

Oct. 14, 1958

F. WELTY ET AL
VALVE FOR DISPENSING CARBONATED AND
NON-CARBONATED BEVERAGES

2,855,958

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2 Sheets-Sheet 1

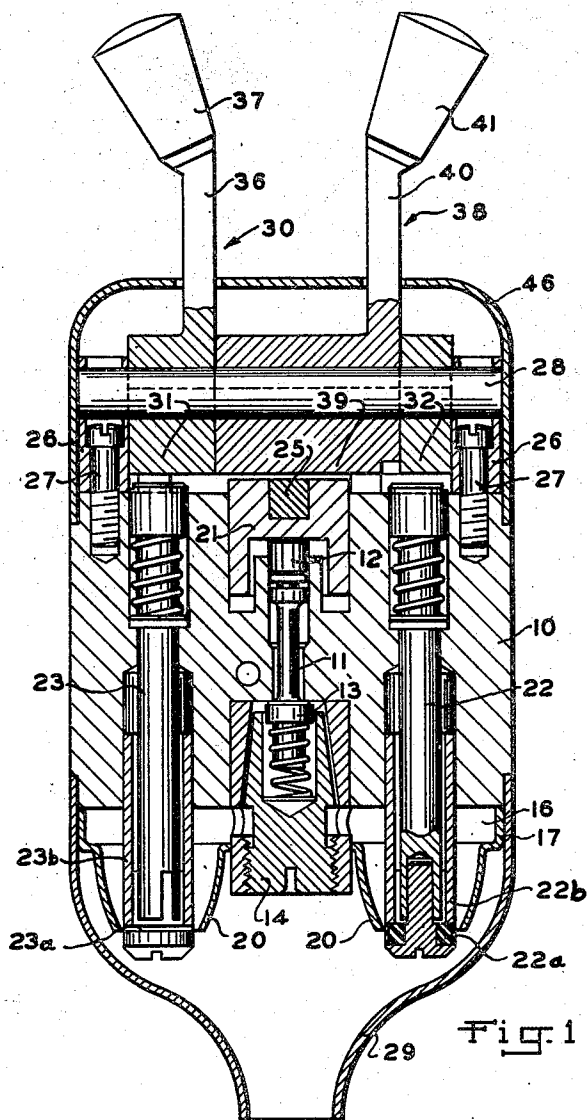


Fig. 1

INVENTORS
FRANK WELTY
RAYMOND WELTY

BY

Francis J. Klempf

ATTORNEY

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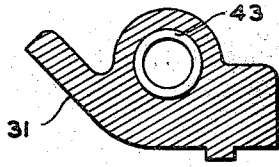


