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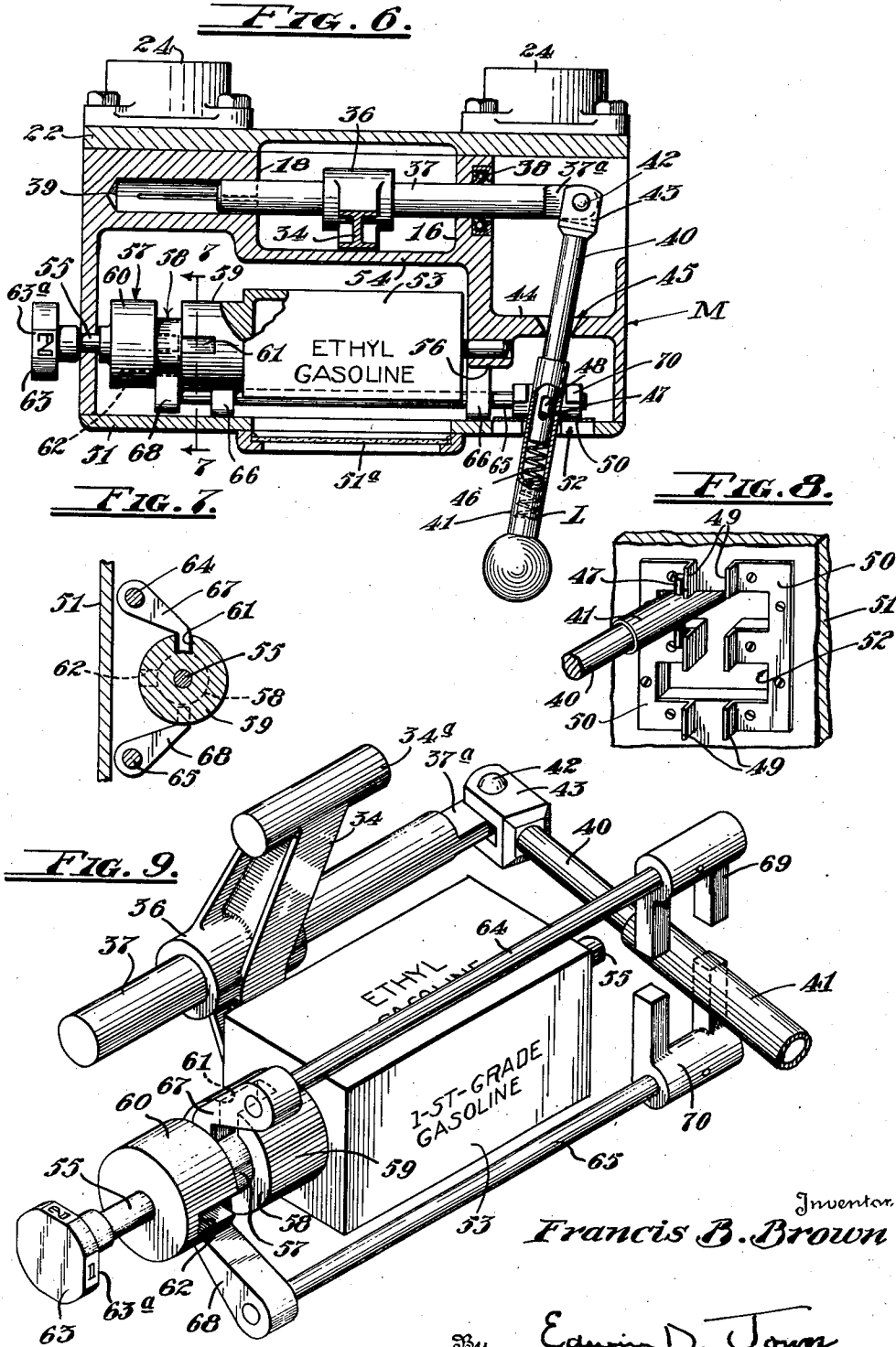
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LIQUID DISPENSING APPARATUS

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LIQUID DISPENSING APPARATUS

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My invention relates to liquid dispensing apparatus for selectively controlling the discharge of fluids of various characters from different sources through a common outlet; and it has particular reference, although not necessarily, to apparatus for selectively controlling the dispensing of different grades of gasoline from the individual compartments of a truck tank, through a metered outlet into the various underground tanks of a gasoline service station.

