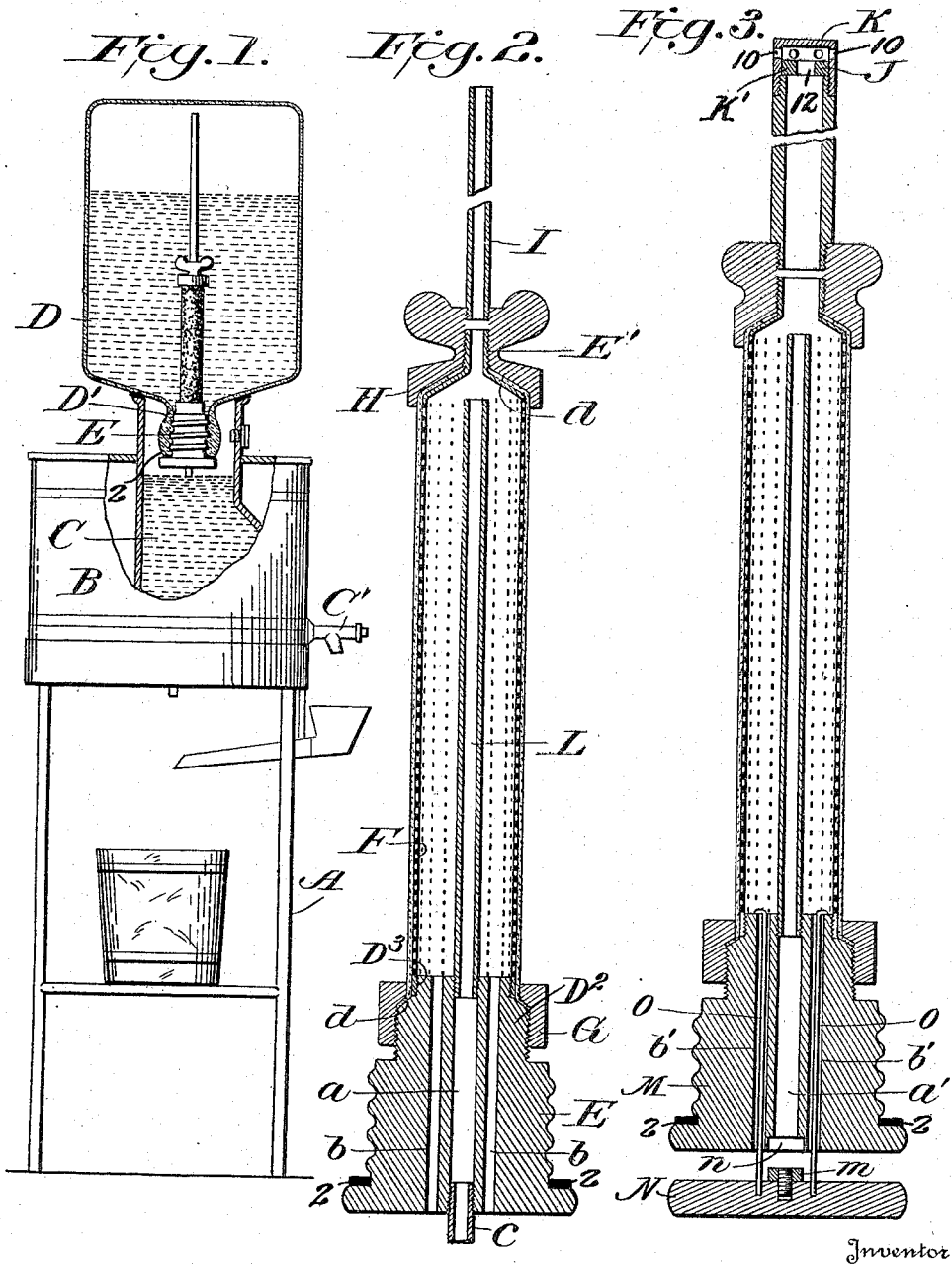


H. E. SCHULSE.  
LIQUID DISPENSING AND FILTERING BOTTLE.  
APPLICATION FILED JUNE 20, 1916.

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# UNITED STATES PATENT OFFICE.

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## LIQUID DISPENSING AND FILTERING BOTTLE.

