Nov. 9, 1937. H. E. WARD ET AL 2,098,682

SELECTIVE VALVE MANIFOLD FOR GASOLINE TANK TRUCKS AND THE LIKE

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Fig. 1.

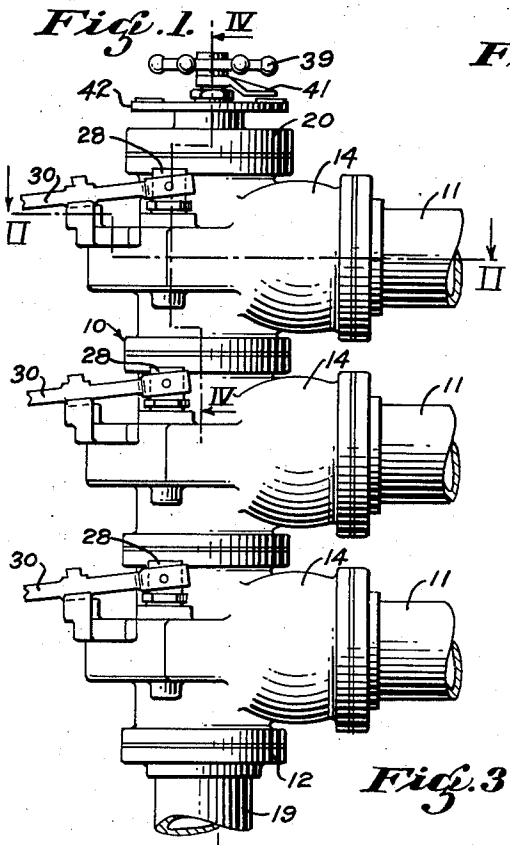


Fig. 4.

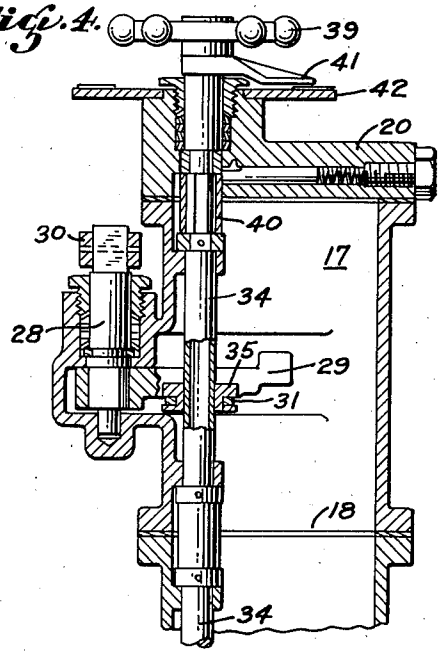


Fig. 5.

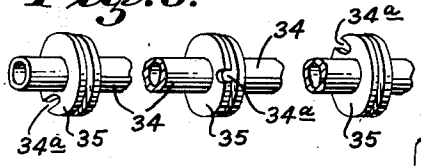


Fig. 3

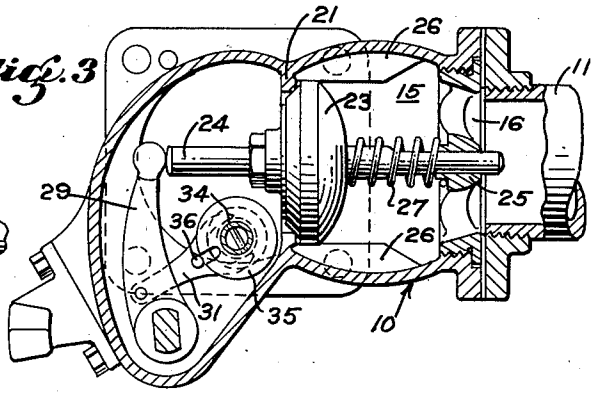
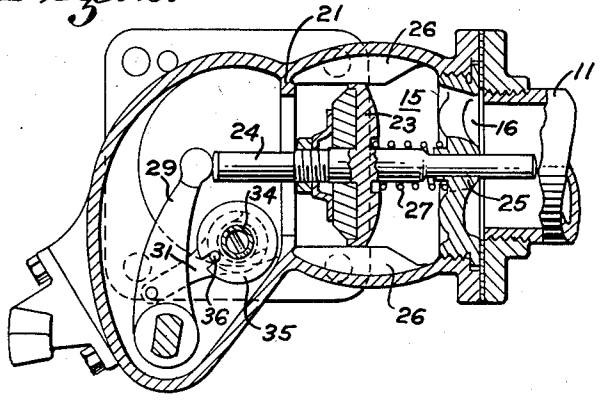


Fig. 2.



