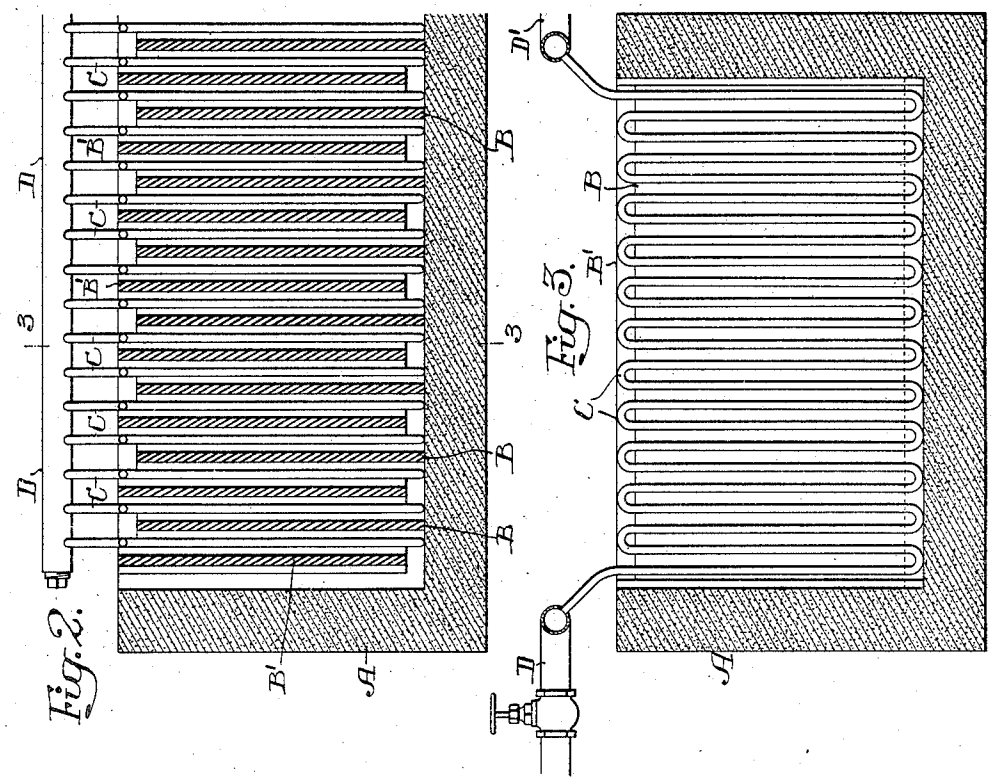
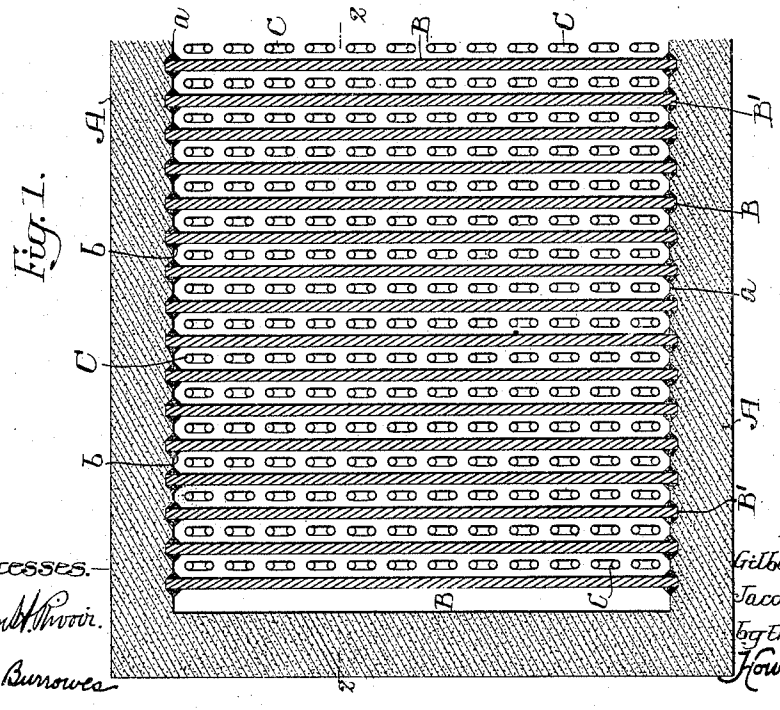
G. C. LANDIS & J. H. SMITH.

