Mar. 13, 1923. 1,448,208

J. GERSTLE

ELECTRODE FOR ELECTROLYTIC CELLS

Filed July 15, 1922

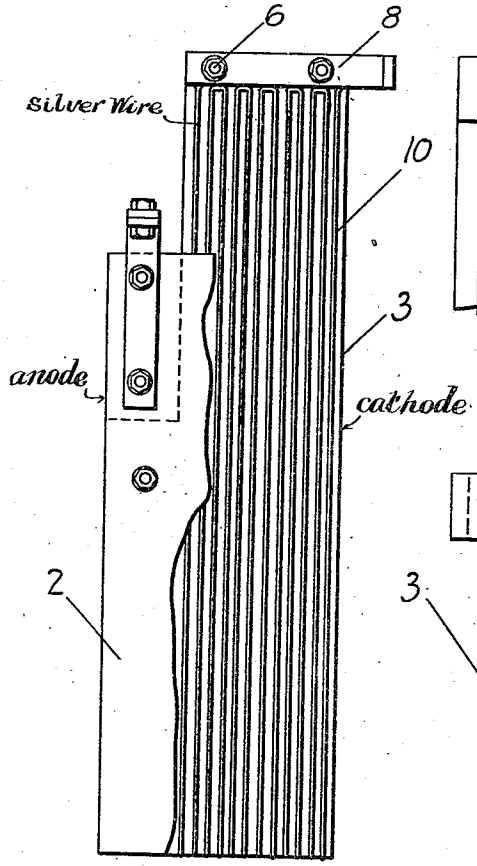


Fig. 2

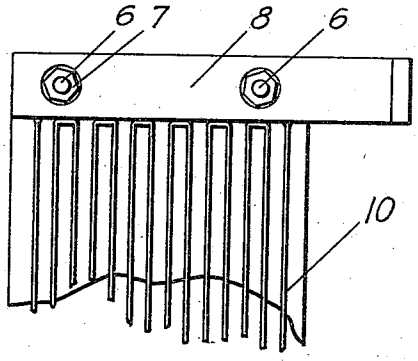


Fig. 3

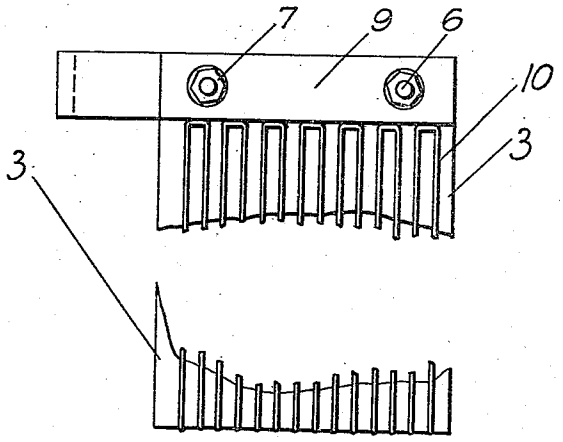


Fig. 4

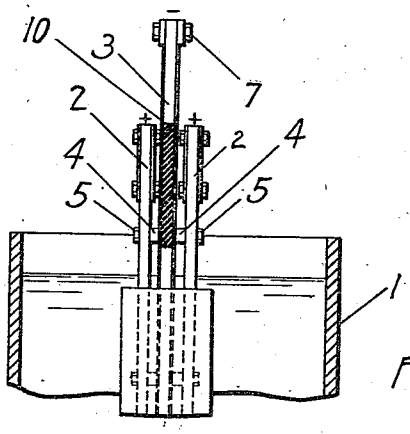


Fig. 1

INVENTOR
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UNITED STATES PATENT OFFICE.

JOHN GERSTLE, OF DAYTON, OHIO, ASSIGNOR TO THE ELECTRO CHEMICAL COMPANY, OF DAYTON, OHIO, A CORPORATION OF OHIO.

ELECTRODE FOR ELECTROLYTIC CELLS.

Application filed July 15, 1922. Serial No. 575,184.

To all whom it may concern:

Be it known that I, JOHN GERSTLE, a citizen of the United States, residing at Dayton, in the county of Montgomery and State of Ohio, have invented certain new and useful Improvements in Electrodes for Electrolytic Cells, of which the following is a specification.