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SELECTIVE VALVE MANIFOLD FOR GASOLINE TANK TRUCKS AND THE LIKE

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3 Claims. (Cl. 277—20)

This invention relates to valves and particularly pertains to a selective valve manifold for use in connection with tanks having a plurality of separate compartments.

Tank trucks for delivering gasoline and other oils are usually divided into separate compartments, each fitted with a separate discharge valve. The outlets of these valves are connected with a meter through a common discharge pipe line. Dishonest drivers of such trucks are enabled to defraud a customer by slightly opening the valve of an empty compartment, while delivering oil to the discharge line from a full compartment. By this practice, air is drawn into the discharge line from the empty compartment and the meter measures this air with the oil, and the customer actually receives gallonage less than that indicated by the meter.

It is the object of our invention to prevent such practice by providing a simple, efficient and inexpensive valve manifold connected with the compartments of a tank, which valve manifold positively prevents more than one compartment from being placed in communication with the discharge line to the meter at a time.

In practice, we provide a manifold having a eparate inlet connection for each compartment or tank and a common outlet connection for connection with the meter. A separate valve is provided for each inlet connection, each of which valves is provided with a separate operating mechanism. These operating mechanisms are normally latched to prevent operation to open the valve. A selective mechanism is provided for selectively releasing the operating mechanisms so that a selected valve may be opened to discharge the contents of its associated compartment. The selective mechanism and latch mechanisms are so associated that only one valve may be opened at one time.

One form which the invention may assume is exemplified in the following description and illustrated by way of example in the accompanying drawing, in which:

Fig. 1 is a view in elevation of our improved manifold with parts in section to disclose certain features of construction.

Fig. 2 is a sectional view through one of the valve units taken on line II—II of Fig. 1, showing the valve operating mechanism and latching mechanism in the position which they assume when the valve of the unit is open.

Fig. 3 is a view similar to Fig. 2 with the exception that the valve operating mechanism and latching mechanism are shown in the position which they normally assume with the valve operating mechanism latched against operation.

Fig. 4 is a longitudinal sectional view taken on line IV—IV of Fig. 1.

Fig. 5 is a perspective view showing the arrangement of the latching disks.

Referring more particularly to the accompanying drawing, 10 indicates a valve manifold having three separate inlet connections 11 which may be connected by pipe lines to three separate tanks or three separate compartments of a single tank. Although in the present instance we have shown the manifold as having three inlet connections, after an understanding of the invention, it will be apparent that it may contain two or more as desired.

The valve manifold has a single outlet connection 12 and each inlet connection is fitted with individual valves which may be so selectively operated to establish communication between any selected inlet connection 11 and the outlet. In the present instance the valve manifold 10 is sectional as it is made up of three valve bodies 14 enclosing three valve units, all of which are identical in construction.

Referring to Fig. 2, it will be seen that each valve body is formed with an intake chamber 15 communicating with an inlet port 16. The valve body 14 is also formed with a discharge chamber 17 communicating with two axially aligned outlet ports 18. The axis of the inlet port 16 is disposed at 90° to the axis of the outlet ports 18 and is disposed substantially midway therebetween. Each valve body 14 is provided with flanges circumscribing the outlet ports so that a plurality of the valve bodies 14 may be arranged with their outlet ports in alignment and secured together to form the manifold 10. The outlet port 18 of the valve body 14 at one end of the manifold is connected with a discharge line 19, while the outlet port of the valve body 14 at the opposite end of the manifold 10 is blanked off by an end plate 20 as will be further described.

