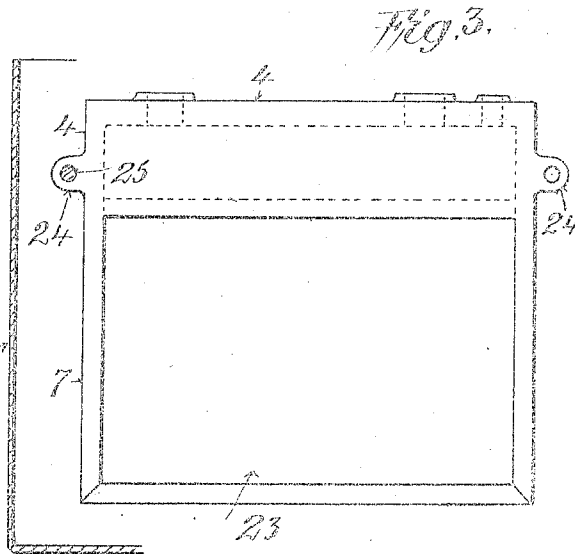
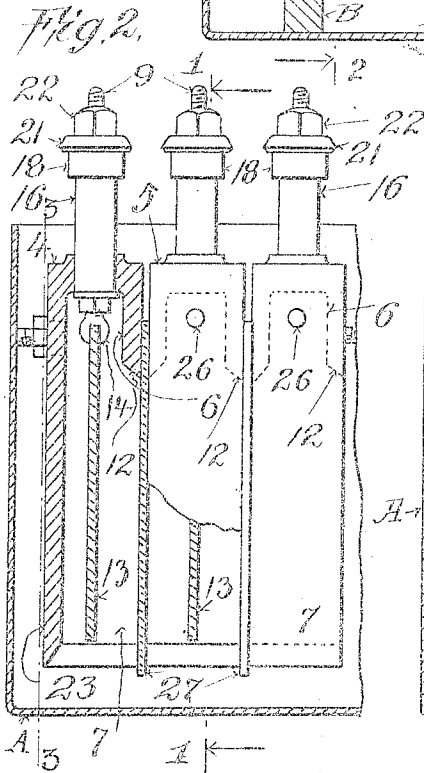
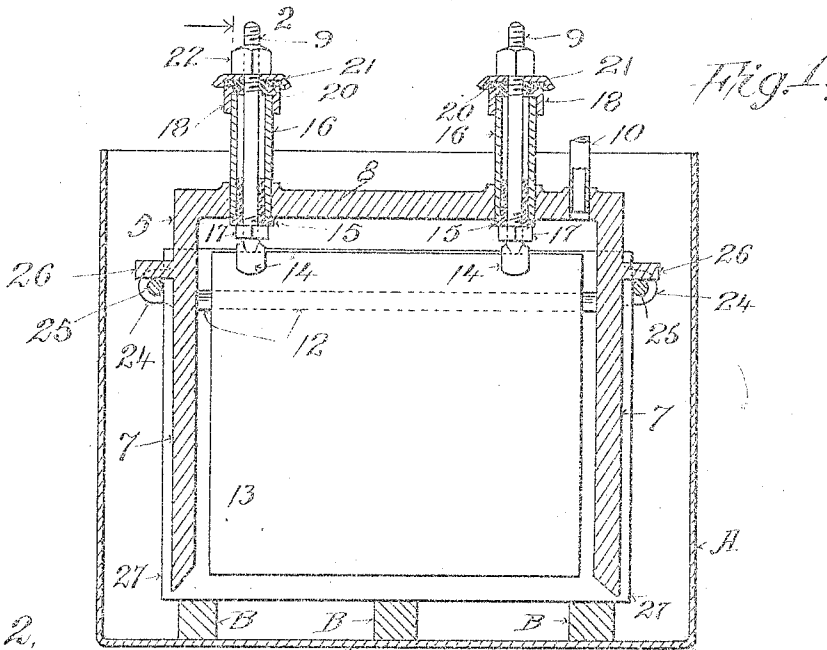


J. B. BURDETT.
ELECTROLYTIC CELL.
APPLICATION FILED NOV. 6, 1912.

1,107,258.