The principal object of my invention is to increase the efficiency of electrolytic cells by providing therefor a cathode made of insulating material that is strung with silver wire. This construction insures high current density at the cathode and non-corrosion of the latter. I prefer to string the cathode with silver wire because silver has the property of low over-voltage, which lessens the reduction of the active material in the electrolyte by nascent hydrogen.

Other important and incidental objects will be brought out in the following specification and particularly set forth in the subjoined claims.

In the accompanying drawings, Figure 1 is an end view of the upper portion of an electrolytic cell, partially in section, showing how the cathode is strung with silver wire. Figure 2 is a side view of said cathode, with one of the anodes broken away to reveal the silver wire stringing on the cathode. Figure 3 is a view of one side of the upper portion of the cathode, and Figure 4 is a view of the other side of said cathode, broken away at the center, said views showing how the silver wire is strung around the cathode.

Throughout the specification and drawings, similar reference characters denote corresponding parts.

Referring to the accompanying drawings for a detailed description of the form of embodiment of my invention illustrated therein, the numeral 1 designates a cell tank preferably constructed of non-conducting material. Suitably mounted in the middle portion of the cell 1 are two anodes 2, 2 preferably constructed of graphite. Projecting upwardly between and above the anodes 2, 2, is a cathode 3. These electrodes are preferably connected together by tie rods 4 and nuts 5 constructed of insulating material. (See Figure 1).

Secured to the sides of the top portion of the cathode 3 by rods 6 and nuts 7, are transverse bars 8 and 9, the bar 8 being longer than the bar 9 and turned at its outer end for connection to a bus bar (not shown).

Suitably strung around the cathode 3 from the bar 8 to the bar 9, is a silver wire 10 which is preferably very light. One free end of this wire is soldered or otherwise secured to the bar 8, from which it projects downwardly along one face of the cathode to one of a succession of notches provided in the lower edge of the latter. After passing through this notch, the wire projects upwardly along the other face of the cathode to the bar 9, and then along it a short distance, being soldered or otherwise suitably secured to said bar along its line of contact therewith. The wire then projects downwardly to the next notch, and thence through it and upwardly along the other face of the cathode to the bar 8. The strands of the wire 10 thus alternate between the bars 8 and 9 until both sides of the cathode are covered. That portion of the cathode around which the wire 10 is strung is constructed of suitable insulating material that is not attacked by the solution.

The cathode 3 strung with the silver wire 10 as above described, or in any other suitable manner, will produce a high current density. The only area on the cathode is that presented by the silver wire, and that area is materially less than the area on the anode. A silver wire is preferred as the current carrying medium on the cathode, because silver has the property of low over-voltage, which lessens the reduction of the sodium hypochlorite by the hydrogen gas.

My silver-wire strung cathode will thus increase the efficiency of the cell because a high current density can be produced without raising the voltage, this high current density being desired at the cathode because it lowers hydrogen reduction of the hypochlorite. Furthermore, with the use of my improved cathode, lime need not be cleaned off so often since it will not stick to the cathode.

Any number of cathodes in an electrolytic cell may be so strung with silver wire to secure the beforementioned results. The anodes may also be strung with it if desired without departing from the spirit of the invention.

Having described my invention, I claim:

1. In an electrolytic cell, a unitary structure provided with an electrode, and a wire

strung member adapted to serve as an electrode of opposite polarity also secured to said unitary structure, said member being insulated from the remaining conducting elements of the structure.

2. In an electrolytic cell, a unitary structure provided with members adapted to be used as anodes, and a wire strung member adapted to serve as cathode also secured to said unitary structure, said member being insulated from the remaining conducting elements of the structure.

3. In an electrolytic cell, a unitary structure provided with members adapted to be used as anodes, and a member strung with silver wire adapted to serve as cathode also secured to said unitary structure, said member being insulated from the remaining conducting elements of the structure.

In testimony whereof I have hereunto set my hand this 3rd day of July, 1922.

JOHN GERSTLE.

Witness:

HOWARD S. SMITH.