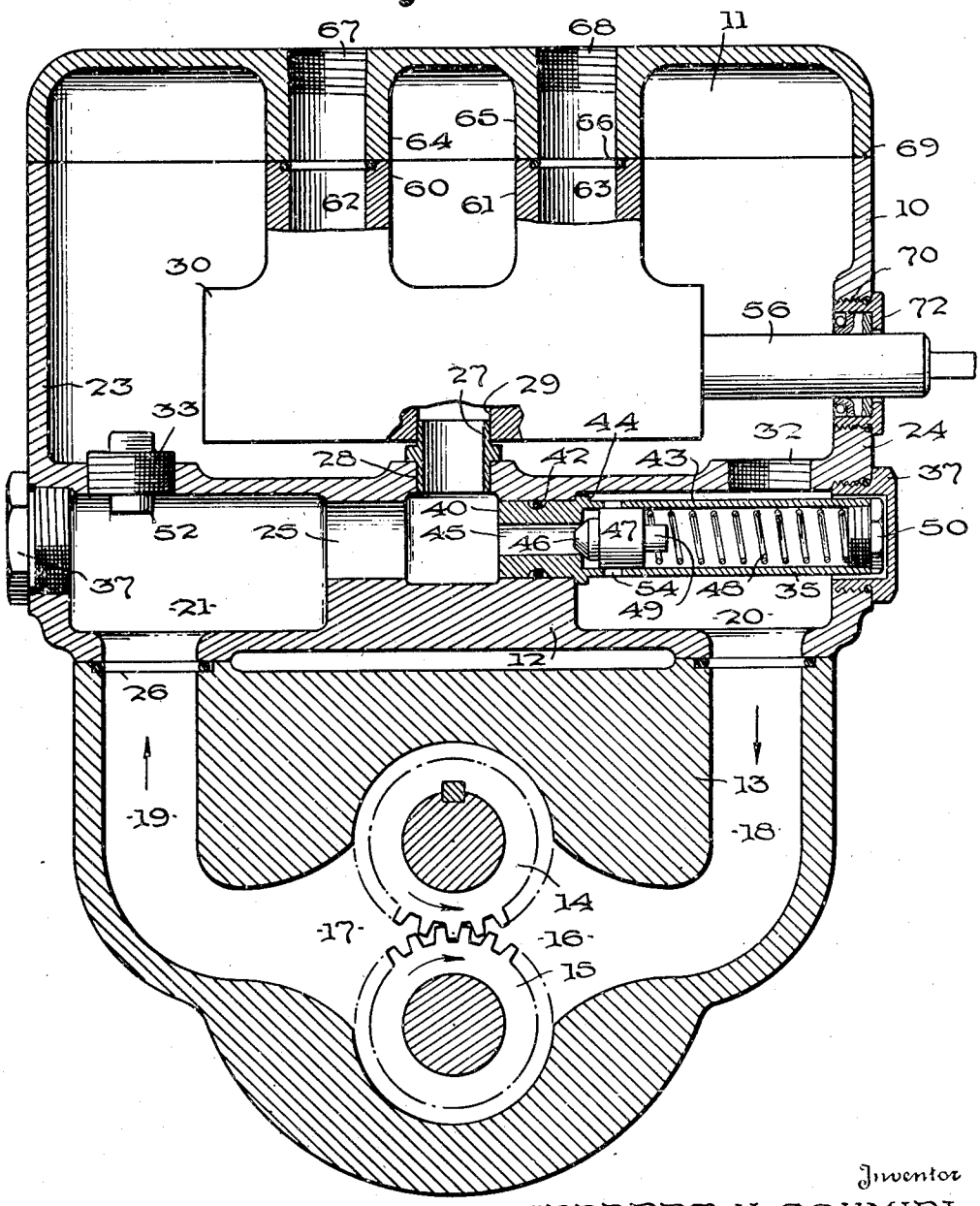
Dec. 21, 1948. H. H. SCHMIEL 2,456,651

TANK UNIT WITH SUBMERGED VALVE AND EXTERNAL PUMP

Filed Oct. 11, 1946 5 Sheets-Sheet 1

FIG. 1.



