

March 15, 1960

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2,928,482

SELECTIVE HYDRAULIC ACTUATING MEANS

Filed March 20, 1957

5 Sheets-Sheet 1

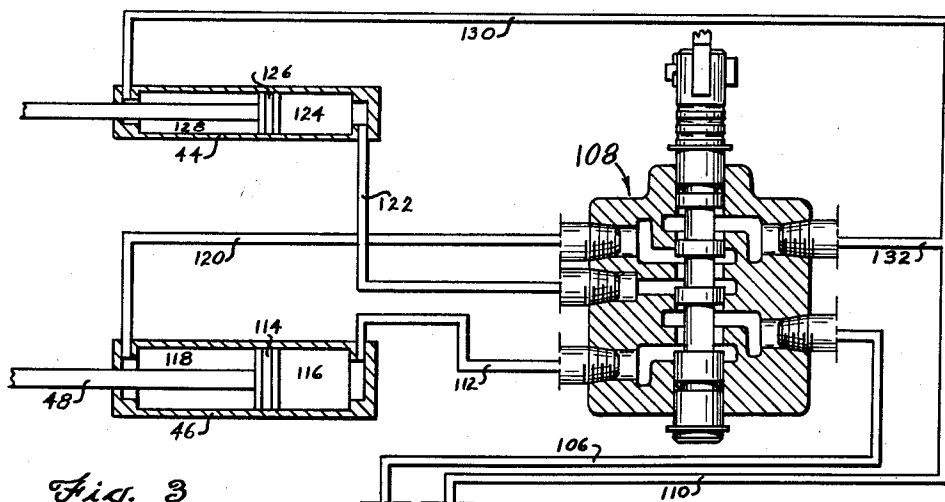


Fig. 3

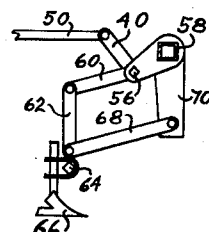
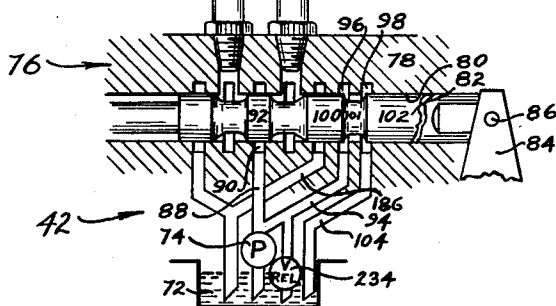


