Jan. 7, 1936. C. W. EISERER 2,026,938

LIFT

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Fig 1.

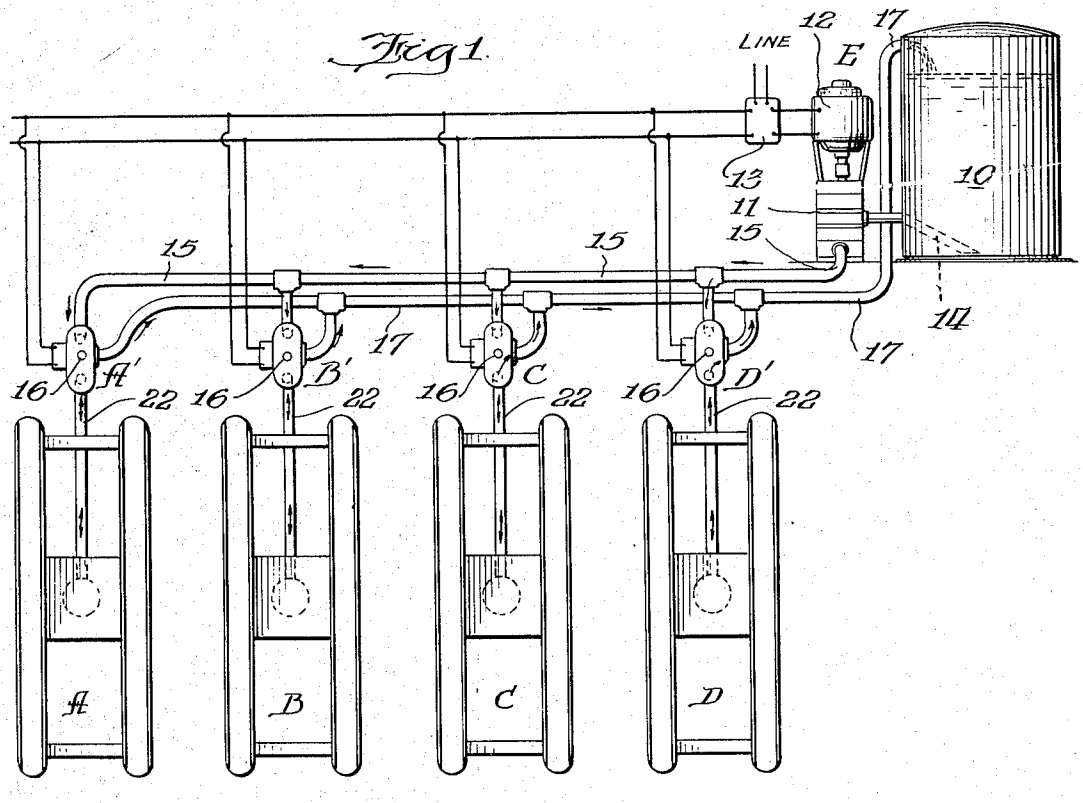
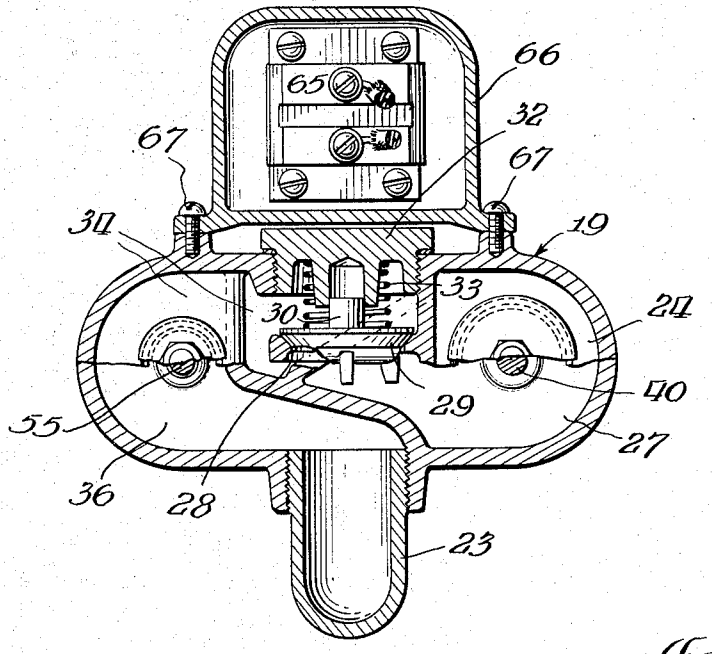


Fig. 6.



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Fig. 2.