Inventor
HERBERT H. SCHMIEL

By Leach & Radue
Attorneys

Dec. 21, 1948. H. H. SCHMIEL 2,456,651

TANK UNIT WITH SUBMERGED VALVE AND EXTERNAL PUMP

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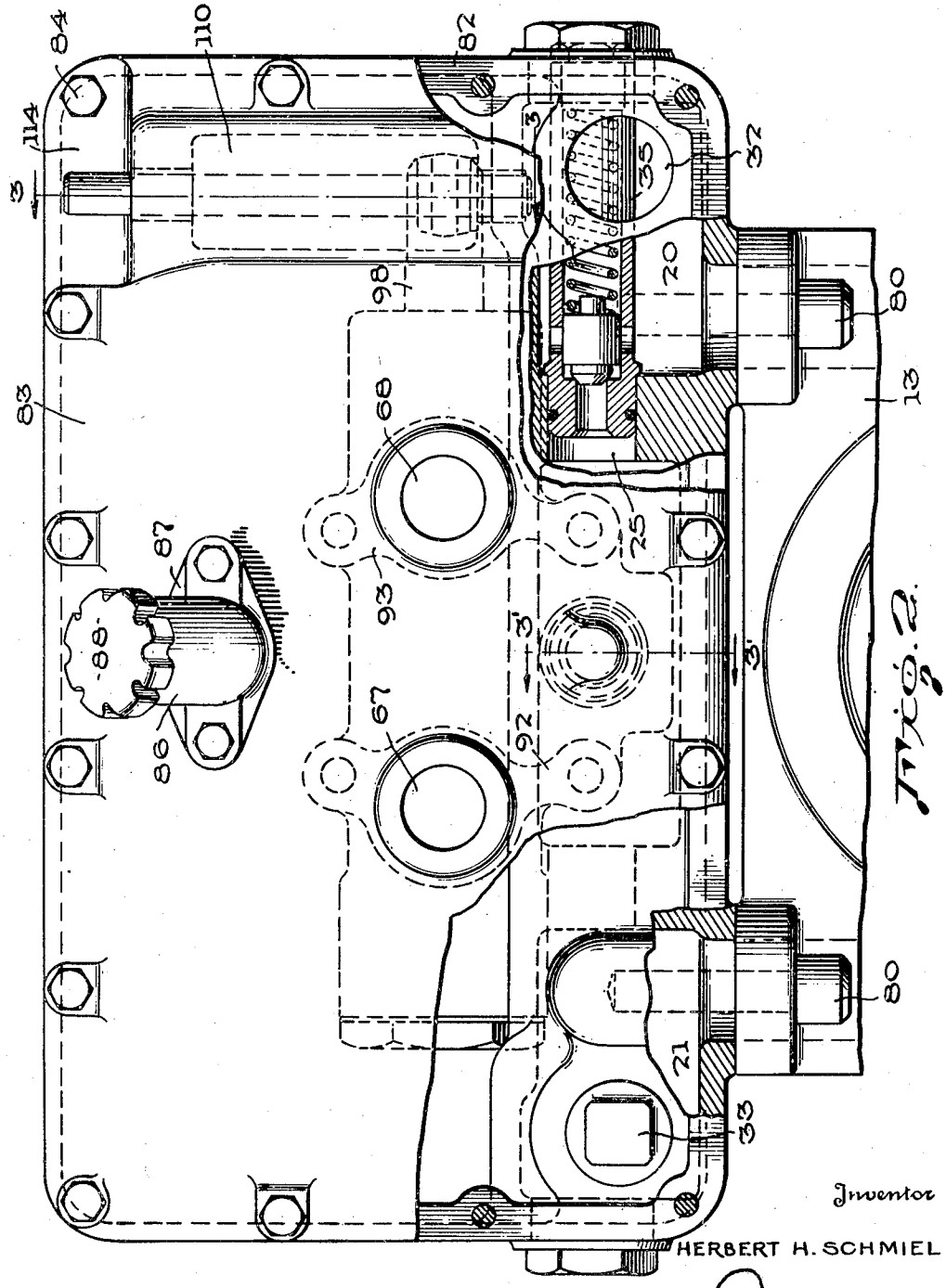


Fig. 2.

