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TREATMENT OF LIQUIDS

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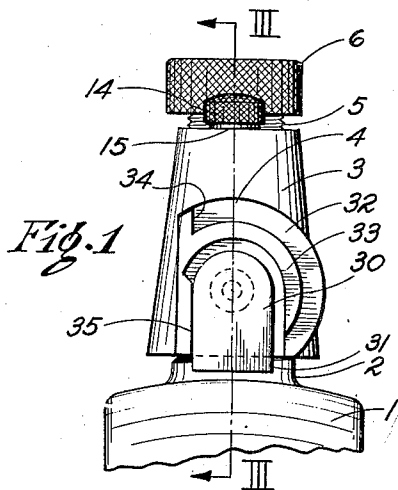
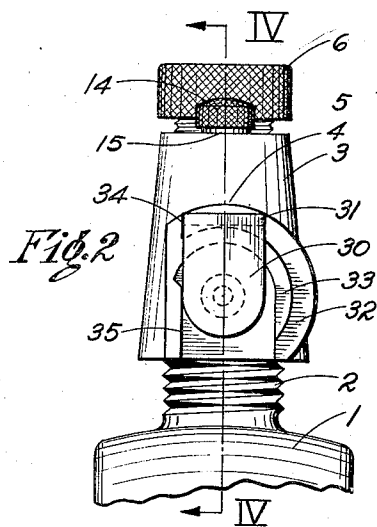
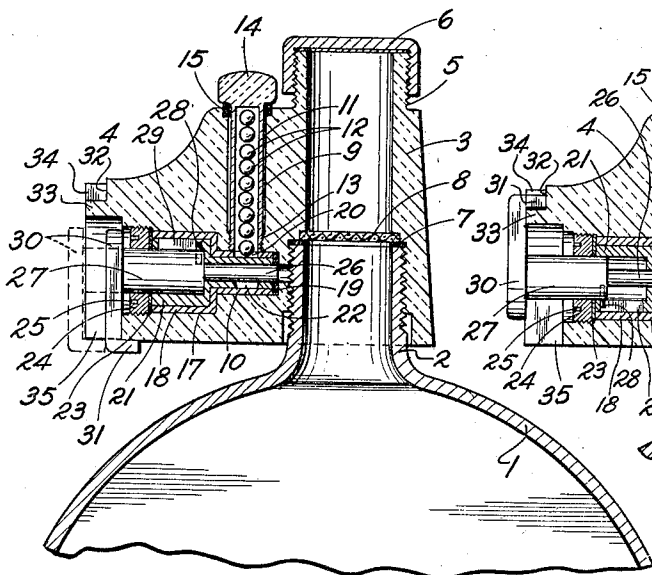
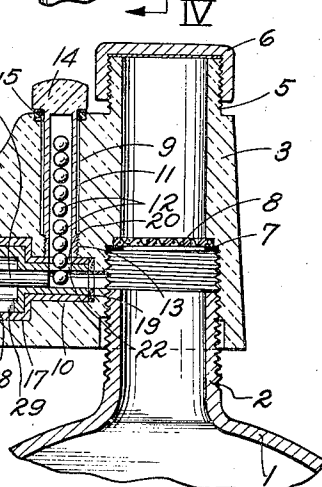
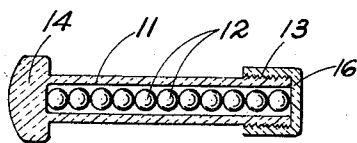


Fig. 5

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UNITED STATES PATENT OFFICE

2,369,232

TREATMENT OF LIQUIDS

Louis W. Hinton, Rocky River, Ohio

Application July 4, 1942, Serial No. 449,800

14 Claims. (Cl. 210—29)

This invention relates to the treatment of liquids, being particularly useful in the purification of water.

An object of the invention is to provide an improved liquid treating device.

Another object is to provide an improved liquid treating device which will be simple in construction.

Another object is to provide an improved liquid treating device which will be neat and attractive in appearance and free from projections which might catch on extraneous objects.

