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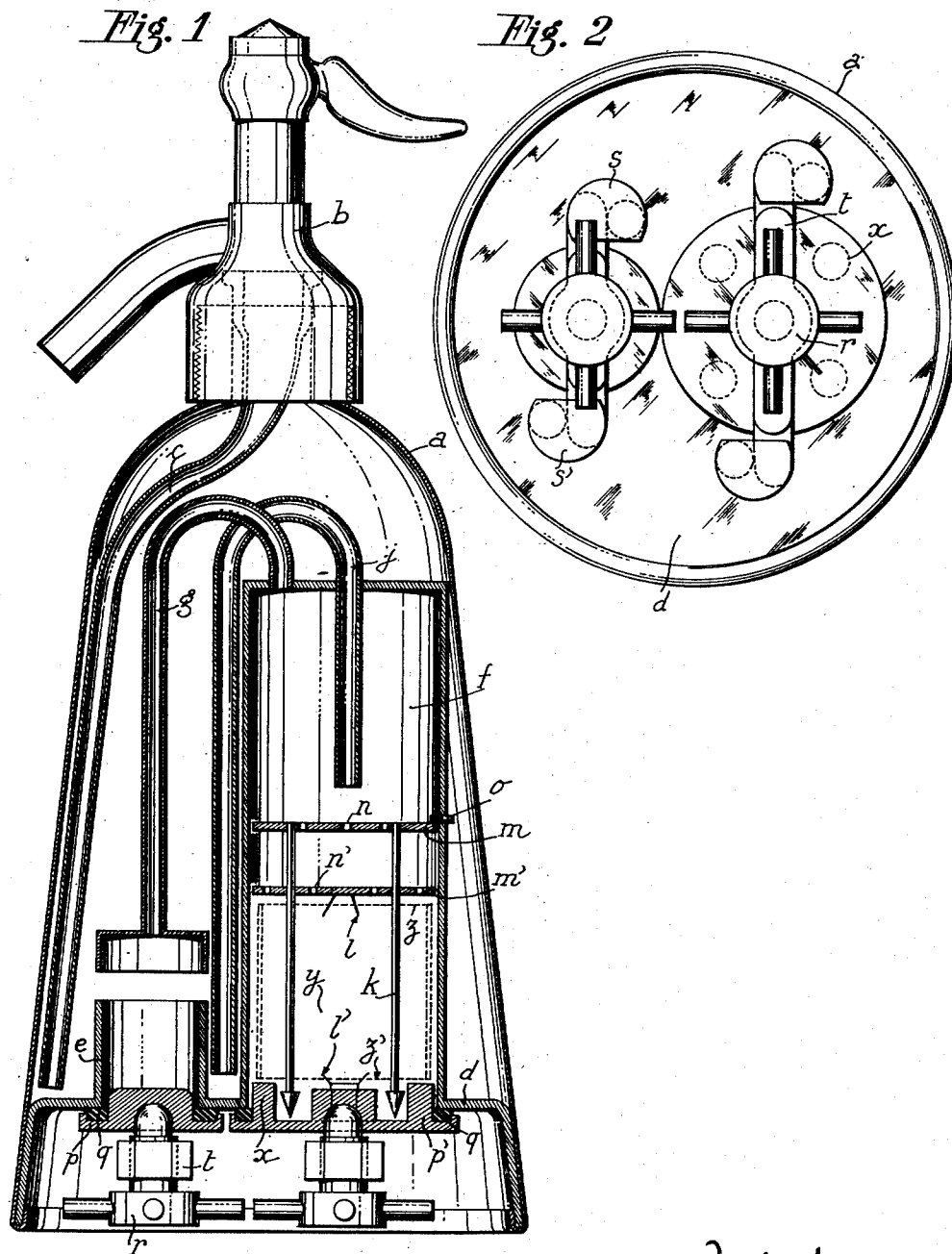
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SIPHON BOTTLE WITH GAS GENERATOR

