

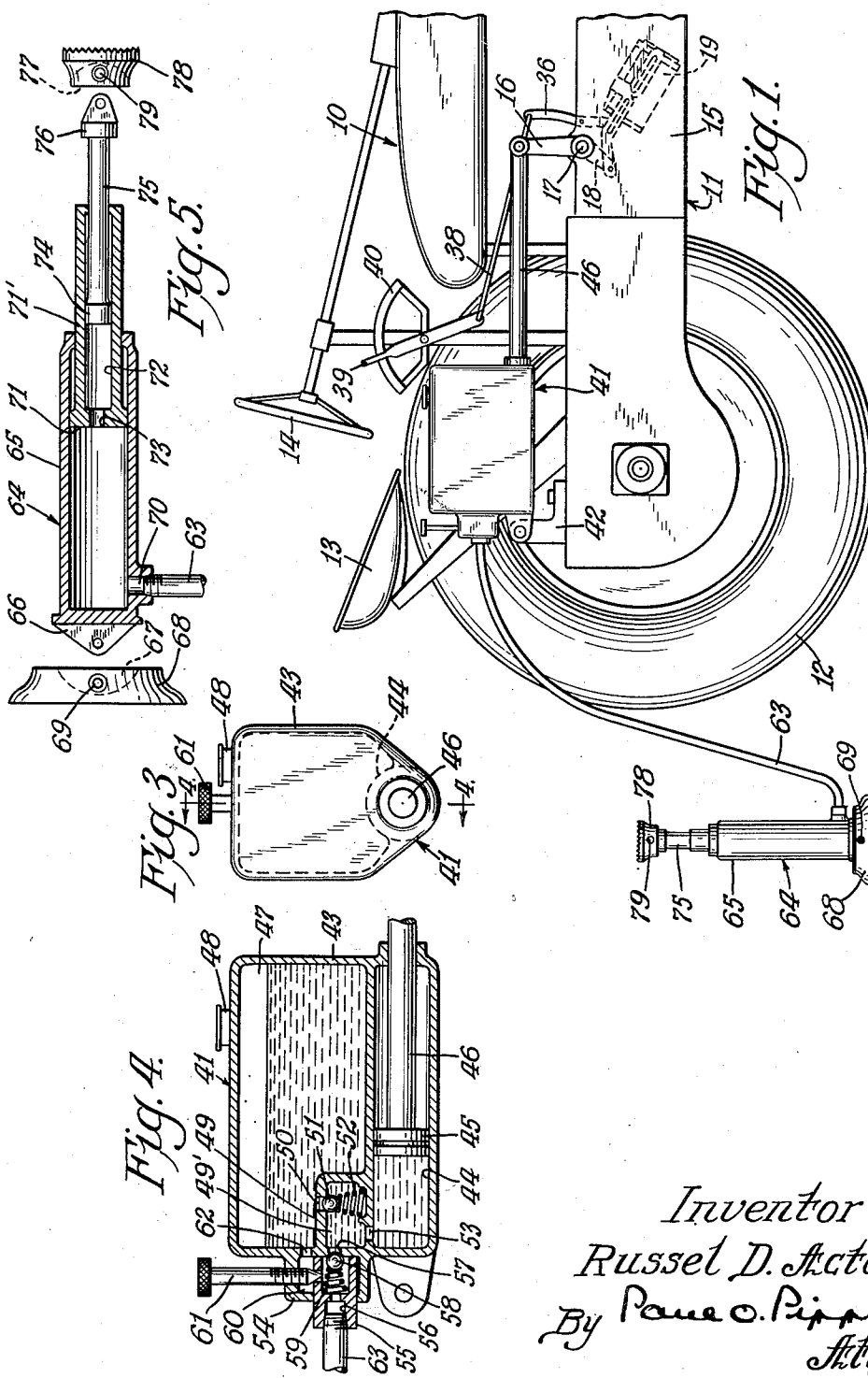
Jan. 15, 1952

R. D. ACTON  
HYDRAULIC LIFT

2,582,896

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3 Sheets-Sheet 1



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3 Sheets-Sheet 2