Another object is to provide an improved liquid treating device which will be extremely compact.

Another object is to provide an improved liquid treating device which will be capable of chemically treating a liquid.

Another object is to provide an improved liquid treating device which will carry a reserve supply of dry chemical material and protect the same from moisture.

Another object is to provide an improved liquid treating device from which dry chemical material may be easily introduced into a container of liquid.

Another object is to provide an improved liquid treating device which may be easily operated.

Another object is to provide an improved liquid treating device in which parts will be protected from moisture.

Another object is to provide an improved liquid treating device in which supplies of solid material may be easily replenished.

Another object is to provide an improved liquid treating device which may be easily and economically manufactured.

Another object is to provide an improved liquid treating device which will supply accurately predetermined quantities of solid liquid treating material.

Another object is to provide an improved liquid treating device which will provide convenient means for carrying and protecting supplemental supplies of solid chemical material.

Other objects will hereinafter appear.

The invention will be better understood from the description of one practical embodiment thereof, illustrated in the accompanying drawing, in which:

Figure 1 is a side elevational view of a device, showing the manner in which it may be applied to a canteen or similar article, and with the parts in the positions they occupy normally when the apparatus is in use, but not being actuated;

Figure 2 is a similar view showing the parts

moved to a position they occupy while the device is being actuated to supply a new charge of bactericidal material to the interior of the canteen;

Figure 3 is a fragmentary sectional view taken on the line III—III of Figure 1;

Figure 4 is a similar sectional view taken on the line IV—IV of Figure 2; and

Figure 5 is a view partially in section showing a magazine carrying a supplemental supply of treating material, as the same appears before being inserted in the device of the preceding figures.

This invention is a carrying forward of, and improvement upon, the invention shown in my copending application, Serial Number 308,240, filed December 8, 1939, and constitutes a continuation thereof as to all common subject matter.

As in the above mentioned application, the invention is shown herein as applied to a canteen 1 for drinking water, the operative parts being carried by a bushing-like fitting which may be secured to, as by being threaded upon the neck 2 of, the bottle or canteen 1 which is of generally conventional or any desired configuration. These parts only slightly extend beyond the neck 2 of the canteen.

The fitting consists of a generally tubular body 3 having formed unitarily therewith a projecting boss 4 at one side which is formed to house the magazine for treating material and the operating mechanism.

The upper end of the tubular body 3 ends in a threaded neck 5, to which may be secured a cap or closure 6, which for convenience may well be the one originally supplied with the bottle or canteen, the external thread on the fitting of this point being the same as that on the neck 2.

A gasket 7 may be positioned within the recessed end of the fitting, bearing upon the end of the neck of the canteen and sealing these parts effectively against leakage. Also a transverse strainer or filter 8 may be positioned at this point to prevent the passage of solid material.

In the projecting boss is formed a generally axial bore 9 intersecting a generally radial bore 10, the former of which serves to define a magazine for the solid material to be supplied, and the latter which contains parts of the actuating mechanism.

The magazine consists of a tubular bottle like container 11 having a cylindrical internal recess in which are contained a number of pills or pellets 12 of antiseptic or disinfectant material, such, for instance, as chloride of lime. To obtain an adequate size of pellet and still provide only

sufficient disinfectant or germicide for the contents of the canteen, this disinfectant material may be combined with salt or any other desired soluble material.

The exterior of the container or vial 11 has, adjacent its opening, a thread 13 which, when inserted in the fitting may be screwed into a corresponding thread formed in the bottom of the axial recess 9.

The closed end of the vial is provided with an enlarged head 14 by which it may be gripped and rotated.

This head, of course, may be square, hexagonal, octagonal, or circular and may be provided with flutes or knurls to give the user a firm grip thereon. It also forms a shoulder which bears upon a rubber or cork gasket 15 carried in a small counterbore-like recess at the outer end of the axial passage.

The threads 13 adjacent the open end of the vial also serve to receive a protective and sealing cap 16, which, of course, is removed and may be discarded before applying the vial to the fitting.