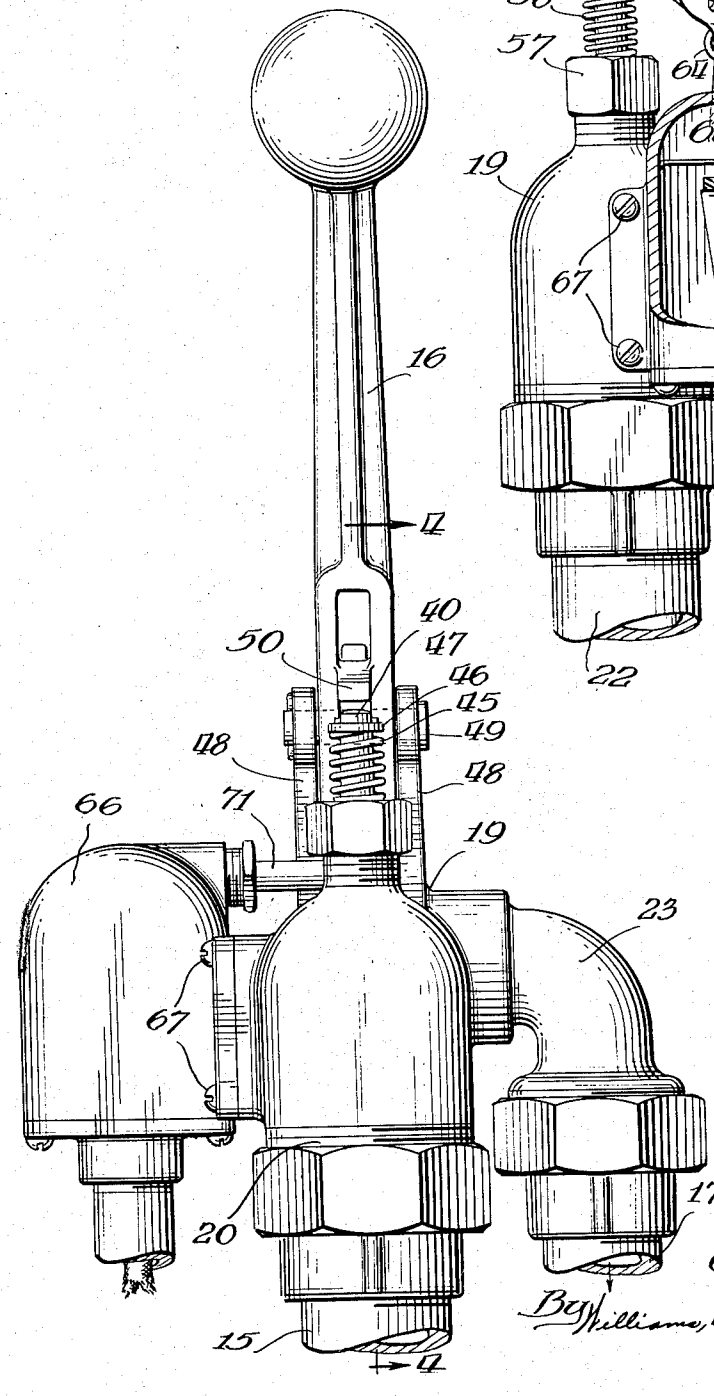
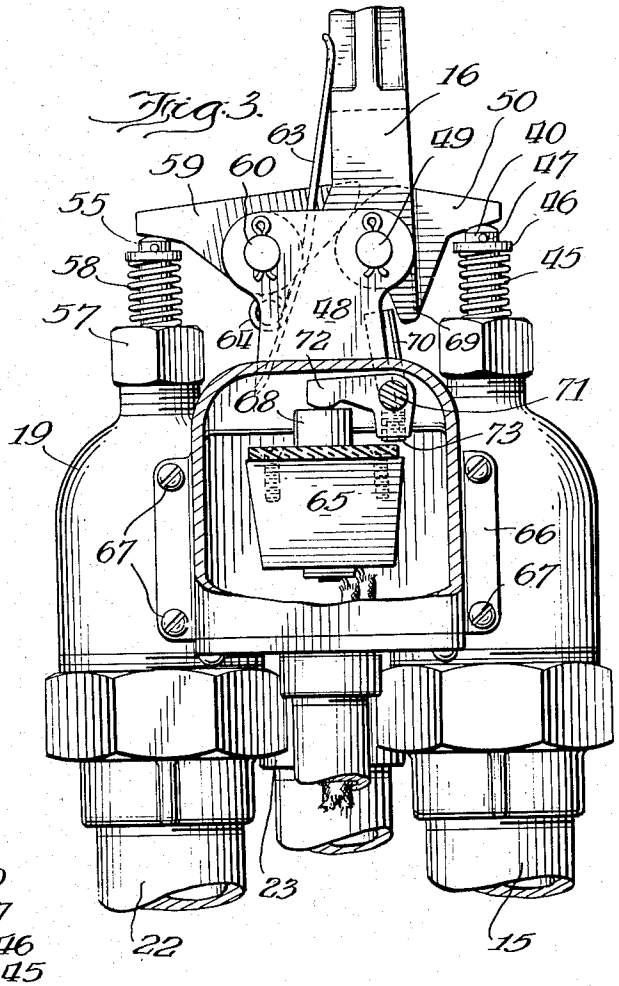


Fig. 3.



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Fig. 4.

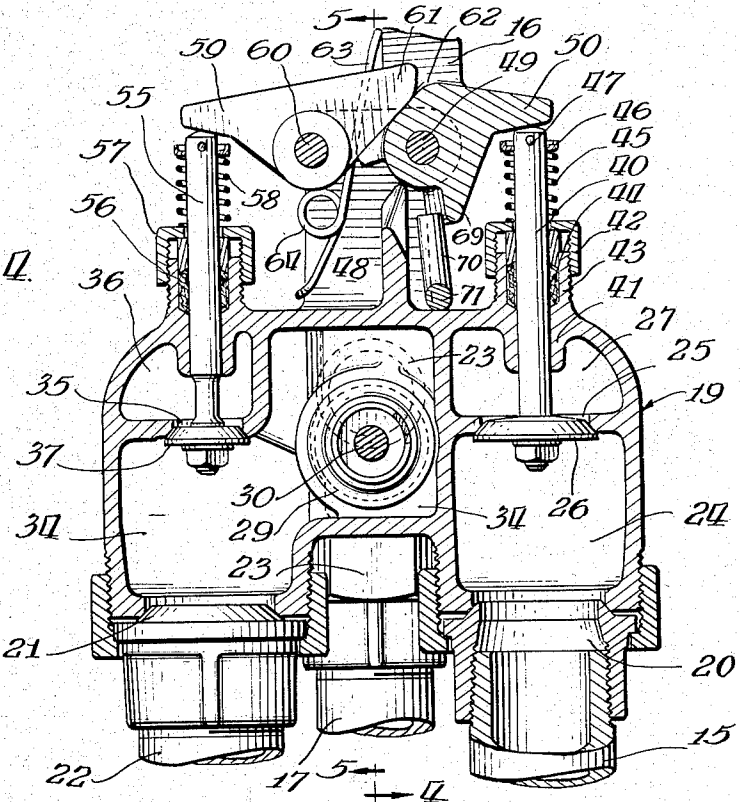
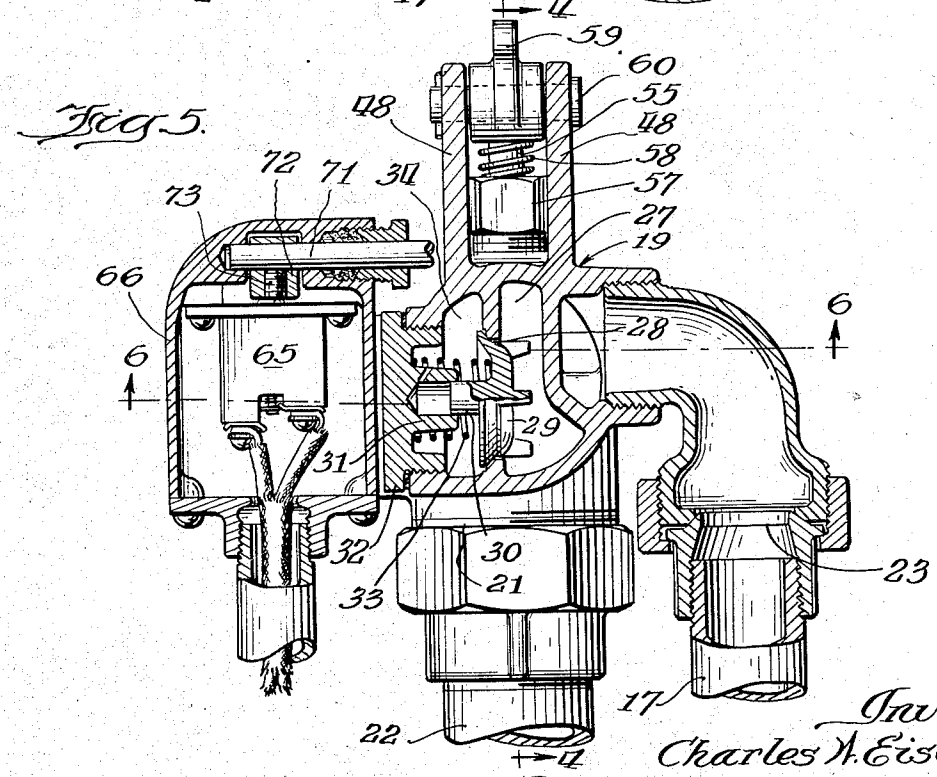