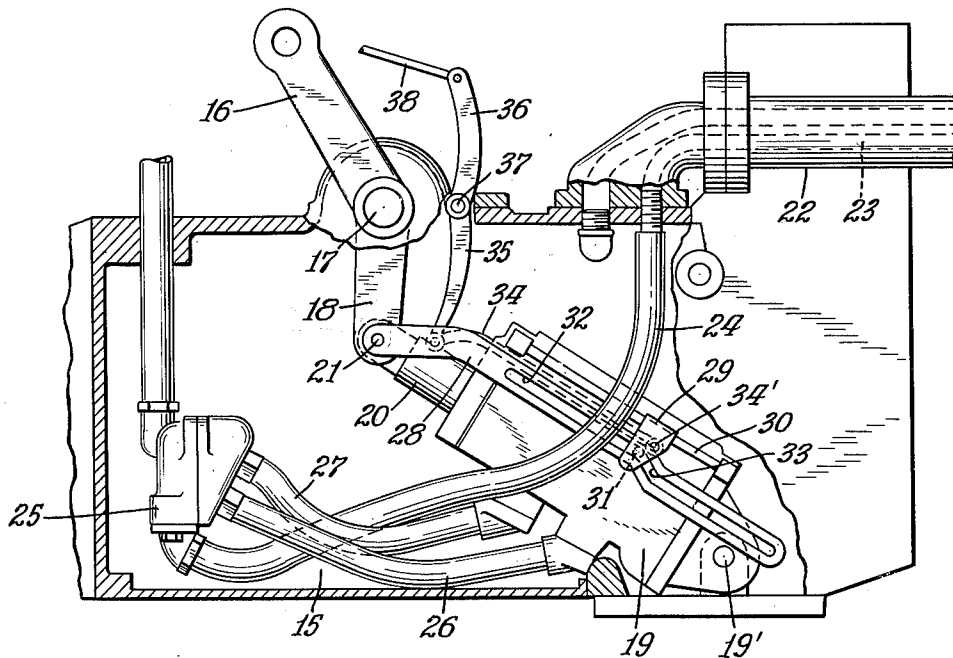
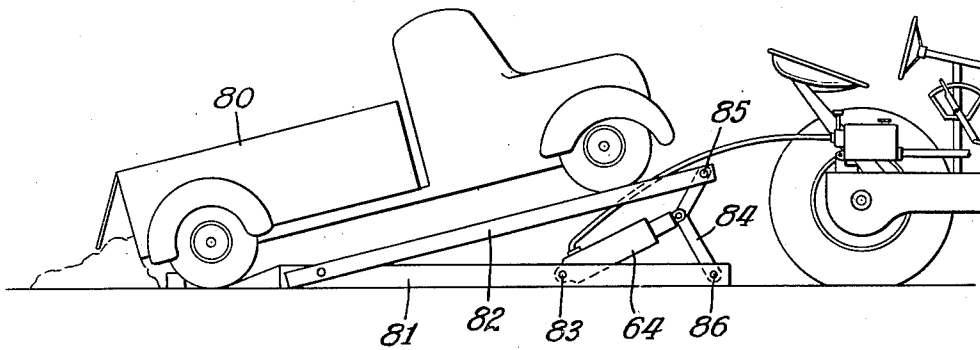


*Fig. 2.*

*Fig. 6.*



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3 Sheets-Sheet 3

Fig. 7.

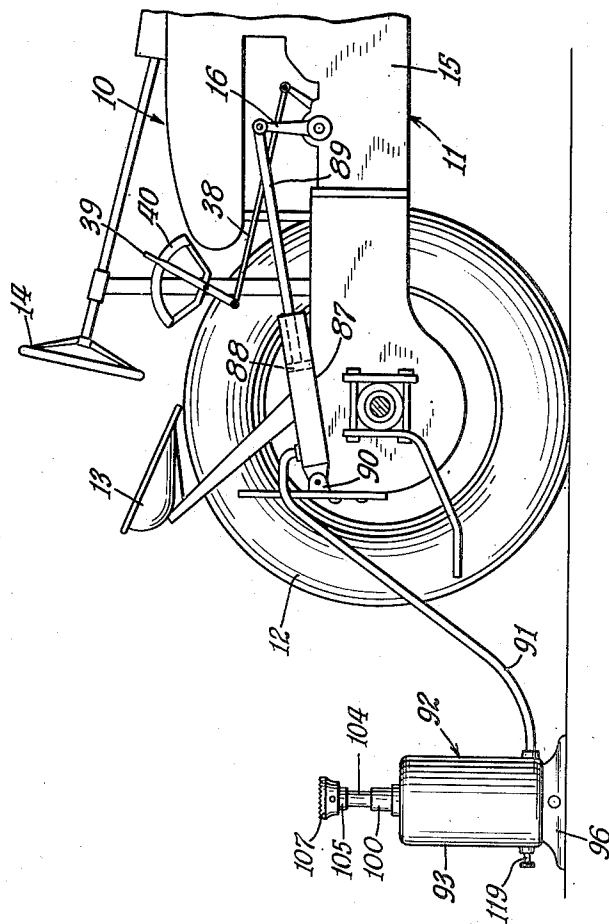
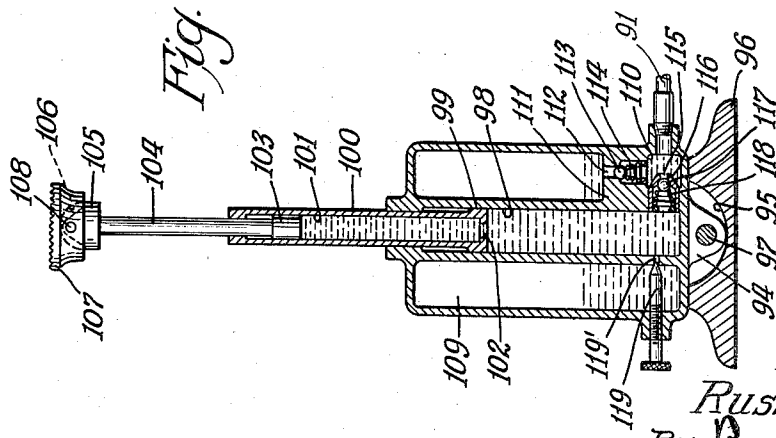


Fig. 8.