The intake chamber of each valve body 14 is separated from the discharge chamber thereof by a partition 21 having a valve port 22 formed therein coaxially of the inlet port 16. A valve member 23 is provided to cooperate with the valve port 22 to control the same, which valve member opens against the flow and closes with it. The valve member 23 is secured on a valve stem 24 which is guided for reciprocation in a valve stem guide 25 adjacent the inlet port 16. The valve member 23 itself is guided at its perimeter by radial guide ribs 26 formed in the body within

the intake chamber 15. It will be noticed that the valve stem 24 projects axially through the valve port 22 into the discharge chamber 17 of the valve body, so that it may be manipulated to operate the valve member 23. A valve spring 27 is provided between the valve stem guide 25 and the valve member 23, which spring constantly tends to maintain the valve seated to close the valve port 22.

Each valve unit of the manifold 10 is provided with an operating mechanism which consists of a valve operating shaft 28, which extends parallel to the axis of the outlet openings at a spaced distance therefrom, and is journalled in the walls of the discharge chamber as illustrated. Secured on this operating shaft 28 within the discharge chamber 17 of the valve body 14 is a valve operating lever 29. It will be noticed from Fig. 2 that this lever is secured at one end on the shaft 28, while its free end is in a position to engage the end of the valve stem 24, so that movement in one direction of the free end of this valve operating lever 29 will move the valve stem axially in a direction unseating the valve 23 and opening the valve port 22. One end of the valve operating shaft 28 projects to a point exteriorly of the valve body 14 so that it may be fitted with a valve operating handle 30, by means of which the valve operating shaft 28 may be turned to actuate the valve operating lever 29 and move the valve member 23 to an open position.

To control the operating lever 29, a selector shaft 34 is provided. This selector shaft 34 is made in units, one unit being provided for each valve body 14 making up the manifold 10. When the manifold is assembled, however, all of these units are rigidly connected together so that they will operate as a single shaft. Secured on the selector shaft is a latch disk 35 for each valve unit, which disks are secured to the shaft 34 and each is formed with a radial keeper slot 34*a* in its perimeter. The keeper slots 34*a* assume relatively different circumferential positions, as illustrated in Fig. 5. The circumferential spacing between the slots is preferably equal. The disk 35 for each valve unit is arranged in such an axial position on the selector shaft as to be in alignment with a latch lever 31 of that unit. This latch lever 31 is bifurcated at one end to slidably engage the selector shaft 34 so that it may move radially with respect thereto. At its other end said lever is pivoted to the operating lever 29.

It will be noticed that the latch lever 31 is provided with a pin 36 to be received in the keeper slot of the cooperating disk 35. Therefore, when the selector shaft is turned to place the disk 35 of a selected valve unit in a position so that the valve 23 of that unit may be opened, the keeper slot will be aligned with the pin 36 so that the lever 31 will be free to move in a direction enabling the operating lever 29 to open the valve. The operating lever 29 may then be swung in a direction engaging the end of the valve stem 24 and opening the valve member 23.

It will be noticed that when the keeper slot 34*a* is engaged by the pin 36, that the selector shaft 34 will be held from turning. Consequently, until the valve member 23 of the selected valve unit is closed by movement of the valve lever 29 to a point where it disengages the pin 36, the selector shaft cannot be turned to enable any other of the valve units to be operated. It is therefore obvious that by turning the selector shaft 34, the valve operating mechanism of any of the valve units may be rendered effective, while the remaining valve units will be latched against opening. Consequently, the valve member 23 of only one valve unit can be opened at a time.

For operating the selector shaft 34, the end plate 20 is provided with a stub shaft 38 having a hand wheel 39 secured on the outer end thereof. This stub shaft is arranged in axial alignment with the selector shaft and is connected thereto by a square sleeve 40. The stub shaft 38 is provided with a pointer 41 cooperating with a dial 42 suitably calibrated to indicate the different valve units, so that by aligning the pointer with one of these calibrations, the disk 35 of the selected valve unit will be positioned to render the valve operating mechanism of that unit effective.