Fig. 5.

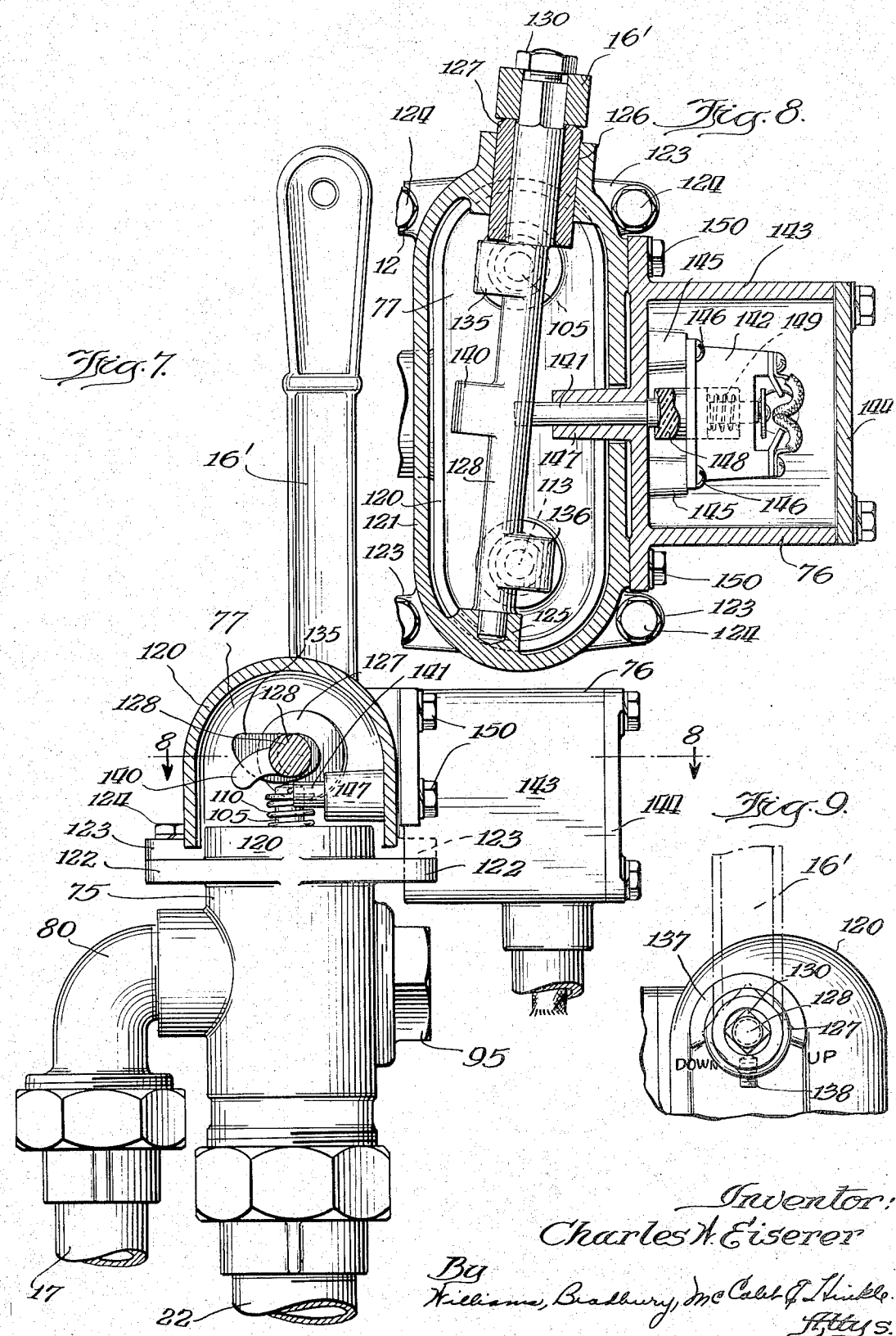


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Fig. 10.