Inventor
HERBERT H. SCHMIEL

By
Leach & Radue
Attorneys

Dec. 21, 1948. H. H. SCHMIEL 2,456,651

TANK UNIT WITH SUBMERGED VALVE AND EXTERNAL PUMP

Filed Oct. 11, 1946 5 Sheets-Sheet 3

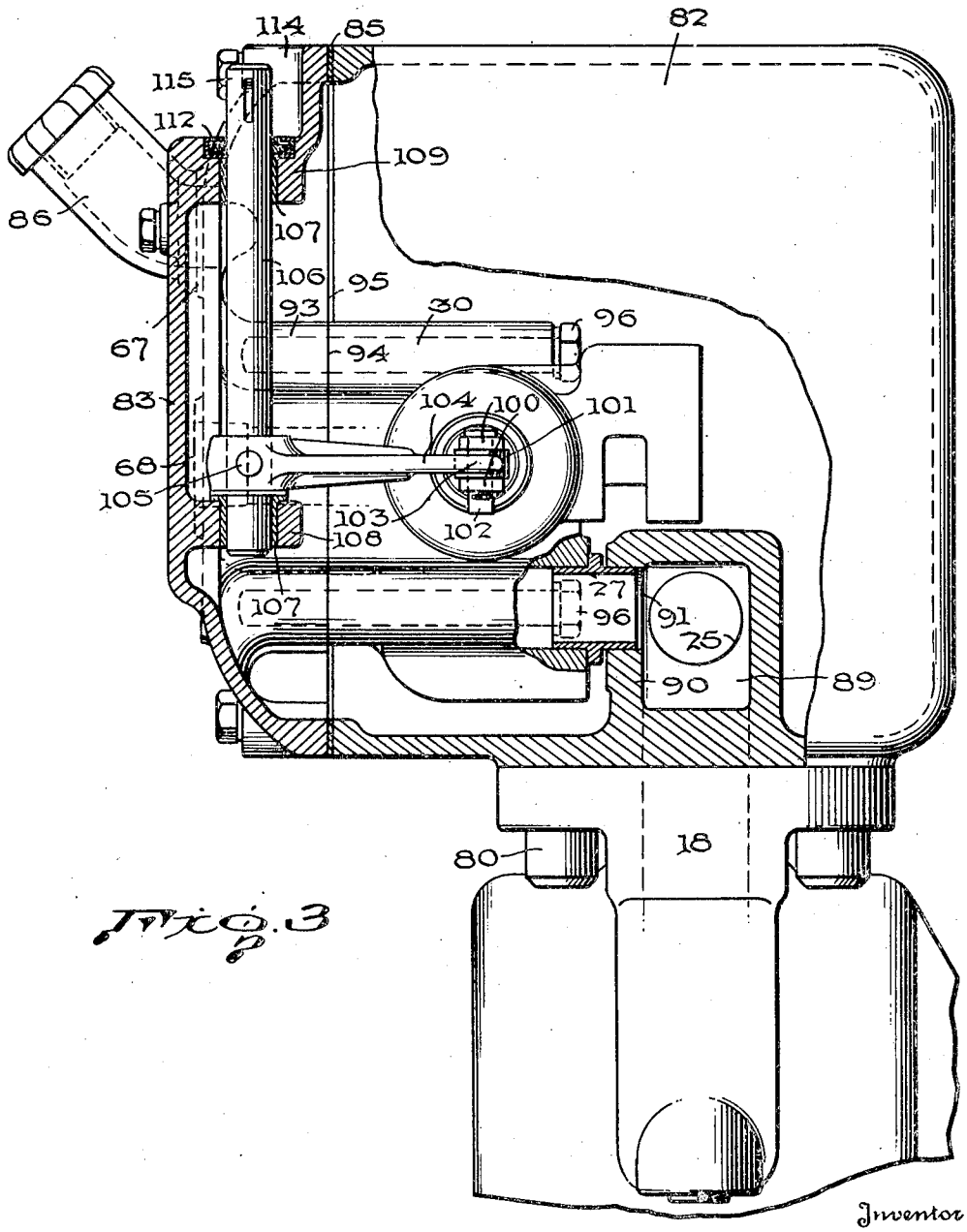


Fig. 3

Inventor
HERBERT H. SCHMIEL

By Leach & Radue
Attorneys

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TANK UNIT WITH SUBMERGED VALVE AND EXTERNAL PUMP

Filed Oct. 11, 1946 5 Sheets-Sheet 4

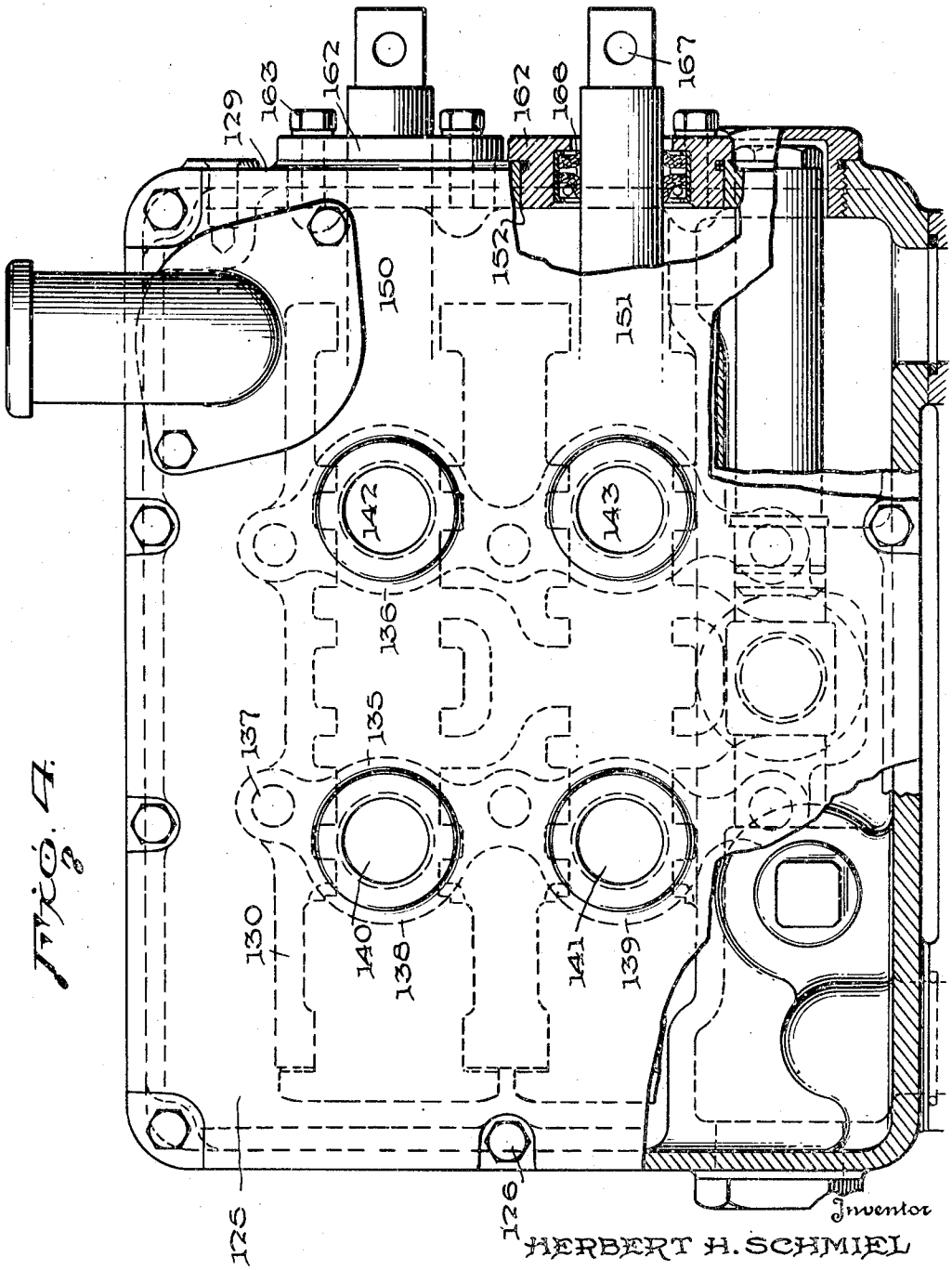


Fig. 4.