ELECTROLYTIC CELL.

APPLICATION FILED JULY 2, 1909.

974,576. **Patented Nov. 1, 1910.**





Witnesses.
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UNITED STATES PATENT OFFICE.

GILBERT C. LANDIS, OF WADSWORTH, AND JACOB H. SMITH, OF RITTMAN, OHIO, ASSIGNORS TO OHIO SALT COMPANY, OF WADSWORTH, OHIO, A CORPORATION OF OHIO.

ELECTROLYTIC CELL.

974,576. Specification of Letters Patent. Patented Nov. 1, 1910.

Application filed July 2, 1909. Serial No. 505,764.

To all whom it may concern:

Be it known that we, GILBERT C. LANDIS and JACOB H. SMITH, both citizens of the United States, residing in Wadsworth, Ohio, and Rittman, Ohio, respectively, have invented certain Improvements in Electrolytic Cells, of which the following is a specification.

One object of our invention is to provide novel means for reducing or maintaining at a relatively low point the temperature of the liquid in an electrolytic cell; it being especially desired that the means employed for this purpose shall be of such a nature as not to affect the current capacity of the electrodes. We further desire to provide an electrolytic cell with improved means for holding its various electrodes in place. These objects and other advantageous ends we secure as hereinafter set forth, reference being had to the accompanying drawings, in which:

Figure 1, is a horizontal section of a portion of an electrolytic cell constructed according to our invention; Fig. 2, is a vertical section on the line 2—2, Fig. 1, and Fig. 3, is a vertical section on the line 3—3, Fig. 2.

In the above drawings, A represents a suitable container for the cell, preferably made of stoneware, slate or other material incapable of conducting an electric current. This has its two opposite sides provided with parallel vertically extending ribs *a* placed at suitable distances apart and holding in the spaces between them the electrodes B and B′. Said electrodes extend into the recesses and a liquid tight joint is formed between each edge of an electrode and the adjacent wall of the container A by some suitable cement, indicated at *b*, of a composition unaffected by the electrolyte employed in the cell. From Fig. 2, it will be noted that all of the electrodes B extend down to and rest upon the bottom of the container, while their upper edges are some distance below the top edge of said container so as to permit the passage over them of the electrolyte as it flows through the cell. The intermediate electrodes B′ on the other hand, have their top edges at about the height of the top edge of the container, or at least at such a level that liquid can not pass over them, while their bottom edges are raised a suitable distance above the bottom of the container. As shown best in Fig. 3, there is between each two electrodes a coil or other suitable mass of tubing C, formed of glass or other material, incapable of conducting an electric current. One end of each of the coils C is connected to a supply main D connected to a source of cooling liquid, such as water or any other desired substance, while their opposite ends are connected to a second main D′ which may be led to any suitable waste pipe or tank for the reception of the cooling liquid after it has performed its function. Under operating conditions, the electrolyte in its treatment is caused to circulate through the tank by any desired means, being supplied to one end thereof and caused to take a circuitous course through the tank, up and down the various spaces between the electrodes. It will be understood that these latter are constructed of suitable material and provided with the necessary terminals in the manner well understood in the art, and in order that the temperature of this electrolyte while under treatment may be kept from rising to an objectionable point, water or other desired cooling or refrigerating liquid is caused to pass through the various cooling pipes C, being supplied from pipe D and discharged into the pipe D′. By this means, injury to the electrodes from abnormal temperatures of the electrolyte is prevented, and by using coils or convolutions of the cooling tubes, especially if they be arranged as shown, the current capacity of the various electrodes is not materially diminished or the operation of the cell objectionably affected. By the employment of the particular construction shown for holding the electrodes in place, these are properly spaced and liquid tight joints between their edges and the adjacent walls of the container are easily secured and maintained.

We claim:

An electrolytic cell consisting of a container; two series of electrodes mounted in said container to form a tortuous path through the same for the electrolyte; a series

of tubes of electrical non-conducting material each in the form of a series of substantially parallel convolutions; one of said tubes being mounted between each pair of electrodes; with two supply pipes each connected to each of said tubes for circulating cooling fluid therethrough.

In testimony whereof, we have signed our names to this specification, in the presence of two subscribing witnesses.

GILBERT C. LANDIS.
JACOB H. SMITH.

Witnesses:
WILLIAM MARTIN,
JNO. H. FISHER.