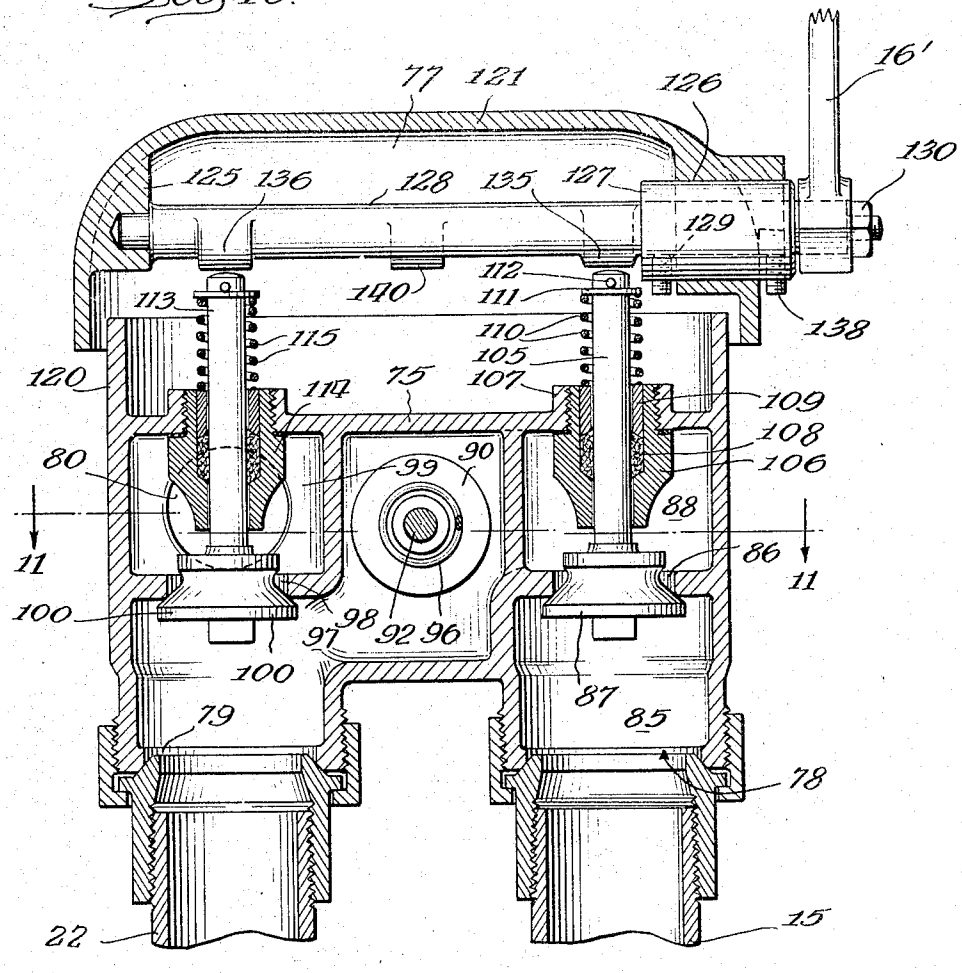
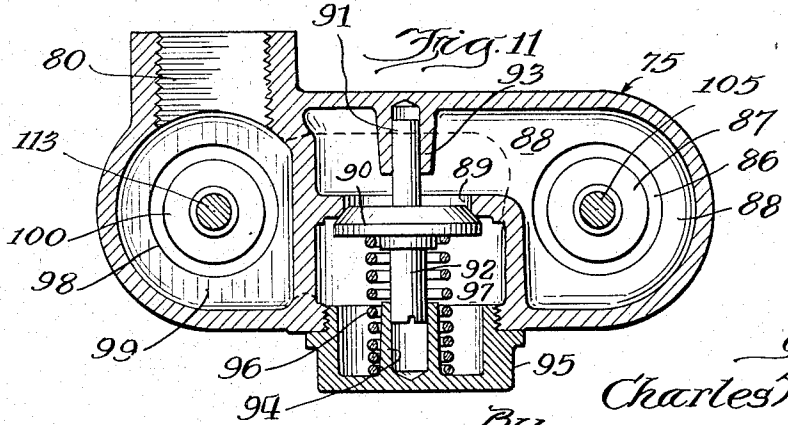


Fig. 11



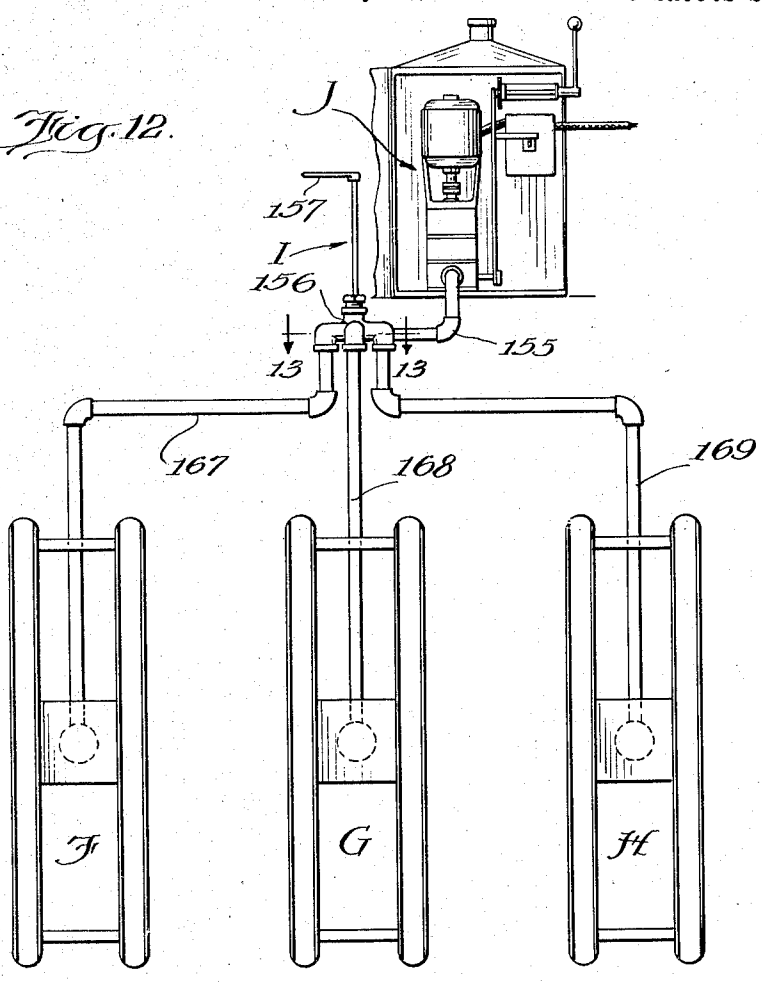
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Fig. 12.



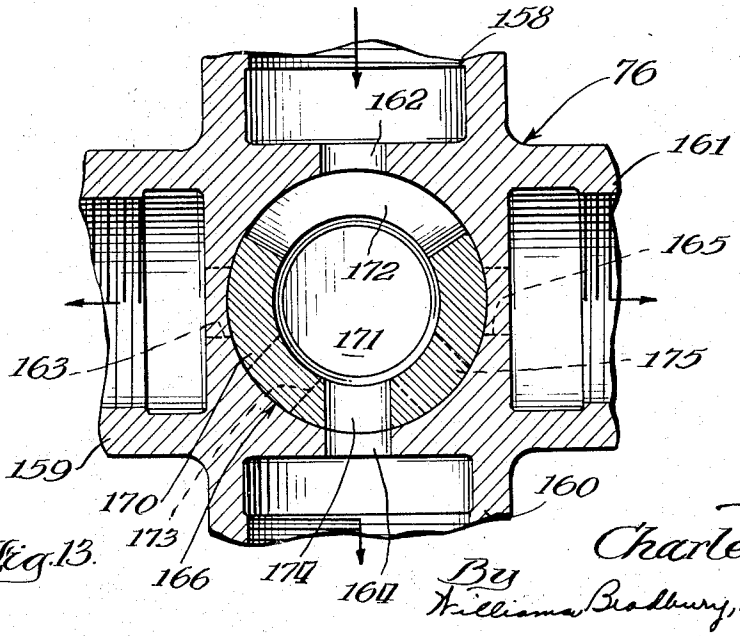


Fig. 13.