The vial, of course, may be made of any desired material such as glass, metal, or the like, but I prefer to make it of a non-breakable, non-corrosive material, such as many of the plastics now in use.

It likewise seems desirable to make the fitting itself of such plastic materials, both because of their non-corrosive nature and for lightness in weight, low specific heat, and other reasons.

The radial bore 10 extends outwardly slightly beyond the innermost end of the axial bore 9, where it is expanded by a counterbore-like section 17 and fixed within these two co-axial spaces is a stationary bushing 18 having its inner end bearing upon a gasket 19 of rubber, cork, or like material. In alignment with the axial bore, a perforation 20 is provided through the reduced end of the bushing 18.

Within the stationary bushing is positioned a rotatable bushing 21, likewise consisting of two co-axial cylindrical parts, the inner end bearing upon the gasket 19.

The reduced inner end of this bushing also has a perforation 22 corresponding to that at the end of the axial bore 9 and which may be brought into alignment with this end with the aperture 20 through the stationary bushing upon rotation.

Another gasket 23 of rubber, cork, or similar flexible material bears upon the outer ends of the stationary and rotatable bushings 18 and 21 and is held in place by a threaded ring 24 threaded within the outer end of the enlarged part of the radial bore, in which it may be secured or tightened, or from which it may be removed, by the use of a spanner or the like engaging grooves or recesses 25 formed in its outer surface.

Inside the rotatable bushing is a plunger consisting of a reduced end 26 which just fits the reduced end of the rotatable bushing 21 and an enlarged shank 27 fitting within the outer portion thereof.

The shank is provided with a projecting pin 28 which may slide in a slot 29 formed through the rotatable bushing and thus causes the bushing and plunger to rotate together while permitting a limited reciprocation of the plunger relative the bushing.

The outer end of the shank 27 is formed with a knob or head 30 shown as having an angularly

disposed flange 31 on one side which, when the plunger is in its innermost position as shown in solid lines in Figure 3, overlaps the bottom edge of the fitting body and prevents any accidental rotation of the plunger.

It will be apparent that when the plunger is retracted to its outermost position as indicated in dotted lines in Figure 3, its end just clears the perforations 20 and 22 through the two bushings, and that when it is rotated 180° from its normal closed position into the position shown in Figures 2 and 4, these two apertures are in alignment.

Hence, by retracting the plunger and turning it 180°, one pellet is permitted to drop through these apertures immediately in front of the end of the plunger 26, and returning the plunger to its innermost position will shove this pellet into the main tubular space within the fitting, from which it may drop into the canteen.

Of course, to permit the feeding of one of these pellets, it is necessary to loosen the fitting upon the threads on the neck of the canteen to the point where the inner end of the radial bore is elevated above the neck of the canteen as shown in Figure 4, while after the pellet has been thus delivered the fitting may again be tightened upon its threads to its normal position indicated in Figure 3.

It will be noted that when the plunger is in its innermost position, its end is tightly embraced by the gasket 19, preventing the entrance of any moisture into the space occupied by the main part of the plunger and into that holding the supply of pellets.

To insure the reciprocation of the plunger only with the parts in a position shown in Figures 1 and 3, and to prevent any accidental rotation thereof, the outer end of the boss 4 of the fitting has been formed with an arcuate surface 32 upon which the end of flange 31 may travel, and with an arcuate rib 33 which projects up under the flange, engaging the under surface of the head 30, these two surfaces, of course, being terminated to just clear the head of the plunger when it is in position to move properly to its closed position with the flange overlying the lower edge of the fitting.

Similarly, the boss 4 is formed with projecting stops 34 and 35 which engage the flat sides of the head 30 and so limit the amount of rotation in either direction which may be imparted thereto.

While I have described the illustrated embodiment of my invention in some particularity, obviously many others will readily occur to those skilled in this art, and I do not, therefore, limit myself to the precise details shown and described, but claim as my invention all embodiments, variations, and modifications thereof coming within the scope of the appended claims.

