

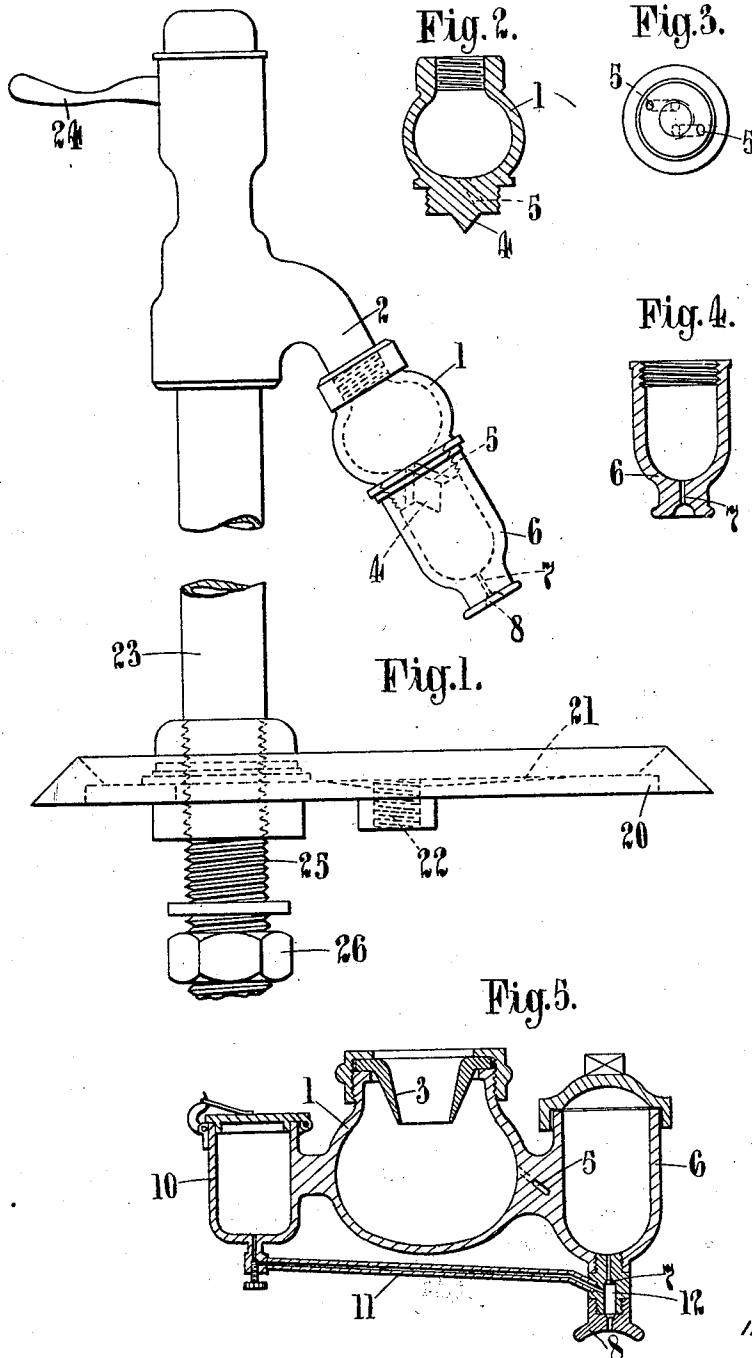
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AERATOR

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AERATOR.

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This invention has for its object to provide a simple and efficacious aerator adapted to be readily fixed to any suitable delivery nozzle or pipe for liquid supply and to cause said supply to be delivered in a finely divided state whereby the liquid may be aerated from the surrounding air or other gas or from air or gas led to the liquid, or in cases where the liquid contains solids in more or less concentrated solution or in suspension, the solids are thrown out of solution or suspension.

The invention further comprises a device whereby a supply of aerated water can at any time be drawn off from an ordinary domestic water supply source.

The invention further comprises a counter fitting adapted to deliver a supply of aerated water directly into a drinking vessel or other receptacle containing a fruit syrup or other beverage.

The accompanying drawings illustrate by way of example constructional arrangements in accordance with the present invention. Figure 1 shows in elevation, an arrangement by which a device in accordance with the present invention is combined with an automatically-closing tap of the soda siphon type.

Figure 2 shows in sectional elevation a form of the pressure chamber.

Figure 3 shows an underside plan view of the said chamber.

Figure 4 shows in sectional elevation a mixing chamber which is attached to the pressure chamber, and

Figure 5 shows a sectional elevation of an alternative form to Figure 1.