Filed Dec. 7, 1951

2 Sheets-Sheet 1



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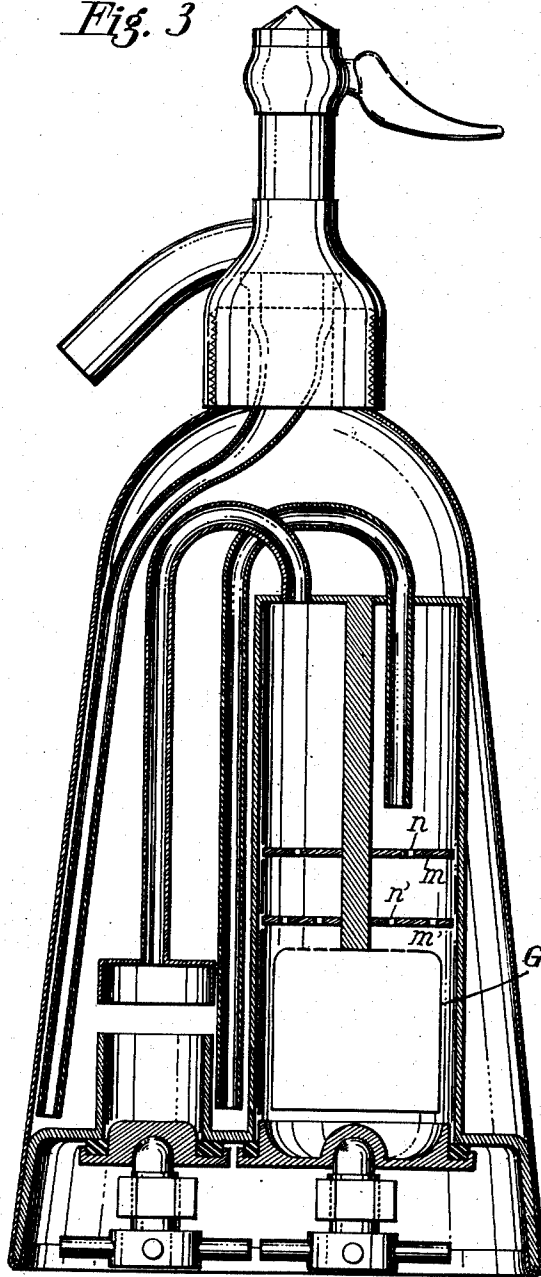
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Fig. 3



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SIPHON BOTTLE WITH GAS GENERATOR

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4 Claims. (Cl. 261—121)

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The present invention relates to apparatuses for gasifying beverages or other liquids; and the objects of the invention are to provide an apparatus improved with regard to the method of filling, the process of saturation with carbon-dioxide, the manner of producing and drawing off the gas, the preservation and fitting of the reagents for producing at the right moment the necessary amount of gas, and the composition, arrangement and location of the various parts of the apparatus.

Further features of the invention will be apparent in the ensuing description, reference being made to the accompanying drawing given solely by way of example.

Fig. 1 is an axial section of a preferred form of a siphon bottle in accordance with the invention.

Fig. 2 is a view thereof from below.

Fig. 3 shows in axial section, a modification of the siphon bottle.

The apparatus as shown in Figs. 1 and 2 comprises essentially a container *a* of any convenient shape generally conical (as indicated) or cylindrical, a head *b*, a tube *c* depending from said head and a bottom *d*, the latter being secured in a water-tight manner to the body of said container by any proper means, such as seam-forming, welding or by screwing into a ring fitted inside the container *a*, or said container *a* and bottom *d* may be in one piece.

The bottom *d* is provided with a filling tube piece *e* and a reaction chamber or gas generator *f* both of which are secured in a water-tight manner to the bottom in any appropriate way. The generator *f* is of any suitable shape, preferably cylindrical and has connected thereto a tube *g* that connects the upper part of the generator to a funnel *h* the open end of which is a short distance from the aforementioned tube *e*, and a second tube *j* one end of which terminates near the bottom of the container.