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Specification of Letters Patent.

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*To all whom it may concern:*

Be it known that I, HERMAN E. SCHULSE, a citizen of the United States, residing at New York city, in the county of New York and State of New York, have invented certain new and useful Improvements in Liquid Dispensing and Filtering Bottles, of which the following is a specification.

My invention relates to certain new and useful improvements in water-coolers designed to dispense mineral, distilled or other waters, directly from a container, or original package, bottle, or demijohn, in the most satisfactory and sanitary manner, and without danger of the contents being contaminated in handling and properly placing the package, bottle or demijohn in position upon a supporting body portion.

Primarily, the present invention is designed to take the place of that class of water coolers so extensively used at the present time for dispensing mineral, distilled or other special waters, by supplying the container, bottle or demijohn with its own means for the purification of the liquid contents thereby enabling the ordinary city service water, if desired, to be used in the aforesaid containers, bottles, or demijohns and to be filtered and purified to rid it of suspended and other impurities before it is delivered to the proper receptacle for withdrawal for human consumption.

A leading object of the present invention is, therefore, to construct or otherwise provide the container, bottle or demijohn in which the water is first placed, with a filter attachment, which may be fashioned to fit upright within the bottle whereby the water in its passage from the inverted bottle, as well understood in this art, must pass through the filter and to be thereby relieved of its impurities before it is delivered into the usual ice-surrounded cooling vessel or chamber, from which latter it is drawn for drinking purposes.

With the above and other objects in view my invention consists of the parts and the construction, arrangements and combination of parts, which I will hereinafter describe and claim.

In the accompanying drawing, forming part of this specification and in which similar reference characters indicate like parts in the several views;

Figure 1 is a side elevation, with parts

broken away, of a liquid container and supporting stand embodying my invention.

Fig. 2 is a vertical sectional view on an enlarged scale of a filter and its attached plug and air-venting devices.

Fig. 3 is a similar view of a filter having an attached plug of modified form.

Inasmuch as the present invention has relation, primarily, to the construction of the container, bottle or demijohn, in which is stored, for subsequent use the water to be consumed, it is not essential that a complete water-cooling outfit should be illustrated and described, since the container, bottle or demijohn is capable of successful use with the different types of water-coolers now commonly used for dispensing mineral, distilled or other waters for drinking purposes, but to properly associate the container, bottle, or demijohn with the leading parts of the aforesaid water-coolers, I have shown a stand, A, which may be of any suitable character and design and upon which is supported a main vessel or receiver, B, within which is located a water containing vessel, C, which it is customary to surround or pack with broken ice, said vessel, C, having a suitable draw-off or faucet, C', and being designed as a receiver for the water delivered from the container, bottle or demijohn, D, in which the water is originally contained and from which it is periodically discharged into the vessel, C, to take the place of water dispensed from said last-named vessel. With the exception of the container, bottle or demijohn, D, the foregoing parts are well known and their purposes will be understood, and the said stand, main vessel, and containing vessel, and their necessary adjuncts, are but representative of any suitable support and water and ice containers intended for similar purposes and having like functions.

As the leading part of the present invention relates, essentially, to the container, bottle, or demijohn in which the water to be dispensed is originally contained, I will now describe a preferred form of the same, while at the same time I do not wish to be understood as limiting myself to the precise, structural features of the same, or to the exact design shown, since modifications of the same are quite apparent without affecting the functional operations and are, accordingly, within the scope of the invention,

As shown, the container, bottle, or demijohn, D, which may be composed of plain glass or of glass subjected to the action of a sand blast, or otherwise treated to dull the surface thereof, and for which material porcelain or other suitable material may be substituted if desired, may be of cylindrical or other desired cross sectional form having a reduced neck, D', which is internally threaded or otherwise fashioned for the attachment of a similarly threaded or other plug or stopper, E, which is fixedly attached to the lower end of an appropriate upright filter. The plug may be of glass, hard-rubber, or the substance commercially known as "bakelite", said plug having a flange with a gasket 2 which is adapted to seat closely against the mouth of the bottle. The plug is also formed with a reduced portion, D<sup>2</sup>, which is externally threaded, and an inclined or tapered portion, d, beyond which there is a further reduced and threaded portion, D<sup>3</sup>, to which the lower end of the body or frame of an upright filter is secured. This filter may be of any approved construction and a very desirable form is shown as consisting of an interior foraminous tube or cylinder, F, whose lower end is threaded to engage the like portion, D<sup>3</sup>, of the plug and whose opposite end, d', is contracted and provided with an externally threaded nipple or portion, E'.