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## UNITED STATES PATENT OFFICE

2,582,896

## HYDRAULIC LIFT

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Application December 6, 1945, Serial No. 633,127

23 Claims. (Cl. 254—93)

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This invention relates to a lifting mechanism and more particularly to a hydraulic lift operable from the power lift of a tractor. More specifically it relates to an all-purpose lifting jack that readily can be attached to and operated from the power lift of a tractor.

There are many instances in the normal operation of a farm where it is desirable to have some type of lifting jack that can be utilized in doing various odd tasks such as dumping an all-purpose truck, removing stumps, lifting implements, jacking up barns, etc. A lifting jack of this type should be operable from the equipment that a farmer normally utilizes both from the standpoint of economy and efficiency. The power lift, hydraulic or otherwise, is usually well adapted for supplying essential power. However the stroke of such a power lift is seldom sufficient to provide a long enough lifting arm when used in conjunction with an ordinary cylinder. It is therefore desirable that a lifting device such as a jack provided which can be adapted to operations remote from the tractor and which can be manually controlled from the operator's station on a tractor. It is also necessary that a lifting device of this sort be so constructed that the length of stroke thereof will exceed the length of the stroke normally provided by operation of the power lift on the tractor. In order to further the requirements of expediency and economy, it is also necessary that a jack of this sort will include a removable base and head so that it can readily be adapted to various operations other than vertical lifting as in the case where it is desired to attach the lifting device to an agricultural implement operating in the field.

An important object of this invention then is to provide for an improved lifting device operable from the power lift mechanism of a tractor.

Another object is to provide a hydraulic lift or jack that will permit the lifting of objects remotely positioned from a tractor and which is operable from the power lift of a tractor.

Another object is to provide a cylinder lift device that will be operable from a power lift cylinder of a tractor and which will permit the lifting or the moving of objects a substantially greater distance than is normally possible by the stroke of the power lift cylinder.

Another object is to provide a hydraulic lifting jack having a fluid reservoir, the jack being remotely operable from the power lift of a tractor.

A still further object is to provide a hydraulic jack operable from a lifting cylinder of a tractor,

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said jack having removable work head and base portions which are normally used for vertical lifting so that it can be readily utilized for other tasks requiring power actuation.

The foregoing and other objects of the invention will become apparent from an examination of the following detailed description and accompanying sheets of drawings, in which:

Figure 1 is a side elevational view of a tractor having a power lift connected to a lifting device.

Figure 2 is a sectional view through a portion of the tractor showing the power lift and the mechanism associated therewith.

Figure 3 is an end view of a hydraulic lift device.

Figure 4 is a sectional view taken along the line 4—4 of Figure 3.

Figure 5 is a sectional view of a hydraulic jack showing a base portion and a work head portion removed from said hydraulic jack.

Figure 6 is a diagrammatic view showing a type of operation to which the invention may be adapted.

Figure 7 is a side elevational view of a tractor and a modified form of the invention.

Figure 8 is a sectional view through a modified form of a hydraulic jack containing a reservoir and associated parts.

Referring to the drawings and particularly to Figures 1 and 2, there is shown a tractor 10 having a longitudinal body 11 at the rear of which are positioned ground wheels 12. An operator's station 13 is positioned at the rear of the tractor 11 and includes a steering mechanism 14. An intermediate housing 15 pivotally supports an actuating lever 16 journaled on a shaft 17. The actuating lever 16 is provided with a depending portion 18 which is connected to a fluid actuated or power-lift device 19. The fluid actuated device is of the conventional cylinder type used on tractors and consists of a piston rod 20 which is connected to a piston, not shown, at one end and to the depending portion 16 at the other end by a pin 21. One end of the fluid actuated device 19 is connected to the intermediate housing 11 as shown at 19'. Connected to the top of the intermediate housing 15 is a pipe 22. The pipe 22 extends to a pump, not shown, which pumps fluid through a conduit 23 to a flexible conduit 24. The fluid flows through the flexible conduit 24 into a distributing valve 25 where it is carried by flexible conduits 26 and 27 to the fluid actuated device 19. A valve control mechanism for the fluid actuated device will presently be described generally. A detail description of the function of this valve mechanism is shown and

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described in the copending application of Carl W. Mott, Serial No. 527,625, entitled "Power Adjusting Mechanism," now Patent 2,409,510 dated October 15, 1946 and filed March 22, 1944.