Inside the generator *f* is located a diffuser-punch device that comprises, punch element *k* of convenient shape and number, for instance arrow-headed rods, and a further punch device *l* of different shape. The diffuser element of said diffuser-punch device may be for instance in the form of two superposed circular plates *m* and *m'* having a convenient number of holes of suitable size and shape. The aforementioned arrow-headed rods *k* are fixed to the plate *m* and the plate *m'*. The punch device *l* is fixed to the plate *m'* and is directed downward. Sufficient clearance is left between the plates *m* and *m'* and the inner face of the generator *f* to allow them to

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move freely longitudinally. A stop *o* is provided to limit the inward travel of the plate *m*. If desired, a filter, not shown in the drawing, may be included between the opening of the tube *g* in the generator *f* and the aforementioned diffuser elements.

As can be seen, the apparatus comprises two distinct capacities: a container and a generator or reacting chamber entirely located inside said container and communicating therewith only through the tubes *g* and *j*. The chamber of the generator *f* is adapted to produce the correct amount of carbon dioxide gas for saturating the liquid in the container, by the reaction at the right moment in the presence of said liquid of suitable chemical products, preferably sodium bicarbonate and tartaric or citric acid.

The reagents may be introduced, mixed, and reacted in many different ways some of which are hereinafter described. In this specific example, an intimate mixture of powdered and dry sodium bicarbonate and tartaric acid in proportions depending on the volume of the container is prepared in advance in a cylindrical water-tight cartridge *y* having a diameter slightly less than the generator *f*.

The opening *e* may be closed by any suitable pressure-resisting water-tight seal for instance a screw-plug, a bayonet locking system combined with a plug, or a device comprising a plug *p* having a packing *q*, fastening screw *r*, a cross-bar *t* and hooks *s*, *s'* (Figs. 1 and 2). The generator chamber may be sealed in the same way, the plug *p'* comprising, however, in addition several small pushers *x* and a complementary punch device *l'*.

The different parts of the apparatus may be in any convenient material such as plastic or metal, and the surfaces of all the internal parts are such as to satisfy hygiene requirements.

The filling of the siphon bottle is performed in the following manner:

The bottle is held inverted in one hand or on a suitable stand and the plugs *p* and *p'* removed. After emptying and cleansing the interior, a cartridge *y* containing the reagents is introduced into the generator *f* and by a gentle push the end *z* thereof is pierced by the elements *k* fixed to the plate *m*. The plug *p'* is then placed into position, the pushers *x* thereof completing the perforation of the cartridge by driving the cartridge still further along the arrow-headed rods *k* thereby causing said heads and the punch elements *l'* to pierce the end *z'*, and the punch elements *l* to pierce the upper end *z*. The described diffuser-punch devices are so designed that when

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the cartridge is inserted in the manner indicated practically no particles of the reagents reach the liquid during the filling operation. To this end the holes relative to the plates *m* and *m'* are in staggered relationship. After the plug *p'* has been securely fixed, the liquid is poured through the tube piece *e* and passes through the funnel *h* and the tube *g* into the chamber of the generator *f*. The liquid also enters the container *a* through the space between the tube piece *e* and the funnel *h*, said space serving moreover as an air-outlet for the air escaping from the container during the filling operation. The rising level of the liquid progressively expels the air contained in the generator through the tube *j* until the level of the end of said tube is attained. The liquid rises in the container up to the inner end of the tube piece *e* whereupon no further air is free to escape from the container and the filling operation is completed and the plug *p* is replaced. The relative levels of the ends of the tubes *j* and *e* are so arranged that the desired liquid-air ratio is obtained in the generator and in the container.

When the siphon bottle is returned to its normal upright position, the liquid contained in the generator passes downward, is diffused by the diffuser plates *m* and *m'*, reaches the reagent cartridge, passes through the pierced holes on the side *z* and the tracks left in the reagents by the arrow-headed rods *k* and through the open spaces between the pushers *x* and thence through the pierced holes in the lower end *z'*. The gas is produced in abundance and rises in the nascent state through the tube *j*, enters the container *a* and saturates the liquid. The diffuser plates *m* and *m'* prevent any foam or liquid particles being carried upward by the gas.

