Jan. 9, 1951

H. I. MACHINIST

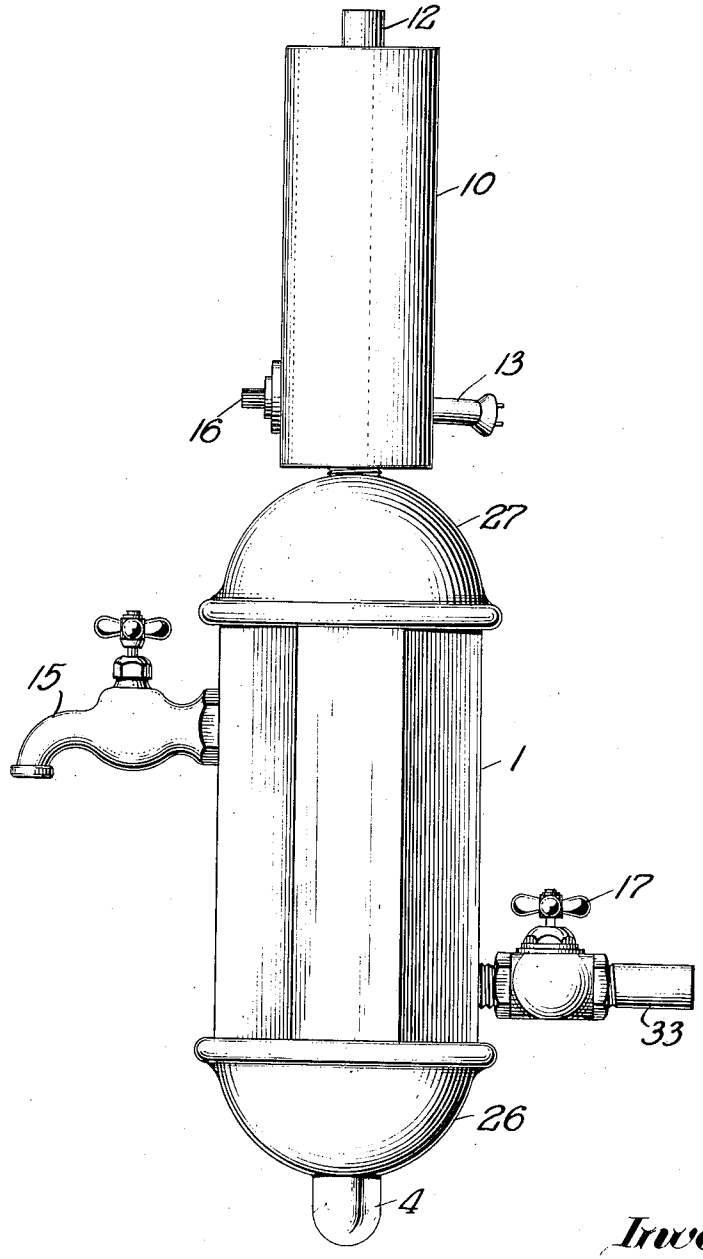
2,537,774

ELECTRONIC PURIFIER

Filed June 23, 1948

2 Sheets-Sheet 1

Fig. 1.



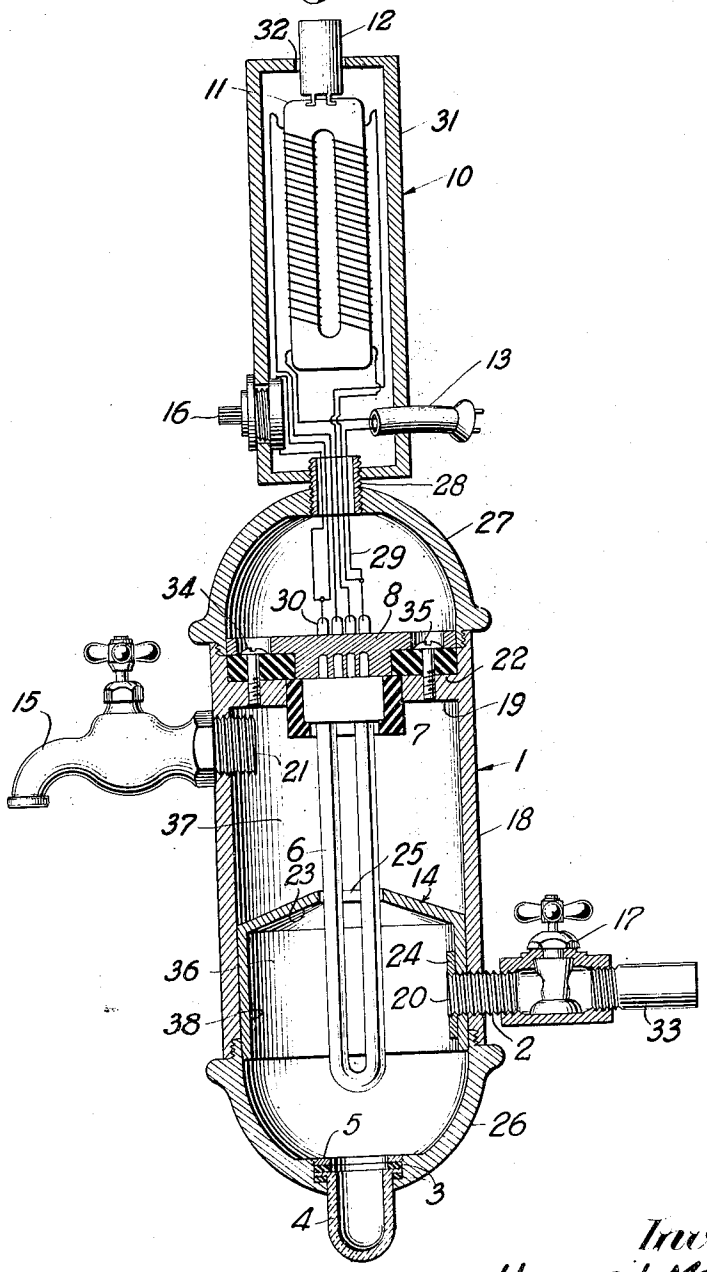
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Fig. 2.