This valve mechanism includes a follower arm 28 which is connected to the depending portion 18 of the actuating lever 16. A member 29 is slidably positioned on a valve control arm 30 and includes a pin 31 which rides in a slot 32 of the member 28. The slot 32 includes an angular portion 33. The sliding member 29 is connected to a connecting arm 34 at one end as indicated by 34'. The other end of the connecting arm 34 is connected to a depending portion 35 of a control arm 36. The control arm 36 is pivotally mounted on the intermediate housing 15 by a shaft 37. A link 38 is connected to the control arm 36 and extends to a detent lever 39 operable about a detent bracket 40, which is positioned in close proximity to the operator's station 13.

Referring to Figures 1, 3, 4, and 5, a multiple stroke hydraulic pressure device is generally indicated by 41 and is pivotally connected to the tractor by a bracket 42. The multiple stroke hydraulic pressure device consists of a housing 43 at the bottom portion of which is a longitudinal cylinder 44. The cylinder 44 carries for reciprocation a piston 45 having a piston arm 46 which is connected to the actuating lever 16. The housing 43 includes a fluid reservoir 47 to which fluid may be supplied through a fluid supply opening 48. A rectangular casing 49 is provided in the interior of the housing 43 and includes a chamber 49'. The chamber 49' is in communication with the fluid reservoir 47 through an opening 50. The opening 50 is normally sealed by a ball valve 51 held in place by a spring 52. The chamber 49' is also in communication with the cylinder 44 through an opening 53. Associated with the external portion of the housing 43 is a casing 54 which supports a fluid control means 55. The fluid control means 55 has a conduit 56 at one end and an opening 57 at the other end. The opening 57 provides for communication between the chamber 49' and the fluid control means 55. A ball valve 58 is normally held to seal the opening 57 by a spring 59. A chamber 60 in the upper portion of the casing 54 is in communication with the fluid reservoir 47 by means of an opening 61. A needle valve 62 normally seals chamber 60 from communication with the fluid control means 55. A flexible conduit 63 is connected to the fluid control means 55 and at one end is in communication with the conduit 56. The flexible element 63 is connected at its other end to a lift device or hydraulic jack 64.

As best shown in Figure 5, the hydraulic jack 64 includes a cylinder 65 which has a depending portion 66 which mates with a depression 67 formed in a supporting base 68. A pin 69 holds the base portion to the depending portion 66. The cylinder 65 has an inlet 70 in communication with the flexible conduit 63. A main piston 71 is mounted for reciprocation within the cylinder 65 and has at its end a piston rod 71'. The piston rod 71' is formed with a chamber or cylinder 72 which is in communication with cylinder 65 by means of an opening 73. A piston 74 reciprocates within the cylinder 72 and includes a piston rod 75 having a connecting member 76. The connecting member 76 mates with a depression 77 which is formed in a jack head 78. The jack head 78 is suitably serrated to frictionally grip objects to be lifted. A pin 79 removably con-

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nects the jack head 77 to the connecting member 76.

Referring particularly to Figure 6, an all-purpose truck of the non-dump type is shown supported on a dumping platform 81 which includes an elevating means 82. The hydraulic jack 64 is pivoted on the dumping platform 81, as indicated at 83, and is connected at its working end to an elevating link mechanism 84. This elevating link mechanism 84 is hingedly connected to the elevating means 82 at a hinge point 85 and to the dumping platform 81 at a hinge point 86. It is apparent that in this operation the supporting base 68 and the working head 77 are removed, and that the hydraulic jack 64 is readily adapted to supply power necessary to actuate the dumping platform 81.

A modified form of the invention is illustrated in Figures 7 and 8. A cylinder 87 includes a piston 88 having a piston arm 89 connected to the actuating lever 16. One end of the cylinder 87 is pivotally connected to the longitudinal body 11 by a bracket 90. A flexible conduit 91 is connected to the cylinder 87 and to a lifting device or hydraulic jack 92. The hydraulic jack 92 includes a housing 93 to which is connected a depending portion 94 which mates with a depression 95 formed in a base support 96. A pin 97 connects the base support 96 with the depending portion 94. The housing 93 is provided with a cylinder 98 in which there is mounted for reciprocation a piston 99 having a piston rod 100. The piston rod 100 is provided with a cylinder 101 which is in communication with the cylinder 98 through an opening 102. A piston 103 is mounted for reciprocation within the cylinder 101 and includes a piston arm 104 at the end of which is provided a connecting member 105 which mates with a depression 106 of a jack head 107, said jack head 107 being connected to the connecting member 105 by a pin 108. The hydraulic jack 92 includes a fluid reservoir 109 which is separated from a chamber 110 by a wall 111. The chamber 110 is in communication with the fluid reservoir 109 by virtue of an opening 112 which is normally sealed by a ball valve 113 and a spring 114. The chamber 110 is in communication with the cylinder 98 through an opening 115 formed in a valve member 116. A ball valve 117 and a spring 118 normally seal said opening 115. A needle valve 119 is positioned within the housing 93 and normally closes an opening 119' which is in communication with the fluid reservoir 109 and the cylinder 98.