Fig. 6

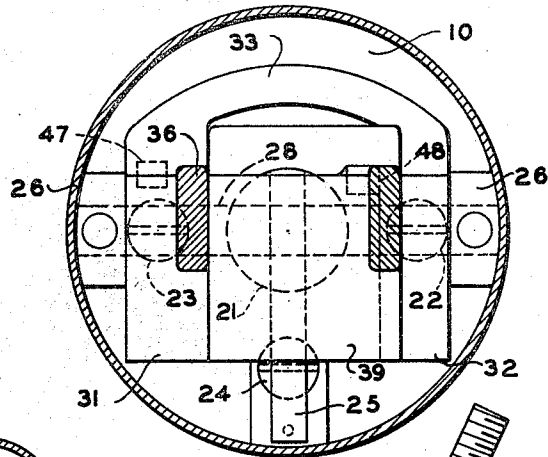


Fig. 3

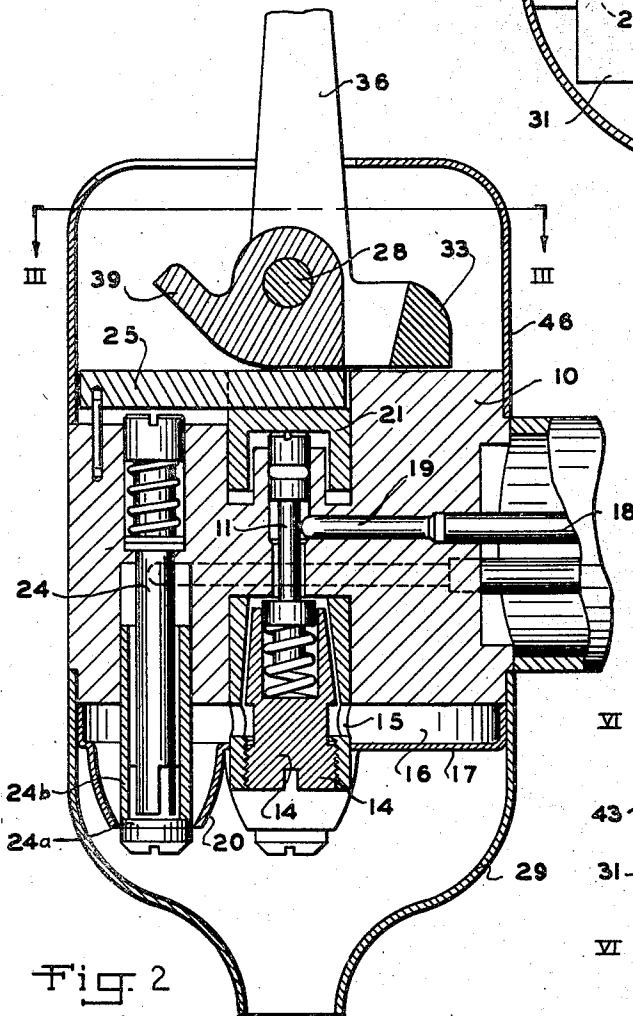


Fig. 2

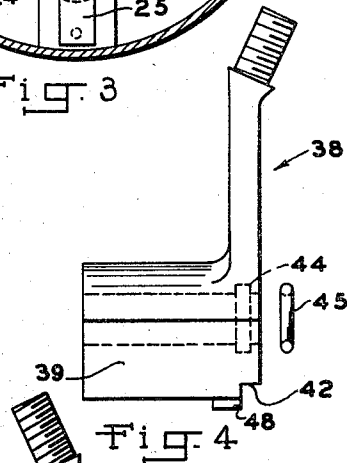


Fig. 4

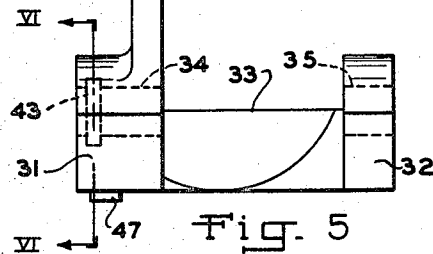


Fig. 5

INVENTOR
FRANK WELTY
RAYMOND WELTY

BY *Francis J. Klempf*
ATTORNEY

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VALVE FOR DISPENSING CARBONATED AND NON-CARBONATED BEVERAGES

Frank Welty and Raymond Welty, Youngstown, Ohio, assignors to Carbonic Dispenser, Inc., Canfield, Ohio, a corporation of Ohio

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6 Claims. (Cl. 137—637)

The present invention relates to fluid valves, and more particularly to an improved valve assembly for mixing and dispensing carbonated and non-carbonated beverages.

It is presently a common practice in taverns and soda fountains and the like to provide facilities for serving soft drinks which include valve mechanisms which are capable of properly mixing a plurality of soft drinks from components thereof and dispensing the beverages in a ready-to-drink condition. Heretofore we have developed valve assemblies for this purpose which comprise a plurality of valves for dispensing a flavoring syrup or extract and one or more valves for dispensing carbonated water, the valve assemblies including means to properly mix the individual components prior to the liquid being dispensed from the valve outlet. For full disclosure of such prior developments reference may be had to our co-pending applications Ser. No. 97,409, filed June 6, 1949, now U. S. Patent No. 2,653,055; Ser. No. 215,205, filed March 13, 1951, now U. S. Patent No. 2,702,051; and Ser. No. 282,752, filed April 17, 1952, now U. S. Patent No. 2,766,772.

While our prior apparatus has been concerned primarily with the mixing and dispensing from a single valve assembly of carbonated beverages of a plurality of flavors, we have also found that there is a substantial commercial demand for mixing and dispensing valves of this same general nature which are adapted for dispensing both carbonated and non-carbonated beverages, the term "non-carbonated," as used in this sense, being sufficiently generic to contemplate beverages having a comparatively low carbonation as well as beverages having no carbonation whatsoever.