As illustrated in Figs. 1 and 2 the pressure chamber 1 is adapted to be screwed on to a threaded liquid delivery nozzle 2, or it may be secured thereon by means of a rubber or other flexible cone 3 (Fig. 5).

The pressure chamber illustrated in Figs. 1 and 2 is of a larger diameter than the delivery orifice of the liquid supply nozzle, and the wall of the chamber opposite the inlet end is substantially flat and has projecting beyond it a conical part 4 through which one or more small passages 5 are drilled. In the form shown the passages are inclined about 10 or 15 degrees to the vertical and in plan are tangential or approximately tangential to a circle concentric with the wall of the chamber.

As shown in Figure 3 a pair of passages are provided, the members of the pair being slightly offset as regards the centre line.

Mounted on the lower end of the pressure chamber is a whirling or mixing chamber 6 having a curved smooth inner wall which in the form shown is cylindrical about a vertical axis. Alternatively it might be conical, or oval in cross-section or of any other smooth whirl-producing shape. The liquid is delivered thereto eccentrically from the passages 5 to produce a circular motion or whirl of the liquid within chamber 6. The bottom of chamber 6 is centrally bored to form a restricted delivery passage 7; or this passage may be formed in a separate nozzle adapted to be screwed into the chamber 6. By using detachable delivery nozzles various size delivery jets may be provided for alternative use.

The restricted passage 7 opens at its delivery end into a cup-shaped recess 8, the shape of the cup being of any suitable form such as parabolic to produce divergence and atomization of fluid on emerging from the jet. The passage 7 may be of circular section or may be of Venturi section.

The complete device shown in Fig. 1 is intended for a counter fitting at saloons or shops retailing beverages. It comprises a base plate 20 having a recessed upper face 21 and drain hole 22 for drip, and a hollow standard 23 leading to the supply nozzle 2, the passage being controlled by a spring lever 24 of a form well known and requiring no further description. The threaded end 25 of the standard 23 extends below the base plate and is provided with a lock nut 26 to be secured under the top of the counter. The supply pipe of any usual form of domestic water supply is adapted to be secured to the threaded end 25 below lock nut 26. By this device, a supply of aerated water can be drawn off at any time into a drinking vessel or other receptacle containing a fruit syrup or any other liquid it is desired to aerate.

In the arrangement shown in Figure 5 in which the pressure chamber 1 and mixing chamber 6 are arranged side by side instead of on the same axis, the passage or passages 5 between the pressure chamber 1 and mixing chamber 6 are bored in the connecting wall between the two chambers. In this arrangement, it will be observed that the line of entry of liquid from the pressure chamber to the mixing chamber is offset with regard to the line of flow of the liquid into the pressure chamber, the walls of the pressure chamber being shaped so as gradually to divert the

direction of flow to the transverse passage or passages 5. As in the construction illustrated in Figures 2 and 3 the passage 5 is directed off the axis so as to produce a whirling motion of the liquid delivered.

In this modification a receptacle 10 is also provided for a liquid such as a fruit syrup or insecticide, a small tube 11 connecting the bottom of the receptacle to an enlargement 12 in the passage 7. The end of the tube 11 is let into the wall of the passage in an inclined direction as shown; and as will readily be understood any liquid contained in the receptacle 10 will be gradually drawn off and delivered with the atomized fluid from the chambers 1, 6 through the jet orifice.

The action of the device is as follows. The liquid is fed under pressure from any usual source of supply into the pressure chamber 1 and then through the inclined tangential passage or passages 5 into the chamber 6 where it strikes the containing wall of the chamber and receives a whirling motion which is maintained through the small passage 7 of the delivery nozzle.

On reaching the lower end of this passage owing to the cup shaped recess into which the passage 7 opens, a fine stream of liquid spreads around the walls of the said recess and is finally delivered in the form of a column of finely divided particles of liquid intimately mixed with particles of air or other gas surrounding the jet. By making the cup shaped depression to conform to a paraboloid section the stream of liquid will tend to spread.

The aeration of the liquid may be augmented by leading into the nozzle a certain amount of air or other gas, for example carbonic acid gas, and for this purpose the receptacle 10 may be suitably modified to hold the gas.

It is of course to be understood that in addition to aerating liquids, beverages or the like, the device can be used for forming fine sprays for insecticides, paints, oils, carburetion, humidifying air, spray cooling, crystallization from saturated or super-saturated solutions and chemical reaction processes.

Obviously the device illustrated in Fig. 5 could be attached to the nozzle 2 of the counter fitting of Fig. 1 by means of cone 3 if desired.

The liquid to be sprayed may be passed through any suitable heating or cooling device before entering the pressure chamber.