Fig. 2

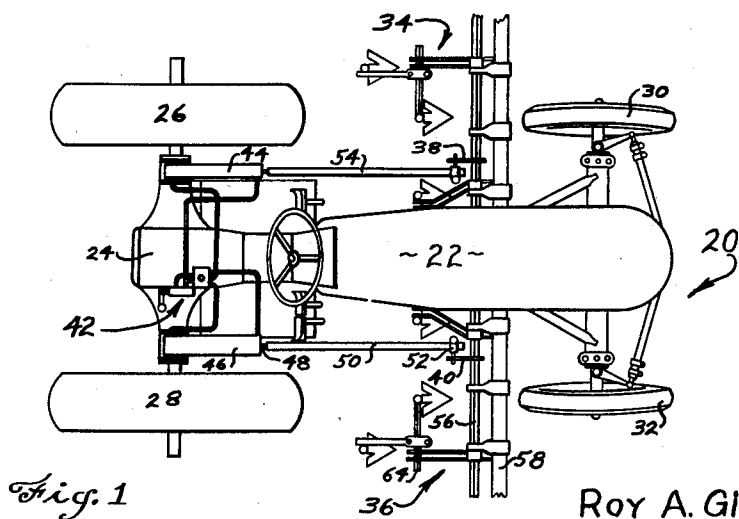


Fig. 1

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5 Sheets-Sheet 2

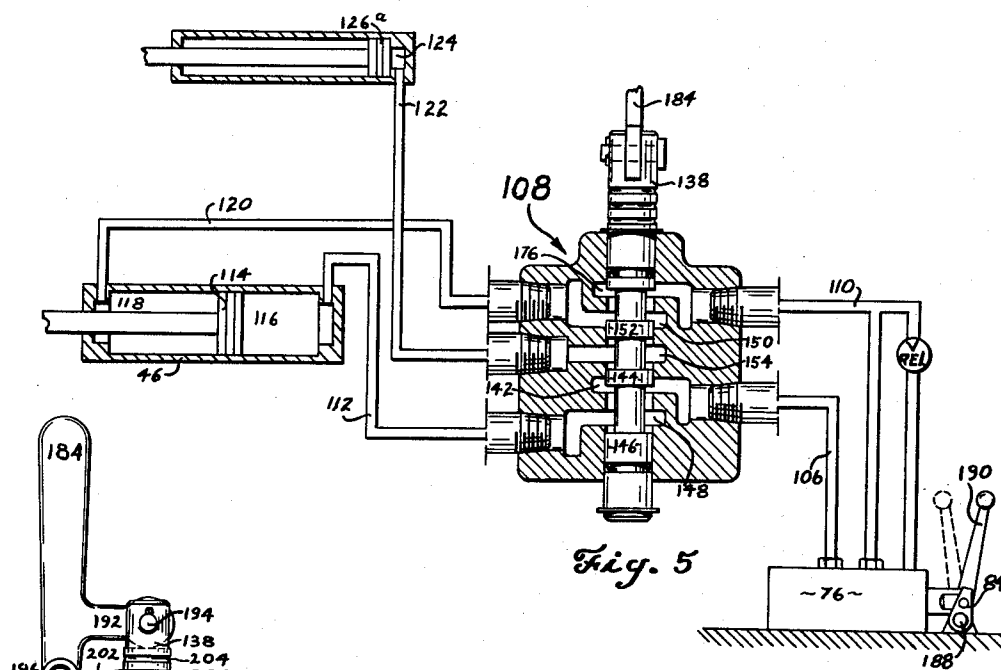


Fig. 5

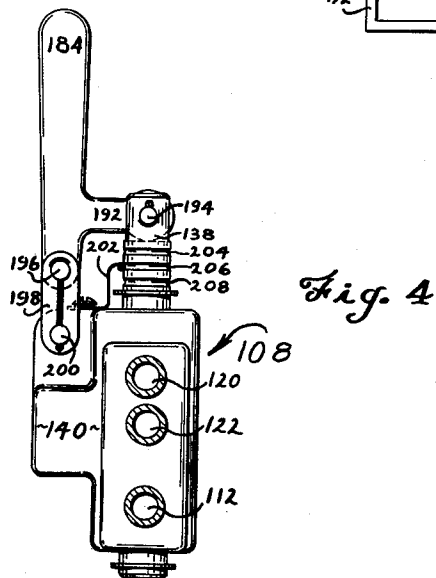


Fig. 4

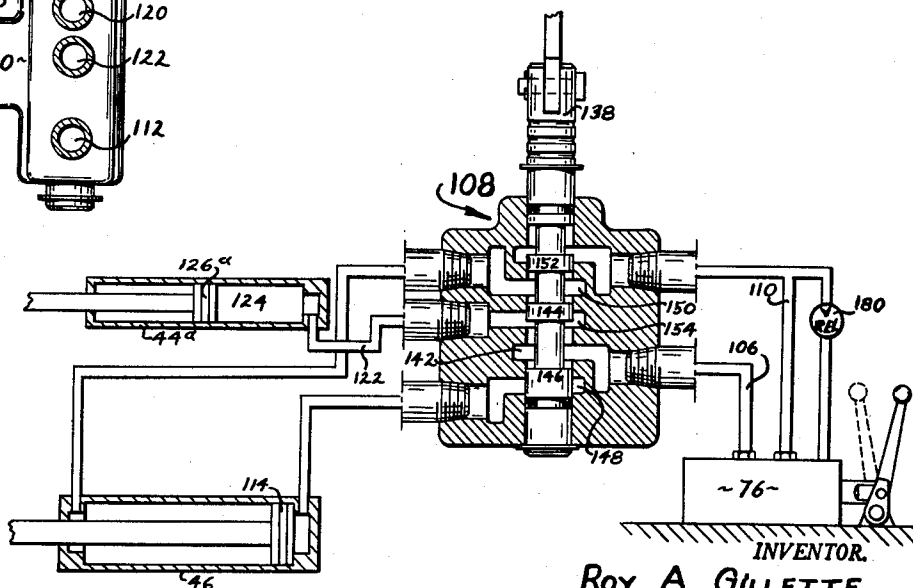


Fig. 6

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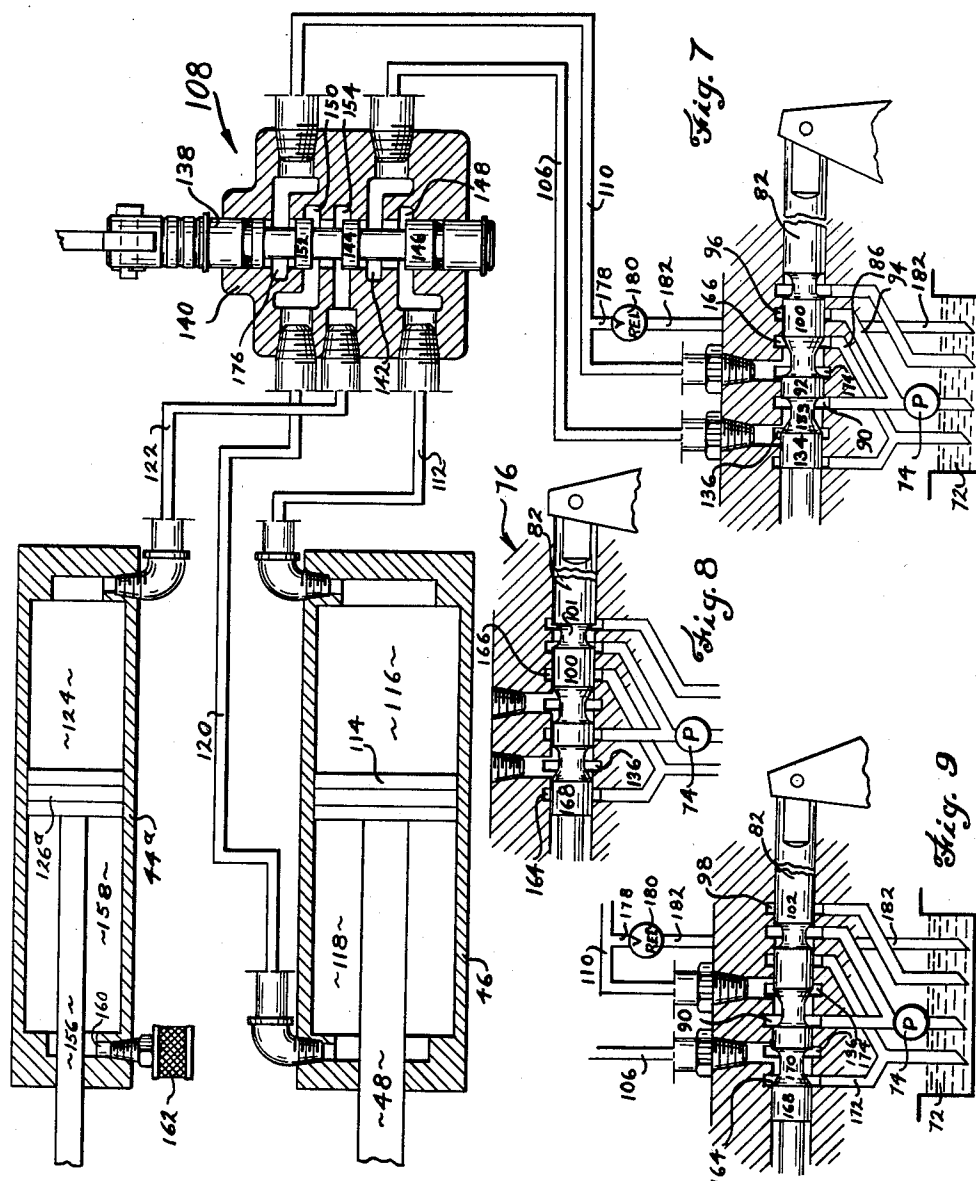
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SELECTIVE HYDRAULIC ACTUATING MEANS