To refill, the siphon bottle is inverted, the plugs *p* and *p'* removed, the generator emptied by tilting the bottle and allowing the diffuser-punch assembly to slide out carrying therewith the used cartridge that is detached and thrown away, the container and generator cleansed if necessary, and the procedure hereinbefore described is repeated.

The reagents contained in the cartridge may be mixed together in the solid state as hereinbefore referred to or entirely separate from each other, both in the solid state, or both in liquid solution (partially in suspension if desired), or one of them in the solid state and the other in liquid solution.

The apparatus may be constructed in such a way that the reacting liquid is directly poured into the generator; this may be so when the liquid to be saturated is not water but for instance wine, or water added to juices, syrups and the like.

Without departing from the scope of the invention, the reagents may be introduced into the generator in yet another manner, suitable devices being accordingly provided. For instance, the sodium bicarbonate and the acid may be introduced separately in a single trough or in two separate troughs placed in the generator, or one of said products first poured into the liquid in the generator. Fig. 3 shows a generator comprising only the diffuser elements *m* and *m'* without the punch devices, and a trough *G* in which the reagents are placed, said trough acting in the same manner as a perforated cartridge.

The siphon bottle in accordance with the invention possesses a considerable number of advantages over known types of siphon bottles.

Filling the bottle through the bottom avoids unscrewing the head, taking off the depending

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tube and reassembling these parts. This construction may be of course employed in any kind of siphon bottle whatever be the saturating method and whether there be or not a reacting chamber. The bottle constructed in accordance with the invention is not only very easily filled but permits a perfect saturation of the liquid.

The generator position peculiar to this invention results in a siphon bottle in which the generator is fixed permanently and is entirely enclosed therein thus enabling the normal siphon bottle appearance to be preserved.

The correct amount of liquid is automatically introduced into the generator and container during the filling operation, as hereinbefore explained, and requires no skill on the part of the user.

Another advantage is the use of an impervious cartridge which may be in any material easily punched, such as paper, metallic paper, a thin metal tube (aluminium, tin-plated sheet, etc.), plastic, card board or a combination of said materials. This cartridge contains the correct proportion of reagents previously prepared, and the opening thereof at one end by means of the sealing plug and at the other by means of the diffuser punch device allows in combination with the action of the diffusers a regular downward flow of the liquid and upward passage of the gas produced. Owing to said device being freely slidable in the generator, the cartridge may be easily withdrawn by simply removing the plug *p'* and allowing the cartridge to fall out.

It is obvious that a siphon bottle in accordance with the invention presents important advantages over known apparatuses of the type in which saturation is obtained by means of individual charges, namely siphon bottles employing bulbs generally made in steel containing highly compressed liquefied gas, and generally adapted to be reloaded due to their high cost price.

In the siphon bottle in accordance with the invention there occurs a progressive saturation instead of a wild discharge of highly compressed gas, the gas is chemically pure and exhibits the well-known characteristics of the nascent state, as opposed to the preserved industrial carbon dioxide that has frequently an unpleasant taste. The inexpensive cartridge packing may be thrown away after use. There is no risk of the packing exploding as is the case with known types of bulbs, neither is there the slightest risk of the siphon bottle itself exploding as may occur when a second bulb is added in the siphons using bulb charges.

The invention is not limited to details of construction hereinbefore set forth and illustrated, which have been given merely by way of example.

