwardly, as shown at 74. Thus, the abutment arms 73 are rigidly connected to the rear flanges 75 of the channel-shaped vertical upstanding members 72. The end portions 74 of the abutment arms 73 are rigidly connected to respective opposite side portions of frame 12 by downwardly, rearwardly, and outwardly extending strut bars 76, 76. As shown in FIGS. 3, 4 and 5, the rear flanges 75 of the upstanding channel bars 72 are rigidly connected adjacent their top end portions by a cross bar 77 located inside the channel bars and provided at its intermediate portion with a cushioning pad 78. A crossbar member 79 is rigidly secured between the lower forward corner portions of the channel bars 72, 72, being located adjacent the front flanges 80, 80 of said channel bars. Pivoted at 81 to the intermediate portion of crossbar 79 and extending upwardly therefrom is a hydraulic cylinder 82 provided with a piston having a piston rod 83 extending from the top end of the cylinder 82, as shown in FIG. 3. Journaled to the top end of piston rod 83 is a sprocket wheel 84 engaged by a sprocket chain 85. One end of the chain 85 is secured to the crossbar 77. The other end of the chain 85 is secured to the intermediate portion of a transverse yoke chamber member 86 having depending end arms 87, 87 in which is journaled a transverse shaft 88. Secured on the opposite ends of the shaft 88 outwardly adjacent the arms 87, 87 are respective rollers 89, 89 normally bearing on the front flanges 80 of the vertical channel bar 72 with rolling contact thereon. The opposite ends of shaft 88 extend rotatably through the intermediate portions of respective bucket link arms 90, 90 whose lower ends are connected at 91, 91 to the rear portion of a bucket 96. Thus, the bucket 96 has a transverse rear wall 97 formed with respective channels 94, 94 in which the lower end portions of the link bars 90, 90 are received and in which said link bars 90, 90 are pivotally connected by transverse pivotal connections 91 as shown in FIG. 1. The top ends of the link bars 90 are provided with rearwardly projecting right-angled arm portions 92, 92 which project rearwardly beyond the rear flanges 75, 75 of the upstanding channel bars 72, 72 and which are connected by a transverse shaft 93. Journaled on shaft 93 are respective bearing rollers 94, 94 which normally engage the rear flanges 75, 75 of the channel bars 72, 72 with rolling contact. However, as will be presently described, the rollers 94, 94 are so located that they can be elevated into contact beneath the arcuately-curved abutment arms 73, 73, and to, at times, constitute fulcrum-bearing elements for outward swinging movement of the bucket link arms 90, 90.

As shown in FIG. 1, the link arms 90 and their top rearwardly extending portions 92 are located in vertical planes outwardly adjacent to respective upstanding vertical channel bars 72, 72.

Pivotally connected to the upper portion of each link arm 90, as shown at 99, is a respective bucket-control cylinder 100 whose piston rod extends into the adjacent channel 98 of

bucket 96 and is pivotally connected therein by a transverse pivot connection 101, as shown in FIG. 1. The bucket-control cylinders 100, 100 are employed to control the position of the bucket 96, for example, to rotate the bucket on its pivots 91, 91 in a clockwise direction for dumping the material carried by the bucket when the material has been elevated, for example, to the dotted view position of the bucket 96 shown in FIG. 2. Thus, when bucket 96 has been elevated to said dotted-view position of FIG. 2, the cylinders 100 are operated to extend their piston rods 102 to thereby rotate bucket 96 in a clockwise direction around the transverse pivotal axis defined by the pivotal connections 91, causing the material carried by the bucket to be dumped therebelow.