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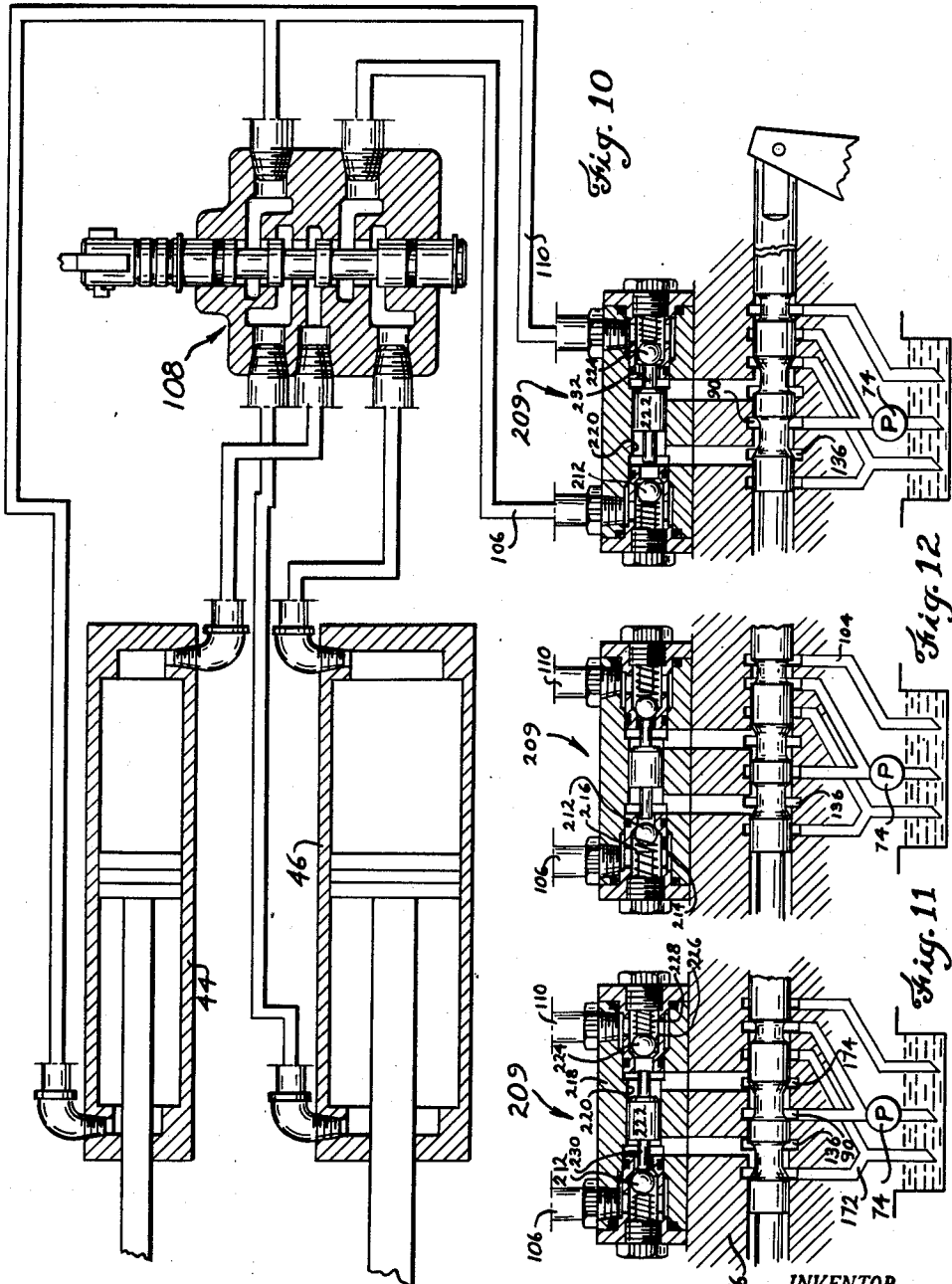
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SELECTIVE HYDRAULIC ACTUATING MEANS