Having now described my invention what I claim as new and desire to secure by Letters Patent is:

1. In a siphon bottle, a container open at the top, a valved head adapted to be connected in a watertight manner to the open top of said container and having a depending plunging pipe adapted to enter said container and extend close to the bottom thereof and through which the liquid contained in said container can be forced through said valve head by any gas pressure in said container, a gas generator of a smaller volume than said container and arranged in a fixed manner entirely within the latter to leave between said container and generator a liquid storage space, said generator being adapted to accommodate a reagent receptacle, the bottom

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of said generator comprising a portion of the bottom of said container, one filling opening in the bottom of said container for permitting water to be supplied simultaneously to said container and said generator, a baffle consisting of a sleeve surrounding said filling opening and projecting inside said container to provide a free space at the end of the liquid filling operation in the inverted position of said bottle, a filling opening in the bottom of said generator for introducing the reagents into said generator, means for sealing in a water-tight manner each of said filling openings, positioning means in said generator for positioning said reagent receptacle inserted therein at such a distance from the top of said generator as to provide a free space in said generator above said reagent receptacle positioned therein, a first U-shaped tube having a small branch opening in the top of said generator and a long branch terminated by a funnel arranged close to the inner end of said baffle, to lead water into said generator during the water filling operation and subsequently inversely to lead the gas from said generator into said liquid storage space during the saturating operation, and a second U-shaped air discharge tube having a small branch extended through the top of said generator and terminating close to said positioning means and a long branch extended through said liquid storage space, and terminating close to the bottom thereof for automatically dosing the necessary amount of water to be admitted through said first tube into said generator, both tubes being located inside said container, whereby the gas producing operation takes place from its commencement without any communication with the exterior, and not before any desired moment as long as the siphon bottle once ready for use is left in inverse position.

2. In a siphon bottle, a container open at the top, a valved head adapted to be connected in a watertight manner to the open top of said container and having a depending plunging pipe adapted to enter said container and extend close to the bottom thereof and through which the liquid contained in said container can be forced through said valve head by any gas pressure in said container, a gas generator of a smaller volume than said container and arranged in a fixed manner entirely within the latter to leave between said container and generator a liquid storage space, said generator being adapted to accommodate a reagent receptacle consisting of an impervious cartridge, the bottom of said generator comprising a portion of the bottom of said container, one filling opening in the bottom of said container for permitting water to be supplied simultaneously to said container and said generator, a baffle consisting of a sleeve surrounding said filling opening and projecting inside said container to provide a free space at the end of the liquid filling operation in the inverted position of said bottle, a filling opening in the bottom of said generator for introducing the reagents into said generator, means for sealing in a water-tight manner each of said filling openings, positioning means in said generator for positioning said impervious cartridge inserted therein at such a distance from the top of said generator as to provide a free space in said generator above said impervious cartridge positioned therein, a first U-shaped tube having a small branch opening in the top of said generator and a long branch terminated by a funnel arranged close to the inner end of said baffle, to lead water

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into said generator during the water filling operation and subsequently inversely to lead the gas from said generator into said liquid storage space during the saturating operation, and a second U-shaped air discharge tube having a small branch extended through the top of said generator and terminating, close to said positioning means and a long branch extended through said liquid storage space, and terminating close to the bottom thereof for automatically dosing the necessary amount of water to be admitted through said first tube into said generator, both tubes being located inside said container, whereby the gas producing operation takes place from its commencement without any communication with the exterior, and not before any desired moment as long as the siphon bottle once ready for use is left in inverse position, said bottle further comprising punch means in said gas generator so arranged in the path of said cartridge when the latter is inserted into said generator through said corresponding filling opening as to perforate the walls of said cartridge.

