

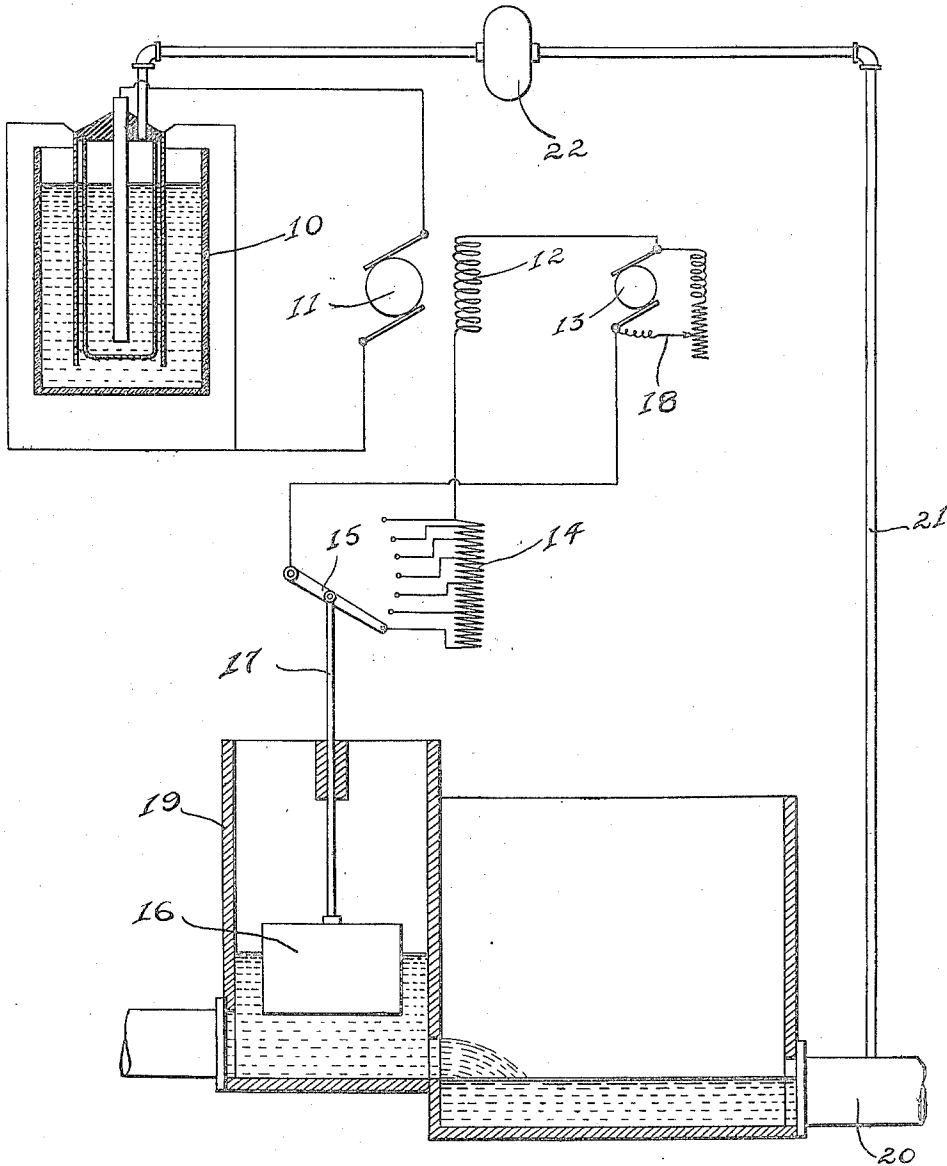
R. E. CASE.
STERILIZING APPARATUS.
APPLICATION FILED MAR. 13, 1916.

1,277,378.

Patented Sept. 3, 1918.

2 SHEETS—SHEET 1.

Fig. 1.



Ralph E. Case Inventor
By *His Attorney*
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2 SHEETS—SHEET 2.

Fig. 2.