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5 Sheets-Sheet 5

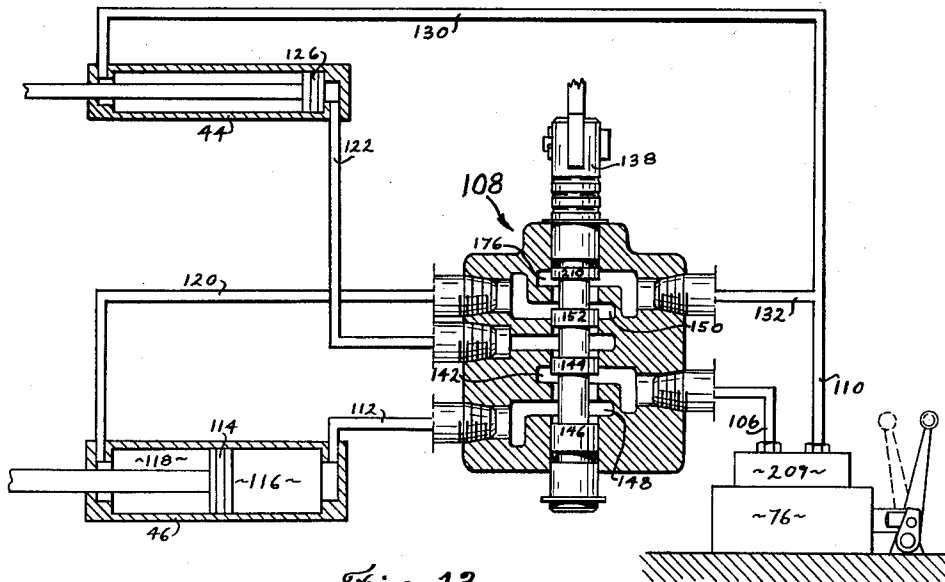


Fig. 13

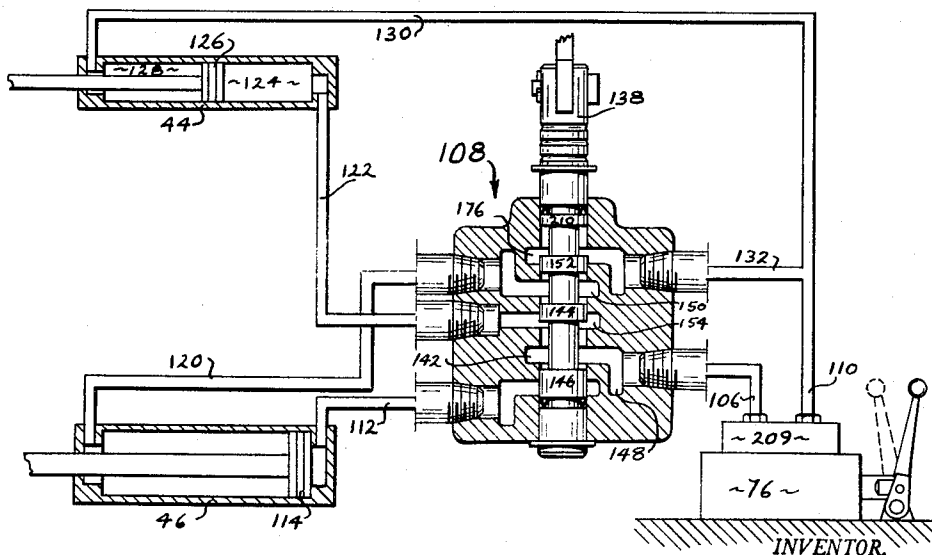


Fig. 14

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1

2,928,482

SELECTIVE HYDRAULIC ACTUATING MEANS

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Application March 20, 1957, Serial No. 647,439

7 Claims. (Cl. 172—304)

The present invention relates to power lifts of the fluid pressure type and an object thereof is to generally improve the construction and operation of devices of this class.

It is often desirable in the art of lifting implements and similar loads to lift separate portions of a device or separate sections of an implement substantially identical amounts even though the separate sections or portions are not mechanically or integrally connected. It is known to lift separate sections of an implement by means of separate hydraulic cylinders, for example, and this arrangement is the subject of applicant's pending application Serial No. 590,123, filed June 8, 1956 for Synchronized Multiple Motor Power Lifts, but which will also be fully disclosed herein.

When used in a tractor mounted cultivator, while usually the two hydraulic cylinders will be actuated simultaneously, at times it is desirable to lift the implements on one side at a different time from those on the other and the present invention is directed to expedients providing for selective lifting or control of one cylinder and the implements connected thereto independently of the others and it being simple and convenient by means of the apparatus disclosed to actuate either cylinder independently, in quick succession, as in cultivating pointed rows, or both together as desired. A further object therefore is to provide synchronized operation of two separate fluid motors or individual operation of either fluid motor independently of the other at will.

Fluid power lift devices are sometimes provided with nonreturn valve arrangements preventing dropping or lowering of the loads imposed on the motors in the absence of positive fluid pressure to actuate the same, as a safety expedient so that the load cannot be dropped inadvertently by untimely operation of the control valve, as disclosed in the pending application of Talak, Serial No. 617,865, filed October 23, 1956 for Control for Hydraulic Power Lifts, but also fully disclosed herein.

A further object therefore is to provide a device as above which will perform the same functions and allow the same type of operation in a system equipped with such a safety nonreturn valve.

Further objects and advantages will become apparent from the following specification and claims in which an illustrative embodiment of the invention is shown, it being understood, however, that the invention is not to be taken as limited to the construction illustrated or in fact in any manner except as defined in the claims.

In the drawings, Figure 1 is a plan view of a tractor equipped with mounted cultivator implements and a hydraulic power lift representative of the disclosed embodiments of the invention.

Fig. 2 is a right side elevation, enlarged, of certain mechanism indicated in Fig. 1.

Fig. 3 is an enlarged view, largely diagrammatic in character, illustrating a preferred form of certain mechanism indicated in Fig. 1.

2

Fig. 4 is a front elevation of certain mechanism indicated in Fig. 1, enlarged and with parts removed.

Fig. 5 is a diagrammatic representation of a slightly modified arrangement of the mechanism indicated in Fig. 1.

Fig. 6 is a similar view showing the parts in a different position.

Fig. 7 is a similar view showing the parts in still another position.

Fig. 8 is a view of a portion of the preferred form of the mechanism indicated in Fig. 3.

Fig. 9 is a similar view with the parts in a different position.

Fig. 10 is a view similar to Fig. 7 but showing the preferred embodiment with the addition of a safety nonreturn valve.

Fig. 11 is a similar view with the parts in a different position.

Fig. 12 is a similar view with the parts in still another position.

Fig. 13 is a diagram of the mechanism of Fig. 10 with the parts in a different position, and

Fig. 14 is a similar view with the parts in still another position.

Returning to Fig. 1, 20 designates generally a tractor including an engine portion 22, a transmission and axle portion 24, traction wheels 26 and 28, and front wheels 30 and 32, all of which may be of any suitable or well-known construction. Tractor 20 carries cultivating rigs 34 and 36 which may be of conventional construction but including respectively upwardly directed lever arms 38 and 40. Tractor 20 carries a source of fluid pressure which will be further described, generally designated as 42, from which fluid is directed as desired to fluid pressure cylinders or motors generally designated as 44 and 46, cylinder 46 having a piston rod 48 connected with a link or push rod 50 pivotally connected at 52 with above-mentioned lever arm 40. In similar manner cylinder 44 is connected through a push rod 54 to above-mentioned lever arm 38.

Lever arm 40, as better seen in Fig. 2, is fixed on a rockshaft 56 carried in a substantially rigid outrigger 58. Rockshaft 56 has an arm 60 pivotally connected to a vertical member 62 which carries a beam or tool bar 64 to which is clamped a series of earth working tools 66, a bracing link 68 being pivoted between vertical member 62 and a downwardly extending portion 70 of rigid structure 68. It will now be apparent that forward movement of push rod 50 will cause clockwise rotation of lever arm 40 and rockshaft 56, such motion rocking also arm 60 and raising member 62 and tool bar 64. Virtually identical structure is associated with arm 38 on the other side of the tractor and which need not be further described.