Referring to Figures 1 and 6, the operation of the fluid jack 64 is as follows: The detent lever 39 is actuated to oscillate the control arm 36 thereby lifting the member 29 out of the angular portion of the slot 32. Movement of the member 29 from the angular portion 33 of the slot 32 rocks control valves not shown from a neutral position which permits fluid to enter the fluid actuated device 19 causing movement of the piston rod 20 and thereby oscillating or reciprocating the actuating lever 16. The movement of the lever 39 provides the operator with complete control of the jacking device with the use of power. By selectively moving the lever 39 the operator can move the actuating lever 16 to any predetermined position and therefore multiple stroke extension of the jack can be effected with positive touch control. The operation of the valve mechanism for the fluid actuated device 19 is adequately described in the aforementioned

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application and further description thereof is deemed not necessary.

The oscillation of the actuating lever 16 causes the piston rod 46 and the piston 45 to exert either a pressure stroke or a suction stroke within the cylinder 44. Upon the suction stroke of the piston 45, the ball valve 51 is unseated from the opening 50 thereby permitting the intake of fluid from the fluid reservoir 47 into the chamber 49' and through the opening 53 into the cylinder 44. At this point the ball valve 58 is sealed over the opening 57. Upon the pressure stroke of the piston 45 the valve 58 is unseated from the opening 57 and fluid flows from the cylinder 44 through the opening 53 into the conduit 56 and into the flexible conduit 63. The flexible conduit 63 carries the fluid to the hydraulic jack 64. As the suction and pressure stroke of the piston 45 is repeated, the fluid in the cylinder 65 causes pressure upon the piston 71 thereby extending the piston arm 71' to its ultimate extended position. Continued fluid pressure within the cylinder 65 causes the fluid to flow through the opening 73 into the cylinder 72 and causes extension of the piston 74 and piston arm 75. It can thus be seen that the operator by moving the detent arm 39 and controlling the strokes of the fluid actuated device will provide for sufficient fluid to be pumped into the hydraulic jack 64 so that full extension of said jack is accomplished. When the operation is completed and the operator wishes to lower the jack, he reaches over and manipulates the needle valve 61. The opening of said valve will allow the fluid to pass into the chamber 60 through the opening 62 and back into the fluid reservoir 47.

As shown in Figure 6, when the operator wishes to utilize the jack in a position other than vertical, such as is necessary sometimes in the emptying of a non-dump all-purpose truck, the operator merely removes the supporting base 68 and the work head 77 and uses the device as a regular cylinder lift.

Referring to Figures 7 and 8, the operation of the modified form of the invention is similar to that previously described. In this modification the jack 92, the fluid reservoir 109, and the valve mechanism therefor are remotely positioned from the tractor. Upon the suction stroke of the piston 88, fluid is drawn from the hydraulic reservoir 109 into the chamber 110. During the suction stroke the fluid is drawn into the chamber 110 and into the cylinder 87. Upon the pressure stroke of the piston 88, the fluid is expelled through the opening 115 past the valve 117 and into the cylinder 98. The repetition of the pressure and the suction action of the cylinder 87 will provide for extension of the piston rods 100 and 104 in the same manner as previously disclosed. The needle valve 119 permits the flow of fluid back into the reservoir and a collapsing of the jack to its normal position.

It will be appreciated that the foregoing description has referred to only preferred embodiments of the invention, and that numerous modifications and alterations may be made without departing from the spirit of the invention as disclosed or the scope thereof as defined in the appended claims.

What is claimed is:

1. In a tractor having an operator's station and a power-lift device, an oscillating arm actuated by said power-lift device, manual control means for said power-lift device operative to preselect any one of a number of predetermined

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positions of said oscillating arm, said manual control means being positioned within reach of said operator's station, the combination therewith of a housing connected to said tractor, a fluid reservoir contained within said housing, a cylinder formed in said housing, a piston positioned for reciprocation within said cylinder, means connecting said piston to said oscillatory arm, a chamber formed in said housing and having an opening in communication with said fluid reservoir and a second opening in communication with said cylinder, a valve positioned to open said first opening upon the suction stroke of said piston, a fluid actuated jack remotely positioned from said tractor, a fluid conduit means communicating with said jack and said chamber, a second valve positioned in said housing, said valve being adapted to open said fluid conduit upon the pressure stroke of said piston, and means for returning fluid from said jack to said reservoir, said means including a needle valve.