Accordingly, it is the primary object of our present invention to provide an improved valve assembly for mixing and dispensing a plurality of flavored beverages wherein the valve is adapted for dispensing non-carbonated as well as carbonated beverages.

Another, and more specific object of this invention is the provision of a valve for mixing and dispensing carbonated and non-carbonated beverages alike which incorporates a substantial number of features of our prior valve mechanisms, and which, in fact, involves a novel modification of such prior valves, so that either type of valve may be manufactured with substantially the same machining and assembly procedures. Our prior mixing and dispensing valves, for carbonated beverages, conventionally include three valves for flavoring syrup, a common valve for carbonated water, and three operating levers, each of which is arranged to operate one of the syrup valves and the carbonated water valve. The arrangement is such that when any of the levers is operated the carbonated water valve and a particular one of the syrup valves open, and a drink of the proper proportions of each component, properly mixed, is dispensed from the valve. By our present invention, however, we propose to modify this conventional valve so that one of the "syrup" valves controls the flow of a non-carbonated base liquid, and to provide a novel operating lever mechanism

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whereby one lever is operative to open syrup and carbonated water valves while another lever is operative to open two syrup valves, one of which "syrup" valves controls the flow of the non-carbonated base liquid. The arrangement is such that without substantial modification of the valve proper, exclusive of the operating lever mechanism, the assembly may be adapted for serving both carbonated and non-carbonated beverages, selectively.

A further object of the invention is the provision of a novel and effective yet highly simplified operating valve mechanism for adapting a conventional carbonated beverage mixing and dispensing valve for dispensing non-carbonated as well as carbonated beverages.

The above and other objects and advantages of the invention will become apparent upon full consideration of the following detailed specification and accompanying drawing wherein is shown a preferred embodiment of our invention.

In the drawing:

Figure 1 is a front axial section view of a beverage mixing and dispensing valve constructed in accordance with the teachings of our invention;

Figure 2 is a side axial section view of the valve apparatus of Figure 1;

Figure 3 is a section view taken along line III—III of Figure 2;

Figure 4 is a front view of one of the operating levers of our valve mechanism;

Figure 5 is a front view of another operating lever of our valve; and

Figure 6 is a section view taken along line VI—VI of Figure 5.

Referring now to the drawing, and initially to Figures 1 and 2 thereof, the reference numeral 10 designates a generally cylindrical body member of our valve, which may be constructed of stainless steel, for example, or other non-corrosive material. The body member 10 is provided centrally with a bore to receive a vertically movable valve plunger 11 having an enlarged head portion 12 and an enlarged lower end portion 13 which comprises the active valving element. Received in the lower end of the body 10, below the valve plunger 11 is a tapered sleeve and plug assembly 14 which communicates with the valve 11 and constitutes a restricted passageway leading therefrom. The assembly 14 is provided with a plurality of radially directed outlets 15 which discharge into an enlarged water entrapping chamber 16 formed by a shell 17 and the lower axial end of the body 10. Communicating with the inlet of the valve 11 is a conduit 18 and passage 19, comprising an inlet source for carbonated water under high pressure. And, as is fully described in our co-pending applications, when the valve 11 is opened carbonated water passes through the restricted passage of the plug assembly 14, where the pressure of the water is reduced substantially to atmospheric pressure, after which the water is discharged into the enlarged entrapping chamber 16. A number of outlets 20 are provided in the shell 17, each surrounding the outlet of another valve, as will presently appear.

Slidably received in the body member 10, at the upper end thereof, is a thimble 21 which is in the form of an inverted cup and which overlies the head of the valve plunger 11. In accordance with the teachings of our prior inventions the thimble 21 provides a large head area so that the valve 11 may be operated by any of a plurality of levers, as is desired in the conventional embodiment of the valve.

Positioned on opposite sides of the valve 11 are vertically slidable valve members 22 and 23 which are employed in the conventional valve assembly as syrup valves. As indicated in Figure 1, the valves 22 and 23 lie substantially in a common plane with the water valve

11, and this is desired in the conventional valve assembly so that either the valves 22 and 23, which normally control the flow of flavoring syrup, may be operated substantially simultaneously with the water valve 11 upon actuation of one of a plurality of operating levers positioned in side-by-side relation adjacent the upper end of the body member 10. In accordance with our conventional construction, the valves 22 and 23 are resiliently urged in an upward or closing direction, and are adapted to be opened by downward force exerted by operating levers having suitable cam surfaces thereon, as will hereafter appear. The valves 22 and 23 are provided with sealing members 22a and 23a at their lower ends which engage depending tubes 22b and 23b to effect the desired valving operation. And in accordance with the teachings of our prior inventions the lower ends of the tubes 22b and 23b are positioned concentrically in like outlets 20 of the enlarged chamber 16 whereby to improve mixing of the beverage components and to assure proper washing of the syrup valves after operation thereof.