3. In a siphon bottle, a container open at the top, a valved head adapted to be connected in a watertight manner to the open top of said container and having a depending plunging pipe adapted to enter said container and extend close to the bottom thereof and through which the liquid contained in said container can be forced through said valve head by any gas pressure in said container, a gas generator of a smaller volume than said container and, arranged in a fixed manner entirely within the latter to leave between said container and generator a liquid storage space, said generator being adapted to accommodate a reagent receptacle consisting of an impervious cartridge, the bottom of said generator comprising a portion of the bottom of said container, one filling opening in the bottom of said container for permitting water to be supplied simultaneously to said container and said generator, a baffle consisting of a sleeve surrounding said filling opening and projecting inside said container to provide a free space at the end of the liquid filling operation in the inverted position of said bottle, a filling opening in the bottom of said generator for introducing the reagents into said generator, means for sealing in a water-tight manner each of said filling openings, positioning means in said generator for positioning said impervious cartridge inserted therein at such a distance from the top of said generator as to provide a free space in said generator above said impervious cartridge positioned therein, a first U-shaped tube having a small branch opening in the top of said generator and a long branch terminated by a funnel arranged close to the inner end of said baffle, to lead water into said generator during the water filling operation and subsequently inversely to lead the gas from said generator into said liquid storage space during the saturating operation, and a second U-shaped air discharge tube having a small branch extended through the top of said generator and terminating, close to said positioning means and a long branch extended through said liquid storage space, and terminating close to the bottom thereof for automatically dosing the necessary amount of water to be admitted through said first tube into said generator, both tubes being located inside said container, whereby the gas producing operation takes place from its commencement without any communication with the exterior, and not before any de-

sired moment as long as the siphon bottle once ready for use is left in inverse position, said bottle further comprising punch means in said gas generator so arranged in the path of said cartridge when the latter is inserted into said generator through said corresponding filling opening as to perforate the walls of said cartridge and at least one gas-pervious partition extended across said generator below the outlet of said small branch for diffusing any liquid flowing down therethrough throughout the cross section of said generator and for preventing ascension of foam produced in said generator.

4. In a siphon bottle, a container open at the top, a valved head adapted to be connected in a watertight manner to the open top of said container and having a depending plunging pipe adapted to enter said container and extend close to the bottom thereof and through which the liquid contained in said container can be forced through said valve head by any gas pressure in said container, a gas generator of a smaller volume than said container and, arranged in a fixed manner entirely within the latter to leave between said container and generator a liquid storage space, said generator being adapted to accommodate a reagent receptacle consisting of an impervious cartridge, the bottom of said generator comprising a portion of the bottom of said container, one filling opening in the bottom of said container for permitting water to be supplied simultaneously to said container and said generator, a baffle consisting of a sleeve surrounding said filling opening and projecting inside said container to provide a free space at the end of the liquid filling operation in the inverted position of said bottle, a filling opening in the bottom of said generator for introducing the reagents into said generator, means for sealing in a water-tight manner each of said filling openings, positioning means in said generator for positioning said impervious cartridge inserted therein at such a distance from the top of said generator as to provide a free space in said generator above said impervious cartridge positioned therein a first U-shaped tube having a small branch opening in the top of said generator and a long branch terminated by a funnel arranged close to the inner end of said baffle, to lead water

into said generator during the water filling operation and subsequently inversely to lead the gas from said generator into said liquid storage space during the saturating operation, and a second U-shaped air discharge tube having a small branch extended through the top of said generator and terminating, close to said positioning means and a long branch extended through said liquid storage space, and terminating close to the bottom thereof for automatically dosing the necessary amount of water to be admitted through said first tube into said generator, both tubes being located inside said container, whereby the gas producing operation takes place from its commencement without any communication with the exterior, and not before any desired moment as long as the siphon bottle once ready for use is left in inverse position, said bottle further comprising punch means in said gas generator so arranged in the path of said cartridge when the latter is inserted into said generator through said corresponding filling opening as to perforate the walls of said cartridge, at least one gas-pervious partition extended across said generator below the outlet of said small branch for diffusing any liquid flowing down therethrough throughout the cross section of said generator and for preventing ascension of foam produced in said generator, and means for ensuring in said generator a thorough contact and penetration between the reagents and any liquid contained therein.

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References Cited in the file of this patent UNITED STATES PATENTS

Number	Name	Date
1,148,817	Alliot	Aug. 3, 1915
1,419,653	Van Meter	June 13, 1922
2,300,300	Lund	Oct. 27, 1942
2,345,081	Ward	Mar. 28, 1944
2,516,934	Weaver	Aug. 1, 1950
2,591,990	Wisdom	Apr. 8, 1952

FOREIGN PATENTS

Number	Country	Date
11,437	Great Britain	May 19, 1903