2. In a tractor having an operator's station and a power-lift device, an oscillating arm actuated by said power-lift device, manual control means for said power-lift device operative to preselect any one of a number of predetermined positions of said oscillating arm, said manual control means being positioned within reach of said operator's station, the combination therewith of a housing connected to said tractor, a fluid reservoir contained within said housing, a cylinder formed in said housing, a piston positioned for reciprocation within said cylinder, means connecting said piston to said oscillating arm, a chamber formed in said housing and having an opening in communication with said fluid reservoir and a second opening in communication with said cylinder, a valve positioned to open said first opening upon the suction stroke of said piston, a fluid actuated jack remotely positioned from said tractor, a fluid conduit means communicating with said jack and said chamber, and a second valve positioned in said housing, said second valve being adapted to open said fluid conduit upon the pressure stroke of said piston.

3. A tractor having an operator's station and a power-lift device, an oscillatory arm actuated by said power-lift device, manual control means for said power-lift device, said manual control means positioned within reach of said operator's station, a cylinder pivotally connected to said tractor, a piston for reciprocation within said cylinder, means connecting said piston and said oscillatory arm, a lifting device remotely positioned from said tractor, said lifting device comprising a housing having a fluid reservoir, a second cylinder within said housing, a piston mounted for reciprocation within said second cylinder, a chamber formed in said housing, said chamber having an opening in communication with said reservoir and a second opening in communication with said second cylinder, a valve positioned to close said first opening upon the pressure stroke of said first piston, and a second valve positioned to close said second opening upon the suction stroke of said first piston.

4. A tractor having an operator's station and a power-lift device, an oscillatory arm actuated by said power-lift device, manual control means for said power-lift device, said manual control means positioned within reach of said operator's station, a cylinder pivotally connected to said tractor, a piston for reciprocation within said cylinder, means connecting said piston and said

oscillatory arm, a lifting device remotely positioned from said tractor, said lifting device comprising a housing having a fluid reservoir, a second cylinder within said housing, a piston mounted for reciprocation within said second cylinder, a chamber formed in said housing, said chamber having an opening in communication with said reservoir and a second opening in communication with said second cylinder, a valve positioned to close said first opening upon the pressure stroke of said first piston, a second valve positioned to close said second opening upon the suction stroke of said first piston, and means for returning fluid from said second cylinder to said fluid reservoir, said means including a needle valve.

5. In a tractor having a fluid power means having an arm adapted to exert a reciprocating force, manual control means for said fluid power means operable to preselect any one of a number of predetermined positions of said arm, the combination with said fluid power means of an actuating mechanism comprising a housing connected to said tractor, said housing having a fluid reservoir, a cylinder formed in said housing, a reciprocating piston in said cylinder, means connecting said piston and said fluid power means, a casing in said housing, said casing having a first opening in communication with said cylinder and a second opening in communication with said fluid reservoir, a valve positioned to open said second opening upon the suction stroke of said piston, a hydraulic lift device remotely positioned from said tractor, a flexible conduit communicating with said lift device and said casing, a second valve connecting said flexible conduit and said casing, said second valve being adapted to open upon the pressure stroke of said piston, and valve means for returning the fluid from said lift device to said fluid reservoir.

6. In a tractor having a fluid power means having an arm adapted to exert a reciprocating force, manual control means for said fluid pressure means operative to preselect any one of a number of predetermined positions of said arm, the combination with said fluid power means of an actuating mechanism comprising a housing pivotally connected to said tractor, said housing having a fluid reservoir, a cylinder formed in said housing, a reciprocating piston in said cylinder, means connecting said piston and said fluid power means, a casing in said housing, said casing having a first opening in communication with said cylinder and a second opening in communication with said fluid reservoir, a valve positioned to open said second opening upon the suction stroke of said piston, a hydraulic lift device remotely positioned from said tractor, a flexible conduit communicating with said lift device and said casing, and a second valve connecting said flexible conduit and said casing, said second valve being adapted to open upon the pressure stroke of said piston.

7. In a tractor having an operator's station and a power actuating mechanism, manual control means for said power actuating mechanism, said manual control means being positioned within reach of said operator's station, a cylinder connected to said tractor, a piston within said cylinder, means for connecting said piston with said power actuating mechanism, the combination with said power actuating mechanism of a lift device remotely positioned from said tractor, said lift device comprising a housing having a fluid reservoir, a second cylinder formed in said

housing, a second piston mounted for reciprocation within said second cylinder, a chamber formed in said housing, said chamber having an opening in communication with said fluid reservoir and a second opening in communication with said second cylinder, a valve means in said housing positioned to open said first opening upon the suction stroke of said first piston, a second valve means positioned to open said second opening upon the pressure stroke of said first piston, and a conduit communicating with said chamber and said first cylinder.

8. In a tractor having an operator's station and a power actuating mechanism, manual control means for said power actuating mechanism, said manual control means being positioned within reach of said operator's station, a cylinder connected to said tractor, a piston within said cylinder, means for connecting said piston with said power actuating mechanism, the combination with said power actuating mechanism of a lift device comprising a housing having a fluid reservoir, a second cylinder formed in said housing, a second piston mounted for reciprocation within said second cylinder, a chamber associated with said housing, said chamber having an opening in communication with said fluid reservoir and a second opening in communication with said second cylinder, a valve associated with said housing, said valve being adapted to open said first opening upon the suction stroke of said first piston, and a second valve associated with said housing, said second valve being adapted to open said second opening upon the pressure stroke of said first piston, a conduit communicating with said chamber and said first cylinder, and conduit means for returning fluid from said second cylinder to said reservoir, said conduit means including a valve.