I claim:

1. A device for purifying liquids comprising a container for liquids having a part provided with a space for receiving a magazine and securing means for securing a magazine in said space, a magazine consisting of an open ended tubular container, securing means adjacent the open end of said container, and an enlarged head at the closed end of the container, the head having between its outer surface and the tubular portion of the container an abrupt shoulder adapted to engage a gasket.

2. A device for purifying liquids which comprises a tubular body having two intersecting

passages formed therein, one of said passages communicating with the interior of the tubular body, a magazine removably secured in one of said passages and dispensing apparatus within the other of said passages, the dispensing apparatus including pellet moving means, the tubular body having connecting means at one end for connecting a container for liquids, and a detachable closure at the other end of the body.

3. A device for purifying liquids comprising a body having a generally cylindrical passage therethrough, securing means adjacent one end of the passage securing the body to a container for liquid, a closure detachably mounted at the other end of said passage, the body having two intersecting recesses, one communicating with the passage therethrough and the other adapted to contain a plurality of pellets of solid liquid treating material, the first mentioned recess containing a rotatable and reciprocable pellet moving plunger extending to the exterior of the body, the plunger having a head adapted to be manually gripped to reciprocate and rotate the same.

4. A device for purifying liquids comprising a body having a generally cylindrical passage therethrough, securing means adjacent one end of the passage securing the body to a container for liquid, a closure detachably mounted at the other end of said passage, the body having two intersecting recesses, one communicating with the passage therethrough and the other adapted to contain a plurality of pellets of solid liquid treating material, the first mentioned recess containing a rotatable and reciprocable pellet moving plunger extending to the exterior of the body, the plunger having a head adapted to be manually gripped to reciprocate and rotate the same, a rotatable bushing surrounding said plunger, key means between the plunger and bushing causing them to rotate together and permitting their relative reciprocation, the bushing having an aperture adapted to be brought into alignment with the pellet containing recess.

5. A device for purifying liquids comprising a body having a generally cylindrical passage therethrough, securing means adjacent one end of the passage securing the body to a container for liquid, a closure detachably mounted at the other end of said passage, the body having two intersecting recesses, one communicating with the passage therethrough and the other adapted to contain a plurality of pellets of solid liquid treating material, the first mentioned recess containing a rotatable and reciprocable pellet moving plunger extending to the exterior of the body, the plunger having a head adapted to be manually gripped to reciprocate and rotate the same, a rotatable bushing surrounding said plunger, key means between the plunger and bushing causing them to rotate together and permitting their relative reciprocation, the bushing having an aperture adapted to be brought into alignment with the pellet containing recess, the head on the plunger having a lateral extension, and an arcuate rib formed on the body arranged to underlie said extension of the head when rotated from its normal position.

6. A device for purifying liquids comprising a body having a generally cylindrical passage therethrough, securing means adjacent one end of the passage securing the body to a container for liquid, a closure detachably mounted at the other end of said passage, the body having two intersecting recesses, one communicating with the passage therethrough and the other adapted to

contain a plurality of pellets of solid liquid treating material, the first mentioned recess containing a rotatable and reciprocable pellet moving plunger extending to the exterior of the body, the plunger having a head adapted to be manually gripped to reciprocate and rotate the same, a rotatable bushing surrounding said plunger, key means between the plunger and bushing causing them to rotate together and permitting their relative reciprocation, the bushing having an aperture adapted to be brought into alignment with the pellet containing recess, the head on the plunger having a lateral extension, and an arcuate rib formed on the body arranged to underlie said extension of the head when rotated from its normal position, projections also formed on the body adjacent the rib limiting the rotation of the head.