Inventor
HERBERT H. SCHMIEL

By

Leach & Radue
Attorneys

Dec. 21, 1948. H. H. SCHMIEL 2,456,651

TANK UNIT WITH SUBMERGED VALVE AND EXTERNAL PUMP

Filed Oct. 11, 1946 5 Sheets-Sheet 5

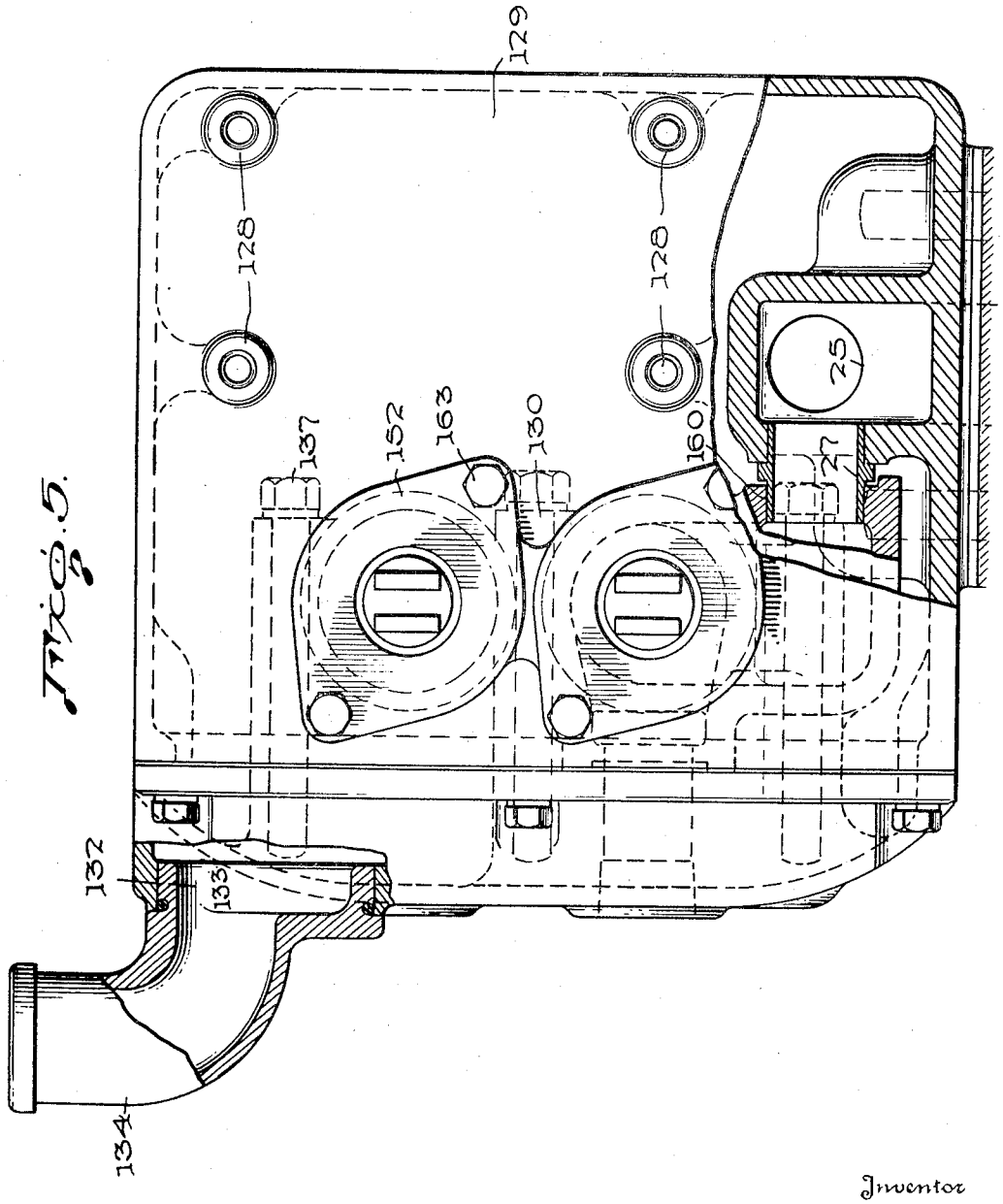


Fig. 5.

Inventor
HERBERT H. SCHMIEL

By Leach & Radue
Attorneys

Patented Dec. 21, 1948

2,456,651

UNITED STATES PATENT OFFICE

2,456,651

TANK UNIT WITH SUBMERGED VALVE AND EXTERNAL PUMP

Herbert H. Schmiel, Cleveland, Ohio, assignor to Hydraulic Equipment Company, Cleveland, Ohio, a corporation of Ohio

Application October 11, 1946, Serial No. 702,603

21 Claims. (Cl. 60—52)

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This invention relates to a packaged or unitized hydraulic operating assembly for hydraulic hoists and the like, and more particularly to a compactly assembled tank, pump and control valve with directly coupled passages and ports.

It is a general object of the present invention to provide a novel and improved packaged unit of tank, submerged control valve and external pump.

More particularly, it is an object of the invention to provide in a pump, valve and tank unit, for operating hydraulic hoists, means for directing and controlling the flow of liquid whereby the pump may be operated by driving it in either direction of rotation.

A further and important object of the invention consists in the arrangement of the tank with chambers, passages and ports whereby the flow of liquid from the pump may be directed to comply with the direction of rotation of the pump by the selective positioning of the system relief valve and a single port closure.

An important feature in connection with this aforementioned object is the provision of a safety means on said closure to insure proper positioning of the relief valve.

Among the novel features of construction may be mentioned the mounting of the valve housing on the cover or closure plate for the tank, together with the means for connecting the pump discharge passage to the valve inlet port automatically assembled by the simple mounting of the cover plate on the tank.

In one embodiment, a particular feature involves the use of a side wall of the tank as the closure plate and in the unique construction wherein all machined surfaces thereof are finished for tightness or other assembly and positioning purposes in the same plane.

Features in connection with the control of the internal valve are various structural arrangements, including optionally packed rotatable shafts passing through the cover plate or sliding packed valve stems in a fixed wall of the housing.

Other and further features and objects of the invention, including the use of interchangeable single and multiple valve constructions, will be more apparent to those skilled in the art upon consideration of the accompanying drawings and following specification wherein are disclosed several exemplary embodiments of the invention, with the understanding that each may be so modified in view of the disclosures in the others, without departing from the spirit of the invention as set forth in the specification and in the appended claims.

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In said drawings:

Fig. 1 is a vertical central section through a representative arrangement of pump, tank and control valve illustrating the essential features of the present invention;

Fig. 2 is a side elevation of a preferred form of the invention using a single control valve, portions of the cover being broken away to illustrate interior arrangements.

Fig. 3 is an end elevation of the preferred form of the device, the cover being in vertical section on line 3—3 of Fig. 2 and a portion of the body being in section on line 3'—3' of Fig. 2;

Fig. 4 is a view similar to Fig. 2, but showing a modified form of the invention in which two submerged control valves are provided; and

Fig. 5 is an end elevation of the device of Fig. 4 with certain parts of the housing broken away and the filler spout in vertical section.

It has heretofore been proposed to combine the various units, except the hoist, of a simple hydraulic system into a single unitized or packaged assembly, but difficulties have been experienced where an effort has been made to provide such an assembly with a reversible pump.

Where the units, including the hoist, the reversible pump, the tank or reservoir and the control valve, are individual and connected by piping, no great problem is encountered when the direction of rotation of the pump must be changed, for instance, in fitting the pump to a different power unit where the direction of rotation of the prime mover or of its power take-off is different. Simple piping changes require only the reversal of the pump inlet and discharge line.

When the pump, control valve and tank are combined into a single package type unit, however, with internal cored or machined fluid passages, the problem of pump reversal becomes more complicated. It will be understood that the pumps used are principally of the gear type and involve inlet and outlet passages which must be interchanged if the direction of rotation is reversed. The absence of simple reversibility in the packaged unit nullifies many of the advantages of this type of device, for it eliminates their universal application. Such units are often supplied to tractor manufacturers for the operation of agricultural or earth moving and handling attachments. Such manufacturers may have different types or sizes of machines and require a packaged unit wherein a pump can

be operated in either direction for simplification in the driving of the same from different power units.

