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STERILIZING APPARATUS

Original Filed Nov. 17, 1930

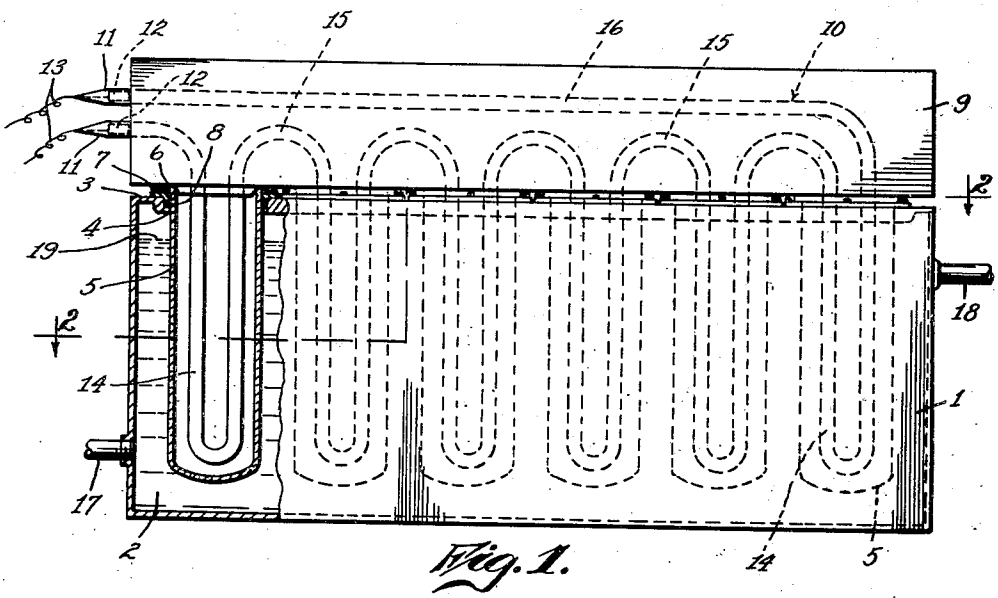

Fig. 1.

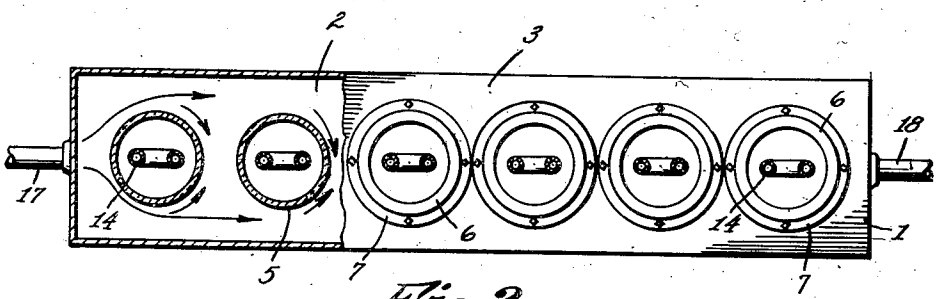

Fig. 2.

Inventor

James C. Ross:

By Lyon & Lyon

Attorneys.

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JAMES C. ROSS, OF LOS ANGELES, CALIFORNIA

STERILIZING APPARATUS

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This invention relates to sterilizing apparatus intended, particularly, for sterilizing liquids, for example, milk, water, wine, orange juice, or other liquids, through the agency of ultra violet rays. Such apparatus usually includes a quartz generator tube, the wall of which will pass violet and ultra violet rays. However, if such a generator tube is immersed in a liquid to be sterilized, it will contaminate the liquid with ozone, nitrous oxide, or other objectionable gases.

The general object of this invention is to produce a simple apparatus in which a large quantity of liquid to be sterilized can be effectively subjected to the action of said rays or energy, and without bringing the liquid directly into contact with the wall of the generator tube.

Heretofore, such generator tubes have been placed within quartz shells or tubes to prevent the formation of gases, as suggested above, and my invention constitutes an improvement in the construction of apparatus for this purpose, enabling a relatively large area of generator tube to be readily employed and of a form which enables a tube to be employed of different lengths to regulate the capacity of the apparatus.

A further object of the invention is to produce a sterilizing apparatus of this type which will insure the subjection of all portions of the liquid to the sterilizing rays.

Further objects of the invention will appear hereinafter.

The invention consists in the novel parts and combinations of parts to be described hereinafter, all of which contribute to produce an efficient sterilizing apparatus.

A preferred embodiment of the invention is described in the following specification, while the broad scope of the invention is pointed out in the appended claims.

In the drawing:

Figure 1 is a side elevation of apparatus embodying my invention, with one end of the body of the device broken away and shown partially in section.

