(No Model.)

E. HERMITE.

APPARATUS FOR ELECTROLYZING CHLORID SOLUTIONS.

No. 553,465. Patented Jan. 21, 1896.

Fig. 2.

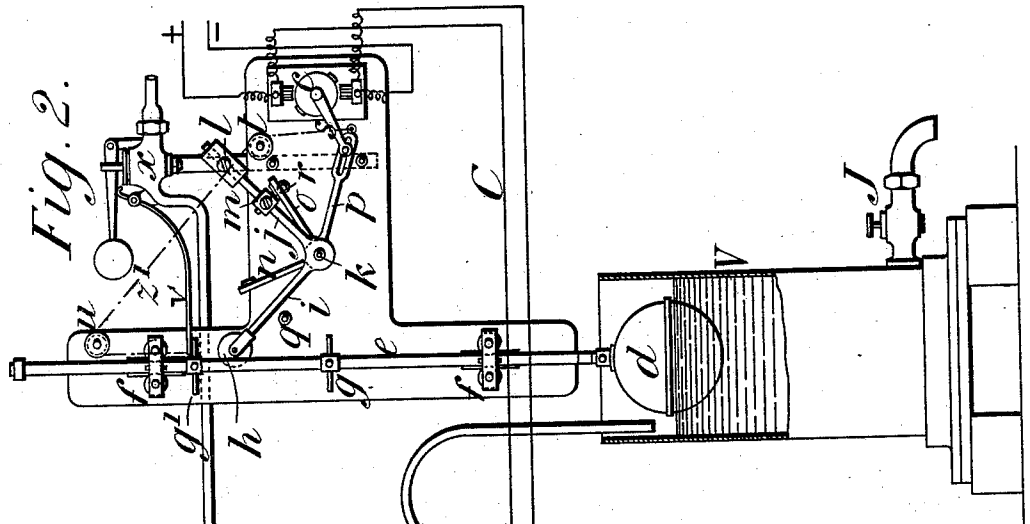
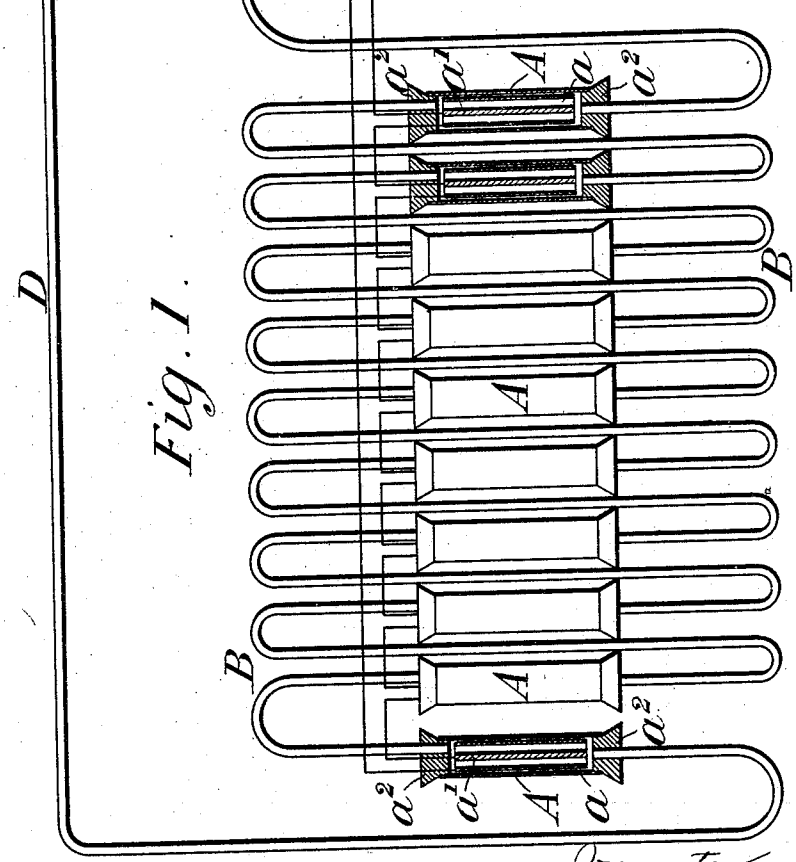


Fig. 1.



Witnesses;
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UNITED STATES PATENT OFFICE.

EUGENE HERMITE, OF LONDON, ENGLAND, ASSIGNOR OF TWO-THIRDS TO EDWARD JAMES PATERSON AND CHARLES FRIEND COOPER, OF SAME PLACE.

APPARATUS FOR ELECTROLYZING CHLORID SOLUTIONS.

SPECIFICATION forming part of Letters Patent No. 553,465, dated January 21, 1896.

Application filed June 22, 1895. Serial No. 553,709. (No model.)

To all whom it may concern:

Be it known that I, EUGENE HERMITE, a citizen of the United States, residing at Pownall Road, Dalston, in the city of London, England, have invented certain new and useful Improvements in Apparatus for Electrolyzing Chloride Solutions, of which the following is a specification.

My present invention relates to apparatus of a simple and inexpensive kind for the purpose of electrolyzing chloride solutions for the production of disinfecting-liquid, and automatic regulating apparatus, as I shall describe, referring to the accompanying drawings.