Referring now to Figure 2, it will be observed that we provide a third syrup valve 24 which is positioned forwardly of the water valve 11, in spaced relation to the plane defined by the valves 22 and 23 and water valve 11. Valve 24 is similar in substantially all respects to valves 22 and 23.

Overlaying the last mentioned valve 24 is a horizontally disposed bar 25, one end of which is loosely received in a complementary recess in the thimble 21. The arrangement is such that upon a downward moving force being applied to the bar 25 both the thimble 21 and the bar are moved downwardly to simultaneously open valves 11 and 24. While upon application of a downward force to the thimble alone, the bar 25 remains stationary, permitting valve 11 to be opened without opening valve 24.

Secured to the body member 10, at the upper end thereof, are spaced supporting blocks 26 which are bored vertically to receive retaining bolts 27. The blocks 26 are also bored horizontally to receive a horizontally disposed pivot rod 28 which is located generally directly above the valves 11, 22 and 23, as indicated in Figure 3, for example.

It should be understood that the apparatus described in the foregoing is merely our conventional mixing and dispensing valve for a plurality of carbonated beverages, substantially as set forth in our heretofore mentioned co-pending applications. To aid in a full understanding of our present and prior inventions it should be noted that in our conventional valve assembly we provide three operating levers, not shown, positioned in side-by-side relation on the pivot rod 28. The center lever of the three has a cam surface overlying the horizontally disposed bar 25 and the center portion of the thimble 21 so that upon operation of the lever water valve 11 and syrup valve 24 will be opened to dispense a carbonated beverage of a desired flavor. The outer levers of the three each have cam surfaces overlying one of the syrup valves 22 or 23 and an edge portion of the thimble 21 so that upon operation of either of these last mentioned levers carbonated beverages of other desired flavors may be dispensed.

And, in accordance with the teachings of our prior inventions there is provided at the bottom of the valve assembly, in surrounding and enclosing relation to the outlets of all the valves, a mixing funnel 29 which collects the beverage components, assures proper intermixing thereof, and discharges the mixed beverage from a central opening.

In accordance with the objects of our present invention we seek to provide a novel modification of our conventional multi-flavor mixing and dispensing valve whereby the same may be utilized for dispensing non-carbonated as well as carbonated beverages, the objects contem-

plating the incorporation in such modification of a body member 10, with its housed valving elements, which is substantially identical with that incorporated into our conventional valve whereby machining and assembly procedures may be standardized to a large degree in the production of both types of valves.

In the mixing and dispensing of non-carbonated beverages it may be desired to use as a base liquid either fresh water or carbonated water having a very low carbonation in comparison with what is normally termed carbonated water. And we have found that in either instance it is unnecessary to provide for the restriction and trapping of such fresh or slightly carbonated water inasmuch as the pressures involved are substantially less and there is no problem of avoiding substantial loss of carbonation. Accordingly, we have found that such fresh or slightly carbonated water may be satisfactorily dispensed from one of the valves 22-24 which is conventionally utilized to control the flow of flavoring syrup.

Thus, in the preferred embodiment of our invention we may connect a source of fresh or slightly carbonated water, not shown, to the inlet of valve 23, for example. And upon opening of such valve the water may flow directly into the mixing funnel 29 without first passing through any substantial restriction or trapping chamber, as is desired in dispensing regular carbonated water.

Of course, it is contemplated that a proportionate quantity of flavoring syrup will be dispensed simultaneously with the non-carbonated water. And for this purpose we prefer to utilize valve 22, which may be connected to a source, not shown, of such syrup, and which, in accordance with the teachings of the invention is caused to open simultaneously or substantially simultaneously with the opening of the non-carbonated water valve 23.

