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LIQUID DISPENSING MEANS

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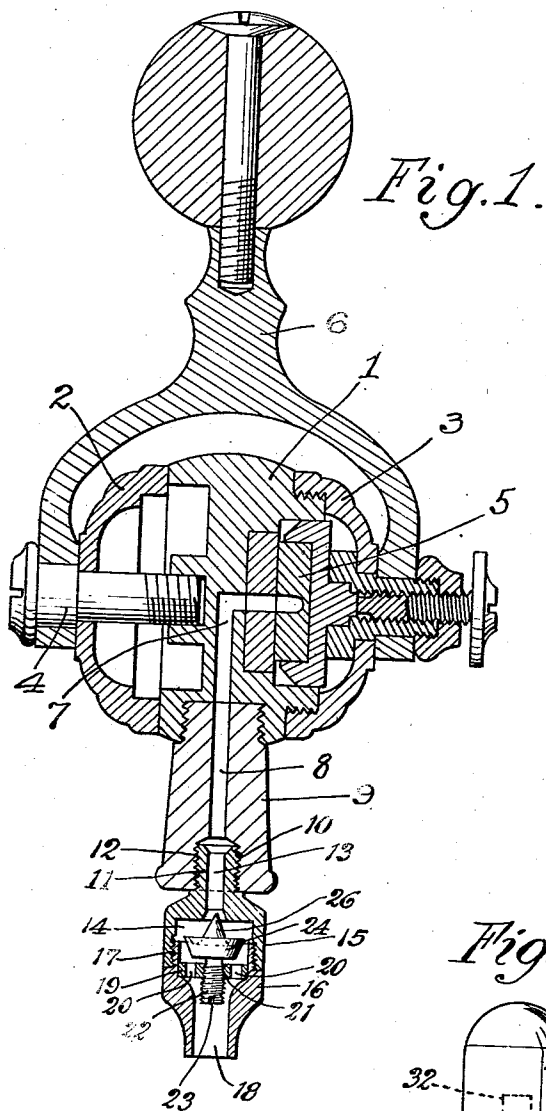


Fig. 1.

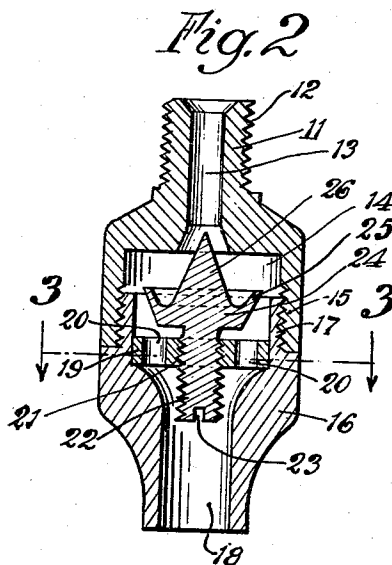


Fig. 2

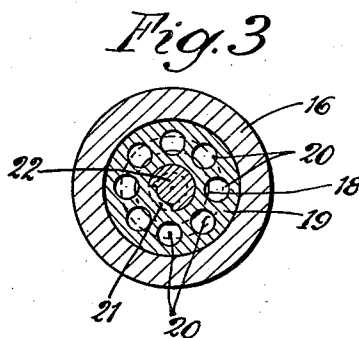


Fig. 3

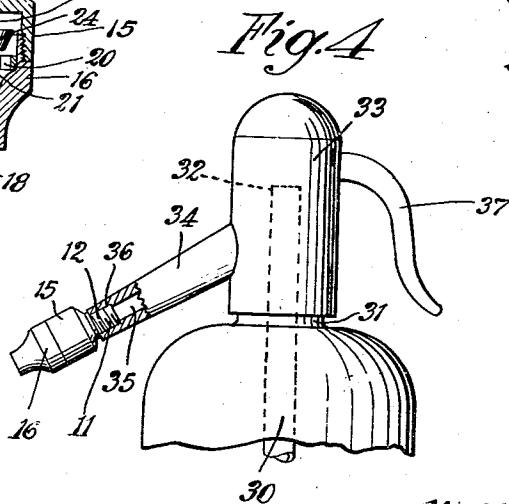


Fig. 4

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LIQUID DISPENSING MEANS

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7 Claims. (Cl. 225—27)

This invention relates to a method and a device for dispensing gaseous liquids. In the form illustrated herewith, it is particularly adapted for the dispensing of liquids in which gases are present, such as the carbonated liquids in use with soda fountains and dispensed from an installed system, or carbonated liquids dispensed from separate containers, such as the so-called siphons. It is not limited to this purpose or use and may be used for the discharge or dispensing of any liquids in which gas is present in solution or otherwise.

One object of the invention is to provide a means or a method for permitting and controlling the discharge of the liquid in such a manner that the gases present in the liquid are retained in the liquid as far as possible at the time the liquid is discharged from the apparatus.