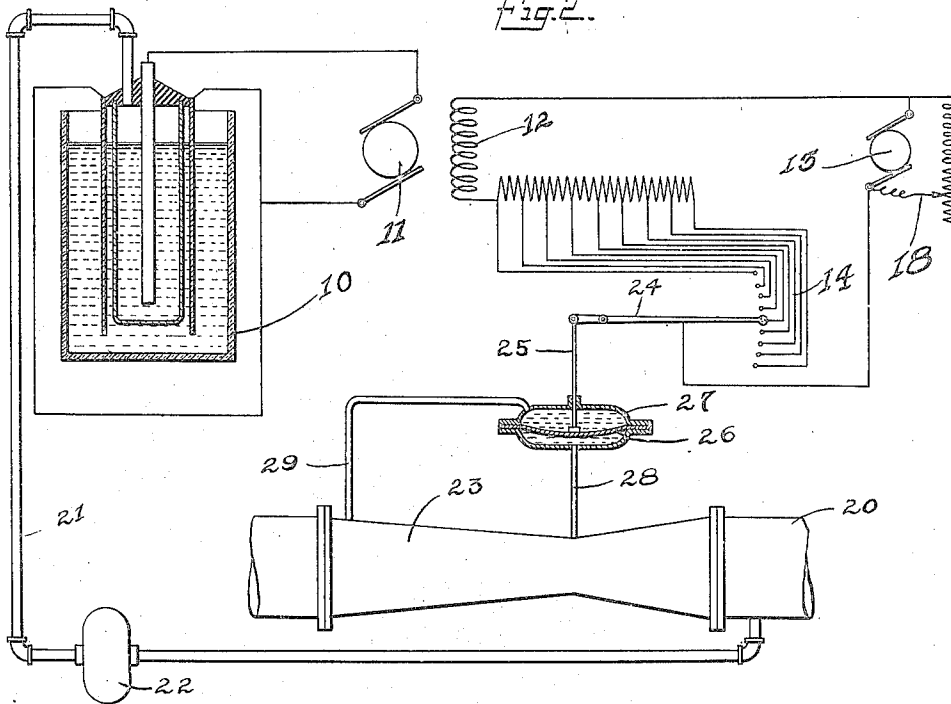
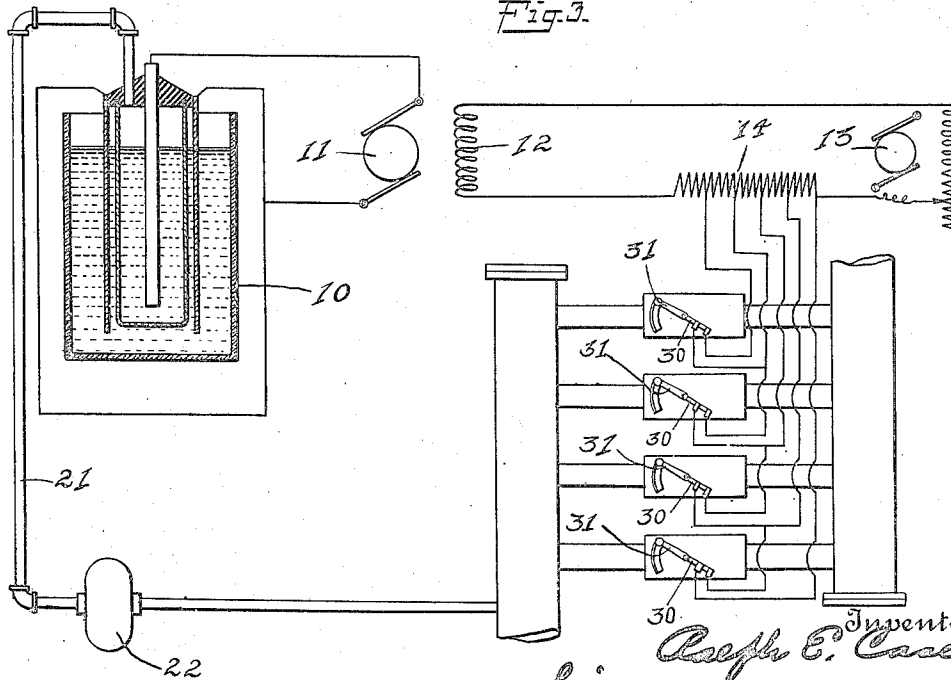


Fig. 3.



Inventor
Ralph E. Case
By his Attorneys
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UNITED STATES PATENT OFFICE.

RALPH E. CASE, OF SOUTH NORWALK, CONNECTICUT, ASSIGNOR TO THE R. U. V. COMPANY, INC., OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

STERILIZING APPARATUS.

1,277,378.

Specification of Letters Patent.

Patented Sept. 3, 1918.

Application filed March 13, 1916. Serial No. 83,711.

To all whom it may concern:

Be it known that I, RALPH E. CASE, a citizen of the United States, residing at South Norwalk, county of Fairfield, and State of Connecticut, have invented certain new and useful Improvements in Sterilizing Apparatus, of which the following is a full, clear, and exact description.

The invention which constitutes the subject matter of this application relates to the art of sterilizing liquids. More specifically the invention has to do with means for automatically supplying a purifying chemical to a liquid in proportion to the amount of the flow. To do this an electrolytic cell for the production of a purifying chemical is employed, the current used in said cell being variably controlled by the quantity of liquid passing through the conduit.

In the drawings:

Figure 1 is a detail diagrammatic view of one form of a complete apparatus embodying my invention;

Fig. 2 illustrates a modified form of the control shown in Fig. 1, and

Fig. 3 is still further modified form of the control.

Referring to the drawing in detail the reference numeral 10 designates an electrolytic cell for generating a sterilizing chemical such as chlorin, and in order to produce the chlorin I preferably employ a concentrated solution of sodium chlorid as the electrolyte. If an electric current be sent through the solution sodium appears at the cathode and chlorin at the anode. Under the ordinary conditions of electrolysis the sodium set free immediately acts upon the water, liberating hydrogen, and forming sodium hydroxid. With suitable arrangements, as understood by those skilled in this art, to cause the evolution of the chlorin apart from the sodium hydroxid this process is made available for the commercial production of chlorin. It will of course be understood that other soluble chlorids may be similarly electrolyzed.