It is a purpose of my invention to provide such an apparatus which is manually operable to selectively control dispensing of gasoline from any one compartment of a truck tank to a metered outlet common to all of the compartments, and in such manner that there is only a negligible amount of contamination or mixture of one grade of gasoline with that of another.

It is also a purpose of my invention to provide such a liquid dispensing apparatus which embodies an indicating means manually operable to preselect and visibly indicate which valve of the apparatus is to be opened to dispense a preselected grade of gasoline, and a control mechanism for a valve opening mechanism which is operable by the indicating means to control movement of the valve operating mechanism to open the preselected valve and none other, all to the end of eliminating the erroneous or intentional dispensing of one grade of gasoline for that of another.

A further purpose of my invention is the provision of a dispensing apparatus having a plurality of valves, one for each tank compartment, and a manually operable valve operating mechanism for selectively actuating the valves, and which includes a single lever, and means for latching the lever in any selected position to prevent the accidental opening or closing of any of the valves.

I will describe only one form of the liquid dispensing apparatus embodying my invention, and then will point out the novel features thereof in claims.

In the accompanying drawings:

Fig. 1 is a view showing in perspective one form of liquid dispensing apparatus embodying my invention.

Fig. 2 is an enlarged vertical sectional view taken on the line 2—2 of Fig. 1.

Fig. 3 is a horizontal sectional view taken on the line 3—3 of Fig. 2.

Fig. 4 is a vertical sectional view taken on the line 4—4 of Fig. 1.

Fig. 5 is a vertical sectional view taken on the line 5—5 of Fig. 1.

Fig. 6 is an enlarged horizontal sectional view taken on the line 6—6 of Fig. 5.

Fig. 7 is a vertical sectional view taken on the line 7—7 of Fig. 6.

Fig. 8 is an enlarged fragmentary perspective view, looking at the inner side of the front plate of the manifold and showing the latch for the operating lever.

Fig. 9 is an enlarged perspective view showing schematically the valve operating means, the indicating means, and the control mechanism.

In carrying out my invention, I provide a manifold M in the form of a hollow metal structure of substantially rectangular shape. By means of vertical partitions 15 and 16, a liquid outlet chamber 17 is formed in the manifold M. These partitions combine with horizontal partitions 18 and 19, 19 to form liquid inlet chambers 20, 20 20 and 21, 21.

The rear of the manifold at the chambers 17, 20, and 21, is open but closed by a plate 22 having inlet openings 23, one for each of the inlet chambers 20 and 21. To the plate 22 are secured threaded collars 24 into which pipes (not shown) are threaded, leading, respectively, from the four compartments of a truck tank (not shown) containing various grades of gasoline, so that the respective gasolines are supplied by gravitational flow to the individual inlet chambers 20 and 21.

Ports 25 are formed in the partitions 15 and 16, one for each of the inlet chambers, and through these individual ports gasoline from the respective inlet chamber is permitted to flow into the common outlet chamber 17, and outwardly of the front of the manifold through an outlet 17^a likewise provided with a collar 24^a for connection to a hose (not shown). The passage of gasoline from any one inlet chamber 20 or 21 is controlled by a valve V or V' which, as shown in Figs. 2 and 3, comprises a cup-shaped valve head 25 having at one side a stud 27, threadedly engaging a conical shaped nut 28. Between the head and nut is a gasket 29 adapted to seat on the port wall to effect a liquid tight seal when the valve is in closed position. At the cup side of the valve head a stud 30 is formed for centering a spring 31 thereon. The valve head 26 slides in a cup shaped guide 32 extending through a suitable opening in the end wall of the manifold, and this guide is provided with a flange 33 bolted to the manifold, and formed with a centering rib 33^a. The large end of the spring 31 abuts the inner side of the guide 32 within the rib 33^a, and yield-

ably urges the valve head 26 to closed position on the seat of the port.