Figure 2 is a plan and partial section taken about at the location of the line 2—2, of Fig. 1.

Referring more particularly to the parts, the apparatus includes a casing composed of a body 1 of box form, and preferably of elongated form as shown, so as to present a sterilizing chamber 2, having an upper horizontal wall 3, said wall being provided with a plurality of openings 4 preferably disposed equidistant from each other. Through each opening 4 a quartz tubing 5 projects downwardly, each tube being provided with a flange 6 at its upper end that may be supported on a gland 7 cooperating with the stuffing box carrying packing 8 to insure a water-tight connection at the points where the tubes pass down through the head or cover wall 3.

The apparatus includes, also, a cover 9 that is in the form of a rectangular block, preferably of an insulating composition, of the character of bakelite. This cover has molded into it a continuous quartz tube 10 which is a generator tube capable of generating sterilizing rays, such as violet rays, or ultra violet rays. For this purpose, I may employ any type of tube capable of generating ultra violet rays. This tube 10, preferably, has both ends 11 located at the same end of the block or cover and these ends carry the terminals 12 for the current that energizes the active gases or vapors within the tube.

The terminals 12 are provided with leading-in wires 13 which enable the terminals to be connected to an electric circuit.

The tube at the underside of the block is formed with a plurality of extensions 14 preferably of U-form, which are disposed apart to correspond with the centers of the quartz tubes so that the block may be set on top of the body with the U-shape extension projecting down in the quartz tubes. (See Fig. 1.) The U-shaped extensions are connected by return bends 15 in the pipe that are molded into the block. The tube includes a straight extension 16 passing along the block above the return bends.

The body 1 is provided with means for circulating a liquid through the sterilizing chamber. For this purpose, I provide an inlet 17 at one end of the body, near the bottom, and an outlet 18 at the other end of the body,

at an elevation which will determine the overflow or level 19 of the liquid that is being sterilized.

As the sterilizing liquid flows in through the inlet 17, it will pass, as indicated by the arrows in Figure 2, along the sides of the quartz tube 5 and also pass through the space between the same. In this way the liquid in passing through the sterilizer will be subjected again and again to the action of the sterilizing agent as it passes the U-form extensions.

What I claim is:

1. In a sterilizing apparatus, the combination of a body with a sterilizing chamber having an upper wall, and having a plurality of openings therein, a plurality of quartz tubes mounted in said openings and extending down into the interior of the said body, a cover seating on said body an having a continuous light-generating tube set in the same with means for producing sterilizing rays emanating from the tube, said tube having extensions projecting downwardly from the cover and received respectively in the said quartz tubes, and means for passing the liquid to be sterilized through the said body and past the said quartz tubes.

2. In a sterilizing apparatus, the combination of an elongated body with a sterilizing chamber within the same, said body having a sterilizing chamber with an upper wall having a plurality of openings therein, a plurality of quartz tubes extending into said openings from above and projecting down into the sterilizing chamber, a cover seating on said body and having a continuous light generating tube set in the same with means for producing sterilizing rays emanating from the tube, said tube having U-form extensions projecting downwardly from the cover and received respectively in the said quartz tubes, and means for passing the liquid to be sterilized longitudinally through the said sterilizing chamber and past the said quartz tubes.

3. In a sterilizing apparatus, the combination of an elongated body with a sterilizing chamber within the same, said body having a sterilizing chamber with an upper wall having a plurality of openings therein, a plurality of quartz tubes extending into said openings from above and projecting down into the sterilizing chamber, a cover seating on said body and consisting of a molded composition, and having a continuous generating tube set in the same with means associated with the tube for producing sterilizing rays emanating from the tube, said tube having U-form extensions projecting downwardly from the cover and received respectively in the said quartz tubes, and means for passing the liquid to be sterilized longitudinally through the said sterilizing chamber and past the said quartz tubes.

4. In a sterilizing apparatus, the combination of an elongated body with a sterilizing chamber within the same, said body having a sterilizing chamber with an upper wall having a plurality of openings therein, a plurality of quartz tubes extending into said openings from above and projecting down into the sterilizing chamber, a cover seating on said body and consisting of a moulded composition, and having a continuous generating tube set in the same with means associated with the tube for producing sterilizing rays emanating from the tube, said tube having U-form extensions projecting downwardly from the cover and received respectively in the said quartz tubes, and means for passing the liquid to be sterilized longitudinally through the said sterilizing chamber and past the said quartz tubes, said continuous tube having both ends projecting from the cover adjacent to each other at the same end of the cover.

Signed at Los Angeles, California, this 12th day of November, 1930.

JAMES C. ROSS.