The electric current employed to effect the electrolytic production of the chlorin is derived from the generator 11 having a field 12, an exciter 13 in circuit therewith and a rheostat 14 having a number of resistances and the usual spring arm 15 whose position is controlled by the height of the float 16

to which it is connected by the rod 17. The float rod 17 may instead be connected to the spring arm 18 of the exciter field. In any event the current flowing through the cell is governed by the position of the float. The height of the water in the receptacle 19, and therefore the height of the float, is made proportional to the amount of water flowing by the proper shaping of the outlet orifice therefrom. This orifice may be shaped in accordance with the formula.

$$Q = KH^{3/2}$$

where Q represents the quantity of liquid passing through the receptacle, K a constant, and H the height of the liquid in the receptacle 19. On the other hand if an ordinary orifice be employed the steps of resistance are varied so that the current flowing through the electrolytic means will be proportional to the quantity of liquid flow. In this way, that is by the rising and falling of the float, any number of resistances may be cut out or brought into the circuit, and the quantity of chlorin or other chemical produced will be directly proportional to the quantity of water flowing through the pipe 20. The apparatus is provided with a conduit 21 through which the chlorin is passed into the pipe 20 to sterilize the liquid flowing therethrough. The receptacle 19 is preferably connected to and just beyond the filtering means (not shown). A pump shown diagrammatically at 22, may be employed to feed the chlorin generated by the cell to the liquid flowing through pipe 20.

Fig. 2 shows a modified form in which a Venturi tube 23 is employed to control an electrical device similar to that shown in Fig. 1. The spring arm 24 is connected to the rod 25 which is in turn connected to a diaphragm 26 located in the housing 27, the position of which diaphragm and therefore the rod 25 and arm 24 is dependent upon the difference in pressure above and below said diaphragm and this is determined, through the instrumentality of the pipes 28 and 29 connected to the Venturi tube, by the quantity of water flowing through said tube, the arrangements and adjustments being such that the amount of sterilizing agent produced is proportional to the amount of water flowing. Connected to the pipe 20 is also a conduit 21 for the chlorin or other steriliz-

ing agent to which a pump or aspirator 22 is connected to force the sterilizing agent produced in cell 10 into the said pipe 20.

In Fig. 3 is illustrated a construction in which the control of the current is effected by a plurality of switches 30 which are automatically actuated by levers 31 which open and close hydraulic valves which, for instance, admit water to filters in a filter plant.

In connection with the various modifications illustrated, it will be noted and understood that immediately upon the cessation of the liquid flow the circuit through which the current passes is automatically broken and no further purifying chemical is produced until the liquid flow is resumed. In Figs. 1 and 2 the circuit is broken by the arms 15 and 24 being disconnected from the rheostat 14. In Fig. 3 this happens when the lever 31 is "closed", said lever provided with any suitable connection to the arm 30 for that purpose.

Any suitable or well known means may be employed to maintain the concentration and the temperature of the electrolyte constant. Furthermore any of the levers 15, 24 and 30 may be provided with automatically controlled contacts to independently or simultaneously put in service one or more electrolytic cells.

What I claim is:

1. In an apparatus for sterilizing liquids, comprising a conduit through which the liquid to be sterilized is adapted to flow, in combination with an electrolytic means for the production of a purifying chemical, means for conveying the chemical from said electrolytic means to said conduit as it is produced, means for automatically breaking and making the circuit of the electrolyzer upon the cessation and resumption of liquid flow through said conduit, and means for varying the quantity of chemical produced in proportion to the amount of liquid passing through said conduit.

2. In an apparatus for sterilizing liquids,

comprising a conduit through which the liquid to be sterilized is adapted to flow, in combination with an electrolytic means for the production of a purifying chemical, means for conveying said chemical to said liquid as it is produced, and means for automatically controlling the production of the chemical in proportion to the quantity of liquid passing through said conduit.

3. In an apparatus for sterilizing liquids, comprising a conduit through which the liquid to be sterilized is adapted to flow, in combination with an electrolytic means for automatically regulating the production of a chemical in proportion to the liquid passing through said conduit, and means for forcing said chemical as it is produced into the liquid passing through said conduit.

4. In an apparatus for sterilizing liquids, a conduit through which the liquid is adapted to flow at varying speeds, an electrolytic means for producing a purifying chemical to be added to said liquid, means for conveying said chemical to said liquid as it is produced, and means actuated by the flow of liquid for controlling the amount of purifying chemical added thereto comprising mechanism which carries the field of the generator supplying current to the electrolytic cell in such a way that the amount of purifying chemical produced will be proportional to the amount of liquid flowing through said conduit.

5. In an apparatus for sterilizing liquids, comprising a conduit through which the liquid to be sterilized is adapted to flow, in combination with an electrolytic means for automatically regulating the production of a chemical in proportion to the quantity and by the flow of the liquid passing through said conduit, and means for conveying said chemical to said liquid as it is produced.

In testimony whereof I hereunto affix my signature.

RALPH E. CASE.