As seen in Fig. 3, fluid pressure source 42 includes a reservoir 72, a pump diagrammatically represented as 74 and a control valve generally designated as 76 which will be described from time to time as necessary for a full understanding of the invention, but comprising generally a housing 78 including a bore 80 in which is slidable a valve element or spool 82, the latter being slidable in the bore by rocking of a lever arm 84 pivoted at 86 thereto. In the position of the parts shown in Fig. 3, fluid is drawn from reservoir 72 by pump 74 and forced into a passageway 88 leading to a port 90. Port 90, however, is blocked by a land 92 on spool 82, the fluid therefore proceeding through a connecting passageway 94 to a port 96 and crossing over to a port 98 about the shank 101 between a land 100 and a land 102 on spool 82. From port 98, the fluid returns through a passageway 104 to reservoir 72, the fluid thus circulating idly

3

through the valve without objectionable heating or causing any serious waste of power. It is, of course, understood that pump 74 is actuated from the power on tractor 20 in any suitable or conventional manner.

Valve 76 is connected through a first conduit 106 with a valve generally designated as 108 and also by a conduit 110, and valve 108 is connected with above-mentioned cylinder 46 by a conduit 112 which may be considered a continuation of conduit 106. Conduit 112 leads to cylinder 46 which is divided by a piston 114 into a pair of displacement chambers 116 and 118 and which, in the usual application of such cylinders, are commonly known as the "push side" and "pull side" respectively. Piston 114 is fixed on above-mentioned piston rod 48 which extends out of chamber 118 in a fluid-tight manner as well known, and a second conduit 120 leads out of chamber 118 to valve 108. Also a conduit 122, which may be considered a continuation of conduit 120 leads from valve 108 to the "push side" 124 of above-mentioned cylinder 44. Cylinder 44 is provided with a piston 126 connected with above-mentioned push rod 54, and from the "pull side" 128 of cylinder 44 a conduit 130 leads to above-mentioned conduit 110 and has a branch 132 also leading into valve 108. The ports and passageways in valve 108 will be described as necessary for a full understanding of the action of this valve, it being stated at this point that the purpose of valve 108 is to cause either cylinder 46 or cylinder 44 or both together to respond to the adjustments of valve 76.

The exterior of valve 108 is shown in Fig. 4, conduits 120, 122, and 112 opening toward the observer, and it will be understood that conduits 106 and branch 132 open away from the observer and are not visible in this view.

For a primary understanding of the device, attention is directed to Fig. 7 which shows a slightly modified but closely analogous construction to Fig. 3. However, spool 82 has been shifted to the right, land 100 now blocking above-mentioned port 96. Assuming cylinder 46 full of fluid, the following will take place. Fluid from pump 74 will be blocked from passage through passageway 94 but, land 92 having been shifted to the right, port 90 is now open through the space about a shank 133 between land 92 and a land 134 to a port 136 communicating with above-mentioned conduit 106. Fluid will therefore, in well known manner, build up pressure substantially instantly and which will be communicated through conduit 106 to valve 108. Valve 108 has a spool 138 which is slidable in a body portion 140 and having a plurality of lands with shanks therebetween, the resulting grooves being registerable with a series of ports as will be described.

In the position of spool 138 shown, fluid in conduit 106 passes through a port 142 between a land 144 and a land 146 into a port 148, thence through above-mentioned conduit 112 to cylinder 46 (in a manner identical with that described in connection with Fig. 3). Pressure in chamber 116 causes movement (to the left in this case) of piston rod 48, thus reducing the volume of chamber 118. Assuming, as stated, chamber 118 to be full of fluid, it then acts as a pump and forces fluid through above-mentioned conduit 120 to a port 150 between a land 152 and above-mentioned land 144 and through a port 154 to above-mentioned conduit 122 and through conduit 122 into chamber 124 of a cylinder 44a, thus causing movement also to the left of a piston 126a. Piston 126a has a rod 156 which connects with above-mentioned push rod 54.

In the situation shown, it would be highly desirable for push rods 50 and 54 to receive simultaneous and equal movement under the conditions set up in Fig. 7 and this is accomplished as follows. The stroke of piston 126a is made equal to that of piston 114 and furthermore, the area of piston 114 presented to chamber

4

118, less the cross-sectional area of piston rod 48 is made equal to the area of piston 126a presented to chamber 124. Therefore, since the volume of a cylinder is equal to the cross-sectional area times the length, if the areas are equal and the volumes are equal, the lengths, or strokes of the pistons will necessarily be equal and the displacement of fluid upon predetermined movement of piston 114, as regards chamber 118, will be the same as the change in volume of chamber 124 for an equal movement of piston 126a. Thus, since the fluid, commonly oil, is to all practical purposes incompressible, it follows that piston 126a will be moved simultaneously with, and the same distance as piston 114. In the embodiment of Fig. 7, chamber 158 is vented to the atmosphere through a passageway 160 and an air filter 162 of well known type.

In other words, cylinder 46 is a so-called double-acting cylinder or fluid motor while cylinder 44a is a single-acting cylinder or motor.

Referring to Fig. 8, spool 82 is shown in a central or neutral position similar to that of Fig. 3, the fluid impelled by pump 74 being bypassed about shank 101 as before and circulating idly. Valve 76 also provides exhaust ports 164 and 166 but which, in this position of the valve, are blocked by a land 168 and above-mentioned land 100 respectively. There is therefore no escape for the pressure fluid in conduit 106 so that piston 114 is maintained in position to keep the rigs 36 raised. Furthermore, since piston 114 cannot move, fluid cannot flow back through conduit 120 nor 122 so that piston 126a is also maintained in position to keep rigs 34 raised, and this condition may be maintained so long as spool 82 is allowed to remain in the position shown in Fig. 8.

When it is desired to lower the implements, spool 82 is shifted to the position shown in Fig. 9. Land 168 is then shifted to the left of above-mentioned port 164, thus opening above-mentioned port 136 about a shank 170 to port 164 which in turn leads, through a passageway 172, back to reservoir 72, thus relieving chamber 116 and permitting rightward movement of piston 114. Fluid may then exhaust from chamber 124 of cylinder 44a through conduit 122, valve 108 between lands 144 and 152 to conduit 120. By virtue of the movement permitted piston 114, this fluid may fill chamber 118. Fluid in chamber 116 may exhaust through conduit 112 and valve 140 between lands 144 and 146 to conduit 106 and then about shank 170 to reservoir 72 as just described. This will cause synchronous lowering of the implements in a manner substantially exactly the reverse of the process of raising hereinbefore described. It will be observed, however, that in this operation above-mentioned land 102 blocks port 98 so that, under this condition, fluid coming from pump 74 will pass through above-mentioned port 90 and a port 174 to above-mentioned conduit 110. Conduit 110, however, is blocked at a port 176 in valve 108 as shown in Fig. 7, the pressure fluid therefore being forced through a branch 178 and through a relief valve 180 and passageway 182 to reservoir 72. Although this involves continuous escape of relatively high pressure through valve 180, the lowering process consumes only a few seconds so that there is no appreciable waste of power or heating of the fluid, it being understood that spool 82 is returned to the Fig. 8 position as soon as the lowering process is completed. It is thus a simple and convenient matter to raise and lower implements simultaneously on both sides of tractor 20.