In accordance with the present invention, a unit is provided which lends itself readily to universal application due to the novel manner in which the tank passages leading to the external pump mounted on the bottom of the tank are utilized. By submerging the valve in the tank, further simplification is effected and an increased tank capacity is provided without any additional overall dimension of the whole assembly.

The unit of the present invention needs only the connection of two pipes thereto leading to a hoist to complete a hydraulic system.

Referring now to the drawings and particularly to Fig. 1 for a simple illustration of the features of the invention, there is shown a tank, pump and control valve assembly constructed in accordance with one embodiment of the invention. The tank 10 is preferably a single casting, with the exception of one separable wall or cover 11. The bottom 12 of the tank is substantially flat as shown, so that the flat base of the pump housing 13 may be secured thereto by suitable attaching means, such as bolts or studs (not shown) threaded into reinforced openings in the tank bottom.

The pump, as illustrated, is of the more or less conventional gear type, including a drive gear 14 and a meshing driven gear 15. These gears work in tight fitting arcuate compartments in the housing merged at their junctions to provide inlet and discharge chambers 16 and 17 interchangeable in function with change in gear rotation connected, respectively, by similar passages 18 and 19 to the base or surface of the pump which is engaged with the bottom of the tank. For counterclockwise rotation of the drive gear 14, as seen in Fig. 1, passage 19 becomes the pump discharge and passage 18, the pump inlet. On reversal of direction of rotation, these passages reverse their functions.

For cooperation with the pump passages 18 and 19, respectively, there is provided a pair of spaced chambers 20 and 21, preferably cast integral with the tank so as to have common bottom walls with the bottom wall 12 of the tank. Conveniently their outer or end walls are common with the end walls 23, 24 of the tank. Each chamber is fitted with a port or passage through its bottom wall which register with the corresponding pump passage, as clearly shown. One of the mating surfaces or bosses surrounding each junction is grooved as at 26 to receive a sealing ring which insures a tight seal at all times.

The chambers 20 and 21 in the lower portion of the tank are separated by an integral central wall of considerable thickness through which is drilled a transverse passage 25 connecting the two chambers. A vertical bore 28 intersects this passage, as shown, and receives a pressed in nipple 27 whose upper end is a pressed fit with bore 29 in the lower wall of the control or "hoist and lower" valve housing 30. Bores 28 and 29 automatically register when the cover is fitted onto the tank.

The upper wall of each chamber 20 and 21 is drilled and threaded as at 32 to provide direct communication between the chamber and the reservoir or tank. A single plug 33, threaded to engage in one of the bores 32, is provided and is intended to close the bore 32 in that chamber 20 or 21 which is intended to be used to receive the high pressure fluid from the pump discharge chamber. Thus, in the arrangement shown in Fig. 1, with counterclockwise rotation of driving gear 14, the opening in the upper wall of chamber 21 is plugged and this chamber becomes the high pressure chamber adapted to deliver fluid from lateral bore 25 through the nipple 27 into the control valve. In order to prevent the return of this liquid directly into the chamber 20 which provides the inlet to the pump, the bore 25 to the right of the junction of the nipple bore therewith is closed off by the system relief valve, which is a cartridge assembly 35.

The outer or end wall of each of the chambers 20 and 21 is bored and threaded to receive a screw cap 37 appropriately gasketed to insure against leakage. On removal of the proper cap, the system relief valve cartridge assembly 35 may be inserted so that its accurately sized inner end extension 40 may be received in the appropriate end of the bore 25, where closeness of fit plus the sealing gasket 42 insures against leakage.

The extension 40 is integral with the tube 43 and spaced therefrom by shoulder 44, which abuts against the inner wall of the chamber 20 or 21 in which the cartridge is fitted. The extension 40 is bored longitudinally as at 45 and the inner end of this bore at its junction with the larger bore of the tube 43 forms a seat for the conical end 46 of the movable valve member 47, which is guided in the tube 43 and held seated by a spring 48, resting against the rear face of the valve, and centered by the pin 49 thereon and abutting the closure cap 50 on the opposite end of the valve assembly tube. This spring is regulated to provide the desired relief pressure for the whole system so that the pump can never be damaged by pumping against too great a resistance.

It will be seen that the closure cap or plug 37 for the chamber which receives the valve cartridge is hollowed on its interior to surround and position the outer end of the relief valve accurately, insuring its remaining in position. The plug 37 for the opposite or inlet chamber is preferably solid so that it cannot be accidently positioned over the relief valve. In this manner the mechanic, who is adjusting the system for any particular rotation of the pump, is insured against making a mistake in positioning the relief valve cartridge.

As a further precaution and to insure against the relief valve cartridge being inserted in the chamber whose upper bore is plugged, the plug 33 is provided with an extension or interfering projection 52, which depends into the chamber a sufficient distance effectively to prevent the insertion of the cartridge past it.

From the above arrangement, it will be seen that the pump circuit is arranged to accommodate its direction of rotation by the proper positioning of the relief valve cartridge and the plug 33 in the respective chambers connected to the pump passages. Thus, as shown, the pump receives its liquid from the tank through the open bore 32. The liquid passes around the outside of the cartridge, to the inlet passage 18, to the inlet chamber 16, then through the pump to discharge chamber 17, discharge passage 19 and chamber 21 in the tank, from whence it goes through 25 and nipple 27 to the control valve housing 30. By means of the control valve setting, it is delivered to the hoist as required. Any liquid returned from the hoist during delivery of the high pressure liquid, if the hoist is of the double acting type

or on the return operation of a single acting hoist, is discharged into the tank from the valve for further use. In the event that the hoist is limited in its movement for any reason whatsoever the pump, which is of the positive displacement type, does not build up excessive pressure sufficient to damage any part of the system for the relief valve 47 is lifted by the pressure in passage 45 and liquid enters the tube or barrel 43 and is discharged through radial passages 54 therein into chamber 20 and returned to the tank or pump.