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UNITED STATES PATENT OFFICE

2,026,938

LIFT

Charles W. Eiserer, Chicago, Ill., assignor to Rotary Lift Company, Memphis, Tenn., a corporation of Tennessee

Application May 25, 1933, Serial No. 672,827

9 Claims. (Cl. 60—97)

My invention relates to lifts, particularly automobile servicing lifts of the fluid operated type such as are employed in filling stations and garages bodily to elevate an automobile to render the chassis and underbody readily accessible for inspection, cleaning and repair.

One of the objects of my invention is to provide an improved arrangement for the selective operation of a plurality of lifts from a single source of fluid pressure.

Another object is to provide a plurality of lifts with individual control for a common source of operating power.

Another object is to provide a plurality of lifts and a common source of operating power with controls which are individual to a lift and in common with the power source.

Another object is to provide each of a plurality of lifts with a control station which individually governs the application of pressure to the associated lift and initiates the operation of a pressure producing plant which is common to all of the lifts.

Another object is to provide a control valve and switch particularly adapted for each lift of a multiple lift installation.

Other objects and advantages will hereinafter appear.

In the drawings:

Fig. 1 shows, in a partially diagrammatic manner, an installation of four lifts, all deriving power from a single source and arranged for individual control;

Fig. 2 is an enlarged side elevation of one form of individual combined control valve and switch;

Fig. 3 is a front elevation and partial section of this combined valve and switch with the upper part of the control handle broken away;

Fig. 4 is a vertical section on the line 4—4 of Fig. 2;

Fig. 5 is a section on the line 5—5 of Fig. 4;

Fig. 6 is a section on the line 6—6 of Fig. 5;

Fig. 7 is an enlarged end elevation and partial section of a modified form—probably the preferable form—of combined control valve and switch;

Fig. 8 is a section on the line 8—8 of Fig. 7;

Fig. 9 is a detail view showing the stop arrangement for the operating handle;

Fig. 10 is a vertical section;

Fig. 11 is a section on the line 11—11 of Fig. 10;

Fig. 12 is a diagrammatic illustration of a modified type of multiple lift installation; and

Fig. 13 is an enlarged section on the line 13—13 of Fig. 12.

Referring first to Fig. 1, the multiple lift installation chosen for illustration comprises four lifts A, B, C and D, all of which are arranged to receive pressure-fluid for elevation from a common source of power supply. Each lift may be of any approved type such, for example, as that set forth in Peter J. Lunati Patent 1,552,326 granted September 1, 1925. Each lift or station is provided with an individual control A', B', C' and D' respectively by means of which the application and release of pressure is independently controlled and the common source of power can be started to create the pressure required.

The common source of power or power plant includes a pressure-fluid reservoir 10—the preferred fluid being oil—a pump 11 for withdrawing fluid from the reservoir and forcing it to the lifts, a pump driving motor 12 and a motor starter 13.

The reservoir may be of any suitable construction preferably with a capacity great enough to supply liquid to permit, if desired, simultaneous elevation of all of the lifts associated therewith. The pressure fluid pump may be of any appropriate type having a liquid and pressure capacity great enough to meet the conditions existent at the particular installation. A rotary type of pump directly connected to its driving motor is shown. It has an inlet 14 connected to reservoir 10 and an outlet connected to a pressure supply pipe 15. The motor may be of any desired type, preferably electrically operated, and of the size, voltage and electrical characteristics required. The motor starter likewise may be of any appropriate type. Preferably it is of the automatic type, several varieties of which are in common use and well known, whereby, when a control circuit thereto is closed or opened, the power circuit to the motor is closed or opened and current limiting resistance or other regulatory and protective equipment is cut out or cut in properly to start and stop the motor and prevent excessive current flowing thereto.

In general the control equipment or control station at each lift comprises a combined valve and master switch, a preferred embodiment of which will be hereinafter explained, operable by a manually actuated control handle 16. Each control handle is movable to three positions,—a neutral or mid-position in which the circuit to the motor starter is open and communication between the pump and the associated lift is closed, an "up" or, as viewed in Figs. 1, 3 and 4, an extreme right hand position, in which the circuit to the motor starter is closed and communi-

cation between the pump and associated lift is open with the result that the lift is elevated, and a "down" or, as viewed in Figs. 1, 3 and 4, an extreme left hand position, in which the circuit to the motor starter remains open and communication is established through a return pipe 17 between the associated lift and the pressure fluid reservoir, with the result that the weight of the lift plunger and its load can force the pressure fluid back into the reservoir and the lift can descend.

Referring now to Figs. 2 to 6, the construction and operation of one form of individual lift control will be explained. The controls at all lifts may be alike.

The control comprises a multiple valve and an electric switch which are selectively operated by the actuation of the control handle to the three positions heretofore mentioned. It includes a casing 19 which has an inlet 20 connected to supply pipe 15, an outlet 21 connected by a pipe 22 to the associated lift and a return 23 connected to return pipe 17. Inlet 20 leads into an inlet chamber 24, the outlet of which is a port 25 controlled by a pressure-application or "up" valve 26. Port 25 connects inlet chamber 24 with an intermediate chamber 27, the outlet of which is a check-port 28 controlled by an automatic check valve 29.

The stem 30 of check valve 29 is slidably seated in a socket formed in a boss 31 of a threaded plug 32 which fits and tightly closes a threaded opening through one outside wall of casing 19. The check valve can be placed within the casing and, should occasion require, removed therefrom through the opening which is closed by plug 32.

A helical spring 33 normally biases check valve 29 to closed position, interrupting communication between intermediate chamber 27 and a combined inlet-outlet chamber 34. Chamber 34 includes the outlet 21 and has a return port 35 which connects it to a return chamber 36. Return chamber 36 communicates with the return pipe 17 through return connection 23. A pressure release or "down" valve 37 controls port 35 and consequently the communication between chambers 34 and 36.

Normally valves 26 and 37 stand closed, but each may be operated by the manipulation of the control handle independently of the other. "Up" valve 26 has a stem 40 which has a sliding fit in a bearing 41 provided by the valve casing and projects through and beyond the casing so as to be operable from the outside. A packing gland 42, which screws upon a threaded boss 43 projecting from the casing and surrounding valve stem 40, serves to compress a packing 44 about the valve stem to prevent leakage. A biasing spring 45 surrounds valve stem 40 and is retained between gland 42 and a stop washer 46. Washer 46 is held in place upon the valve stem by a cotter pin 47 which passes through the stem. Consequently spring 40 urges the "up" valve 26 to closed position.