Each pair of valves V and V' are axially alined so that the confronting ends of the nuts 28 are likewise alined. This arrangement is for the purpose of permitting the valves of either pair to be opened by a common element. In the case of the pair of valves V, the element is in the form of an arm 34; and in the case of the valves V', the element is in the form of an arm 35. These arms are cast integral with a hub 36 fixed to a shaft 37 extending through a liquid seal 38 and journaled in a bearing 39 in the partition 18 (Fig. 6). Thus, the shaft 37 is mounted for movements both axially and circumferentially. The arms 34 and 35 are formed at their free ends with heads 34^a and 35^a, respectively, which extend to opposite sides of the arms to be interposed between the small ends of the nuts 28 of one pair of valves or the other, depending upon the circumferential position of the shaft 37.

Lateral movements of the arms 34 and 35 are effected through axial movements of the shaft, and depending upon which head 34^a or 35^a is interposed between the respective pair of valves and in which direction the shaft is then axially shifted, determines which valve of either pair is opened.

The shaft 37 is adapted to be actuated by means of a lever L (Fig. 6) comprising a solid section 40 and a tubular section 41 telescopically receiving the solid section. The section 40 is pivotally connected to the reduced end 37^a of the shaft 37, by a pin 42 extending through the forked end 43 of the section. This connection permits the shaft to be rotated by vertical movement of the lever L, and to be moved axially by horizontal pivotal movement of the lever. To support the lever for these movements, a partition 44 is embodied in the manifold having a vertical slot 45 therein. Through this slot the lever section 40 extends, and the walls of the slot are beveled as shown to allow of the necessary rocking movement horizontally of the lever.

The telescopic association of the lever sections 40 and 41 is for the purpose of providing actuating means for a latch to secure the lever in any of its several positions of adjustment and to thereby prevent accidental operation of the valves V and V'. Normally the lever section 41 is urged outwardly by a spring 46 contained therein, but such urging is limited by a pin 47 fixed in the section 41 and extending through a slot 48 in the solid section 40. This pin 47 constitutes the latch pin of the latch for it is designed to engage any one of a plurality of keepers 49 (Fig. 8) under the action of the spring 46, and to disengage any keeper by pushing the lever section inwardly against the tension of the spring.

The keepers 49 are in the form of lips on plates 50, 50 secured to the inner side (Fig. 8) of a front plate 51 for the manifold M. The plates 50 and 51 are constructed to provide an I-shaped slot 52 through which the lever L extends and in which it is adapted to be moved in the selective opening of the valves V and V'.

My invention also embodies an indicating means manually operable to visibly select any one of the valves in advance of actuating the lever L to open that valve, and a control mechanism for the lever operable by the indicating means to restrict or restrain the lever, when unlatched, to that movement necessary to open the selected valve. Thus is eliminated the possibility of accidentally or intentionally actuating the lever to

dispense gasoline from any compartment of the truck tank, except that compartment corresponding to the valve selected in accordance with the indicating means.

The indicating means comprises a changeable sign in the form of a block 53 (Figs. 6 and 9) having on its side faces legends describing the respective grades of gasoline contained in the tank compartments. This block is rotatably mounted in a chamber formed in the manifold by a curved wall 54 (Fig. 5), so as to be disposed to the rear of a window 51^a in the plate 51 and through which each legend on the block can be seen as the block is rotated. The block is fixed to a shaft 55, one end of which is journaled in a projection 56 and the other end in one end wall of the manifold (Fig. 6).