9. In a tractor having an operator's station and a power actuating mechanism, a manual control means for said power actuating mechanism, said manual control means being positioned within reach of said operator's station, a cylinder connected to said tractor, a piston within said cylinder, means for connecting said piston with said power actuating mechanism, the combination with said power actuating mechanism of a lift device comprising a housing having a fluid reservoir, a second cylinder formed in said housing, a second piston mounted for reciprocation within said second cylinder, a chamber associated with said housing, said chamber having an opening in communication with said fluid reservoir and a second opening in communication with said second cylinder, a valve associated with said housing, said valve being adapted to open said first opening upon the suction stroke of said first piston, and a second valve associated with said housing, said second valve being adapted to open said second opening upon the pressure stroke of said first piston, a conduit communicating with said chamber and said first cylinder, and conduit means for returning fluid from said second cylinder to said reservoir.

10. In a tractor having an operator's station and a power actuating mechanism, a manual control means for said power actuating mechanism, said manual control means being positioned within reach of said operator's station, a cylinder connected to said tractor, a piston within said cylinder, means for connecting said piston with said power actuating mechanism, the combination with said power actuating mechanism of a lift device comprising a housing having a

fluid reservoir, a second cylinder formed in said housing, a second piston mounted for reciprocation within said second cylinder, a chamber associated with said housing, said chamber having an opening in communication with said fluid reservoir and a second opening in communication with said second cylinder, a valve associated with said housing, said valve being adapted to open said first opening upon the suction stroke of said first piston, and a second valve associated with said housing, said second valve being adapted to open said second opening upon the pressure stroke of said first piston, and a conduit communicating with said chamber and said first cylinder.

11. In a tractor having an operator's station and a power actuating mechanism, manual control means for said power actuating mechanism, a hydraulic lifting cylinder actuated by said power actuating mechanism, the combination with said power actuating mechanism of a hydraulic jack remotely positioned from said tractor, said jack comprising a housing having a fluid reservoir, a cylinder associated with said jack, a piston mounted for reciprocation within said cylinder, a chamber associated with said housing, said chamber having an opening in communication with said fluid reservoir and a second opening in communication with said cylinder, a valve for opening said first opening upon the suction stroke of said hydraulic lift cylinder, a second valve for opening said second opening upon the pressure stroke of said hydraulic lift cylinder, and a conduit in communication with said hydraulic lift cylinder and said chamber.

12. In a tractor having an operator's station and a power actuating mechanism, a hydraulic lifting cylinder including a reciprocating piston connected to said actuating mechanism, the combination with said power actuating mechanism of a hydraulic jack associated with said tractor, said jack comprising a reservoir, a second cylinder having a second piston, a chamber formed in said jack, said chamber having an opening in communication with said fluid reservoir and a second opening in communication with said second cylinder, a valve for opening said first opening upon the reciprocation of said first piston in one direction, a second valve for opening said second opening upon reciprocation of said first piston in the opposite direction, and a conduit in communication with said hydraulic lifting cylinder and said chamber.

13. In a tractor having an operator's station and a power actuating mechanism, a hydraulic lifting cylinder including a reciprocating piston connected to said power actuating mechanism, the combination with said power actuating mechanism of a hydraulic lift device comprising a housing, a fluid reservoir and a second cylinder, a second reciprocating piston within said second cylinder, a chamber formed in said housing, a valve positioned to permit the flow of fluid from said fluid reservoir to said chamber upon a depression within said chamber, a second valve positioned to permit the flow of fluid from said chamber to said cylinder upon fluid pressure within said chamber, and a fluid conduit connected to said chamber and to said hydraulic lifting cylinder for transmitting fluid pressure to and from said chamber.

14. In a tractor having an operator's station and a power actuating mechanism, a hydraulic lifting cylinder including a reciprocating piston connected to said power actuating mechanism,

the combination with said power actuating mechanism of a hydraulic jack remotely positioned from said tractor, said hydraulic jack comprising a fluid reservoir, a lifting mechanism within said jack, and valve means for supplying fluid from said reservoir to said lifting mechanism upon reciprocation of said piston.