A bracket 48, extending upwardly from the valve casing, has the control handle 16 pivotally attached thereto by a pin 49 and the handle has a cam 50 formed integrally therewith or rigidly attached thereto in a position to act upon valve stem 40. Thus when the control handle is moved to "up" position (i. e., toward the right as viewed in Figs. 1, 3 and 4) cam 50 forces stem 40 inwardly to unseat valve 26 and open the port between chambers 24 and 27. Pressure-fluid supplied by the pump can then flow through inlet 20 and chamber 24 into chamber 27 where it acts upon check valve 29 to open the same. The fluid thereupon flows on into chamber 34 and out through outlet 21 and pipe 22 to the lift, causing the plunger of the lift to rise. The check valve automatically prevents the flow of pressure-fluid in the reverse direction.

Release valve 37 has a stem 55 which is likewise slidably mounted in the casing with a fit made fluid tight by a packing 56 and a gland 57. It has a biasing spring 58 arranged to urge the release valve to closed position. A cam 59 which is pivotally attached to bracket 48 by a pin 60 has one end in position to engage the upper end of stem 55 and its other end 61 in position to be engaged by a cam surface 62 of cam 50. Thus when the control handle is moved to "down" position (i. e., toward the left as viewed in Figs. 1, 3 and 4) cam 50 is rotated counterclockwise, its cam surface 62 rotates cam 59 in a counterclockwise direction and stem 55 is forced inwardly, against the force of spring 58, to open release valve 37 and establish communication between chambers 34 and 36. Under this condition "up" valve 26 is closed and, because pressure from the pump is thereby interrupted, check valve 29 is also closed and the pressure fluid can flow back from the lift through pipe 22 and chamber 34 through port 35 into chamber 36 and from thence through outlet 23 and pipe 17 back to the reservoir. The weight of the lift plunger and its load forces the fluid back through this path to the reservoir and the lift can descend.

In the mid-position of control handle 16 all three of the valves 26, 29 and 37 are closed and whatever pressure fluid has been applied to the lift is retained in status quo. As a result the lift remains in whatever position it had attained when the control handle was moved to mid or neutral position. A spring 63 held by a stud 64 which projects from one of the brackets 48 and which bears at one end against the bracket and at the other end against control handle 16 assists in returning the control handle to mid position whenever it is released by the operator.

A motor starter control switch 65 is mounted in an auxiliary switch housing 66 which is attached to the valve casing by suitable means, such as screws 67. Switch 66, which may be of any of the well known appropriate types is provided with a push button 68. When the push button is depressed the switch is closed and when the push button is released the switch automatically opens. Cam 50 has an arm 69 which can engage a lever 70 when the cam is moved in a clockwise direction; i. e., when the control handle is moved to "up" position.

Lever 70 is attached to a shaft 71 which is journaled in switch housing 66 and carries at its inner end within the housing a switch operating lever 72. Lever 72 may be adjustably fixed to shaft 71 by a set screw 73. When the control handle is moved to "up" position to open valve 26 and establish communication between the common power plant and the associated lift, cam arm 69 engages lever 70 and rocks the same and shaft 71 and switch operating lever 72 to depress the push button 68 and effect the closure of the switch. All of the switches of all of the lift control stations are connected in parallel to motor starter 13 so that upon the closure of any switch the motor starter is brought into action to start the motor. Likewise the opening of any switch tends to act upon the motor starter to open the

circuit to the motor but, since all of the control switches are in parallel, the motor starter will maintain closed the circuit to the motor until all of the control switches have been opened.

Briefly reviewed, the operation of such a multiple lift installation is as follows: To start the elevation of any of the lifts A, B, C and D, the control handle of the control station adjacent that lift is moved to its "up" position. This operation of the control handle starts the motor of the power station and also opens control valve 26. Thereupon the pump forces pressure fluid from the reservoir to the particular lift the handle of which has been moved to "up" position. When the lift has been elevated to the desired height the control handle is moved to mid-position whereupon the circuit to the motor is interrupted and valve 26 is closed. Due to the automatic closure of the check valve 29 the lift will remain in its elevated position until the control handle of its control station is moved to the "down" position. When the handle is moved to the "down" position release valve 37 is opened permitting the weight of the lift and its load to force the pressure-fluid back to the reservoir and allowing the lift to descend.

Whenever the source of power is started from any lift or control station it continues to operate until the requirement for power by all of the lifts is satisfied. Thus, the actuation to elevating or "up" position of the control associated with any particular lift starts the common power plant to supply the pressure-fluid required for elevation and also establishes communication between the lift and the power plant so that the pressure-fluid can act upon the lift to elevate the same. When the lift has been elevated to the desired extent the control associated therewith is restored to normal or neutral position whereupon the communication between the lift and power plant is closed, stopping the flow of pressure-fluid therebetween, and at the same time stopping the common power plant unless the elevation of such other lift associated therewith has been started and, in consequence, pressure-fluid is still required.

Should such a condition obtain the power plant remains in operation until the controls of all lifts associated therewith are restored to neutral or normal inoperative mid-position. Each lift may be lowered from elevated position independently of all others by manipulating the control handle to the "down" position whereupon the pressure-fluid is permitted to return from the lift to the common power plant resulting in the lift being permitted to come down.

Figs. 7 to 11 show a slightly modified control, which, because of the smaller number of parts and more complete housing of the operating mechanism, has some advantages over the one just described.

This combined valve and motor control switch includes a valve casing 75 to which are attached a switch housing 76 and an operating-cam-housing 77. Valve casing 75 has an inlet 78 for connection to supply pipe 15, an outlet 79 for connection by means of pipe 22 to the associated lift and a return 80 for connection to return pipe 17. Inlet 78 leads into an inlet chamber 85 which has an outlet through port 86 controlled by a pressure application or "up" valve 87. Port 86 connects inlet chamber 85 with an intermediate chamber 88, the outlet of which is a check port 89 controlled by an automatic check valve 90. This check valve is provided with two guide stems 91 and 92 projecting from opposite faces thereof. Stem 91 has a sliding fit in a socket provided by a boss 93 formed in one wall of valve casing 75.

The other stem 92 slidably fits in a socket formed in a boss 94 of a screw plug 95 which threads tightly into an opening in the wall of casing 75 in alignment with port 89. A spring 96 normally biases check valve 90 to closed position, interrupting communication between intermediate chamber 88 and a combined inlet-outlet chamber 97. Chamber 97 includes the outlet 79 and has a return port 98 which connects it to a return chamber 99. Return chamber 99 communicates with return pipe 17 through return connection 80. A pressure release or "down" valve 100 controls port 98.