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UNITED STATES PATENT OFFICE

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ELECTRONIC PURIFIER

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Application June 23, 1948, Serial No. 34,751

6 Claims. (Cl. 21—102)

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This invention relates to a purifier for liquids and more particularly to a liquid purifier in which the bacteria is electronically removed.

It is an object of the instant invention to simplify the purification of liquids.

A further object is to provide an electronic purifier that can remain in operation for relatively long periods of time with servicing.

Still another object is to provide an electronic purifier that is readily serviced.

It is also an object of the instant invention to provide an electronic purifier that is of simple construction and requiring little space.

Other objects of the instant invention will become apparent in the course of the following specification.

In the accomplishment of these objectives, the electronic liquid purifier may be made with an irradiating chamber toward the base of which is an intake port and toward the top an outlet port for any liquid. An electronic lamp of the germicidal variety is inserted in an inverted position in the chamber with the base of the lamp and the coacting socket suitably protected from the liquid. The bottom of the irradiating chamber may be made removably and upwardly therein is inserted an irradiating partition so formed that the lamp extends downwardly therethrough. By making the passageway between the lamp and the partition narrow, all the liquid entering the base of the chamber is brought in substantial contact with the glass of the lamp. The usual electrical components for actuating the lamp may be mounted in a separate compartment above the irradiating chamber, and a removable transparent bacteria trap at the base of the chamber permits ready inspection and servicing of the device.

The invention will appear more clearly from the following detailed description when taken in connection with the accompanying drawings showing, by way of example, a preferred embodiment of the inventive idea.

In the drawings:

Figure 1 is a front elevational view of the electronic liquid purifier constructed in accordance with the principles of this invention.

Figure 2 is a sectional view along the vertical center line of the purifier shown in Figure 1.

Referring now in greater detail to the drawings in which like reference numerals indicate like parts, reference numeral 1 indicates the irradiating chamber, 10 the electrical component compartment, 14 the irradiating partition, and 6 the electronic lamp of the germicidal variety.

The irradiating chamber 1 may be formed with

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the hollow cylindrical member 18 having an open base and a top member 19 formed integral with the cylindrical member 18 or otherwise as desired. Toward the base of the cylindrical member 18 is the liquid intake port 20 and toward the top the liquid outlet port 21.

The electronic lamp 6 of the germicidal variety is supported by the socket 8 in an inverted position within the chamber 1 as shown in Figure 2. The socket 8 is secured to the top member 19 with the gasket 22 and the screws 34 and 35 which prevents the liquid from coming in contact with the electrical connections of both the socket 8 and lamp 6 or leaking out of the top of the chamber 1.

Through the open base of the cylindrical member 18, the irradiating partition 14 is inserted. The partition 14 comprises a hollow cylindrical member 38 having an open base and open top and a hollow cone frustum 23 with open base and top superposed on the upper rim thereof. The diameter of the cylindrical member 38 is designed so that the partition 14 fits snugly against the inside surface portion of the member 18 when inserted and an opening is left in the side to register with the intake port 20. A nipple 24 with turned up rim may be inserted through the alined openings and threaded into another nipple secured between a shut-off valve 17 in the pipe line and the wall of the cylindrical member 18 to hold the partition 14 in position which permits the partition to be readily removed for cleaning and the like. The diameter of the top of the frustum 23 is sufficient to permit the lamp 6 to be inserted therethrough as shown in Figure 2 and leaving a relatively small space 25 therebetween. In this way, all the liquid entering the base of the irradiating chamber 1 through the inlet port 20 is forced upwardly by the partition 14 in close proximity to the glass of the lamp 6 before passing to the upward part of the chamber 1 and seeking the outlet port 21. The irradiating partition 14 is preferably made of highly reflective material such as alzak aluminum or highly polished chrome or the like.

