

June 22, 1948.

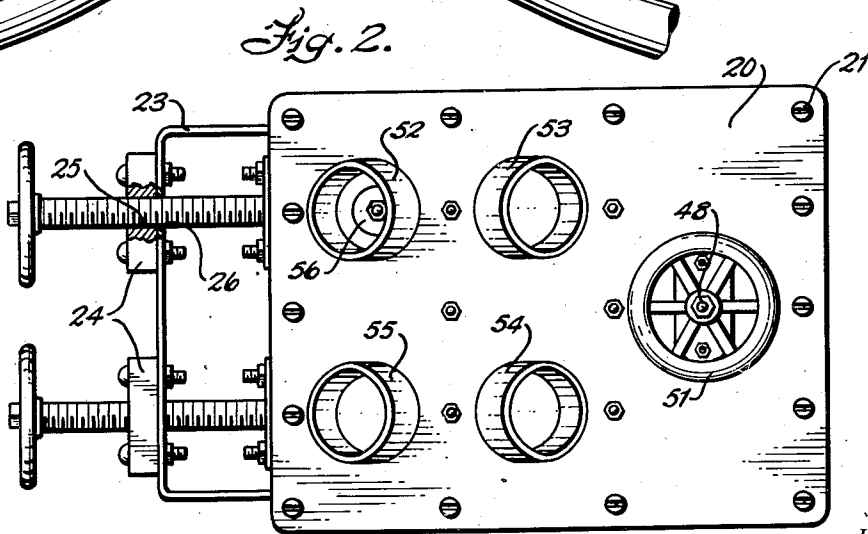
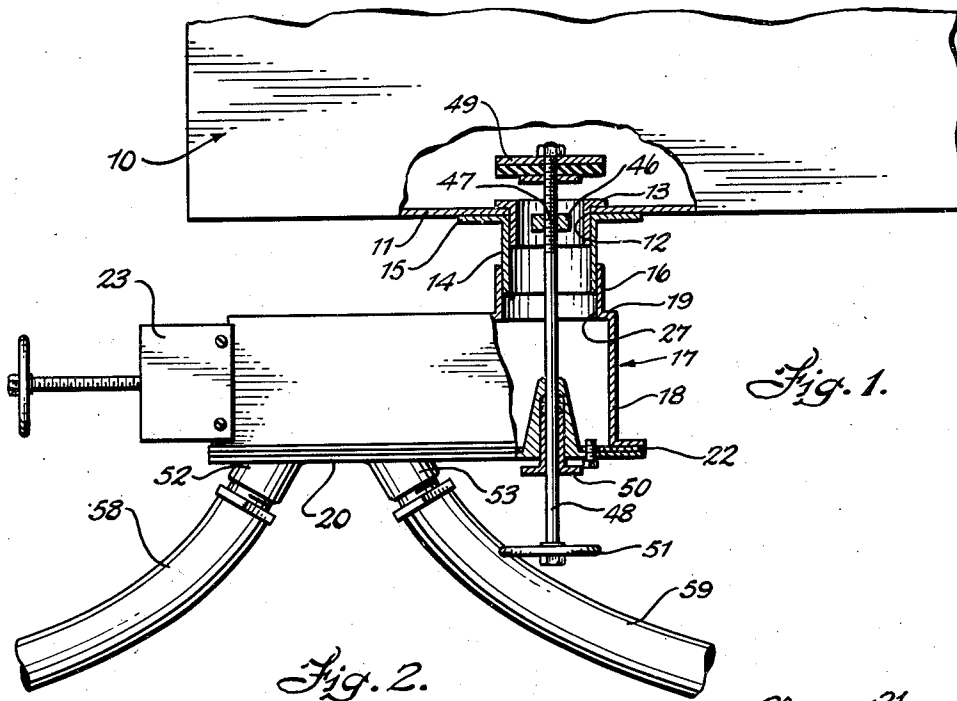
R. M. GLANTZER