Normally valves 87 and 100 stand closed, but each may be operated independently of the other by the manipulation of the control handle 16'. "Up" valve 87 has a stem 105 fixed thereto or made integral therewith which has a sliding fit in a bearing plug 106. This plug is externally threaded to fit an internally threaded boss 107 which forms a rim about an opening in one wall of casing 75. The bore through plug 106 is enlarged at its outer end to form a chamber for suitable packing 108 which is compressed by a sleeve 109 to form a pressure tight joint about the valve stem. A helical spring 110 surrounds stem 105 and is compressed between sleeve 109 and a washer 111 which abuts a pin 112 passed through a hole in the stem. This spring normally biases the "up" valve to closed position. In a like manner "down" valve 100 has a stem 113 which is slidably retained in a bearing provided by a plug 114 and is biased to a normally closed position by a spring 115.

The outer ends of valve stems 105 and 113 project into cam housing 77. This cam housing is formed by a somewhat oval shaped flange 120, which projects upwardly above the top wall of valve casing 75, and a correspondingly shaped dome like cover 121 which fits over flange 120. The valve casing is provided with lugs 122 having threaded openings therethrough and cover 121 has similar lugs 123 which have unthreaded openings registering with the threaded openings in lugs 122. Headed screws 124 which pass through the unthreaded openings of cover lugs 123 and into the threaded openings of valve casing lugs 122 securely attach the cover of the cam housing in place. The cover 121 has a bearing boss 125 formed therein at one end and offset from the plane common to the axes of stems 105 and 113. The opposite end of cover 121 has an opening 126 therethrough in axial alignment with the bearing socket in boss 125. This opening 126 forms a bearing for a sleeve 127, which sleeve surrounds and is fixed to a cam shaft 128 by a set screw 129. Shaft 128 has one end seated in the bearing socket of boss 125 and the other end extended through sleeve 127 to project outside of the cam housing for receiving control handle 16'. The projecting end of cam shaft 128 may be squared to fit a corresponding square opening in the hub of handle 16', and its tip threaded for a nut 130, which serves to retain the handle in place thereon.

Shaft 128 is provided with two oppositely directed curve faced cams 135 and 136 which are located to act upon valve stems 105 and 113 respectively. Thus when control handle 16' is moved to "up" position (i. e., counterclockwise as viewed in Fig. 7) cam 135 depresses stem 105 to open the "up" valve 87 and when it is moved to

the opposite or "down" position cam 136 depresses stem 113 to open "down" valve 100. When returned to mid or neutral position from either its "up" or "down" position, the corresponding cam 135 or 136 releases its depressed valve stem and the "up" or "down" valve is closed by its biasing spring.

The wall of cover 121 may be extended in a segment shaped stop 137 (see particularly Fig. 9) against the ends of which a pin 138 projecting from sleeve 127 will strike at the full "up" and "down" positions of control handle 16'. Set screw 129 and pin 138, which also may be a set screw, serve to retain the cam shaft in proper position. The diagonal position of the cam shaft relative to the axial plane of the two valve stems—a condition most clearly shown in Fig. 8—insures that the two oppositely directed cams 135 and 136 can act upon the valve stems with substantially axial thrust.

Shaft 128, also carries a cam 140 which is formed thereon in a position to engage the push-rod 141 and thereby actuate a motor control switch 142. Switch 142, which may be of any approved push-button type, is mounted in a switch housing 143. This switch housing is in the form of a box, preferably cast in one piece except for the front which is closed by a suitable gasket and a screw attached cover plate 144. The rear wall of the switch box is formed with four lugs or posts 145, upon which the switch is mounted by means of screws 146, and a rearwardly projecting cylindrical boss 147. Boss 147 projects through a hole in cam housing cover 120 and has a bore therethrough for slidably holding push rod 141. The inner end of push rod 141 is in a position to engage and operate the push button 148 of switch 142, the button being normally held in its outer or switch-open position by a spring 149. When control handle 16' is moved to "up" position it not only effects the opening of "up" valve 87 as heretofore described, but also it causes cam 140 to force push-rod 141 outwardly against push button 148 and thereby close the contacts of switch 142 to start the motor. The return of the control handle to mid or neutral position permits the switch to open to stop the motor and also, as previously described, permits the "up" valve to close. The switch box 143 is attached to the side of the valve casing by screws 150.

Briefly reviewed, the operation of this control is as follows: Movement of control handle 16' from mid to "up" position closes switch 142 to start the motor and opens "up" valve 87 to open communication between the fluid pressure pump and the associated lift. Pressure fluid flows from the pump through supply pipe 15 to inlet chamber 85 and from thence through port 86, which is now open, into intermediate chamber 88. The pressure against check valve 90 opens the same so that the pressure fluid flows through port 89 into outlet chamber 97 and from thence through pipe 22 to the associated lift, causing the same to rise. Whenever control handle 16' is returned to mid-position switch 142 is opened and valve 87 is closed, stopping the motor (unless some other lift is requiring power) and shutting off the supply of pressure fluid. Check valve 90 then prevents the return of pressure fluid by way of the supply pipe and consequently the lift remains in its elevated position. When it is desired to lower the lift handle 16' is moved to "down" position whereupon release valve 100 is opened, permitting the pressure fluid to flow back from the lift through chambers 97 and 98 and return pipe 17.

The circuit connections between the switches of the several control stations and the motor starter is such that whenever the control handle of any control is returned from "up" to mid-position the motor of the power supply unit does not stop if the control handle of any other station is then in "up" position. In other words, just as in the case of the previously described installation, any control station can start the motor but, when once started, the motor does not stop if any lift requires power, although the supply of pressure fluid may be interrupted at any time at any lift.

With either of the controls heretofore described the control handle automatically returns to mid or neutral position when released while out of that position.

Fig. 12 shows a typical arrangement for controlling a plurality of lifts from a single control station. Three lifts F, G and H are shown, the same being individually controlled from a single control station I and receiving pressure-fluid from a common power plant J. Preferably the control station and power plant are located close enough together to enable an operator to manipulate both at the same time. The power plant per se forms no part of the present invention but, although any appropriate construction may be employed, I prefer to use the type set forth in my copending application Serial No. 672,826, filed May 25, 1933. In general the power plant should include a pressure-fluid reservoir, a motor driven pump for withdrawing fluid from the reservoir and forcing the same through a common supply pipe 155 to control station I and suitable means for controlling the starting and stopping of the pump motor.