Over the open bases of the irradiating chamber 1 and the irradiating partition 14, the base cap 26 is removably secured by coacting threaded portions. At the bottom of the base cap 26 is the bacteria trap 4 which may be made of any suitable transparent material with an outwardly turned upper rim for fitting into a coacting aperture in the bottom of the cap 26 where it is secured between the gaskets 3 by the nut 5 thread-

ed into a coacting tap on the inside surface portion of the cap 26.

The faucet 15 may be secured to the outlet port 21 by any suitable means.

A cover 27 or the like may be screwed into the top rim of the irradiating chamber 1 as shown in Figure 2 for protecting the electrical parts of the socket 8 and for supporting the electrical component compartment 10, later described, by the nipple 28 threaded into coacting taps between the chamber and compartment. Suitable electrical conductors 29 are electrically connected to the usual prongs 30 of the socket 8 and extend upwardly through the nipple 28 to the components as shown in the following paragraph.

The component compartment 10 comprises a housing 31 disposed around the transformer 11 which is secured therein by any suitable means. The housing 31 is attached at the base by the nipple 28 to the irradiating chamber 1 as previously shown. At the top of the housing 31 is an opening 32 for the removable insertion of the starter 12 which is in a convenient location for replacement whenever necessary. Through one side of the housing 31 is the switch 16 and through the opposite side the cable 13 shielding the conductors leading to any suitable source of electrical power. The conductors 29 and the like leading from the prongs 30 of the socket 8 to the switch 16, transformer 11, starter 12, and thence to the source of electrical power are connected in the usual and well known manner for lamps of the type described.

The operation of the electronic purifier is as follows: The switch 16 is turned to the "on" position which in coaction with the transformer 11 and starter 12 causes the lamp 6 to give off the purifying rays. The faucet 15 is then turned to the "on" position and the liquid or water from the pipe line 33 under pressure passes through the shut-off valve 17, which has previously been turned to the "on" position, thence through the inlet port 20 into the lower chamber 36, thence upwardly, directed by the irradiating partition 14 toward the glass of the lamp 6 by virtue of the narrow opening 25 in the top of the partition 14 into the upper chamber 37, toward the outlet port 21. If desired, the switch 16 may be turned to the "on" position only when the faucet 15 is open or about to be opened. When servicing the purifier, the shut-off valve 17 is moved to the closed position, the base cap 26 unscrewed, the nipple 24 removed which releases the irradiating partition 14 to be slipped out of the chamber 1. Thus removed, all parts of the chamber 1 are readily cleaned and replaced.

It is apparent that the specific illustrations shown above have been given by way of illustration and not by way of limitation and that the structures above described are subject to wide variation and modification without departing from the scope or intent of the invention, all of which variations and modifications are to be included within the scope of the present invention.

What is claimed is:

1. A liquid purifier comprising an irradiating chamber in combination with an electronic lamp of the germicidal type, the irradiating chamber comprising a closed hollow body portion, the body portion having a liquid intake port and a liquid outlet port, an irradiating partition disposed in the body portion and adapted to divide the same into two compartments with the intake port on one side and the outlet port on the other side, the partition having an opening greater than the diameter of the lamp and adapted for the insertion of the same therethrough, a socket for the lamp disposed on the inside surface portion of the chamber and alined with the opening in the partition, an electric power source for the socket, and means electrically connecting the power source to the socket.

2. A liquid purifier comprising an irradiating chamber in combination with an electronic lamp of the germicidal type, the irradiating chamber comprising a body portion, a top member and a base member for the body portion, a liquid intake port through the body member substantially at the bottom, a liquid outlet through the body member substantially at the top, an irradiating partition transversely disposed in the body portion between said ports, the partition having an opening of greater diameter than the lamp and adapted for the insertion of the same therethrough, a socket for the lamp disposed on the inside surface portion of the top member and alined with the opening in the partition, an electric power source for the lamp, and means electrically connecting the power source to the socket.

3. A liquid purifier comprising an irradiating chamber in combination with an electronic lamp of the germicidal type, the irradiating chamber comprising a body portion, said body portion having a top member and a removably disposed base member, a bacteria trap in the base member, a liquid intake port through the body portion above the base member, a liquid outlet port through the body portion below the top member, means opening and closing said ports, an irradiating partition transversely disposed in the body portion between the inlet and outlet ports, said partition having an opening of substantially greater diameter than the lamp and adapted for the insertion of the same therethrough, a socket for the lamp disposed on the inside surface portion of the top member and alined with the opening in the partition, an electric power source for the socket, and means electrically connecting the power source to the socket.