Valve 108 has other positions for other types of operation and provides for actuating either cylinder 46 or cylinder 44a independently of its companion. Turning to Fig. 5 which illustrates control of motor 46 alone, spool 138 has been shifted downwardly by means of a handle 184, Fig. 4. Returning to Fig. 5, fluid coming

5

from valve 76 to conduit 106 as described in connection with Fig. 7 will enter port 142 and pass between lands 144 and 146 as before, leaving through port 148 and conduit 112, thus causing actuation of piston 114 and raising of rigs 36—on the right-hand side of the tractor, in the embodiment shown. Fluid in chamber 118 will escape as before through conduit 120 but, since land 152 has now been shifted downwardly, it blocks port 154 and opens port 150 to port 176 leading to above-mentioned conduit 110, thus bypassing the fluid from chamber 118 so that it does not actuate piston 126a. Conduit 122 from chamber 124, as heretofore stated, leads into port 154 but which is blocked between lands 144 and 152. Valve 76 is in the position indicated in Fig. 7 and fluid returning through conduit 110 enters above-mentioned port 174 and crosses over to above-mentioned port 166, returning to reservoir 172 through a passageway 186. As will be apparent, returning valve spool 82 to the Fig. 8 position will block port 136 and maintain piston 114 in position to hold rigs 36 in their raised position.

Fig. 6 illustrates the actuation of cylinder 44a independently of cylinder 46, in this instance valve spool 138 being shifted upwardly from the mid-position shown in Fig. 7. With valve 76 shifted into the raising position shown, pressure fluid in conduit 106 enters port 142 in valve 108 but is blocked by the new position of land 146 and does not enter port 148. Land 144, however, has been moved upwardly and the fluid crosses over between lands 144 and 146 to port 154, thus entering conduit 122 and passing therethrough into chamber 124. In this condition both ports 148 and 150 are blocked, the former by land 146 and the latter between lands 144 and 152 so that piston 114 in cylinder 146 is maintained immovable while piston 126a responds to valve 76. As will be apparent, shifting valve 76 to the Fig. 9 position will permit fluid in chamber 124 to reverse or exhaust through conduits 122 and 106 in a manner substantially opposite to the flow in the raising adjustment of valve 76. In this situation fluid coming from pump 74, as in the case of Fig. 9, passes into conduit 110 and exhausts through relief valve 180. As heretofore explained, this condition obtains for only a very short time and therefore is not objectionable.

Valves 76 and 108 are actuated by suitable controls, above-mentioned lever arm 84, best shown in Fig. 5, being fixed on a shaft 188 journaled on a suitable support 189. Also fixed on shaft 188 is a hand lever 190, rocking of which will cause rocking of shaft 188 and lever arm 84 and consequent shifting of spool 82. Hand lever 190 may be placed in any convenient location but commonly the entire unit 42 is placed within easy reach of the tractor operator so that hand lever 190 is also conveniently located.

Spool 138 of valve 108, as stated, is actuated by a hand lever 184, best seen in Fig. 4. It has an actuating arm 192 pivoted at 194 to above-mentioned spool 138. Lever 184 extends beyond arm 192 and is pivoted at 196 to a link 198, in turn pivoted at 200 on valve body 140. In this manner the rocking action of hand lever 184 is transformed into axial sliding movement of spool 138 with a minimum of complication. A detent spring 202 suitably anchored on body portion 140 engages grooves 204, 206, and 208 respectively in the lower, middle, and upper positions of spool 138, thus yieldingly maintaining the spool in the desired positions.

Referring now to Figs. 3, 13 and 14, the principles of operation are similar except that cylinder 44 is double-acting rather than single-acting, and that an auxiliary valve generally designated as 209 has been interposed in the conduits 106 and 110 in Figs. 13 and 14, which will be fully described later, but which has no effect insofar as the normal operation of valves 76 and 108 is concerned, and which therefore may be disregarded at this point. With valve 76 in the Fig. 7 of raising posi-

6

tion, pressure fluid will be directed into conduit 106 as heretofore described and will pass through valve 108 to conduit 112 as before, thus causing leftward movement of piston 114. Fluid in chamber 118 again will be displaced through conduit 120, valve 108, and conduit 122, into chamber 124 of cylinder 44. This will cause leftward movement of piston 126 in the manner hereinbefore described and fluid in chamber 128 (assuming cylinder 44 entirely full of fluid as is normal) will be displaced through conduit 130 which joins with conduit 110, this fluid entering port 174, Fig. 7, and crossing over to port 166 between lands 92 and 100 and exhausting through above-mentioned passageway 186 to reservoir 72. The effect then is similar to that obtained by the Fig. 7 embodiment except that chamber 128 is under the control of valve 76 rather than vented to atmosphere.

When it is desired to lower the implements with the Fig. 3 embodiment, valve 76 is placed in the position shown in Fig. 9. Pressure fluid is therefore applied to conduit 110 (relief valve 180 being eliminated in Fig. 3) and travels therethrough and through conduit 130 into chamber 128. On the other hand, fluid is exhausted from chamber 116 of cylinder 46 through conduit 112, valve 108, and conduit 106, crossing over from port 136 in valve 76 to port 164 and exhausting to reservoir 72 through passageway 172. This permits rightward movement of piston 114, Fig. 3, thereby enlarging chamber 118 and providing for the exhaust of fluid from chamber 124 through conduit 122, valve 107, and conduit 120 into chamber 118. Thus the two sets of rigs may be raised and lowered together by simple manipulation of valve 76 by means of hand lever 190.