As will be apparent from FIG. 3, the bucket 96 is normally in a lowered, forwardly extending position, with its bottom wall 104 horizontal and close to the ground, so that when the vehicle is moved forwardly the bucket will engage material forwardly adjacent thereto and cause it to enter bucket 96. Thereafter, the bucket may be elevated by admitting pressure fluid into the main elevating cylinder 82, causing piston rod 83 to be extended upwardly, which elevates sprocket wheel 84 and causes the sprocket chain 85 to pull yoke member 86 and the parts connected thereto upwardly. Thus, the link arms 90 are elevated and the bucket 96 rises, being guided vertically by the engagement of the rollers 94 with the rear flanges 75 of channel bar 72 and by the engagement of the rollers 89 with the front flanges of said channel bars. When the rollers 94 engage the abutment arms 73, further upward movement of rollers 94 is prevented and the continued extension of piston rod 83 causes the link arms 90 and the bucket 96 to rotate in a counterclockwise direction, as viewed in FIG. 3, for example, from the dotted-view position of FIG. 3 in a counterclockwise direction upwardly and outwardly. Eventually, the upward extension of the piston rod 83 is sufficient to elevate the bucket 96 to the position of maximum forward extension thereof, shown in dotted view in FIG. 2, wherein the link bars 90 are substantially horizontal, with their right-angled rear end portions 92 substantially vertical. As above mentioned, when the bucket is in this position, the bucket control cylinders 100 may be operated to dump the load from the bucket into a suitable subjacent container, for example, into a suitable vehicle, such as a sump truck.

The bucket 96 may be returned to its lowered position, shown in full-line view in FIG. 3, by reversing the operation of the lifting cylinder 82. Thus, as previously mentioned, the operation of cylinder 82 is controlled by the hand lever 66, which operates conventional reversing valve means, not shown, for controlling the supply of hydraulic fluid from pump 57 to the cylinder 82. Thus, the hand lever 66 may be moved in one direction to cause the bucket to rise, and in the opposite direction to cause the bucket to descend.

In a similar manner, the bucket dumping control cylinders 100, 100 are operated under the control of a hand lever 67. Hand lever 67 controls conventional reversing valve means connected between the hydraulic pump 57 and the cylinders 100 so as to control the delivery and return of hydraulic fluid for the cylinders. When the hand lever 67 is operated in one direction the piston rods 102 are extended, causing the bucket 96 to be rotated in a clockwise direction, as viewed in FIG. 2, for dumping action, whereas, when the hand lever 67 is moved in the opposite direction, the piston rods 102 are retracted, causing the bucket 96 to be returned to its normal position.

The vehicle is steered by operating the respective steering wheels 64 and 65, which control the front and rear steering cylinders 29 and 51. Thus, the steering wheel 64 may be operatively connected to a conventional reversing valve which is connected between the front steering cylinder 29 and the hydraulic pump 57 and which is arranged to control the delivery and return of hydraulic fluid for cylinder 29. When the wheel 64 is rotated in a clockwise direction, as viewed in FIG. 1, the associated valve admits hydraulic fluid to the cylinder 29 in a direction to retract the piston rod 28, causing the wheels 19, 19 to rotate in a corresponding clockwise

direction, as viewed in FIG. 6, whereby the vehicle is steered to the right. Similarly, when the wheel 64 is rotated in a counterclockwise direction, as viewed in FIG. 1, the front wheels 19, 19 are steered to the left, resulting from the extension of piston rod 28 from cylinder 29.

The steering wheel 65 is similarly arranged for steering the rear wheels 42, 42, namely, by operating a conventional reversing valve suitably arranged between pump 57 and the rear steering cylinder 51 for controlling the delivery and return of hydraulic fluid for the cylinder 51. The valve controlling wheel 65, therefore, may be operated to control the orientation of the rear wheels 42, 42. For example, when the steering wheel 65 is rotated in a clockwise direction, as viewed in FIG. 1, the rear wheels 42, 42 may be arranged to rotate in a counterclockwise direction, as viewed in FIG. 1, thereby steering the vehicle to the right for forward movement thereof, and conversely, when the wheel 65 is rotated in a counterclockwise direction, as viewed in FIG. 1, the rear wheels 42 will be rotated in a clockwise direction, causing the vehicle to turn to the left. The steering wheels 64 and 65 may be both operated simultaneously, for example, where it is desired to cause the vehicle to revolve in a tight circle, or to cause the vehicle to move sideways in either direction. Therefore, the various controls provided enable the operator to maneuver the vehicle in any desired manner even in a very limited space. Thus, the vehicle can be driven in a diagonal direction, sideways, or in a small tight circle around a stationary vertical axis without any forward or lateral motion.