2,443,679

TRANSFER VALVE

Filed Dec. 19, 1945

3 Sheets-Sheet 1



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By

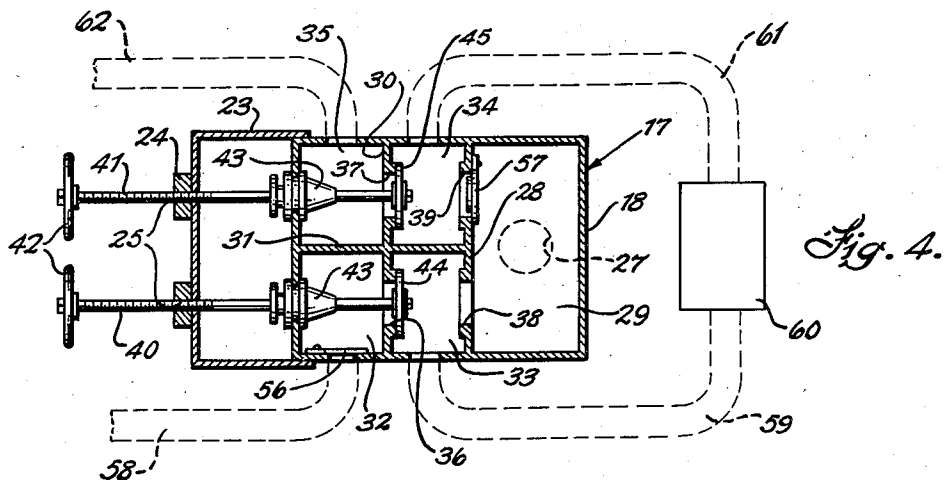
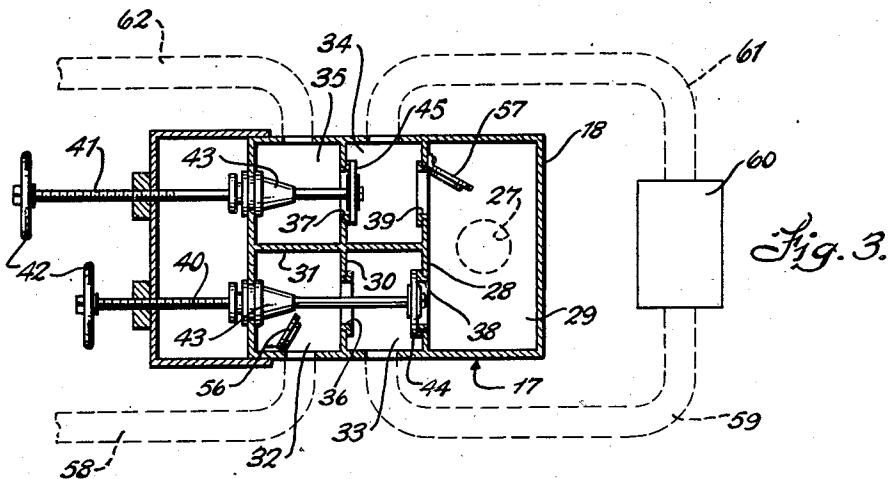
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3 Sheets-Sheet 2



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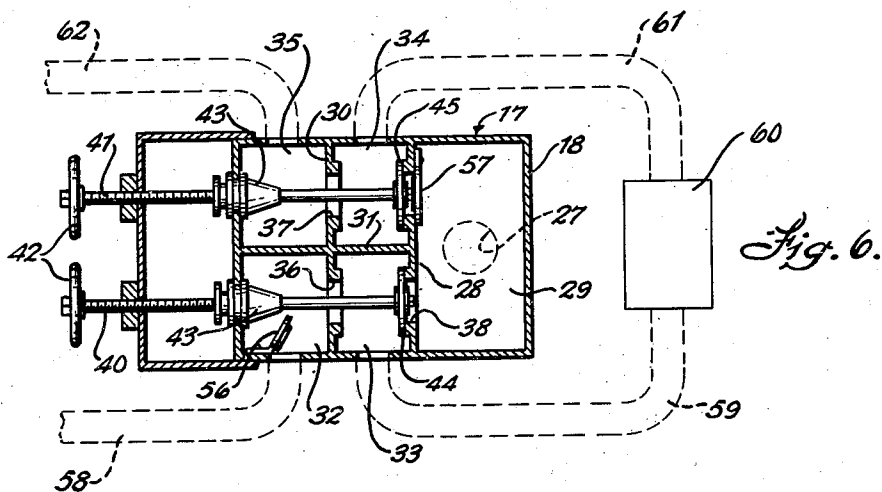
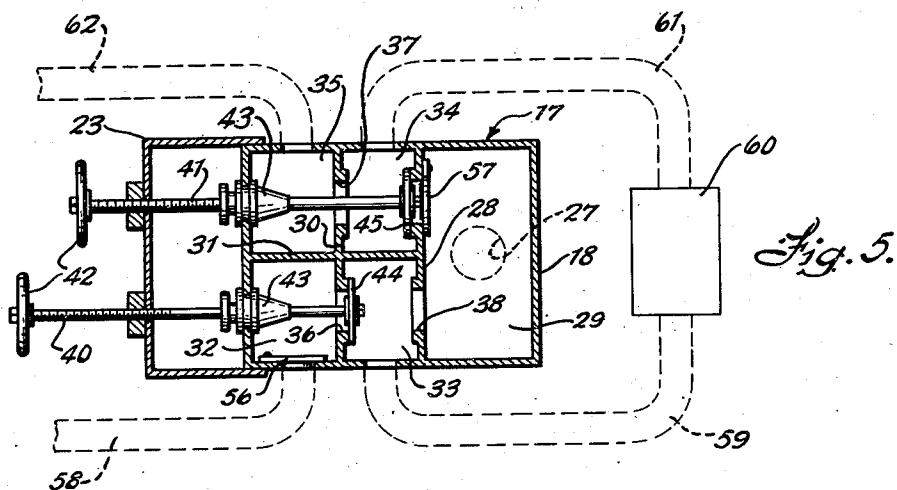
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3 Sheets-Sheet 3