Figure 1 is a vertical section of an electrolyzing-battery according to my present invention; and Fig. 2 is an elevation, partly in section, of the automatic regulating apparatus which may be applied, as shown, to the new electrolyzing-battery or to others such as those described in the specification of the British Patent, No. 6,497, of 1894.

The battery consists of a number of tubes A, of glass, ceramic or other insulating material which is not attacked by the liquid operated on. Within each tube A is placed a zinc tube a constituting the cathode and in the center is placed a wire a' of platinum or a copper wire coated with platinum forming the anode. Each tube A is closed by plugs a^2 at the top and the bottom and through the plugs pass the ends of bent glass tubes B communicating from the bottom of each cell to the top of the next in order, except in the case of the first and last cells A of the row. The first cell on the left is supplied with the chloride solution from a supply-pipe D, this solution being sea-water where that is available, or a solution of sodium chloride with a little magnesium chloride. From the top of the first cell the liquid flows to the top of the second, from the bottom of which it flows to the top of the third, and so on, until it reaches the last cell, from the bottom of which it flows to the tank or other recipient of the electrolyzed solution. By wires C leading to and from a dynamo-machine or other source of electricity the cells are connected in series, the anode of each being connected to the cathode of the next throughout the row. Instead of arranging the cells in a row they might obviously be arranged circularly or otherwise.

The apparatus shown in Fig. 2 determines automatically the flow or stoppage of the liquid and of the electrical current. For this purpose, V being the vessel receiving from the battery the electrolyzed solution which may be drawn off from time to time by the cock J or otherwise, I provide in it a float d attached to a vertically-sliding rod e, which is guided between rollers f and carries two tappets g and g'. On a pivot k is mounted a bell-crank lever, one of its arms i carrying a roller h, the other arm j loaded with a tumbling-weight l and carrying a striker m. On the same pivot k is mounted a three-armed lever, two of its arms n and o terminating in cushions to receive the blow of the striker m. The stroke of the arms n and o is limited by fixed stops q and r. The third arm p is jointed to the lever s of a switch c and is connected by a chain z' passing over guide-pulleys t and u to a lever v which operates a valve x of the supply-pipe D.

In the position of the parts shown the valve x is closed and the switch c does not close the circuit. When the float d descends, the tappet g' depresses the roller h, causing the weight l to rise until it passes the position vertically over the pivot k, whereupon it falls over to the left, its striker m causing the arm n to move over against the stop q. By this movement the arm p causes the switch c to turn partly round and close the circuit; also, the chain z' being loosened, the lever v, which may be loaded, descends, opening the valve x. Liquid is now supplied to the electrolyzing-battery, which is also in circuit with the source of electricity, and the vessel V becomes filled with electrolyzed solution until the float d so far rises that it brings back the parts of the regulating mechanism to the position shown, the supply of liquid and of electricity being so cut off.

Having thus described the nature of my said invention and the best means I know for carrying the same into practical effect, I claim—

1. In an electrolyzing apparatus, a battery

consisting of a plurality of tubes of insulating material closed at their ends, a plurality of tubular cathodes arranged respectively in said tubes and containing wire anodes, a series of tubular connections which place the ends of the plurality of tubes in communication from the bottom of each to the top of the next in regular order whereby the liquid flows from one tube to another throughout the series, a liquid supply connected with a tube at one end of the series for introducing the liquid thereinto, and a vessel for receiving the liquid from a tube at the opposite end of the series, substantially as described.

2. In an electrolyzing apparatus, a battery consisting of a series of tubes of insulating material having plugs which close their ends, a series of tubular cathodes arranged in said tubes, a wire anode arranged in each cathode, tubular connections between the ends of the tubes for the flow of liquid throughout the series of tubes, a vessel for receiving the electrolyzed solution from the tubes, a float arranged in said vessel, a valve controlling the flow of liquid to the tubes, a switch electrically connected with the cathodes and anodes, and mechanism controlled by the float for operating the valve and the switch to cut off the supply of liquid and the electric current, substantially as described.

3. In an electrolyzing apparatus, the combination with a battery composed of a series of tubes of insulating material, tubular cathodes and wire anodes arranged in the tubes, and tubular connections between the tubes for the flow of liquid throughout the series of tubes, of a valve for controlling the flow of liquid to the tubes, a switch electrically connected with the cathodes and anodes, and a float-controlled mechanism for operating the valve and the switch to cut off the supply of liquid and the electric current, substantially as described.

4. In an electrolyzing apparatus, the combination with a battery composed of a series of tubes of insulating material, tubular cathodes and wire anodes arranged in the tubes, and tubular connections between the tubes for the flow of liquid throughout the series of tubes, of a vessel receiving the electrolyzed solution from the tubes, a float arranged in the vessel, and devices controlled by the float for shutting off the supply of liquid to the tubes and the electric current to the cathodes and anodes, substantially as described.

5. In an electrolyzing apparatus, the combination with a battery composed of a series of tubes of insulating material, having cathodes and anodes therein, and tubular connections between the tubes for the flow of liquid throughout the series of tubes, of a float-controlled mechanism for shutting off the supply of liquid and the electric current, substantially as described.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 10th day of June, A. D. 1895.

EUGENE HERMITE.

Witnesses:
EDWARD J. PATERSON,
W. ROSSI SATTRICK.