The control station comprises a multiple port valve 156—the details of which are shown most clearly in Fig. 13, which by means of a control handle 157 may be operated selectively to connect any one of the three lifts to supply pipe 155. This control valve has four external connections 158, 159, 160 and 161 leading through ports 162, 163, 164 and 165 respectively to a central cylindrical distributing chamber 166. Connection 158 is connected to supply pipe 155 while connections 159, 160 and 161 are connected by pipes 167, 168 and 169 respectively to lifts F, G and H. A distributing head 170 is rotatably fitted in chamber 166 and is provided with a central passage 171. A relatively large port 172 and three smaller ports 173, 174 and 175 afford communication between central passage 171 and the exterior of valve 170. These ports enable the distributing valve-head to interconnect port 162 with any one of the ports 163, 164 or 165 depending upon the position to which control handle 157 is moved.

Thus in the mid-position as shown in Fig. 13 port 162 communicates through port 172, chamber 171 and port 174 to port 164 and from thence through pipe 168 to lift G. In this condition the supply pipe 155 and consequently the source of fluid pressure is connected to lift G. When the pump is in operation pressure fluid is supplied to lift G to elevate the same; when the pump is stopped the weight of the lift plunger and its load can force the pressure fluid back into the reservoir, permitting the lift to descend. In the other positions of the control handle the power plant may be similarly connected to either lift F or lift H, as desired.

Of course, it will be understood that, with the same or a slightly modified type of control valve, the number of lifts controllable from the single central control station may be decreased and

that, by providing more ports in the distributing head thereof a greater number of lifts can be controlled.

Having thus illustrated and described the nature and typical embodiments of my invention, what I claim and desire to secure by United States Letters Patent is as follows:

1. In combination, a plurality of fluid operated lifts, a source of fluid pressure common to all of the lifts, and an independent control for each lift, each control including valves and a switch, the switches being adapted and arranged to start the operation of the common source of fluid pressure and the valves to establish and interrupt the flow of pressure fluid between the source of pressure and the associated lift and in cooperation with all of the switches of all other controls to stop the operation of the common source of fluid pressure.

2. In combination, a plurality of fluid operated lifts, a fluid pressure pump common to all of the lifts, a motor for operating the pump, fluid connections between the pump and all of the lifts, and a control associated with each lift, each control including valves in the fluid connections and a switch controlling the motor and being adapted and arranged to start the motor and open and close the fluid connection between the pump and its associated lift and in cooperation with all of the switches of all other controls to stop the motor.

3. In combination a plurality of fluid operated lifts, a fluid pressure pump common to all of the lifts, a motor for driving the pump, fluid supply connections between the pump and all of the lifts, fluid return connections between the pump and all of the lifts, and a control individual to each lift, each control including a switch and being capable of opening and closing communication between its lift and the fluid supply and return connections and of starting the motor and in cooperation with all of the switches of other controls of stopping the motor.

4. In a lift installation comprising a plurality of fluid operated lifts and a common motor operated fluid pressure pump, the combination of an independent control for each lift; each control comprising a valve for establishing and interrupting communication between its lift and the pump, a switch for starting the motor, and a control handle which simultaneously actuates the valve and switch.

5. A multiple lift installation comprising a plurality of hydraulic lifts; a fluid pressure pump common to all of the lifts; a motor for driving the pump; and an independent control station associated with each lift, each control station including a combined pressure-application, check and pressure-release valves, a switch for controlling the operation of the motor, and a single handle for controlling the pressure-application and pressure-release valves and the switch.

6. In a multiple lift installation the combination with a plurality of hydraulic lifts, and a common source of fluid pressure including a pump and motor for driving the same of a plurality of independent lift controls, one for each lift and each comprising a pressure-application control valve, a check valve and a pressure-release valve mounted in a common valve casing, a motor control switch mounted on the valve casing, a manually actuated control handle mounted on the valve casing, and operative connections between the control handle and the pressure-application and pressure-release valves and the motor control switch.

7. The combination with a control unit comprising a valve casing having an inlet port, a combined inlet and outlet port, and an outlet port; a valve controlling the inlet port; a valve controlling the outlet port, each of said valves having an actuating stem slidably mounted in and projecting through the casing; a manually actuated control handle pivotally mounted on the casing and operable to two extreme positions and a mid-position; operative connections between the control handle and both of the valve stems whereby the handle opens the inlet valve when moved to one extreme position, opens the outlet valve when moved to the other extreme position and effects closure of both valves when in mid-position; an automatic check valve between the inlet port and the combined inlet and outlet port to permit fluid to flow from the inlet port to the combined inlet and outlet port and prevent flow of fluid in the reverse direction; and a switch operable by the handle when moved to the position opening the inlet valve of a pressure fluid actuated lift having fluid connections with the outlet and combined ports of the control unit; a fluid pump connected to the inlet port of the control unit; a pump motor; and circuit connections whereby the circuit to the motor is opened and closed when the switch opens and closes.

8. The combination with a control unit comprising a valve casing having an inlet port, an outlet port, and a combined inlet and outlet port; a valve controlling the inlet port; a valve controlling the outlet port, each valve having an actuating stem slidably mounted in and projecting through the casing; a manually actuated control handle pivotally mounted on the casing; a shaft operable by the handle; a switch mounted on the casing; and three cams operable by the shaft, two of said cams being operable upon the valve stems and one being operable upon the switch, the two cams operable upon the valve stems being oppositely related to the shaft so that movement of the handle in opposite directions from a mid-position operates one or the other of said valves and the cam operable upon the switch being so related to the other two cams that the switch is open when the handle is in mid-position and is closed when the handle is moved to open the inlet valve of a pressure fluid actuated lift having fluid connections with the outlet and combined ports of the control unit; a fluid pump connected to the inlet port of the control unit; a pump motor; and circuit connections whereby the circuit to the motor is opened and closed when the switch opens and closes.

9. The combination with a control unit comprising a valve casing having an inlet port, an outlet port, and a combined inlet and outlet port; a valve controlling the inlet port; a valve controlling the outlet port, each valve having an actuating stem slidably mounted in and projecting through the casing; a manually actuated control handle pivotally mounted on the casing; a shaft operable by the handle; a switch mounted on the casing; three cams operable by the shaft, two of said cams being operable upon the valve stems and one being operable upon the switch, the two cams operable upon the valve stems being oppositely related to the shaft so that movement of the handle in opposite directions from a mid-position operates one or the other of said valves and the cam operable upon the switch being so related to the other two cams that the switch is

open when the handle is in mid-position and is closed when the handle is moved to open the inlet valve; and an automatic check valve located between the inlet and combined inlet and outlet ports to permit flow of fluid from the inlet port to the combined inlet and outlet port and prevent flow of fluid in the reverse direction of a pressure fluid actuated lift having fluid connections with the outlet and combined ports of the control unit; a fluid pump connected to the inlet port of the control unit; a pump motor; and circuit connections whereby the circuit to the motor is opened and closed when the switch opens and closes.

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