The control mechanism comprises a member 57 fixed to the shaft 55 at one end of the block and provided with a groove 58 to divide the member into two abutments 59 and 60. These abutments are formed with coaxial slots 61 and 62, respectively, leading to the groove 58 and spaced 90 degrees apart. Where the shaft 55 projects from the end of the manifold, it is formed with a handle 63 having peripheral facets 63^a bearing consecutive numerals for indicating the valves V and V' (Fig. 9).

A pair of rods 64 and 65 are mounted in suitable supports 66 fixed in the manifold, so as to be capable of independent axial movements. These rods have fixed to one end tongues 67 and 68, respectively, normally within the groove 58 to engage the confronting walls of the abutments 59 and 60 and thus secure the rods against axial movement in either direction from an intermediate or neutral position. Fixed to the other end of the rods are forks 69 and 70, respectively, and the fingers of these forks extend to opposite sides of the lever L in such manner that when the lever is lowered or elevated from an intermediate or neutral position, and then moved horizontally in either direction, it will abut one finger or the other of either fork.

Where either rod is secured against axial movement by its respective tongue 67 or 68, the fork restrains the lever against horizontal movement in either direction. However, when the abutment member 57 is rotated to bring the tongue into registration with either slot 61 or 62, then the rod is free to be axially moved but only in one direction, depending upon with which slot the respective tongue registers. The respective fork can now yield to allow the lever to be moved but only in that direction in which the rod is free to move. In this manner the control mechanism functions to restrict horizontal movements of the lever to that position necessary to open that valve as pre-selected and visibly indicated by and through operation of the indicating means.

The operation of the apparatus is as follows:

Normally all four valves V and V' are closed under the action of the springs, so that gasoline from the inlet chambers 20 and 21 cannot pass through the ports 25 into the outlet chamber 17. The lever L is normally disposed in the vertical portion of the I-slot 52, with the latch pin 47 between the keepers 49 to prevent any horizontal movement of the lever.

Assuming it is desired to dispense gasoline from the lower left-hand inlet chamber (Fig. 2), the handle 63 is rotated to present the numeral 1 to the operator, thereby actuating the sign block 53 so that that legend for the grade of gasoline contained in the aforesaid inlet chamber

is exposed to view through the window. Such operation of the indicating means actuates the control mechanism so that its parts occupy the position shown in Fig. 9. Thus the slot 61 is now opposite the tongue 59 to allow axial movement of the rod 64 but only to the right, while the slot 62 is out of line with the tongue 68 so that the rod 65 is locked against axial movement in either direction.

The indicating means and the control mechanism are now set to permit operation of the levers to open the valve for the aforesaid inlet chamber and no other. Now, by lifting the lever to the upper end of the slot 52, where it is positioned between the fingers of the fork 69, the shaft 37 is rotated to cause the arms 34 and 35 to occupy the positions shown in dash lines in Fig. 5, wherein the head 35^a is axially aligned with the nuts 27 for the valves V'. Now, by first pushing the lever inwardly to move the latch pin clear of the keepers, the lever can be shifted to the right as when viewed in Fig. 9, to engage the fork 69 and shift the rod 64 to the right, and to pass into the right upper extremity of the I-slot. This movement of the lever shifts the shaft 37 axially to the left, thereby moving the head 35^a to the left to open the valve V' for the aforesaid inlet chamber.

Opening of this valve allows gasoline to flow from the corresponding port into the outlet chamber 17, whence it passes from the manifold through the outlet 17^a. Once the lever has been operated to open the aforesaid valve, inward pressure on the lever is removed, thus causing the latch pin to engage a pair of keepers and secure the lever in this valve opening position.