Surrounding the foraminous tube or cylinder there are one or more layers of woven or other filtering cloth or like filter bed material, preferably composed of asbestos fibers or the like having the property of withholding sedimentary matter while permitting the passage of liquid. The filtering medium may be of tubular form and be appropriately drawn or placed over or around the foraminous tube or cylinder and having its lower end extended beyond the corresponding end of the tube or cylinder so that it will project over the inclined portion, d, of the plug and be firmly compressed and held thereagainst, so as to preserve a tight joint at this point, by means of an appropriate nut or follower, G, which is threaded upon the portion, D<sup>2</sup>, of said plug, and has an internal beveled part to co-act with the inclined surface, d, of the plug to thereby compress with a wedging action the projecting end of the filter medium, before mentioned.

At the upper end, the fibrous or other filtering agent, or bed, is turned over the inclined or tapering portion, d', of the foraminous tube or cylinder and it is clamped thereagainst to preserve a tight joint at this point, by a corresponding inclined surface formed on the interior of a nut, H, which has internal threads adapted for engagement with the threads on the upper reduced portion or nipple, E', of said tube or cylinder,

these threads being also adapted for engagement with similar threads on one end of an air-vent tube, I, which projects above the last-mentioned nut and to a point approximately close to the bottom of the bottle and which becomes the upper portion of the bottle when the latter is in its inverted and dispensing position, as shown in Fig. 1.

If desired, the upper end of the vent tube may be provided with a suitable check valve and which valve is of some importance in that it serves to close the vent tube against the admission of water from the bottle or container when the latter is lying on its side, or is partly inverted. While any suitable check valve may be used for the purpose above stated, the valve shown in the present case is desirable and it consists of the cap, K, and a disk, K', loosely mounted in said cap. The cap is provided with air outlets, 10, and the disk has an opening, 12, in its center. When the bottle is resting upon its bottom and before it is inverted, the check valve or disk will seat against the bottom of the cap and the periphery of the disk will close the side openings, 10, in said cap and the disk will remain in this position even though the bottle is tilted on its side, and thus prevent the entrance of water from the bottle into the tube. This position of the disk will be substantially maintained until the bottle has been tilted to such point that the disk will drop away from its seat and open the inlets, 10, but in this case, the inlets will be, as a rule, above the liquid level in the bottle.

The plug which is fixedly secured to the lower end of the filter is formed with a plurality of passages, one of which, a, is formed centrally of the plug and has an internally threaded wall for the attachment of the lower end of an air-vent tube, L, which extends longitudinally through the filter and has its upper end in communication with the tube, I. These tubes constitute practically a single air passage and air in the filtered water container, C, is permitted, under suitable conditions, to pass through the tubes, I and L, and into the upper end of the inverted bottle so that it may enter the bottle above the level of the liquid and thus overcome any tendency of a vacuum being created in the bottle during the time that water is being dispensed or withdrawn from the filtered water container, C.

The other passages, b, formed in the plug or stopper, E, communicate at one end with the interior of the filter and at the other end with the interior of the filtered water vessel, C, but the latter end of these water passages, b, is, in practice, disposed at a higher level than the corresponding end of the central air-venting passage, a, and this may be accomplished by attaching to the lower end of the air venting passage a short tubular section, c, which is adapted to enter the