To operate the valves 22 and 23 in the manner desired we have provided a novel valve operating member 30 which is provided with a pair of spaced but rigidly connected operating cams 31 and 32 of the type shown in Figure 6. In accordance with the teachings of the invention the cams 31 and 32 are disposed over the exposed heads of valves 23 and 22, respectively, and are rigidly connected along their back edges by an integral bridging member 33, there being formed an integral U-shaped assembly, as shown in Figure 3. The cams 31 and 32 are also provided with aligned bores 34 and 35 which are arranged to receive the pivot rod 28 whereby the cams may be pivotally mounted in operative relation over the valves 22 and 23.

As shown in Figure 3, in the preferred embodiment of the invention cam 31 is of somewhat greater thickness than the cam 32. And integral with and extending upwardly from the inner edge of the cam 31 is an operating lever 36 which is provided with a threaded upper end portion to receive a knob 37. The arrangement is such that an operator may grasp the knob 37 and draw the same forwardly so that the cams 31 and 32 depress valves 22 and 23 to release components for a non-carbonated drink. It will be understood, of course that such components are mixed in the funnel 29 and further during gravity flow into a cup or glass held below the outlet of the funnel so that a uniformly mixed drink is obtained.

Also mounted on the pivot rod 28, between the integrally connected cams 31 and 32 is a second valve operating member 38 having a cam 39 which is similar to the cams 31 and 32, but which is disposed over the thimble 21 and horizontally disposed bar 25, the arrangement being such that upon rotation of the cam 39 the thimble 21 and bar 25 are simultaneously depressed to open valves 24 and 11. And in accordance with the teachings of the invention the valve 24 controls the flow of flavoring syrup while the valve 11, having an outlet passage leading to the flow restrictor 14 and water trapping chamber 16 controls the flow of carbonated water,

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that is, highly carbonated water, which forms a conventional component of carbonated beverages.

Integral with and extending upwardly from the cam 39, at the side thereof opposite the operating lever 31 is an operating lever 40 for the cam 39, which last mentioned lever is also provided with a threaded upper end portion for receiving a knob 41. As will be apparent in Figures 1 and 3 the operating levers 36 and 40 are symmetrically disposed with respect to the valve assembly as a whole. And this is provided by making the cam 31 wider than cam 32 as will be understood.

In the embodiment of the invention herein illustrated the operating levers 36 and 40 are spaced rather widely, in order to obtain a more pleasing outward appearance, and therefore we have provided a recess 42 at the right hand side of the cam 39 so that the same clears the valve 22 at all times.

Usually it is desirable to restrain the free movement of the valve operating members 30 and 38 somewhat. And for this purpose we prefer to provide an annular recess, as at 43 and 44, in each of the members 30 and 38. The recesses 43 and 44 are adapted to receive conventional O-rings, as shown at 45 in Figure 4, which frictionally grip the pivot rod 28 in the assembled apparatus to thus provide a predetermined restraining force to all movement of the operating members.

In the illustrated embodiment of the invention we provide means to prevent or limit rearward movement of the levers 36 and 40 comprising lugs 47 and 48 which engage the upper surface of the body member 10 to provide a positive stop, defining a normal or neutral position for the levers.

To enclose the mechanism at the upper end of the valve assembly we provide a cup-like cap 46 which is provided with suitable slots 47 to receive the operating levers 36 and 40. Screws, not shown, or any other suitable means may be employed to retain the cap 46 in assembled relation. The funnel 29 is generally secured in a like manner at the lower end of the assembly. And as will be readily observed, the cap 46 and funnel 29 serve to continue the general smooth contours of the valve assembly and to provide an overall pleasing outward appearance.

It should now be apparent that we have accomplished the objects initially set forth. We have provided a novel and highly simplified modification of our conventional carbonated beverage mixing and dispensing valve whereby the same is adapted for the mixing and dispensing of a non-carbonated beverage as well as a carbonated beverage.

As has been fully explained in the foregoing specification we have accomplished this modification without altering in any substantial regard the main body portion of the valve, including the body member proper and the active valving elements and other elements incorporated therein. Rather the modification is accomplished by means of a novel modification of the valve operating members whereby in place of the conventional mechanism, comprising three independent levers, each operative to actuate a separate syrup valve and a common carbonated water valve, we provide two levers one of which comprises spaced but rigidly interconnected cam operators which are arranged to operate two "syrup" valves simultaneously, and the other of which is arranged to operate a syrup and a carbonated water valve simultaneously in the conventional manner. Thus, in our present modification we may connect a source of fresh or slightly carbonated water to one of the "syrup" valves whereby upon actuation of one of the operating members a non-carbonated drink is mixed and dispensed.