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UNITED STATES PATENT OFFICE

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TRANSFER VALVE

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5 Claims. (Cl. 277-55)

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This invention relates to a transfer valve and more particularly to a valve adapted for attachment to a mobile water tank such as is commonly used for hauling water to a concrete mixer and for sprinkling concrete that has been laid.

The primary object of the invention is to facilitate the loading of the mobile tank, and the discharge of the liquid therefrom.

Another object is to facilitate the transfer of the liquid within the tank from one place to another without danger of leakage or loss during the period of transit.

The above and other objects may be attained by employing this invention which embodies among its features a transfer valve adapted to be attached to the discharge port of a mobile tank comprising a valve body having a flow chamber extending across one end which is provided with a port communicating with the tank, said valve body having an inlet chamber, and a discharge chamber adjacent the opposite end of the valve body, said body also having a pump intake chamber disposed between the inlet chamber and the flow chamber and a pump discharge chamber disposed between the discharge chamber and the flow chamber, the walls of the pump intake chamber, and of the pump discharge chamber having ports therein which communicate with the flow chamber and with the inlet chamber and the discharge chamber, and means operable in both the pump intake and the pump discharge chambers selectively to close the respective port therein.

Other features include a check valve operable to prevent the flow of liquid from the flow chamber into the pump discharge chamber and a second check valve operable in the inlet chamber to prevent the flow of liquid through the inlet port thereof.

In the drawings:

Figure 1 is a fragmentary side view of a mobile tank showing this improved valve attached thereto, certain portions being shown in section to more fully illustrate the details of construction,

Figure 2 is a bottom plan view of the valve,

Figure 3 is a sectional view through the valve diagrammatically showing it connected to a pump with the control valve set to fill the tank,

Figure 4 is a view similar to Figure 3 showing the valves set to prevent the discharge of liquid from the tank,

Figure 5 is a view similar to Figure 3 showing the valves set to discharge liquid from the tank, and

Figure 6 is a view similar to Figure 3 showing

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the valves set to pump the liquid from a source other than the tank and discharge it under pressure through the discharge line.

Referring to the drawings in detail, a portable or mobile tank 10 is provided in its bottom wall 11 with a discharge opening 12 into which a bushing 13 is fitted. This bushing extends downwardly into a tubular member 14 having an attaching flange 15 which is adapted to be welded or otherwise secured to the under side of the bottom wall 11 to form a fluid tight joint therewith. Threaded or otherwise connected to the lower extremity of the tubular member 14 is a nipple 16 which is carried by my improved valve designated generally 17 which comprises a rectangular valve body 18 the top of which is closed by a solid wall 19 while the bottom open side of the body 18 is closed by a removable cover plate 20 held in proper position on the valve body 18 by means of attaching screws 21. A suitable sealing gasket 22 forms a fluid tight joint at the junction of the body 18 and the cover plate 20. Attached to one end of the valve body is a substantially U-shaped frame carrying spaced blocks 24 which are provided with internally screw threaded openings 25 for a purpose to be more fully hereinafter explained. These internally screw threaded openings 25 are aligned with spaced openings 26 formed in the bight portion of the U-shaped frame 23 as will be readily understood upon reference to Figure 2.