Manifestly, to close the valve and discontinue the flow of gasoline through the respective port, the lever must be unlatched and then restored to the vertical portion of the slot 52, and in so doing the rod 64 is moved to return the tongue 67 into the groove 58, while the shaft 37 and the heads 34^a and 35^a are shifted to normal axial position.

To open any of the other valves to dispense any of the other grades of gasoline, the necessary operation of the lever should be clear from the preceding operation, and also that the indicating means and the control mechanism must be set by the operator for a selected grade of gasoline before the lever can be actuated to open the corresponding valve.

Although gasoline of one grade, entering the outlet chamber 17 is mixed with gasoline of another grade previously delivered to the chamber, because of the size of that chamber and the low location of the outlet 17^a, the contamination of one grade of gasoline by that of the other is negligible for all practical purposes.

Although I have herein shown and described only one form of liquid dispensing apparatus embodying my invention, it is to be understood that various changes and modifications may be made herein, without departing from the spirit of my invention and the spirit and scope of the appended claims.

I claim:

1. A liquid dispensing apparatus, comprising; a manifold having at least two pairs of ports, with the ports of each pair confronting each other; valves for each of the ports yieldably urged to closed position; an arm for each pair of valves movable laterally to singly open the valves; and a rotatable and axially movable shaft to which the arms are so fixed that when the shaft is in either of two circumferential positions, one arm

or the other is disposed between the valves of the respective pair so that by moving the shaft axially in one direction or the other, one valve or the other will be moved to open position.

2. A liquid dispensing apparatus, comprising; a manifold having at least two pairs of ports, with the ports of each pair confronting each other; valves for each of the ports yieldably urged to closed position; an arm for each pair of valves movable laterally to singly open the valves; a rotatable and axially movable shaft to which the arms are so fixed that when the shaft is in either of two circumferential positions one arm or the other is disposed between the valves of the respective pair so that by moving the shaft axially in one direction or the other one valve or the other will be moved to open position; and a lever for actuating the shaft to open any of the valves.

3. A liquid dispensing apparatus, comprising; a manifold having at least two pairs of ports, with the ports of each pair confronting each other; valves for each of the ports yieldably urged to closed position; an arm for each pair of valves movable laterally to singly open the valves; a rotatable and axially movable shaft to which the arms are so fixed that when the shaft is in either of two circumferential positions one arm or the other is disposed between the valves of the respective pair so that by moving the shaft axially in one direction or the other, one valve or the other will be moved to open position; a lever for actuating the shaft to open any of the valves; and control mechanism for restricting movement of the lever so as to open a preselected valve in advance of operation of the lever.

4. A liquid dispensing apparatus, comprising; a manifold having at least two pairs of ports, with the ports of each pair confronting each other; valves for each of the ports yieldably urged to closed position; an arm for each pair of valves movable laterally to singly open the valves; a rotatable and axially movable shaft to which the arms are so fixed that when the shaft is in either of two circumferential positions one arm or the other is disposed between the valves of the respective pair so that by moving the shaft axially in one direction or the other, one valve or the other will be moved to open position; a lever for actuating the shaft to open any of the valves; a control mechanism for restricting movement of the lever so as to open a preselected valve in advance of operation of the lever; and indicating means operable by the control mechanism to indicate the preselected valve.

5. A liquid dispensing apparatus, comprising; a manifold having a plurality of ports arranged in pairs; valves for each of the ports; an arm for singly actuating each pair of valves; and a circumferentially and axially movable shaft to which all of the arms are so fixed that when the shaft is in any predetermined circumferential position only one arm will be operable to singly actuate the respective pair of valves according as the shaft is moved axially in one direction or the other.

6. A liquid dispensing apparatus, comprising; a manifold having a plurality of ports arranged in pairs; valves for each of the ports; an arm for singly actuating each pair of valves; a circumferentially and axially movable shaft to which all of the arms are so fixed that when the shaft is in any predetermined circumferential position only one arm will be operable to singly actuate the respective pair of valves according as the shaft is moved axially in one direction or the other; and

a lever for actuating the shaft to open any preselected valve.