filtered water vessel and to dip into and be sealed by the water thereof, and to be uncovered when the level of the filtered water in the vessel, C, is lowered by the withdrawal of a portion of the contents, thereby permitting the air to rush into and through the passage, *a*, and the tubes, I and L, to the interior of the bottle, demijohn, or other container to prevent the formation of a vacuum therein, and to insure the proper delivery of water through the filter and the water passages, *b*, and into the container to take the place of the water dispensed or withdrawn, as above indicated. In other words, when the bottle, container, or demijohn is in operative position, the lower end of the air-vent tube, *c*, is covered and accordingly sealed by the water in the filtered water vessel, C, and hence the filtering function through the upright filter is rendered of no effect, but as soon as the level of the water in the container, C, is lowered and the end of the vent pipe is uncovered thereby, filtration starts due to the gravity and the hydrostatic head in the bottle and any tendency of a vacuum to form in the upper portion of the bottle is met by the air admitted through the vent-tubes and into the bottle above the level of the liquid therein. When sufficient water has passed through the filter and into the filtered water vessel, C, to again raise the level thereof to the end of the vent-tube, filtration again ceases, and there is no further flow through the filter until the vent-tube is again uncovered. By this means, I am able to automatically start and cut off the filtering function by controlling the air vent by the level of the water in the container, C, and hence the filter is sealed and remains inactive and is rendered active by the height of the filtered water in the vessel, C.

In some instances, I may prefer to substitute for the plug of Fig. 2, the construction shown in Fig. 3. In most respects this plug, M, is similar to the one before mentioned, but it is provided with a float valve attachment, which consists of a float, N, carrying an appropriate washer, *m*, adapted to a seat, *n*, formed in the outer face of the plug and surrounding the air vent, *a'*, said float having fixedly secured to it, the parallel guide rods, or wires, O, which extend through the water passages, *b'*, and are retained to the plug by bending the inner ends of the wires to one side or by adopting other well known means for the purpose.

When using the modified form of plug shown in Fig. 3, the float normally lies within the filtered water vessel, C, and when the level of the water therein reaches the float, the latter is lifted thereby and until its washer, *m*, firmly seats and closes the lower end of the vent-tube, *a'*, thereby preventing the admission of air to the bottle and seal-

ing the filter substantially in the manner before described. When water is drawn from the filtered water vessel and the level of the water is correspondingly lowered, the float drops by gravity and thereby uncovers the inlet end of the vent tube and air may now rush through this tube and into the bottle to meet any tendency of a suction or vacuum to form therein by reason of the water now flowing through the filter and into the filtered water container.

In some respects I prefer to use the float valve structure just described, but manifestly my invention is not restricted to either form of plug, since the results accomplished in both cases are substantially identical.

The air which enters through the vent tube and into the interior of the bottle or demijohn is admitted quietly and there is a total elimination of the violent bubbling which is so common to water coolers of like character now in use and wherein the air is discharged through the body of water in the bottle and gives up its impurities to the water and causes the formation of bubbles of large size and of considerable pressure and which on bursting in the space above the water create spasmodic pulsations and the general disturbance of the water and the stirring up of sedimentary matter, which commonly collects about the interior of the mouth of the bottle.

By extending the lower end of the air-tube slightly below the mouth of the bottle or by employing the float in a like position, the end of the tube is sealed by the water in the container, C, but the lower end of the bottle neck is not submerged; in fact, the neck does not come in contact with the water to be consumed and consequently there can be no contamination of the water entering the container, C, by reason of this water coming in contact with the parts of the bottle which are usually handled by those whose duty it is to remove the bottles at stated times. Also, the air which enters through the vent tube to the interior of the bottle cannot affect the purity of the water delivered from the filter, since all of the contents of the bottle must pass through the filter before they can reach the filtered-water vessel.

The arrangement also, is such that the water in the cooling receptacle is maintained at a more uniform temperature in that the water is delivered into the same, from the bottle or demijohn more gradually and in no manner violently.

The water cooler described and shown is capable of being made at a minimum cost as the bottle presents no manufacturing difficulties, and the filter portion is readily removable for renewal or for cleansing purposes, and its dimensions are such that it and the plug may be removed at any time with-

out difficulty. Such a filter as has been described enables the ordinary city water to be used, filtered and purified, as a substitute for the costly mineral and distilled waters which are now used for drinking purposes.

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

1. The combination with a filtered water vessel having a faucet, of a liquid dispensing bottle adapted to be supported in an inverted position on said vessel and having a neck portion, a plug stopper for said neck portion and a filter medium fixedly secured to the stopper and removable therewith and sustained thereby in the dispensing vessel in an upright position, said filter medium and stopper having an internal air-venting passage which extends therethrough to a point above the level of the water in the dispensing vessel, said venting passage opening into the filtered water vessel and adapted to be sealed and unsealed by the level of the water therein.