The hydraulic wheel-driving motors 23 and 43 are provided with suitable reversing valve-control means so that the direction of the driven wheels can be independently controlled. As above mentioned, said reversing valve means are provided with the operating pedals 69 and 70, located forwardly adjacent the operator's seat 63. Therefore, the operator may control the direction of the respective wheels in accordance with the requirements of movement of the vehicle. For example by applying forward motion, or backward motion on all four wheels, the vehicle may be steered by means of its steering mechanism in the same manner as an automobile. As above mentioned, the steering mechanism may be operated, if so desired, to drive the vehicle in a diagonal direction, or even sideways. By applying forward drive on one side of the vehicle, and reverse drive on the other side, the vehicle may be made to turn around in its own tracks.

As will be readily apparent, the vehicle may be employed not only as a loader, but may be employed with attachments other than the loading bucket 96, such as various types of plows, rotary snow-blowers, or the like.

It will be noted that in the illustrated arrangement, namely, as a loader vehicle employing the bucket 96, the hydraulic lifting cylinder is arranged to apply maximum lifting effort when the bucket is in its lower positions, namely, while it is being elevated vertically, guided by the upstanding vertical channel bars 72, 72. As long as the rollers 94 and 89 simultaneously move upwardly along the rear and front flanges of the upstanding channel bar 72, the hydraulic cylinder 82 has a mechanical advantage of substantially 2 to 1. When the upper rollers 94 engage the abutment arm 73, the link bars 90 and bucket 96 begin to swing outwardly and the rate of rise of the bucket relative to extension of piston rod 83 begins to increase, thereby reducing the mechanical advantage. Thus, the mechanical advantage is maximum at the initial lifting effort, when it is most needed, and decreases as the bucket is elevated to its highest position.

As will be readily understood, the maximum lifting effort is required to raise the bucket 96 from the ground to its dotted-view position in FIG. 3, since this is essentially a direct vertical lift, being guided by the vertical upstanding channel bar 72. After the bucket has been elevated to its dotted-view position of FIG. 3, namely, with the rollers 94 engaging the stop arms 73, it is desirable to swing the bucket forwardly to an unloading position, such as that shown in dotted view in FIG. 2, and to effect this swinging movement in a relatively short period of

time, namely a time period shorter than that required to elevate the bucket from its full-line position in FIG. 3, to its dotted-view position. This fast rise is accomplished by the apparatus herein described since the swinging movement of the bucket 96 is accomplished without any excessive further extension of piston rod 83 subsequent to the engagement of rollers 94 with the abutment arm 73, the amount of additional extension required being substantially of the same order as that required to move rollers 94 into engagement with abutment arms 73. Thus, after the rollers 94 have been elevated into engagement with abutment arms 73, not much further extension of piston rod 83 is required to swing link arms 90 and bucket 96 from the dotted-view position thereof shown in FIG. 3, to the dotted-view positions thereof shown in FIG. 2. This provides a quick rise after the bucket has been elevated to the dotted-view position thereof in FIG. 3.

It will thus be seen that the movement of the bucket and its supporting linkage comprises a vertical rise at first, followed by a relatively fast pivoting action which swings the bucket forwardly and upwardly at a rapid rate toward its dumping position. The initial vertical rise is relatively slow as compared with the secondary forward and upward swinging movement of the bucket and its associated linkage elements.

The upstanding channel bars 72, 72 are relatively wide, with their parallel webs not only contributing to improved rigidity of the construction, but also serving as a protective housing means for the moving parts located therebetween, such as the hydraulic cylinder 82 with its extensible piston 83 carrying the sprocket wheel 84 and meshing with the lifting chain 85. Thus, the channel bars 72 serve not only as an upstanding guide means for the support bar means associated with bucket 96, but also define a protective enclosure for major components of the mechanism.

It will be understood that although the presently illustrated and described device employs upstanding channel bars 72, 72 and the guide means for the link arms 90, any other equivalent upstanding guide means may be employed in conjunction with suitable bearing means on the link arms providing the equivalent of a sliding action of the link arms on the guide means.

While a specific embodiment of an improved hydraulic loader assembly has been disclosed in the foregoing description, it will be understood that various modifications within the spirit of the invention may occur to those skilled in the art. Therefore, it is intended that no limitations be placed on the invention except as defined by the scope of the appended claims.