Individual control of the two cylinders is possible and perhaps even more convenient in this embodiment. Turning to Fig. 13, actuation of cylinder 46 alone is accomplished by shifting valve spool 138 to its lowermost position. Under these conditions pressure fluid transmitted to conduit 106 by valve 76 passes between lands 144 and 146 in valve 108, from port 142 to port 148, thence through conduit 112 into chamber 116. Fluid in chamber 118, however, exhausts through conduit 120 into port 150, and, between land 152 and a land 210 to port 176 from which it passes through branch 132 and conduit 110 to reservoir 72 in a manner similar to that described in connection with Fig. 5. Shifting valve 76 to the lowering position reverses the flow, as will be apparent, and provides opposite movement of piston 114 in the manner shown in Fig. 9. Under these conditions conduit 122 is blocked by the position of lands 152 and 144 and therefore pressure in conduit 130, although directed there by valve 76, will have no effect on piston 126.

Turning to Fig. 14 which shows spool 138 in its uppermost position for actuation of cylinder 44 alone, pressure fluid in conduit 106 enters port 142 as before but is blocked from port 148 by land 146. However, it crosses over between lands 146 and 144 to port 154 and passes through conduit 122 into chamber 124 of cylinder 44, this causing leftward movement of piston 126, fluid in chamber 128 exhausting through conduit 130 and valve 76 in the manner indicated in Fig. 7. Since conduit 112 is blocked in valve 108 as stated, piston 114 in cylinder 46 does not move and, in fact, is locked in position since conduit 120 is blocked at port 150 between lands 144 and 152. When it is desired to retract piston 126 or lower the implements connected thereto, valve 76 is placed in the Fig. 9 position, whereupon fluid is forced through conduits 110 and 130 into chamber 128, and exhausted through conduits 122 and 106 from chamber 124. Pressure fluid in conduit 110 cannot affect piston 114 since branch 132 is blocked at port 176 by lands 152 and 210.

In fluid actuated power lifts of this nature there is danger that the implements may be left in a raised position and that someone unwittingly actuating valve 76 in a lowering direction may permit the implements

to be dropped and may be injured thereby. Furthermore, slidable spool valves of the type of 76 and 108 are never completely fluid-tight so that implements left in a raised position may gradually drop as fluid seeps through the clearances between the spools and bodies of the valves. To avoid these difficulties a safety expedient hereinbefore mentioned has been provided as in the pending Talak application in which positively seating ball type valves prevent any return of fluid from the power lift cylinders except when such return is intentional. Such valves can be interposed, in the present instance in above-mentioned conduits 106 and 110, and, insofar as the preferred embodiment is concerned, outside of the resulting increased safety and efficiency, will not affect the operation.

In Fig. 12 such a safety nonreturn valve generally designated as 209 is shown in axial section associated with above-mentioned valve 76. In this view valve 76 is in the middle or holding position so that pump 74 is bypassing through passageway 104. Assuming, however, that there is pressure, due to the weight of implements, in conduit 106, flow into port 136, from which seepage might take place, is prevented by a ball valve 212 seated in a shouldered bore 214 and pressed by a spring 216. Assuming now that it is desired to lower the implements, it is necessary to provide a backflow of fluid in conduit 106 as indicated in Fig. 11. Under these conditions port 136 is connected to exhaust passageway 172, whereas pump 74 is connected through port 90 with port 174. Ball valve 212 is carried in a valve body 218 providing a bore 220 and in which is slidable a piston or slug 222, and the aforesaid adjustment of valve 76 transmits the pressure from pump 74 in this case to the right side of piston 222 in bore 220. This fluid pressure does two things, first it forces a ball valve 224 off of a seat in a bore 226 against the pressure of a spring 228 and passes through conduit 110, thereby initiating retracting movement of whichever piston happens to be controlled by valve 108. Second, at the same time it presses piston 222 to the left so that a stem 230 unseats ball 212, thus allowing the necessary backflow through conduit 106. Turning now to Fig. 10, when it is desired to raise the implements, pressure fluid from pump 74 is transmitted from port 90 to port 136 and to bore 220 on the left side of piston 222. In a manner analogous to that just described, this pressure fluid unseats ball valve 212 thereby gaining access to conduit 106, while also forcing piston 222 to the right so that a stem 232 unseats above-mentioned ball valve 224. In this manner the high pressure fluid obtains access to conduit 106 and the exhaust fluid returns through conduit 110. Thus the exhaust or return of fluid to the reservoir through either conduit depends upon the presence of fluid pressure in the opposite conduit so that, if pump 74 is not running and for that reason no fluid pressure is available in port 90, no amount of manipulation of valve 76 nor of valve 108 will have any effect on either of the motors 46 or 44.

Beyond valve 218 the operation is identical with that described in connection with Figs. 3, 13 and 14. In the Fig. 10 embodiment both motors 44 and 46 will respond to the adjustments of valve 76. In the Fig. 13 adjustment motor 46 alone will respond, and in the Fig. 14 adjustment motor 44 alone will respond. In all of these adjustments of this embodiment of the invention, valve 209 is effective and, while not interfering in any manner with normal operation, will secure implements, if raised, against inadvertent dropping and also against gradual dropping as a result of fluid seepage past either of the valve spools.

While the device is substantially fool-proof, if by any possibility, as for example inept operation of valve 108, flow of fluid is blocked into either cylinder 44 or 46, excessive pressure might be built up in passageways 88 and 94, which excessive pressure is relieved by the usual over-pressure valve 234, which does not interfere with free

flow of fluid in passageway 94, but provides for escape of fluid into reservoir 72 if the pressure approaches a dangerous value.

The operation of the arrangement is thought to be clear from the foregoing description, sufficient to say, that with valve 108 in its middle adjustment, both fluid motors will respond to shifting of valve 76, implements on both sides of the tractor being raised or lowered simultaneously and equal amounts under control of the tractor operator. On the other hand, with valve 108 adjusted in one of its other positions, one cylinder only will respond to valve 76 while the other cylinder will respond to said valve after adjustment of valve 108 to its opposite extreme position. These two operations can follow each other in rapid succession, as necessary in cultivating pointed rows, for example, by simple and easily learned manipulation of the two valves, it being possible to raise the implements on either side alone and then in a very short time to lift the implements on the other side. Conversely, with both sets of implements raised and entering a pointed row, either side may be lowered first, followed promptly or as soon as necessary by the other side. Along with these advantages, it is possible to provide a safeguard against accidental or undesired dropping of the implements, without in any way interfering with the desired simultaneous and individual control of the implements.