Another object is to provide such a device and to provide in it ready means for adjustment and cleaning, to permit adequate control of the size of the discharge opening and to permit ready enlargement of that opening for "flushing" and other cleaning action. This adjustment or cleaning means is so arranged that it may be adjusted from the outside without removing the device from its normal position of use and without taking it apart or otherwise opening it.

Other objects will appear throughout the specification and claims.

The invention is illustrated more or less diagrammatically in the accompanying drawing, wherein:

Figure 1 is a section of one form of a liquid dispensing means with the device of the present invention in place;

Figure 2 is a detailed longitudinal sectional view of the controlling device shown in Figure 1 on an enlarged scale;

Figure 3 is a transverse section taken at line 3—3 of Figure 2;

Figure 4 is a side elevation with parts broken away and parts in section illustrating the device in position in one form of "siphon".

Like parts are designated by like characters throughout the specification and drawing.

1 illustrates the body of one form of a draft arm. The invention may be applied to any draft arm. As shown, there are associated with the draft arm body a cap 2 and a cap 3. 2 is secured to the body by a pivot screw 4, and 3 is screwed directly to the body by appropriate threads on each part. A valve mechanism provides means for controlling the flow of fluid through the draft arm and includes a member

5 and a handle 6 for rotating it to open and close the passage 7 through the valve assembly and the draft arm. A passage 8 communicates with the passage 7 and is formed within the nozzle 9 which is screwed to the body 1 by threads formed on each. The nozzle part 9 is interiorly threaded as at 10 to receive a controlling device.

The controlling device of the present invention comprises a portion 11 exteriorly threaded as at 12, to be received in the interiorly threaded portion 10 of the nozzle 9, and a passage 13 is formed in this member. This passage communicates with an enlarged cavity 14, formed in an enlarged section 15. The enlarged section 15 is preferably interiorly threaded about its lower margin. The portion 15 thus forms a housing to contain a controlling member which will be described below.

Co-operating with the portion 15 is a second housing member 16 provided with an exteriorly threaded portion 17 which engages the threading on the interior of the portion 15. A discharging passage 18, formed in the section 16, is preferably of a greater cross section than the passage 13 in the member 11. A member 19 is positioned within the section 16 and is provided with one or more perforations 20. The member 19 is also provided with a perforation 21 within which is threaded a part 22 of a controlling and guiding member. The lower or outer end of this part may be notched as at 23 so that it may be rotated by a screw driver or other suitable tool and thus may be adjusted toward and from the discharging end of the passage 13. Preferably integral with the member 22 is a portion 24 provided with an inwardly facing outwardly flared or inclined annular wall member 25. A conical member 26 is formed as a part of the controlling member and preferably extends partially into the discharge end of the passage 13. The discharge orifice from the passage 13 is thus given an annular shape and liquid discharged from it passes downwardly and outwardly from the passage 13 flowing along the surface of the cone 26, and then, reversing its direction, it flows upwardly along the inner face of the member 25. It is then discharged over the edge of this member and flows downwardly and outwardly through the perforations 20 in the member 19 and is finally discharged through the outer passage 18.

In general the device of the present invention will be used so that liquid is discharged downwardly but it is not limited to that use or position and it may be used to discharge the liquid in any direction. In the form of Figure 4, the

control device is the same as that previously shown and described, but instead of being mounted upon a draft arm or similar device, which may form a part of an installed liquid discharging system or apparatus, it is attached to a siphon 30, which has an upwardly extending member 31 and a discharge or outlet tube 32 which may be supported directly upon the siphon, but is more often supported within a cap 33 from which a discharge portion 34 having a discharging passage 35 extends. The outer, or discharging end of the passage 35 is interiorly threaded as at 36 to engage the threads 12 of the control device. Siphons are generally provided with some valve mechanism which normally acts to prevent discharge but which may be opened to permit discharge. A member 37 is indicated diagrammatically as comprising the means for opening such a valve. This means and the valve itself are not shown in detail, as their details form no essential part of the present invention which may be adapted to the use of almost any form of siphon, and the showing of the device herewith in connection with a siphon is merely to illustrate that possible use.

It will be realized that whereas I have herewith shown and described an operating form of my invention, nevertheless many changes might be made in the form, shape and arrangement of parts without departing from the spirit of my invention.

While the device is shown in position in a draft arm and also in a siphon, it is not limited to these uses and may be used in any association where a device of the sort disclosed is desirable or adaptable. Also, it may be associated with any form of draft arm irrespective of the particular valve and controlling means, and the draft arm and assembly shown partially in Figure 1 is shown as representing merely one typical form of draft arm and its details are not described in full, as they form no essential part of the invention or of its method of operation. The tapered portion at the lower end of the passage 13 may or may not be omitted. As shown, the inclination of this tapered portion is substantially the same as the inclination of the conical portion 26. This relationship, while desirable for many purposes, is not essential, and the taper in the passages 13 might be omitted or if present its angle of inclination might differ from that of the member 26.