Through our novel modification we may maintain substantially standardized manufacturing procedures in the commercial production of valve assemblies having widely divergent application in use, all of which results in substantial economies as will be readily understood. And there are further advantages accruing to the modified

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apparatus in that the many advantageous features of the conventional apparatus may be retained substantially throughout.

It should be understood, however, that the embodiment herein illustrated and described in detail is intended to be illustrative only, and reference should be had to the following appended claims in determining the full scope of the invention.

We claim:

1. In a soft drink mixing and dispensing valve assembly of the type having a body member, a mixing and dispensing chamber within said body member, a first centrally disposed valve vertically movable in said body member, carbonated water inlet means leading to said first valve, outlet means for said first valve including water restricting and entrapping means, second and third vertically movable valves positioned in said body member on opposite sides of said first valve, a fourth vertically movable valve positioned in offset relation to said first valve, non-carbonated water inlet means communicating with said second valve, syrup inlet means communicating with said third and fourth valve, outlet means for said second, third and fourth valves, the outlet means for each of said valves communicating with said mixing and dispensing chamber, each of said valves having a projecting head portion, a plurality of cams pivotally mounted on said body member above said projecting head portions for moving said valves; the improvement which comprises a first cam mounted for pivotal movement over said projecting head portions of said first and fourth valves and adapted upon pivotal movement to actuate said first and fourth valves whereby a carbonated beverage is mixed and dispensed, second and third cams mounted for pivotal movement over said projecting head portions of said second and third valves, said second and third valves being positioned on opposite sides of and adjacent said first cam, and means rigidly interconnecting said second and third cams whereby the pivotal movement thereof is simultaneous to actuate said second and third valves to mix and dispense a non-carbonated beverage.

2. Apparatus according to claim 1 further characterized by said cams forming integral parts of operating members for said valves, said first cam forming part of a first member having a lever extending upwardly therefrom, and said second and third cams forming integral parts of a second operating member having a lever extending upwardly therefrom.

3. Apparatus according to claim 2 further characterized by said second operating member comprising a pair of spaced cam members, said means rigidly interconnecting comprising an integral U-shaped member, said second operating lever being integral with and extending upwardly from one of said spaced cam members, and said spaced cam members forming said second and third arms.

4. In a soft drink mixing and dispensing assembly of the type having a body member, a mixing and dispensing chamber in said body member, a centrally disposed first valve vertically movable in said body member, carbonated water inlet means communicating with said first valve, outlet means for said first valve including water restricting and entrapping means, three other vertically movable valves positioned in said body member in spaced relation with respect to said first valve; the improvement comprising first and second operating members, said first and second operating members being pivotally mounted on said body member, said first operating member engaging said first valve and one of said three other valves and adapted to open and close the same, syrup inlet means communicating with said one of said three other valves and outlet means therefor whereby a carbonated beverage is mixed and dispensed upon proper actuation of said first operating member, said second operating member engaging the remaining two valves of said three other valves and adapted to open and close the same simul-

taneously, syrup inlet means communicating with one of said remaining two valves and outlet means therefor, non-carbonated water inlet means communicating with the other of said two remaining valves and outlet means therefor whereby a non-carbonated beverage is mixed and dispensed upon proper actuation of said second operating member, and the outlet means of said valves communicating with said mixing and dispensing chamber.

5. Apparatus according to claim 4 further characterized by said valve assembly including means to pivotally mount said operating members in side-by-side relation, said first valve and said two remaining valves being positioned in side-by-side relation below the pivotal axis of said operating members, said first operating member having a cam arranged to open said first valve and said one of said other valves, and said second operating member having a pair of spaced cams positioned on either side of said first operating member and arranged to open said two remaining valves.

6. Apparatus according to claim 5 further characterized by said first operating member being offset to one side of the central axis of said valve assembly and having an operating lever extending upwardly therefrom adjacent the side thereof most offset, said second operating lever having one cam of greater axial thickness than the other and having an operating lever extending upwardly from the cam of greater thickness, and said operating levers being spaced substantially symmetrically on either side of said central axis.

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