The body 18 is provided with a port 27 which communicates with the interior of the nipple 16 and extending transversely of the body 18 near the end having a port 27 is a partition wall 28 forming a flow chamber 29 which extends throughout the entire width thereof. A second transversely extending partition wall 30 is provided in the valve body 18 in spaced relation the partition wall 28 and extending longitudinally of the body between the partition wall 28 and the end of the body 18 opposite that containing the flow chamber 29 is a partition wall 31. It will thus be seen that that portion of the valve body 18 between the flow chamber 29 and the opposite end of the body will be divided into a plurality of chambers 32, 33, 34 and 35 respectively hereinafter referred to as the inlet chamber, the pump intake chamber, the pump discharge chamber and the discharge chamber or valve discharge chamber. Formed in the partition wall 30 is a pair of spaced ports 36 and 37 which respectively establish communication between the inlet chamber 32 and the pump intake chamber 33, and the discharge chamber 35 and the pump dis-

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charge chamber 34. Aligning with the port 36 and formed in the wall 28 is a port 38 which establishes communication between the pump intake chamber 33 and the flow chamber 29, and formed in axial alignment with the port 37 in the wall 28 is a port 39 which establishes communication between the pump discharge chamber 34 and the flow chamber 29.

Threadedly mounted in each of the openings 25 in the blocks 24 are externally screw threaded valve stems 40 and 41. The outer ends of these stems are provided with hand wheels 42 by which the stems may be rotated while the inner ends of the stems enter the chambers 32 and 35 respectively through suitable packing glands 43. These stems extend longitudinally through the chambers 32 and 35 respectively and attached to the innermost end of the valve stem 40 is a valve 44 which is operable within the chamber 33 while the innermost end of the valve stem 41 carries a valve 45 which is operable in the chamber 34. The valve stem 40 is of sufficient length and threaded for a distance sufficient to enable it to close the port 36 or the port 38 as the case may be and the valve stem 41 is likewise of sufficient length and threaded for a distance sufficient to enable it to move the valve 45 into a position to close the port 37 or the port 39.

Extending transversely of the bushing 13 intermediate its end is a web 46 having an axially arranged internally screw threaded opening 47 for the reception of the threaded end of a valve stem 48 carrying at its inner end a valve 49 while the outer end of the valve stem extends through a suitable packing gland 50 carried by the cover plate 20 and is provided with a hand wheel 51 by means of which the valve 49 may be moved to open or close the passage through the bushing 13 and thus prevent the entrance of the liquid into or out of the tank 10 or if the valve is open to permit the liquid to be pumped into the tank or discharged therefrom as the case may be. Carried by the cover plate 20 are downwardly extending inclined threaded sockets 52, 53, 54 and 55 which communicate respectively with the chambers 32, 33, 34 and 35. A suitable check valve 56 is arranged adjacent the inside of the cover plate 20 to prevent the flow of liquid out of the chamber 32 and into the nipple 52, and a suitable check valve 57 is operable in the chamber 29 to prevent the flow of liquid from the chamber 29 through the port 39 and into the chamber 34.

In operation a suitable liquid supply pipe such as a flexible hose 58 is connected to the socket 52, and a similar flexible hose or other suitable connection 59 is connected to the socket 53 and leads to the intake side of a pump diagrammatically indicated at 60 in Figures 3 to 6 inclusive. The discharge side of the pump is connected through a suitable conduit 61 to the socket 54, and a discharge pipe 62 is connected to the socket 55 opening into the discharge chamber 35.

Upon setting the valves 44 and 45 into the positions illustrated in Figure 3 and connecting the pipe 58 with a suitable source of water supply, it is obvious that upon operating the pump 60 liquid will be pumped from the pipe 58 through the check valve 56 and into the inlet chamber 32 from whence the liquid passes through the port 36, the pipe 59 and pump 60 to be discharged through the conduit 61 into the pump discharge chamber 34 from whence it passes through the port 39 and into the flow chamber 29 to be dis-

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charged through the port 27 and with the valve 49 in open position, finally into the tank 10. Having filled the tank it is only necessary to turn the stem 40 to move the valve 44 into the position illustrated in Figure 4, disconnect the supply pipe 58 and carry the liquid to the point where it is to be used. The discharge pipe 62 is then connected to the socket 55 and upon moving the valve 45 into the position illustrated in the Figure 5 it will be obvious that when the pump is operated, the liquid will be pumped from the tank 10 into the flow chamber 29 from whence it passed through the port 38 into the pump intake chamber 33. Leaving the pump intake chamber 33 through the conduit 59 the fluid enters the pump 60 and is discharged therefrom through the conduit 61 into the pump discharge chamber 34. The liquid flowing through the port 37 enters the discharge chamber 35 and is forced therefrom through the pipe 62 to the concrete mixer or to be sprayed upon the finished or layed concrete. In some instances it may be desirable to connect the pipe 58 directly to a hydrant and thus avoid the necessity of discharging the tank 10 in which event the valves are set into the position illustrated in Figure 6 so that the flow will be through pipe 58 into the inlet chamber 32 and thence through port 36 to the pump intake chamber 33 from whence the liquid will pass through the conduit 59 to the pump 60 and be discharged through the conduit 61 into the pump discharge chamber 34 from whence it will pass through the port 37 into the discharge chamber 35 to be forced out through the discharge pipe 62.