The use and operation of the invention are as follows:

It has been found in the past that in apparatuses for the dispensing of liquid containing gases which it is desired to retain in the liquid after dispensing, the normal valve mechanism in a siphon or draft arm, when first opened, and sometimes after being fully opened, provides a sharp edged opening for the passage of such size that the liquid as it passes through the passage and over the sharp edges or edge formed in or at the beginning of or at the end of the said passage is in effect "torn" apart and the gases are liberated. In the device of the present invention, the final size of the discharge opening is not in any way determined by the valve mechanism. The effect of the valve is merely to control the flow of liquid toward the final discharge opening, and this final discharge opening is so arranged as to prevent the "tearing" action of the liquid and to retain as large a portion as possible of the gas in the liquid either in solution or otherwise.

There is thus provided an annular opening

formed by the member 26 and the lower end of the passage 13, whether the latter is conical or not in its lower end. Fluid passing through this opening is turned and largely reversed and flows upward along the inner walls of the outwardly flared wall-like member 25 and passes over the edges of this member through a larger annular opening formed by the outer edge of the member 25 and by the inner surface of the housing defined by the parts 15 and 16. The action which takes place within the housing is relatively smooth and undisturbed because of the shape and dimensions of the parts described, and since even that portion of the gas which has escaped from the fluid at this stage of discharge is still within the housing, some of it is re-engaged with the liquid or entrapped or dissolved and carried along with the liquid. Thus, by reason of the arrangement and shape of the parts shown and described herewith, discharge of gas from the liquid is reduced to a minimum and some of the gas which escapes from the liquid during its passage through the system is taken up by the liquid again before the final combined discharge of the liquid and the gas through the opening 18.

I claim:

1. In a means for retaining gases in liquids a hollow housing, an inlet passage thereto and a discharge passage therefrom, a perforated partition separate from said inlet passage positioned within said housing, a liquid guiding member mounted in said partition, said guiding member comprising a portion engaging said partition and a generally conical member and, associated with said conical member, an outwardly flared wall like member, the outer margin of said wall like member approaching closely the inner surface of said hollow housing.

2. In a means for retaining gases in liquids a hollow housing, an inlet passage thereto and a discharge passage therefrom, a perforated partition separate from said inlet passage positioned within said housing, a liquid guiding member mounted in said partition, said guiding member comprising a portion engaging said partition and a generally conical member and, associated with said conical member, an outwardly flared wall like member, the conical member adapted normally to have its point projecting partially into the inlet passage, the space within said housing being of greater cross section than the said inlet and outlet passages.

3. In a means for retaining gases in liquids a hollow housing, an inlet passage thereto and a discharge passage therefrom, a perforated partition separate from said inlet passage positioned within said housing, a plurality of perforations within said partition, a liquid guiding member adjustably mounted in said partition, said guiding member comprising a portion engaging said partition and a generally conical member and, associated with said conical member, an outwardly flared wall like member, the conical member adapted normally to have its point projecting partially into the inlet passage.

4. In a means for retaining gases and reentraining gases in liquids a hollow housing, an inlet passage thereto and a discharge passage therefrom of larger cross section than said inlet passage, a perforated partition separate from said inlet passage positioned within said housing, a liquid guiding member adjustably mounted in said partition, said guiding member comprising a portion engaging said partition and a generally conical member and, associated with said conical

member, an outwardly flared wall like member, the conical member adapted normally to have its point projecting partially into the inlet passage, the space within said housing being of greater cross section than the said inlet and outlet passages, the outer margin of said wall like member approaching closely to the inner surface of said hollow housing.

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5. In a means for retaining gases in gaseous liquids, a hollow housing, an inlet passage thereto, said passage being inwardly flared and progressively enlarged, and a discharge passage from said housing, a liquid guiding member adjustably positioned within said housing, said guiding member comprising a generally conical part and an outwardly flared wall-like member positioned about and adjacent said conical member, said conical part projecting in the direction of inflowing liquid.
6. In a means for retaining gases in and reentraining them in liquids containing gases, a hollow housing, an inlet passage thereto, said pas-

sage being inwardly flared and progressively enlarged, and a discharge passage from said housing, a liquid guiding member adjustably positioned within said housing, said guiding member comprising a generally conical part and an outwardly flared wall-like member positioned about and adjacent said conical member, said conical part projecting in the direction of inflowing liquid and partially into said inlet passage.

7. In a means for retaining gases in and for reentraining them in gaseous liquids, a hollow housing, an inlet passage thereto, and a discharge passage from said housing, a normally stationary liquid guiding member adjustably positioned within said housing, said guiding member comprising a generally conical part and an outwardly flared wall-like member positioned about and adjacent said conical member and closely approaching said hollow housing, said conical part projecting in the direction of inflowing liquid.

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