In operation of the device, it is constructed substantially as illustrated and described and the inlet ports 16 of the various valve units are connected by pipe lines to separate tanks or to separate compartments of a single tank. At this time the selector shaft is in a position with all of the keeper slots of the disks 35 out of register with the pins 36 of the latch levers 31, so that all of the valve members 23 of the respective units will be closed and the operating levers 29 ineffective. If it is desired to permit the discharge of fluid from a particular tank or compartment, the selector shaft 34 is operated through the medium of the hand wheel 39 to place the disk 35 of the selected valve unit in a position rendering the valve operating mechanism of that unit effective.

It will be obvious from Figs. 2 and 3 that when the disk 35 is moved to such a position, that it will permit the pin 36 of the latch lever 31 of the valve operating mechanism of that unit to move to a position enabling operation of the valve operating lever 29 to open the valve. That is to say, the latch pin 36 will be placed in a position in register with the keeper slot 34*a* of the disk 35, so that the operating lever 29 may be moved in a direction opening the valve member 23. The moment that the operating lever 29 of the selected unit is moved toward opening the valve member 23, the selector shaft 34 will be held against further operation due to the engagement of the pin 36 with the keeper slot 34*a* in the disk 35 of the selected unit. Therefore, the valve members 23 of the remaining valve units cannot be opened until the valve member 23 of the selected unit is closed and the latching pin 36 disengaged from the keeper slot 34*a* of the disk 35 of the selected unit.

From the foregoing it is obvious that we have provided a valve manifold by means of which fluid may be drawn from only one compartment or tank of a particular group at a time, and while fluid is being drawn from the selected compartment or tank, fluid cannot be drawn from the remaining compartments or tanks of the group.

While we have shown the preferred form of our invention, it is to be understood that various changes may be made in its construction by those skilled in the art without departing from the spirit of the invention as defined in the appended claims.

Having thus described our invention, what we claim and desire to secure by Letters Patent is:

1. An apparatus of the character described comprising a manifold having a plurality of separate inlets and a common outlet, a separate valve to control each inlet and normally maintaining the same closed, a separate valve operating mechanism for each valve, each of said valve operating mechanisms including a valve operating member,

a latching mechanism for each of said operating members normally latching said members in an inoperative position, said latching mechanisms including a selector shaft, a separate disk on said shaft for each latching mechanism, said disks each having a keeper slot, the keeper slots of said disks being relatively differently positioned, each latching mechanism including a latching lever associated with said operating member, each latching lever having a pin to cooperate with the keeper slot of the cooperating disk whereby when said keeper slot and pin are in alignment said operating member may be operated to open the valve.

2. An apparatus of the character described comprising a manifold having a plurality of separate inlets and a common outlet, a separate valve to control each inlet and normally closing the same, a separate valve operating mechanism for each valve, each of said valve operating mechanisms including an oscillatory operating lever mounted within the manifold and capable of engaging the valve and opening the same, a latch lever for each operating lever, said latch lever being mounted in the manifold, a selector shaft extending through said manifold and being fitted with a disk for each latch lever, complementary means on each disk and latch lever for latching said operating lever from operation to open the valve, said complementary means permitting operation of said lever to open the valve upon positioning of said disk in a predetermined position relative to the latch lever.

3. An apparatus of the character described comprising a manifold having a plurality of separate inlets and a common outlet, a separate valve to control each inlet and normally closing the same, a separate valve operating mechanism for each valve, each of said valve operating mechanisms including an oscillatory operating lever mounted within the manifold and capable of engaging the valve and opening the same, a latch lever for each operating lever, said latch lever being mounted in the manifold, a selector shaft extending through said manifold and being fitted with a disk for each latch lever, each disk having a radial slot formed in its perimeter, the slots of the different disks being relatively differently positioned and fixed in such relation, a latch pin on each latch lever normally engaging the periphery of the disk and acting to prevent operation of the operating lever through the medium of the latch lever, said pin engaging said slot in said disk when the same is brought into alignment therewith and thereby releasing the operating lever through the latch lever for operation to open the valve.

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