The above being a complete disclosure of an illustrative embodiment of the invention, what is claimed as new and desired to be secured by Letters Patent of the United States is:

1. In a power lift for tractor mounted implements the combination of a source of pressure fluid, a control valve for said pressure fluid, a pressure conduit and an exhaust conduit controlled by said control valve, a first cylinder containing a piston having a push side and a pull side adapted to raise and lower a first set of earth working rigs connected thereto, a second cylinder containing a piston having a push side and a pull side adapted to raise and lower a second set of earth working rigs connected thereto, a selector valve connected to said pressure and exhaust conduits, conduits connected to said selector valve and to the push side and the pull side respectively of each of the cylinders, said selector valve connecting said pressure conduit with the push side of the first cylinder, and the pull side of the first cylinder with the push side of the second cylinder, said selector valve having another position in which it connects said pressure conduit with the push side of the first cylinder, and the pull side of said first cylinder with said exhaust conduit, and another position in which it connects said pressure conduit with the push side of the second cylinder and the pull side of said second cylinder with said exhaust conduit.

2. In a power lift for tractor mounted implements the combination of a source of pressure fluid, a control valve for said pressure fluid, a pressure conduit and an exhaust conduit controlled by said control valve, a first cylinder containing a piston having a push side and a pull side adapted to raise and lower a first set of earth working rigs connected thereto, a second cylinder containing a piston having a push side and a pull side adapted to raise and lower a second set of earth working rigs connected thereto, a selector valve connected to said pressure and exhaust conduits, conduits connected to said selector valve and to the push side and the pull side respectively of each of the cylinders, said selector valve connecting said pressure conduit with the push side of the first cylinder, and the pull side of the first cylinder with the push side of the second cylinder, said selector valve having another position in which it connects said pressure conduit with the push side of the first cylinder, and the pull side of said first cylinder with said exhaust conduit, and another position in which it connects said pressure conduit with the push side of the second cylinder.

3. In a power lift mechanism for a tractor having a

double acting fluid motor including a first displacement member adapted to position an earth working rig secured thereto, and a single acting fluid motor having a second displacement member responsive to pressure in the pressure chamber defined by the servo motor and second displacement element and adapted to position an earth working rig secured thereto, the combination of a pump supplying fluid under pressure through first conduit means to a selector valve, second conduit means connecting the selector valve with the inlet of the pump, control valve means located between the pump and selector valve for controlling the flow of fluid in the first and second conduit means between the pump and selector valve, third conduit means connecting the selector valve with one side of the double acting fluid motor, fourth conduit means connecting the other side of the double acting fluid motor with the selector valve, fifth conduit means connecting the pressure chamber of the second servo motor with the selector valve, whereby upon movement of the selector valve to a position to interconnect the first with the third conduit means and the fourth and fifth conduit means the first and second displacement members are moved in the same direction to adjust the positions of the rigs secured thereto; and, upon movement of the selector valve to a second position to interconnect the first with the third conduit means and the fourth and second conduit means while blocking off the fifth conduit means the first displacement member may be actuated to adjust the position of the rig secured thereto; and, upon movement of the selector valve to a third position to interconnect the first and fifth conduits while blocking the third and fourth conduits the second displacement member may be actuated to adjust the position of the rig secured thereto independently of the first displacement member.

4. A hydraulic system for positioning working implements including a first and second servo motor, each adapted to be connected with an implement, a source of fluid under pressure, selector valve means for regulating the flow of fluid to the servo motors, control valve means for controlling the flow of fluid between the source of fluid under pressure and the selector valve, and conduit means interconnecting the source of fluid under pressure, control valve, selector valve, and first and second servo motor means, whereby when the selector valve is moved to one position fluid under pressure is supplied to one side of the first servo motor and fluid from the other side of the first servo motor is directed to one side of the second servo motor to simultaneously position the first and second servo motors; upon movement of the selector valve to a second position fluid under pressure is supplied to said one side of the first servo motor, the flow of fluid to said second servo motor is blocked and the other side of the first servo motor is exhausted whereby the position of the implement secured to the first servo motor may be adjusted independently of the second servo motor; and, upon movement of the selector valve to a third position fluid under pressure is directed to one side of the second servo motor and flow of fluid from said first servo motor is blocked whereby the position of the implement secured to the second servo motor may be adjusted independently of the first servo motor.

5. A power lift mechanism in accordance with claim 4, in which the area on said other side of the first servo motor is equal to the area on said one side of the second servo motor whereby when the selector valve is in the first position the implements secured to the servo motors are adjusted at the same rate.

6. In a selective hydraulic actuating means including a source of fluid under pressure, first and second servo motors for positioning earth working implements or the like, selector valve means for regulating the flow of fluid to the servo motors, control valve means for controlling the flow of fluid between the source of fluid under pressure and the selector valve, first conduit means interconnecting the source of fluid under pressure and control valve, second conduit means interconnecting the control valve and selector valve, and third conduit means interconnecting the selector valve and first and second servo motors, whereby when the selector valve is moved to one position fluid under pressure is supplied to one side of the first servo motor and fluid from the other side of the first servo motor is directed to one side of the second servo motor to simultaneously position the first and second servo motor; upon movement of the selector valve to a second position fluid under pressure is supplied to said one side of the first servo motor, the flow of fluid from the second servo motor is blocked, and the other side of the first servo motor is exhausted, whereby the position of the implement secured to the first servo motor may be adjusted independently of the second servo motor; and, upon movement of the selector valve to the third position fluid under pressure is directed to one side of the second servo motor and flow of fluid from said first servo motor is blocked whereby the position of the implement secured to the second servo motor may be adjusted independently of the first servo motor, and safety valve means interposed in said second conduit means for preventing inadvertent change in position of either or both of the servo motors.

7. A selective hydraulic actuating means in accordance with claim 6 in which the second conduit means includes a supply and exhaust conduit between the control valve and selector valve, and the safety valve means includes a housing containing a slidable abutment member dividing the housing into first and second chambers communicating with the supply and exhaust conduit respectively, a non-return valve in each of said supply and exhaust conduits for preventing the flow of fluid back through said supply and exhaust conduits, and means on said abutment for opening the return valve in the exhaust conduit when fluid under pressure is directed to the supply conduit, first chamber, and non-return valve to the selector valve.

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