15. In a tractor having an operator's station and a power actuating mechanism, a reciprocating arm movable by said power actuating mechanism, a manual control means for said power actuating mechanism within reach of said operator's station operative to preselect any one of a number of predetermined positions of such reciprocating arm, the combination with said power actuating mechanism of a housing associated with said tractor, a reservoir within said housing, a cylinder associated with said housing, a piston mounted for reciprocation within said cylinder, means connecting said cylinder with said reciprocating arm, a hydraulic lift device remotely positioned from said tractor, a conduit in communication with said housing and said hydraulic lift device, a valve in communication with said fluid reservoir and said cylinder, a second valve in communication with said fluid reservoir and said conduit, means operable to close said first valve upon the pressure stroke of said piston, means operable to close said second valve upon the suction stroke of said piston, means for returning fluid from said conduit to said fluid reservoir, said means including an opening in communication with said conduit and said fluid reservoir, and a manual control valve normally seated over said opening, said valve being within reach of said operator's station.

16. In a tractor having an operator's station and a power actuating mechanism having a reciprocating member, a manual control means for said power actuating mechanism within reach of said operator's station operative to preselect any one of a number of predetermined positions of said reciprocating member, the combination with said power actuating mechanism of a housing associated with said tractor, a reservoir within said housing, a cylinder associated with said housing, a piston mounted for reciprocation within said cylinder, means connecting said cylinder with said reciprocating arm, a hydraulic lift device remotely positioned from said tractor, a conduit in communication with said housing and said hydraulic lift device, a valve in communication with said fluid reservoir and said cylinder, a second valve in communication with said fluid reservoir and said conduit, means operable to close said first valve upon the pressure stroke of said piston, and means operable to close said second valve upon the suction stroke of said piston.

17. In a tractor having an operator's station and a power actuating mechanism having a reciprocating member, a manual control means for said power actuating mechanism within reach of said operator's station, said control means being operable to preselect any one of a number of predetermined positions of said reciprocating member, the combination with said power actuating mechanism of a lifting device comprising a housing, a fluid reservoir associated with said housing, a cylinder associated with said housing, a piston mounted for reciprocation within said cylinder, means connecting said piston with said reciprocating member, a hydraulic jack associated with said tractor, a conduit in communication with said jack and said housing, and valve

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means positioned within said housing, said valve means being operable to permit flow of fluid from said fluid reservoir to said jack upon the pressure stroke of said piston.

18. In a tractor having an operator's station and a power actuating mechanism having an oscillating arm, a manual control means for said power actuating means within reach of said operator's station, said control means being operable to preselect any one of a number of predetermined positions of said oscillating arm, the combination with said power actuating mechanism of a lifting device having a housing, a fluid reservoir associated with said housing, a cylinder associated with said housing, a piston mounted for reciprocation within said cylinder, means connecting said piston with said oscillating arm, a hydraulic jack associated with said tractor, a conduit in communication with said jack and said housing, and valve means positioned within said housing, said valve means being operable to permit flow of fluid from said fluid reservoir to said jack upon actuation of said piston.

19. In a tractor having an operator's station and a power actuating mechanism, a hydraulic lifting cylinder having a reciprocating piston connected to said power actuating mechanism, the combination with said power actuating mechanism of a fluid lift jack associated with said tractor, said fluid lift jack comprising a fluid reservoir, a second cylinder associated with said fluid lift jack, a second piston mounted for reciprocation within said cylinder, a working head removably connected to said piston, and a supporting base removably connected to said fluid lift jack.

20. For a tractor having a power actuating mechanism including a movable arm connected to the tractor, an operator's station, said tractor having manual control means adjacent the operator's station for said arm operable to select any of a plurality of predetermined positions of said arm, a power transmitting device including a fluid cylinder adapted to be connected to said tractor, a piston in said cylinder for connection to the arm on the tractor for reciprocation, an extensible fluid operated cylinder and piston unit adapted to be remotely located with respect to the tractor and connected thereto by flexible conduit means, said flexible conduit means providing for variable location of the tractor independent of the location of the remotely located cylinder and piston unit, a fluid reservoir associated with said piston and cylinder unit, connected to said conduit means, and valve means positioned in said conduit means constructed and arranged to

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draw fluid from the reservoir upon successive strokes of the tractor mounted piston in one direction and to deliver the fluid to the remotely mounted cylinder whereby said piston is moved in one direction.

21. A device as set forth in claim 20 in which the reservoir is structurally associated with the tractor mounted cylinder.

22. A device as set forth in claim 20 in which the reservoir is structurally associated with the cylinder of the remotely located unit.

23. In combination with a tractor, a power actuating mechanism having a movable arm connected to the tractor, an operator's station, manual control means adjacent said operator's station for said power actuating mechanism operable to preselect any of a number of predetermined positions of said movable arm, a fluid cylinder connected to said tractor, a piston connected to said arm for reciprocation within said cylinder, an extensible fluid jacking device remotely positioned with respect to the tractor, a fluid reservoir associated with said jacking device and flexible fluid transmission means between said fluid cylinder and said jacking device, said flexible means providing for variable location of the tractor independent of the remotely located jacking device, and said jacking device having valve means constructed and arranged to direct fluid from said cylinder to move said jacking device in one direction upon successive reciprocating actuating strokes of the piston.

RUSSEL D. ACTON.

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