4. A liquid purifier comprising an irradiating chamber in combination with an electronic lamp of the germicidal type, the irradiating chamber comprising a substantially hollow cylindrical body portion, a top member disposed in the body portion, a socket for the lamp disposed on the inside surface portion of the top member substantially along the vertical center line of the body portion and adapted for the inverted insertion of the lamp, a base cap removably disposed on the bottom of the body portion, a transparent bacteria trap removably disposed in the base cap, an outlet port through the body portion below the top member, an inlet port through the body portion above the base cap, means opening and closing said ports, the liquid purifier further comprising an irradiating partition said partition comprising a hollow cylindrical member with open base and open top and having an outside diameter sufficient for insertion in the base of the irradiating chamber and adapted to fit tightly against the inside surface portion of the wall thereof, a hollow cone frustum with open base and open top disposed at the top of the cylindrical member, the diameter of the top of the frustum being substantially greater than the diameter of the lamp and adapted for the insertion of the same therethrough, the cylindrical member having an opening in the side and adapted to register with the intake port of the irradiating chamber when the partition is in-

serted therein, an electrical component chamber for the lamp disposed above the irradiating chamber, an electrical power source for the electrical components, and means electrically connecting the power source, electrical components, and lamp.

5. A liquid purifier comprising an irradiating chamber, said chamber comprising a hollow cylindrical body portion, said body portion having a liquid intake port substantially above the bottom and a liquid outlet port substantially below the top, a top member disposed in the body portion below the upper rim and substantially perpendicular to the axis of the body portion, a socket for an electronic lamp of the germicidal type disposed in an inverted position on the inside surface portion of the top member substantially along the axis of the body portion, an electronic lamp of the germicidal type for the socket, a base cap removably disposed on the bottom of the body portion, a transparent bacteria trap removably disposed in the bottom of the base cap; the liquid purifier further comprising an irradiating partition removably disposed in the body portion, said partition comprising a substantially hollow cylindrical body portion with open top and base and adapted to fit tightly against the inside surface portion of the irradiating chamber when inserted upwardly through the open base thereof, a hollow cone frustum with open base and top disposed at the top of the hollow cylindrical body portion, the diameter of the top of the cone frustum being substantially greater than the diameter of the lamp and adapted for the insertion of the same therethrough, the hollow cylindrical body portion of the partition having an opening in the side and adapted to register with the intake port of the irradiating chamber when the partition is inserted therein, means securing the partition in the irradiating chamber, an electrical component chamber removably disposed above the irradiating chamber, a transformer and a starter disposed in said component chamber, an electrical power source for the components and socket, an electrical circuit between said power source, components, and lamp, and means opening and closing said circuit.

6. A purifier for a liquid comprising an irradiating chamber, said chamber comprising a substantially hollow cylindrical body portion, said body portion having a liquid intake port substantially at the bottom and a liquid outlet port substantially at the top, means opening and closing said ports, a top member disposed in the body portion below the upper rim thereof and in a plane substantially perpendicular to the

axis, a socket for an electronic lamp of the germicidal type removably disposed in an inverted position on the inside surface portion of the top member substantially along the axis of the cylindrical body portion, an electronic lamp of the germicidal type removably disposed in the socket and adapted to extend downwardly in the irradiating chamber, means sealing the socket and base of the lamp from the liquid, a base cap removably disposed on the bottom of the cylindrical body portion, a transparent bacteria trap removably disposed in the bottom of the base cap, means sealing the bacteria trap against the passage of the liquid; the purifier further comprising an irradiating partition removably disposed in the irradiating chamber, said partition comprising a substantially hollow cylindrical body portion with open base and top and adapted to be fitted upwardly through the open base of the hollow cylindrical body portion of the irradiating chamber and snugly against the inside surface portion thereof, the hollow cylindrical body portion of the partition having an opening in the side registering with the intake part of the irradiating chamber when in position, means through said opening coacting with the intake port and adapted to releasably maintain the partition in the irradiating chamber; the irradiating partition further comprising a hollow cone frustum with open base and top disposed at the top of the hollow cylindrical body portion, the diameter of the top of the cone frustum being greater than the diameter of the lamp and adapted for the insertion of the same therethrough; the purifier further comprising an electrical component compartment for the lamp removably disposed at the top of the irradiating chamber, a transformer disposed in the component compartment, a starter removably disposed in the end of said compartment, an electrical power source for the components and lamp, an electrical power source for the components and lamp, electrical conductors between the components, lamp and electrical power source, a switch disposed in the side of the component compartment connected in the circuit and adapted to turn the lamp "on" and "off."

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