The valve housing 30 contains any suitable type of control or "hoist and lower" valve for operating either a single or a double acting hoist. The structure of the passages and ports in the control valve housing and in the plunger, whose stem 56 is illustrated at the right, has not been shown, since it can be of any conventional type but preferably of the form illustrated in Fig. 6 of Patent No. 2,362,944, granted November 14, 1944, to William T. Stephens. The valve illustrated in said Fig. 6 includes two control plungers, the upper being arranged for a double acting hoist, and the lower, using the same housing arrangement, contains a plunger for controlling a single acting hoist. Either of these types may be used in this invention.

In Fig. 1 of the present application, the high pressure inlet to the control valve housing is seen at 29 and the low pressure outlet, while not visible, discharges directly into the tank, so that when the valve plunger 56 is in the neutral position, liquid flows freely from the pump through the free by-pass of the valve to the tank against substantially zero pressure. The control valve housing has a pair of vertically extending bosses 60 and 61, bored respectively at 62 and 63 to conduct liquid to one end or the other of a double acting hoist in accordance with the setting of the valve plunger. These bosses cooperate with similar bosses 64 and 65 depending from the cover 11 of the tank. One of the surfaces of each pair of meeting bosses is recessed to receive a suitable sealing ring or gasket 66 to insure fluid tightness. The bosses 64 and 65 are vertically bored and the outer ends are fitted with pipe threads 67 and 68 for receiving the pipes leading to the two ends of a double acting hoist.

An important feature in the construction of a lid or cover for the tank, which is intended to be bolted into position by fastening means, not shown, is that all of the machine surfaces, i. e., the faces of the bosses 64 and 65, and the periphery 69 where it joins the top edge of the main body of the tank, are in the same plane, thereby materially simplifying the manufacturing operation. When the tank cover is bolted into position it not only effectively seals between the two sets of bosses, but insures the valve housing remaining in position on the press fitted nipple 27.

For the sake of simplicity, the operating extension 56 of the valve plunger passes through a relatively large opening 70 in the side wall of the tank. This opening is threaded to receive the outer housing 72 of a packing and wiping assembly. Suitable sealing material therein insures against leakage or seepage of the low pressure fluid into the tank along the surface of the plunger.

In Figs. 2 and 3 of the drawings, a modified and preferred embodiment of the invention is illustrated. This includes all of the principles of the simpler embodiment of Fig. 1 incorporated into a slightly different arrangement. In this preferred construction, the pump and its passages is identical with the one already described and is only illustrated in part to show its relationship to the tank structure. These two figures show the securing studs 80, four in number, which fasten the pump to the bottom wall of the tank. In this embodiment the tank 82 is a one piece casting having integral top, bottom, end and back walls and the removable cover or closure 83 forms the front wall. A number of studs 84 are illustrated in the two views for securely attaching the cover to the main body of the tank and an appropriate gasket 85 insures against leakage. In order to reduce the overall height of the whole assembly, it is preferred to provide the filler spout 86 for the tank as an extension upwardly and outwardly from the cover. This spout 86 inclines upwardly as seen in Figs. 2 and 3 and has a flanged base 87 appropriately gasketed and bolted to the face of the cover so that the spout bore registers with a corresponding opening in the cover. A cap 88, vented in any desired manner, provides a dustproof closure for the filler.

The chambers 20 and 21 in the lower portion of the tank are not substantially different, except in details, from those illustrated in Fig. 1 and need no further description except to say that the openings 32 are in the front walls thereof, rather than in the top walls, for convenience of access for inserting the plug 33 when the front cover is removed. The manner of fitting and using the relief valve cartridge assembly 35 remains the same. As seen in Figs. 2 and 3, the chambers 20 and 21 are more widely spaced than in Fig. 1 and are connected via machined bores 25 by a cored passage 89, the front wall 90 of which is bored as at 91 to receive the nipple 27, with a pressed fit, which conducts fluid to the valve housing.

As in the first embodiment, the valve housing 30 is carried by the cover, but in the present instance, the cover is the side plate for the tank. For strength it is a dished casting 83, as previously defined and has cast integral therewith, and adjacent its lower edge, the combined bosses and pads 92 and 93 surfaced off at 95 in the plane of the periphery of the cover to facilitate machining operations, as previously explained. Meeting these bosses and pads in this plane is the appropriately surfaced portion 94 of the valve housing casting. Elongated studs 96 extend through portions of this valve housing casting and are received in threaded bores in the pads 92 and 93 for securely attaching the valve housing to the cover plate. Obviously, suitable gaskets or sealing means are provided at the meeting faces 94 and 95 to insure liquid tightness between the cover and housing for full pressure delivery to the hoist ports 67 and 68, best shown in Fig. 2 as having bores passing through the front face of the cover for the reception of pipes leading to the hoist. These gaskets may be like those shown at 66 in Fig. 1.

The valve plunger extends out of the right end of the housing as seen at 98 and is provided with a forked end 100. A roller 101 is rotatably mounted between the arms of the fork by means of a vertical pin 102. This roller is straddled by the arms 103 forming a fork on the outer end of lever 104, the opposite end of which fits over and is attached by pin 105 to vertical shaft 106 journalled in bushings 107 carried by the cover. The lower bushing is pressed in lug 108 projecting inwardly from its cover. The upper bushing 107 extends through a horizontal wall 109 form-

ing the top of a cover section, which is appropriately swelled outwardly at 110 for the purpose of housing the shaft 106. Downward movement of the shaft is prevented by engagement of the collar, through which pin 105 passes, with the upper end of the lower bushing. Above the upper bushing, a packing assembly 112 prevents seepage of liquid. The shaft 106 projects above the wall portion 109 of the cover into a recess 114 formed in the cover. The end 115 of the shaft extends into this recess to be below the top of the tank and to receive any appropriate operating lever or linkage. In this manner, nothing projects above the upper surface of the tank to hinder its convenient location in restricted space.

When any adjustment or repairs of the valve are required the cover plate is removed and the valve and all its operating mechanism withdrawn with the same, separation taking place at the pressed nipple 27. If desired, the valve may be replaced with one of the same or another type where different types of control are desired.