2. The combination with a filtered water vessel, of a liquid filtering bottle adapted to be supported in an inverted position on said vessel, and having a neck portion, a plug stopper for said bottle adapted to enter said vessel, a filter medium fixedly secured to said stopper and sustained thereby in the bottle in an upright position, said filter medium having an internal air venting passage which extends to a point above the level of the water in the bottle, said venting passage extending through the stopper and communicating with the filtered water vessel and adapted to be sealed and unsealed by a difference in the level of the water therein, said filtered water vessel having a draw-off attachment.

3. The combination with a filtered water vessel, of a liquid filtering bottle adapted to be supported in an inverted position thereon, and having one end open, a plug stopper for the open end of the bottle, a cylindrical filter secured to the stopper and maintained upright in the liquid contents of the bottle, detachable connections between the stopper and filter, said stopper having a liquid passage leading from the interior of the filter into said vessel and said stopper having a venting tube which extends through the filter to a point above the level of the liquid in the bottle, the inlet to said tube being within the filtered water vessel and adapted to be sealed and unsealed by the level of the water therein, said filtered water vessel having a draw-off attachment.

4. The combination of a water bottle having a neck portion, a stopper for the bottle, said stopper and the neck of the bottle having interengaging connections, a filter axially aligned with the stopper and secured thereto and adapted to be sustained thereby

in the bottle in an upright position, said stopper having a water passage through it connecting with the interior of the filter, and said stopper having an air-venting passage through it, said passage extending through the filter to a point above the level of the liquid in the bottle, and a filtered water vessel into which the neck portion of the bottle enters, said vessel having a filtered water draw-off.

5. The combination with a liquid container having a mouth portion, of a plug stopper therefor, a cylindrical filter, and means securing the same to the stopper, said stopper having a liquid passage communicating with the interior of the filter and an air-venting passage which extends through the filter and beyond the same and to a point above the level of the liquid in the container, a receiver to which the container is fitted, said receiver having a filtered liquid draw-off and means carried by the plug for sealing the air vent thereof by the level of the liquid in said receiver.

6. The combination with a receiving vessel, of a liquid container fitted thereto and having a plug stopper, a filter secured to the stopper and maintained thereby in the container in an upright position, said plug having a water passage connecting the interior of the filter with said receiver and said plug having an air-venting passage which extends therethrough and through the filter to a point above the level of the liquid in the container, and means carried by the plug stopper for sealing the venting passage and the filter by the level of the liquid in the receiver, said receiver having a draw-off for filtered liquid.

7. The combination with a liquid container and dispenser, of a plug stopper therefor having an air-venting passage and a water passage, an upright filter medium supported on the plug axially in line therewith having a foraminous member and fibrous filtering material thereover, a follower on the plug, said follower and plug having opposed inclined surfaces between which one end of the filter medium is clamped, opposed inclined surfaces between which the other end of said filtering material is clamped, an air-venting tube connected to the plug and extending through the filter, and a venting tube axially in line with the filter and extending to a point above the level of the liquid in the container.

8. The combination with a liquid container, of a plug stopper therefor having an air-venting passage and a water passage, an upright filter medium supported on the plug axially in line therewith having a foraminous member and fibrous filtering material thereover, a follower on the plug, said follower and plug having opposed inclined

surfaces between which one end of the filter medium is clamped, opposed inclined surfaces between which the other end of said filtering material is clamped, an air-venting tube connected to the plug and extending through the filter, a venting tube axially in line with the filter and extending to a point above the level of the liquid in the container, and a check valve in the last-named venting tube.

9. A liquid dispensing and filtering bottle having a contracted neck portion, a plug stopper therefor, a filter on the stopper

and maintained thereby in the bottle in an upright position, said stopper and filter having an air passage which extends to a point above the level of the liquid in the bottle and which opens to the atmosphere at the outer end, said passage having a check valve and said plug having a liquid passage connecting with the interior of the filter, and a float valve attachment movably sustained on the plug and adapted to open and close the outer end of said air passage.

In testimony whereof I affix my signature.

HERMAN E. SCHULSE.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."