What I claim is:

1. In a loader, a wheel support, upstanding guide means rigidly mounted on said support, a load-carrying member, support bar means pivoted to said load-carrying member, means on said support bar means slidably engaging with said guide means, means to elevate said support bar means and load-carrying member along said guide means, and means to swing said support bars means and load-carrying member outwardly response to the elevation of said support bar means to a predetermined height on said guide means, wherein said load-carrying member comprises a bucket member, and load dumping means operatively connected between said support bar means and said bucket member and including means to rotate the bucket member relative to the support bar means, and wherein said support bar means comprises respective link bars located on opposite sides of the upstanding guide means and being provided with bearing means transversely engaging the front and rear portions of the guide means.

2. The loader of claim 1, and wherein said bearing means comprises rollers journaled to the link bars.

3. The loader of claim 1, and wherein said guide means is provided with front and rear guide bearing surfaces extending parallel with said guide means and wherein said bearing means comprises respective front and rear sets of rollers journaled to the link bars and being engageable with said guide bearing surfaces.

4. The loader of claim 3, and rearwardly extending abutment means on top portions of said guide means located over the rear guide bearing surfaces and being engageable by the rear rollers to limit upward movement of the link bars, whereby to initiate the outward swing movement of the support bar means when said support bar means reaches said predetermined height on said guide means.

5. The loader of claim 4, and wherein said link bars are provided with rearwardly directed top arm portions and wherein said rear rollers are journaled to said top arm portions.

6. The loader of claim 5, and wherein said front rollers are journaled to the intermediate portions of the link bars and the bucket member is pivoted to the forward ends of the link bars.

7. The loader of claim 6, and wherein the means to elevate the support bar means comprises a flexible chain connected between the guide means and the intermediate portions of the link bars, and a hydraulic cylinder pivoted to the support adjacent the lower end of the guide means and having an extensible piston rod provided with abutment means engaging said chain to exert upward force thereon responsive to extension of the piston rod.

8. The loader of claim 7, and wherein said last-named abutment means comprises a sprocket wheel journaled to the end of the piston rod and meshingly engaging with said chain.

9. In a loader, a wheeled support, upstanding guide means rigidly mounted on said support, a load-carrying member, support bar means pivoted to said load-carrying member, means on said support bar means slidably engaging with said guide means, means to elevate said support bar means and load-carrying member along said guide means, and means to swing said support bar means and load-carrying member outwardly responsive to the elevation of said support bar means to a predetermined height on said guide means, wherein said load-carrying member comprises a bucket member, and load-dumping means operatively connected between said support bar means and said bucket member and including means to rotate the bucket member relative to the support bar means,

and wherein the means to elevate the support bar means comprises flexible tension means connected between the support and the intermediate portion of the support bar means, and extensible hydraulic cylinder means pivoted to the support and acting between said flexible tension means and said support, said cylinder means being located to exert upward force on said flexible tension means.

10. The loader of claim 9, and wherein said wheeled support is provided with respective pairs of steerable front and rear wheels, and means to independently drive said wheels.

11. The loader of claim 10, and means to independently steer said pairs of front and rear wheels.

12. The loader of claim 9, and wherein said wheeled support is provided with a pair of vertically journaled front wheel frames at its front forward portion with respective front wheels journaled in said front wheel frame and with a pair of vertically journaled rear wheel frames at its rear portion with respective rear wheels journaled in said last-named wheel frames, means drivingly coupling the front wheel frames together for simultaneous steering movement, means drivingly coupling the rear wheel frames together for simultaneous steering movement, respective hydraulic cylinders operatively connected to the coupling means for the front and rear wheel frames, and means to independently operate said hydraulic cylinders.

13. The loader of claim 12, and means to independently drive said wheels.

14. The loader of claim 13, and wherein the means to independently drive the wheels comprises respective hydraulic motors mounted on the support and drivingly connected to the wheels.

15. The loader of claim 8, and wherein said upstanding guide means comprises a pair of upstanding channel bars arranged with their web portions in parallel relationship and having front and rear flanges defining said front and rear guide bearing surfaces.

16. The loader of claim 15, and wherein said chain is located between said channel bars.