In Figs. 4 and 5 is illustrated a further embodiment of the invention illustrating its flexibility to satisfy varying requirements. In this construction many of the parts are duplicates of those in the earlier embodiments, and particularly the construction and assembly of the pump and its passages as well as the chambers, ports, plugs and relief valve, which are the same and will not be described. The principal difference in the construction of Figs. 4 and 5 is in the control valve and its mounting. In this construction two control valve plungers are provided in order to permit the operation of two single or double acting hoists, or one of each, as desired. Here again the valve construction may be identical or only modified slightly from that illustrated in the Stephens patent referred to above. In Figs. 4 and 5, the cover 125 is of dished construction, is fitted as the front wall of the tank and is provided with appropriate fastenings 126 for rigid attachment to the tank. The tank itself is seen to have a plurality of bosses 128 on the end wall 129 thereof which are bored and tapped to receive mounting screws for supporting the tank from an appropriate portion of the cooperating machinery.

The valve housing for the dual valves is shown at 130 and is so much larger than in the preferred embodiment that the filler cap must be raised and moved to one corner of the cover plate where the surface is appropriately flattened, as seen in Fig. 5, to receive it. It is also drilled as at 132 to receive the projecting flange 133 on the filler. Since the filler is so close to the upper edge of the tank as to clear the valve within the cover the filler neck 134 extends somewhat above the upper surface of the tank.

The housing 130 for the control valves is constructed not substantially different from that illustrated in the Stephens patent, where two control plungers are illustrated, except that the system relief valve in the present case is preferably incorporated in the fluid circulating system for the pump, and the entrance for the high pressure fluid is in the back wall, to conveniently receive the nipple 27, as in the previous embodiments. The cover and the control valve housing have mating pads 135 and 136, each including bored holes receiving fastenings 137, and bosses 138 and 139 surrounding the passages 140, 141, 142 and 143, for the four hoist ports which pass through the front wall of the cover and are reinforced by appopriate enlargements, as seen in Fig. 5. This permits the control of two hoists of any kind.

The stems of the two control plungers are shown at 150 and 151 and are adapted to extend outwardly through bores 152 in the end wall 129 of the tank. It will be seen that the plungers can be inserted first and passed through these bores, which are then free of their packing means, and the nipple engaged with the bore 160 in the rear wall of the valve housing 130. When the cover is then bolted into position the nipple is pressed to a tight fit and the plungers are centralized in the wall bores 152 so that the packing assemblies 162 may be placed in position and their flanges secured by the studs 163. These packings insure against leakage of the low pressure fluid around the stems of the plungers and have effectively incorporated therein the wipers 166 to remove any grit or other foreign matter collected on the protruding portions of plungers 150 and 151 which might otherwise be drawn through the seal to thus impair the sealing quality and contaminate the operating fluid in the tank. Any effective and desired means may be used to manipulate the plungers, which may be flattened and perforated as at 167 for convenient attachment of linkage thereto.

As in the preferred construction, the mating surfaces, appropriately gasketed or sealed between the valve housing 130 and the pads and bosses on the cover, are in the plane of the cover edge so that a single machining operation takes care of the whole fitting.

It will be appreciated that with any of the control valve assemblies the relief valve may be incorporated in the valve housing as illustrated in the Stephens patent and as a substitute for the cartridge shown in the drawings a simple plug may close the passages between the low pressure chamber 20 and the adjacent chamber, to which the valve housing nipple is attached. The construction just now described, however, requires a larger valve housing, which occupies more space in the tank and thus reduces its liquid capacity. The form shown in the present drawings is preferred.

I claim:

1. An operating unit for a hydraulic hoist comprising in combination, a tank for reserve liquid, a reversible gear pump secured to and beneath the bottom wall of the tank, two liquid passages in said pump, a pair of spaced chambers in the tank integral with the bottom thereof and connected respectively to said passages, an opening between each chamber and the tank, a hoist control valve in said tank and having an inlet port for high pressure liquid, a duct connecting said chambers together and to said port, a system relief valve adapted to be fitted into either of said chambers to separate the receiving chamber from said duct except when the valve is open under high pressure, and a plug for closing the opening in the other chamber which becomes the pump discharge chamber.

2. The unit as defined in claim 1 in which each chamber opens through a plugged port in a side wall of the tank for the insertion of the system relief valve.

3. The unit as defined in claim 1 in which each chamber opens through a plugged port in a side wall of the tank for the insertion of the system relief valve and in which the said plug is provided with a projection which occupies space in

its chamber to prevent entrance of the relief valve therein.

4. The unit as defined in claim 1 in which the tank has integral top, bottom, ends and one side wall and in which the remaining side wall is a cover and means mounting said hoist control valve on said cover.

5. The unit as defined in claim 1 in which the tank has integral top, bottom, ends and one side wall and in which the remaining side wall is a cover, means mounting said hoist control valve on said cover, and means extending through said cover for actuating said control valve.

6. In a pump, valve and tank unit for operating a hydraulic hoist, in combination, a tank having therein a pair of separate chambers against one wall thereof, a connecting duct between said chambers, a reversible pump secured to the outside of said wall and having a pair of passages communicating respectively with said chambers and selectively constituting inlet and outlet for said pump, a valve in said housing having an inlet associated directly with said duct and a hoist port adapted for access through a wall of the tank, an opening from each chamber into the tank, a hole through a tank wall into each chamber, means insertable through either hole to isolate the corresponding chamber from said duct, means to close the opening in the opposite chamber, and plugs for both said holes.

7. The unit as claimed in claim 6 in which the isolating means is a system relief valve adapted to discharge into the chamber receiving it.

8. In a unit for operating a hydraulic hoist, in combination, a tank, a pair of spaced chambers in the tank integral with the bottom wall thereof, a reversible pump mounted against the outside of said bottom wall and having two passages for selective use respectively as inlet and outlet, apertures in the bottom wall connecting each passage to one of said chambers, an opening from each chamber into the tank, an aperture through each end wall of the tank communicating only with the adjacent chamber, a conduit connecting said chambers and ported to supply liquid at pump pressure to a control valve, a spring pressed relief valve assembly adapted to be received in either of said chamber through the proper aperture dependent upon the direction of rotation of said pump, said relief valve assembly being constructed to close off communication between the chamber in which it is positioned and said conduit except when opened by high pressure, a closure for each aperture and a closure for the opening in the chamber not fitted with the relief valve.