I claim:—

1. A counter fitting comprising a base plate, a hollow standard to convey liquid, means to connect a liquid-supplying pipe to said standard, a liquid flow control means, a nozzle to said standard, an aerator on said nozzle comprising a smooth-walled whirl-pro-

ducing chamber, an eccentrically arranged restricted inlet-passage thereto, a delivery passage therefrom, the delivery end of said delivery passage opening into a cup-shaped recess.

2. Aerator comprising a smooth walled pressure chamber, an inlet opening thereto, means to attach said chamber to a nozzle or pipe by means of said opening a smooth-walled whirl-producing chamber, a restricted communication passage between said two chambers, said passage being offset from said inlet opening and entering said whirl-producing chamber eccentrically, a restricted delivery passage leading from said second chamber, the delivery end opening into a cup-shaped recess, a receptacle to hold fluid, means to convey said fluid in small quantity to said delivery passage.

3. A counter fitting comprising a base plate, a liquid conveying standard rising therefrom, a nozzle opening from the standard, means for controlling the flow of fluid through the nozzle, and an aerator removably connected to the nozzle, said aerator comprising a smooth-walled pressure chamber into which the liquid from the nozzle is directly delivered, a smooth-walled whirl-producing chamber arranged beyond the pressure chamber, and a restricted communication between said chambers said communication comprising a passage leading from the pressure chamber and entering the whirl-producing chamber eccentrically of the latter, the whirl-producing chamber being formed with an outlet terminating at its delivery end in a cup-shaped recess.

4. An aerator comprising a whirl-producing chamber having an upper wall or roof, a smooth bottom wall, and a smooth lateral wall symmetrically extending round a central axis and curving gradually and unbrokenly into said bottom wall and formed with an eccentrically arranged restricted inlet passage, said passage being directed at its out-flow end so as to deliver fluid rectilinearly to a point in said lateral wall intermediate its length, said chamber having a delivery passage formed therein and opening at its delivery end into a cup-shaped recess.

5. An aerator comprising a whirl-producing chamber having an upper wall or roof, a smooth bottom wall, and a smooth lateral wall symmetrically extending round a central axis and curving gradually and unbrokenly into said bottom wall and formed with an eccentrically arranged restricted inlet passage, said passage having a length of at least three times its diameter and being directed at its out-flow end so as to deliver fluid rectilinearly to a point in said lateral wall intermediate its length, said chamber having a delivery passage formed therein and opening at its delivery end into a cup-shaped recess.

6. An aerator comprising a whirl-produc-

ing chamber having an upper wall or roof, a smooth bottom wall, and a smooth lateral wall symmetrically extending round a central axis and curving gradually and unbrokenly into said bottom wall and formed with an eccentrically arranged restricted inlet passage, said passage being directed at its out-flow end so as to deliver fluid rectilinearly to a point in said lateral wall intermediate its length, said chamber having a delivery passage formed therein and having a length of at least three times its mean diameter and opening at its delivery end into a cup-shaped recess.

7. An aerator comprising a whirl-producing chamber having an upper wall or roof, a smooth bottom wall, and a smooth lateral wall symmetrically extending round a central axis and curving gradually and unbrokenly into said bottom wall and formed with an eccentrically arranged restricted inlet passage, said passage having a length of at least three times its diameter and being directed at its out-flow end so as to deliver fluid rectilinearly to a point in said lateral wall intermediate its length, said chamber having formed therein a delivery passage extending from said chamber and having a length of at least three times its mean diameter and opening at its delivery end into a cup-shaped recess.

8. An aerator including a whirl-producing

chamber having an upper wall or roof, a smooth bottom wall, and a smooth lateral wall symmetrically extending round a central axis and curving gradually and unbrokenly into said bottom wall and formed with a plurality of eccentrically arranged restricted inlet passages, said passages being directed at their out-flow ends so as to deliver fluid rectilinearly to points in said lateral wall intermediate its length, said chamber having a delivery passage extending from said chamber and opening at its delivery end into a cup-shaped recess.

9. An aerator comprising a whirl-producing chamber having an upper wall or roof, a smooth bottom wall, and a smooth lateral wall symmetrically extending round a central axis and curving gradually and unbrokenly into said bottom wall and formed with a plurality of eccentrically arranged restricted inlet passages extending through said roof, their out-flow ends being separated by a projection of generally triangular section, said passages being directed at their out-flow ends so as to deliver fluid rectilinearly to points in said lateral wall intermediate its length, said chamber having a delivery passage extending from said chamber and opening at its delivery end into a cup-shaped recess.

In testimony whereof I affix my signature.
HERMES GEORGE LAWRENCE de WHALLEY.