It is obvious from the foregoing that by the simple manipulation of the hand wheels 42 which may be conveniently located to be accessible from the rear end of the tank 10, the various different ports of the valves may be readily controlled.

While in the foregoing there has been shown and described the preferred embodiment of this invention it is to be understood that minor changes in the details of construction, combination and arrangement of parts may be resorted to without departing from the spirit and scope of the invention as claimed.

What I claim is:

1. A transfer valve comprising a valve body having a flow chamber adapted to communicate with a reservoir, an inlet chamber and a discharge chamber and also having a pump intake chamber between the flow chamber and the inlet chamber and a pump discharge chamber between the flow chamber and the discharge chamber, said body having aligned ports establishing communication between the inlet chamber, the pump intake and the pump intake chamber and the flow chamber, said body also having aligned ports establishing communication between the discharge chamber, the pump discharge chamber and the flow chamber, means operable in the pump intake chamber selectively to open or close the ports opening thereinto and means operable within the pump discharge chamber to open or close the ports opening thereinto.

2. A transfer valve comprising a valve body having a flow chamber adapted to communicate with a reservoir, an inlet chamber and a discharge chamber and also having a pump intake chamber between the flow chamber and the inlet chamber and a pump discharge chamber between the flow chamber and the discharge chamber, said body having aligned ports establishing communication between the inlet chamber, the

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pump intake and the pump intake chamber and the flow chamber, said body also having aligned ports establishing communication between the discharge chamber, the pump discharge chamber and the flow chamber, means operable in the pump intake chamber selectively to open or close the ports opening thereinto and means operable within the pump discharge chamber to open or close the ports opening thereinto and a check valve operable to prevent the flow of liquid from the flow chamber to the pump discharge chamber.

3. A transfer valve comprising a valve body having a flow chamber adapted to communicate with a reservoir, an inlet chamber and a discharge chamber and also having a pump intake chamber between the flow chamber and the inlet chamber and a pump discharge chamber between the flow chamber and the discharge chamber, said body having aligned ports establishing communication between the inlet chamber, the pump intake and the pump intake chamber and the flow chamber, said body also having aligned ports establishing communication between the discharge chamber, the pump discharge chamber and the flow chamber, a valve operable in the pump intake chamber, means selectively to move the valve to close the port between the pump intake chamber and the inlet chamber or the pump intake chamber and the flow chamber, a valve operable in the pump discharge chamber and means selectively to move the last mentioned valve to close the port between the pump discharge chamber and the discharge chamber or the port between the pump discharge chamber and the flow chamber.

4. A transfer valve comprising a valve body having a flow chamber adapted to communicate with a reservoir, an inlet chamber and a discharge chamber and also having a pump intake chamber between the flow chamber and the inlet chamber and a pump discharge chamber between the flow chamber and the discharge chamber, said body having aligned ports establishing communication between the inlet chamber, the pump intake and the pump intake chamber and the flow chamber, said body also having

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aligned ports establishing communication between the discharge chamber, the pump discharge chamber and the flow chamber, a valve operable in the pump intake chamber, means selectively to move the valve to close the port between the pump intake chamber and the inlet chamber or the pump intake chamber and the flow chamber, a valve operable in the pump discharge chamber and means selectively to move the last mentioned valve to close the port between the pump discharge chamber and the discharge chamber or the port between the pump discharge chamber and the flow chamber, and a check valve operable to prevent the flow of liquid from the flow chamber to the pump discharge chamber.

5. A transfer valve comprising a rectangular valve body, a pair of spaced parallel partition walls extending transversely of the body, one of said partition walls cooperating with one end of the body in forming a flow chamber which extends the full width of the body, said flow chamber having a port opening through one of its outer walls, a valve for closing said port, a longitudinal partition wall extending from the partition wall adjacent the flow chamber to the opposite end of the valve body and separating the body into an inlet chamber and a discharge chamber at the end opposite the flow chamber and into a pump intake chamber and a pump discharge chamber between the inlet chamber and the flow chamber and the discharge chamber and the flow chamber, each transverse partition wall having a pair of ports and valves operable in the pump intake chamber and in the pump discharge chamber selectively to close the ports in the partition walls.

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