7. A device for purifying liquids comprising a body having a generally cylindrical passage therethrough, securing means adjacent one end of the passage securing the body to a container for liquid, a closure detachably mounted at the other end of said passage, the body having two intersecting recesses, one communicating with the passage therethrough and the other adapted to contain a plurality of pellets of solid liquid treating material, the first mentioned recess containing a rotatable and reciprocable pellet moving plunger extending to the exterior of the body, the plunger having a head adapted to be manually gripped to reciprocate and rotate the same, a rotatable bushing surrounding said plunger, key means between the plunger and bushing causing them to rotate together and permitting their relative reciprocation, the bushing having an aperture adapted to be brought into alignment with the pellet containing recess, a stationary bushing surrounding the rotatable bushing having an aperture in alignment with the pellet receiving recess, the head on the plunger having a lateral extension, and an arcuate rib formed on the body arranged to underlie said extension of the head when rotated from its normal position, projections also formed on the body adjacent the rib limiting the rotation of the head.

8. A liquid treating device for use with a liquid container having a threaded tubular outlet, comprising a bushing having a thread adapted to engage the thread of said container outlet, a tubular magazine provided in the bushing and adapted to contain a stack of pellets, a closure detachably secured to the bushing and overlying one end of the magazine, a guideway communicating with the other end of the magazine, a plunger slidable in said guideway, the guideway having a cross sectional area rendering the space within it and beyond the plunger capable of receiving only one pellet at a time from the magazine, a gasket within the bushing adapted to be seated upon the outlet of the container, the guideway opening through the side of the bushing between a portion of the bushing's thread and the gasket.

9. A liquid treating device for use with a liquid container having a threaded tubular outlet, comprising a bushing having a thread adapted to engage the thread of said container outlet, a tubular magazine provided in the bushing and adapted to contain a stack of pellets, a closure detachably secured to the bushing and overlying one end of the magazine, a guideway communicating with the other end of the magazine, a plunger slidable in said guideway, the guideway having a cross sectional area rendering the space

within it and beyond the plunger capable of receiving only one pellet at a time from the magazine, a gasket within the bushing adapted to be seated upon the outlet of the container, the guideway opening through the side of the bushing between a portion of the bushing's thread and the gasket, a filter across the interior of said bushing on the side of said gasket remote from said thread.

10. A liquid treating device for use with a liquid container having a threaded tubular outlet, comprising a bushing having a thread adapted to engage the thread of said container outlet, a tubular magazine provided in the bushing and adapted to contain a stack of pellets, a closure detachably secured to the bushing and overlying one end of the magazine, a guideway communicating with the other end of the magazine, a plunger slidable in said guideway, the guideway having a cross sectional area rendering the space within it and beyond the plunger capable of receiving only one pellet at a time from the magazine, a gasket within the bushing adapted to be seated upon the outlet of the container, the guideway opening through the side of the bushing between a portion of the bushing's thread and the gasket, a filter across the interior of said bushing on the side of said gasket remote from said thread, and a closure detachably secured to said bushing at the end remote from the outlet of said container.

11. A canteen comprising in combination with a container for containing liquids, a magazine carried thereby capable of receiving a plurality of solid pellets, a pellet carrier associated with said magazine and of substantially the same thickness as a single pellet and movable to move

one pellet at a time from the magazine and deliver the same to the interior of the container, the container having an outlet, and a filter overlying the outlet.

12. A canteen comprising in combination with a container for containing liquids and having an outlet, a magazine carried thereby capable of receiving a plurality of solid pellets, a pellet carrier associated with said magazine and of substantially the same thickness as a single pellet and movable to move one pellet at a time from the magazine and deliver the same to the interior of the container.

13. A canteen comprising in combination with a container for containing liquids and having an outlet, a tubular magazine carried thereby capable of receiving a plurality of solid pellets stacked one upon another, a guideway intercepting said magazine and communicating with the interior of the container, a pellet moving plunger slidable in said guideway movable selectively to clear and to intercept the space in said magazine, the space within the guideway being only slightly greater than the cross sectional area of a single pellet.

14. A device for purifying liquids comprising a container for liquids having a part defining a space for receiving a magazine and securing means for securing a magazine in said space, a magazine consisting of an open-ended tubular container, securing means engageable with those of the liquid container, the magazine having an enlarged head at its closed end overlying and projecting beyond the space defined by the liquid container.

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