9. In a unit for operating a hydraulic hoist, in combination, a tank, a pair of spaced chambers in the tank integral with the bottom wall thereof, a reversible pump mounted against the outside of said bottom wall and having two passages for selective use respectively as inlet and outlet, apertures in the bottom wall connecting each passage to one of said chambers, an opening from each chamber into the tank, an aperture through each end wall of the tank communicating only with the adjacent chamber, a conduit connecting said chambers and ported to supply liquid at pump pressure to a control valve, a spring pressed relief valve assembly adapted to be received in either of said chambers through the proper aperture dependent upon the direction of rotation of said pump, said relief valve assembly being constructed to close off communication between the chamber in which it is positioned and said conduit except when opened by high pressure, a closure for each aperture and a closure for the opening in the chamber not fitted with the relief valve, said chamber closure having a projection thereon to extend into the chamber to indicate the absence of a relief valve assembly therein.

10. In a unit for operating a hydraulic hoist, in combination, an integral tank having a removable side wall, a pair of spaced chambers in the tank each having their bottom and one end wall common with the corresponding tank walls, a reversible gear pump carried on the outside of the bottom wall and having two passages connected respectively to said chambers and for selective use respectively as pump inlet and discharge, a threaded opening from each chamber into the tank, a plugged aperture through each common chamber and tank wall, a conduit connecting the said chambers and having a port facing the said removable side, a "hoist and lower" valve assembly mounted on said side and having an inlet port for registry with said conduit port when the side is in position, means insertible on unplugging one of said apertures to close off communication between the one of said chambers forming the pump inlet and said conduit, and a closure for the threaded opening in the other compartment.

11. The unit as claimed in claim 10 in which said closure is provided with an extension to occupy a portion of the chamber that would be occupied by said close off means if improperly positioned in the same chamber.

12. In a unit for operating a hydraulic hoist, in combination, an integral tank having a removable wall, a pair of spaced chambers in the tank each having their bottom and one end wall common with the corresponding tank walls, a reversible gear pump carried on the outside of the bottom wall and having two passages connected respectively to said chambers and for selective use respectively as pump inlet and discharge, a threaded opening from each chamber into the tank, a plugged aperture through each common chamber and tank wall, a conduit connecting the said chambers and having a port facing the said removable wall, a "hoist and lower" valve assembly mounted on said wall and having an inlet port for registry with said conduit port when the wall is in position, means insertible on unplugging one of said apertures to close off communication between the one of said chambers forming the pump inlet and said conduit, a closure for the threaded opening in the other compartment, and a system relief valve adapted to discharge into the tank.

13. In a pump, valve and tank package unit, in combination, a cast metal tank having a removable side wall, a chamber cast integral with the bottom wall and having a port facing said side wall, a pump mounted on the outer side of the bottom wall and having an inlet passage extending through said bottom wall and a discharge passage extending through said bottom wall and into said chamber, a control valve housing mounted on said removable side wall and having a "hoist" port, a waste discharge opening into the tank and an inlet port positioned to be registered with said chamber port when the wall is secured to the tank.

14. The unit as defined in claim 13 in which a thimble having a pressed fit engages in both said chamber and inlet ports.

15. The unit as defined in claim 13 in which the removable wall is equipped with a port registering with said "hoist" port, abutting flat surfaces on the cover and valve housing surrounding said

last mentioned ports, sealing means in one of said surfaces to prevent leakage and means in said cover port to receive a connecting pipe.

16. A reservoir or tank for a hydraulic hoist system including in combination, an integral casting forming bottom, top, end walls and one side wall, means for attaching a pump to the outer surface of the bottom wall, a cover for the open side of said tank comprising a deeply dished casting, a plane peripheral flange for attachment to the tank, bosses on the concave side of said cover, said bosses and flange being surfaced to the same plane, a control valve housing secured to said cover and abutting said bosses, one of said bosses being perforated for the passage of fluid to the exterior of the tank, an abutting boss on the valve housing, and sealing means between said bosses to insure fluid tightness.

17. A reservoir or tank for a hydraulic hoist system including in combination, an integral casting forming bottom, top, end walls and one side wall, means for attaching a pump to the outer surface of the bottom wall, a cover for the open side of said tank comprising a deeply dished casting, a plane peripheral flange on the cover for attachment to the tank, bosses on the concave side of said cover, said bosses and flange being surfaced to the same plane, a control valve housing secured to said cover and abutting said bosses, one of said bosses being perforated for the passage of fluid to the exterior of the tank, an abutting boss on the valve housing, sealing means between said bosses to insure fluid tightness, a boss extending from the bottom of said tank and having an opening connected through the bottom wall to the pump discharge, an inlet passage on said valve housing having a surrounding boss, said last mentioned bosses being positioned for cooperation when the cover is in position to connect the pump to the valve.

18. The arrangement defined in claim 17 in which the last mentioned bosses meet in a plane parallel to the plane of the cover flange.

19. A reservoir for a hydraulic hoist system comprising an open sided tank, means for attaching a pump to the outer surface of a wall of said tank, a cover for the open side of said tank, a control valve housing attached to said cover and having a port opening therethrough, a port in said tank connected to the pump discharge, a port in said housing for the valve inlet, said last mentioned two ports being so positioned that they register when the cover is applied to the tank.

20. The combination as defined in claim 19 and including a valve plunger in said housing, an extension on said plunger projecting from the housing into the tank, operating means on the inner face of said cover for cooperation with said extension and a portion of said means extending through said cover.

21. In a pump, valve and tank package unit, in combination, a cast metal tank having a removable side wall, a chamber cast integral with the bottom wall and having a port facing said side wall, a pump mounted on the outer side of the bottom wall and having an inlet passage extending through said bottom wall and a discharge passage extending through said bottom wall and into said chamber, a control valve housing mounted on said removable side wall and having a "hoist" port, a waste discharge opening into the tank and an inlet port positioned to be registered with said chamber port when the wall is secured to the tank, a plunger extending from the valve housing, a substantially vertical shaft journalled from the said side wall and within the tank, the upper end of said shaft passing through the said side wall and mechanism connecting said shaft to said plunger.

HERBERT H. SCHMIEL.

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