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ANODE FOR ELECTROLYZERS WITH VERTICAL DIAPHRAGMS

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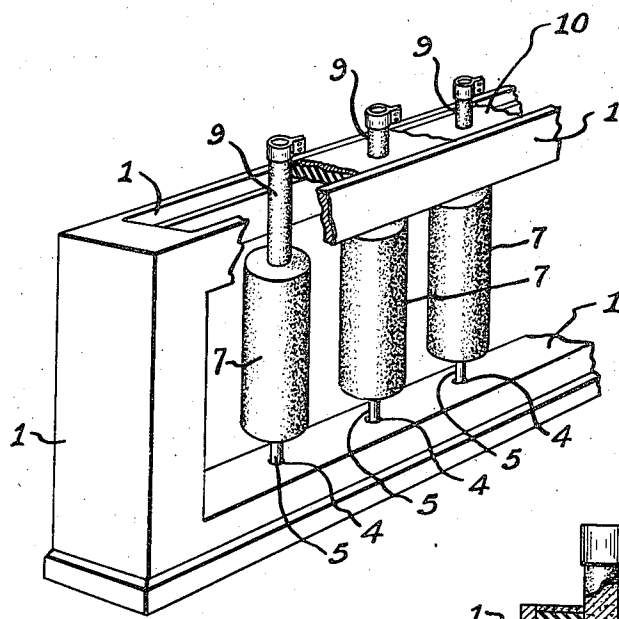


FIG. 1.

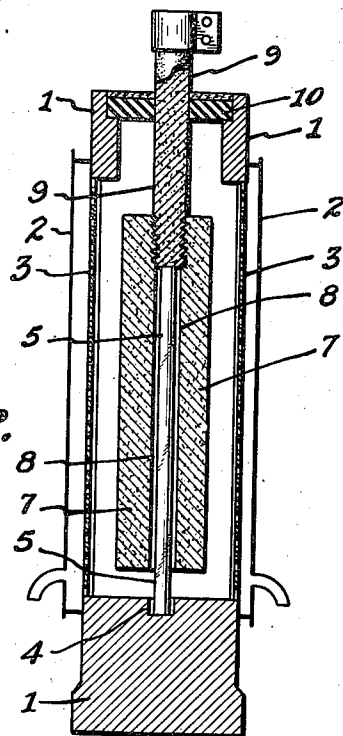


FIG. 2.

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ANODE FOR ELECTROLYZERS WITH
VERTICAL DIAPHRAGMS

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3 Claims. (Cl. 204—4)

The duration of the carbon anodes which are used in electrolyzing devices of the type with vertical diaphragms is (obviously without giving consideration to the intrinsic quality of the carbons) a function of the greater or smaller degree of perfection of the parallelism between anodes and cathodes.

Indeed, if the said parallelism is not a perfect one, affluxes of current take place in the carbons at the points where they are nearest to the electrodes. These local overloads cause, of course, their disintegration and their premature wear.

This inconvenience is avoided by the arrangements which form the subject matter of my present invention. The main feature of my invention consists in that the carbon anode is formed of a circular or prismatic cylinder which is bored axially and provided with a dummy hole which is large enough for receiving a carrying rod made of a material which is unattackable by the solution to be electrolyzed and by the products of the electrolysis. This rod is immobilized in the transverse direction in its lower part; the anode is slid onto the rod and rests through the bottom of its hole on the upper part of the said rod. The transverse dimensions of the hole and of the rod are such that the play between the same is small. Under these conditions the anode is supported and centered. The means provided for immobilizing the lower part of the carrier rod is so located in the cell that both parts of the anode which are opposite the cathodes are equi-distant from the latter.

The current is fed to the anode preferably through a carbon rod which is fast, for instance by screwing therein, with the upper part of the anode. The lower end of this rod may form the bottom of the anode hole.

Owing to this arrangement for the anode, it is easy to insure the tightness for the passage of the rod which supplies the current through the ceiling of the gas chamber, this tightness being here obtained through a mere casting of packing cement or mastic.

An embodiment of my invention is shown by way of example in the appended drawing.

In this drawing:

Fig. 1 is a perspective elevational view with partial tearing away of a part of such a cell.