7. A liquid dispensing apparatus, comprising; a manifold having a plurality of ports arranged in pairs; valves for each of the ports; an arm for singly actuating each pair of valves; a circumferentially and axially movable shaft to which all of the arms are so fixed that when the shaft is in any predetermined circumferential position only one arm will be operable to singly actuate the respective pair of valves according as the shaft is moved axially in one direction or the other; a lever for actuating the shaft to open any preselected valve; and control mechanism adjustable to restrain movement of the lever to actuate a preselected valve in advance of movement of the lever.

8. A liquid dispensing apparatus, comprising; a manifold having a plurality of ports arranged in pairs; valves for each of the ports; an arm for singly actuating each pair of valves; a circumferentially and axially movable shaft to which all of the arms are so fixed that when the shaft is in any predetermined circumferential position only one arm will be operable to singly actuate the respective pair of valves according as the shaft is moved axially in one direction or the other; a lever for actuating the shaft to open any preselected valve; control mechanism adjustable to restrain movement of the lever to actuate a preselected valve in advance of movement of the lever; and indicating means operable by the control mechanism to indicate the preselected valve.

9. A liquid dispensing apparatus, comprising; a manifold having at least two pairs of ports, with the ports of each pair confronting each other; valves for each of the ports yieldably urged to closed position; an arm for each pair of valves movable laterally to singly open the valves; a rotatable and axially movable shaft to which the arms are so fixed that when the shaft is in either of two circumferential positions one arm or the other is disposed between the valves of the respective pair so that by moving the shaft axially in one direction or the other one valve or the other will be moved to open position; a lever for actuating the shaft to open any preselected valve; a guiding member for the lever; and coacting means on the guiding member and lever for latching the lever in any of its valve opening positions.

10. A liquid dispensing apparatus, comprising; a manifold; valves in the manifold; means for selectively actuating the valves including a lever;

mechanism for controlling movement of the lever to actuate a preselected valve, comprising two shafts mounted in the manifold for axial movement; forks on the shafts between either of which the lever is adapted to extend, to restrain movement of the lever axially of the shafts; a pair of tongues one on each of the shafts; a pair of rotatable abutments between which the tongues extend to restrain axial movement of the shafts, said abutments having disalined slots therein to receive the tongues and thus permit axial movement of the shafts; and means for rotating the abutments to aline or disaline the slots with the tongues.

11. A liquid dispensing apparatus, comprising; a manifold; valves in the manifold; means for selectively actuating the valves including a lever; mechanism for controlling movement of the lever to actuate a preselected valve, comprising two shafts mounted in the manifold for axial movement; forks on the shafts between either of which the lever is adapted to extend, to restrain movement of the lever axially of the shafts; a pair of tongues one on each of the shafts; a pair of rotatable abutments between which the tongues extend to restrain axial movement of the shafts, said abutments having disalined slots therein to receive the tongues and thus permit axial movement of the shafts; means for rotating the abutments to aline or disaline the slots with the tongues; and means correlated with the abutments for indicating the circumferential position of any of the slots when alined with either tongue.

12. A liquid dispensing apparatus, comprising, a manifold having ports therein and a wall formed with an opening, and another wall formed with a slot; valves for the ports; a mechanism for selectively actuating the valves including a shaft mounted in the manifold for rotational and axial movements, a lever of telescopic inner and outer sections urged to axially extended position and having a pin and slot connection for defining the extended position, the inner section pivotally connected to the shaft, fulcrumed in the opening of the first mentioned wall, and extending through the slot of the second mentioned wall, the pin of said connection carried by the inner lever section and normally engaging the second mentioned wall, and said slot of a form to allow lateral adjustment of the lever to rotate and axially move the shaft; and keepers on the second mentioned wall engageable by said pin for latching the lever in any position of lateral adjustment.

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