Fig. 2 is a cross sectional view of an electrolytic cell according to my invention;

In the form of execution shown in the drawing the cell comprises, in the usual manner, a frame 1 on both sides of which the cathode ele-

ments 2 are applied and maintained by any known suitable device. The usual diaphragms are shown at 3 (Figure 2). In the lower beam of the frame 1 are provided recesses 4 which are equi-distant from both cathode elements 2, 3. In these recesses are vertically lodged glass rods 5. On each of these rods is slid an elementary anode 7 provided, for this purpose, with an axial hole 8 having a diameter slightly larger than the diameter of the rod 5. The bottom of the hole 8 is closed by a carbon rod 9 located in the upper part of the elementary anode 7. By the lower part of this rod 9, the anode is thus suspended on the upper end of the rod 5. The carbon rod 9 passes through the ceiling 10 of the gas chamber formed by the upper part—subdivided in two portions—of the frame 1. The packing joint between the rod 9 and the ceiling 10 is obtained by pouring onto the ceiling 10, which is located slightly below the upper part of the frame 1, a grout of tarry cement such as those which are usually employed in sealing of electrolytic cells.

From the above information, it results clearly that the position of the elementary anodes with respect to the cathode elements is insured in a correct manner as to the parallelism between anode and cathode, for the elementary anodes cannot undergo any lateral sliding movement and they rest by their own weight on a rigid carrier at a point which is subject neither to wear nor to deterioration and which is located above their center of gravity. These elementary anodes will always keep in the electrolyzer, as long as there remains some thickness of carbon about the carrier rod 5, their rigid vertical position and their perfect alignment in the middle plane of the cathodes. Their distances with respect to the latter will thus always be identical and regular. On the other hand it is easy, by rotating the anodes about their axis, to modify their orientation in order to bring new parts of elementary anodes opposite the cathodes when the said anodes have undergone a wear sufficient for causing an undesirable increase of the voltage between anode and cathode.

Finally, the axial bore of the elementary anodes permits a more regular impregnation of the latter, the penetration of the impregnation liquid (such as linseed-oil, for instance) taking place both from inward and from outward. Furthermore, the air which is confined in the pores of the carbons being able more easily to escape during the impregnation, there is less reason to

fear that parts of the carbons could not be impregnated.

What I claim is:

1. In an electrolyzer having vertical diaphragms supported on a frame, an anode having a reduced portion of circular cross section extending through and laterally supported in the top of said frame, the major portion of said anode being cylindrical and having an axial bore entering from the bottom of said anode and terminating above the center of gravity thereof, said frame having a recess in the bottom thereof, and a rod of non-attackable material slightly smaller in diameter than said bore so as to fit loosely therein, and of a length greater than the sum of the length of said bore plus the depth of said recess disposed within said bore with its lower end projecting therefrom and seated in said recess to support said anode vertically and laterally.

2. In an electrolyzer having vertical diaphragms supported on a frame, an anode having a major portion of cylindrical form and having an axial bore, one end of said bore being threaded, a conducting element having at one end a threaded portion engaging in the threads in said anode and terminating said bore above the center of gravity of the anode, said conducting member extending through and laterally supported in the top of said frame, said frame having a recess in the bottom thereof and a rod of

non-attackable material slightly smaller in diameter than said bore so as to fit loosely therein, and of a length greater than the sum of the length of the unthreaded portion of said bore plus the depth of said recess to project from said bore when situated therein with an end of said rod abutting said threaded conducting member, the projecting end of said rod being seated in said recess to support said anode vertically and laterally.

3. In an electrolyzer having vertical diaphragms supported on a frame, an anode having a reduced portion of circular cross section extending through and laterally supported in the top of said frame, a gas type packing on the top of said frame and surrounding said reduced portion, the major portion of said anode being cylindrical and having an axial bore entering from the bottom of said anode and terminating above the center of gravity thereof, said frame having a recess in the bottom thereof, and a rod of non-attackable material slightly smaller in diameter than said bore so as to fit loosely therein, and of a length greater than the sum of the length of said bore plus the depth of said recess disposed within said bore with its lower end projecting therefrom and seated in said recess to support said anode vertically and laterally.

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