Patented Aug. 18, 1914.



Witnesses:
O. R. Darby
Samuel R. Darby

Inventor
John B. Burdett
By his Attorney
Samuel R. Darby

UNITED STATES PATENT OFFICE.

JOHN B. BURDETT, OF CHICAGO, ILLINOIS, ASSIGNOR TO DAVIS-BOURNONVILLE COMPANY, OF NEW YORK, N. Y., AND CHICAGO, ILLINOIS, A CORPORATION OF NEW YORK.

ELECTROLYTIC CELL.

1,107,258.

Specification of Letters Patent.

Patented Aug. 18, 1914.

Application filed November 6, 1912. Serial No. 729,751.

To all whom it may concern:

Be it known that I, JOHN B. BURDETT, a citizen of the United States, residing at Chicago, county of Cook, State of Illinois, have made a certain new and useful Invention in Electrolytic Cells, of which the following is a specification.

This invention relates to electrolytic cells and particularly to apparatus of this class designed for use in decomposing water or other liquid into its constituent gases.

The object of the invention is to simplify and improve the construction of apparatus of this nature and to render the same more efficient in operation and more economical to construct.

A further object of the invention is to provide an electrolytic apparatus of the nature referred to wherein provision is made for the efficient separation of the gases into which the water or other liquid is decomposed, and to maintain such separation.

Other objects of the invention will appear more fully hereinafter.

The invention consists substantially in the construction, combination, location, and relative arrangement of parts, all as will be more fully hereinafter set forth, as shown in the accompanying drawings, and finally pointed out in the appended claims.

Referring to the accompanying drawing, and to the various views and reference signs appearing thereon,—Figure 1 is a view in vertical section showing an electrolytic apparatus constructed in accordance with the principles of my invention, the line of section being indicated at 1, 1, Fig. 2, looking in the direction of the arrows. Fig. 2 is a view in section of a portion of the electrolytic cell on the line 2, 2, Fig. 1, looking in the direction of the arrows. Fig. 3 is a view in side elevation parts in section on the line 3, 3, Fig. 2 of the end element of the cell.

The same reference numeral designates the same part wherever it occurs throughout the several views.

In the drawing, reference letter A designates a tank or other receptacle adapted to contain the water or other liquid electrolyte to be decomposed.

B designates suitable blocks or supports placed in the bottom of the vessel A, if

desired or required, upon which the cell elements are supported.

The cell elements are designated respectively by numerals 4, 5, the element 4 is the end element of a series designed to be secured together to form the complete cell, the elements 5 being duplicates of each other and as many of them employed as may be required to make up a cell of the required size or capacity. Each element 5 is in the form of a channel having the sides 6 and end portions 7 extended beyond the edges of the sides 6, thus forming a bell which, in use, is designed to be inverted, that is, the channel of the element is presented downwardly. Through the connecting portion 8 of each element 5, that is, the base or web which connects the side walls 6 thereof are formed openings through which extend the circuit terminal rods or connections 9 for the electrodes. An opening also through the web portion 8 of the cell members 4, 5 receives therethrough a pipe or other suitable connection 10 to conduct the gas from the bell as it collects within the same during the decomposing process. The said pipe connection 10 delivers to a suitable or convenient gasometer and through any suitable connections as is usual in apparatus of this nature.

In practice I prefer to bevel the lower edges of the sides of the bells as indicated at 12 in order to facilitate the entrance of the gases evolved from, or at the surface of the electrode plates, and to insure the collection of the gases within the channels of the bells. Extending into each bell is an electrode member 13, the terminal rods 9 being welded or otherwise suitably connected or attached to the upper edge thereof as indicated at 14, said electrode plates extending to a considerable distance below the lower edges of the intermediate cell members 5 as clearly shown in the drawing. The terminal rods 9 may and preferably should be efficiently insulated from the bells. I have shown a simple arrangement wherein I insulate each terminal rod with a sleeve 15 of insulating material, said sleeve extending through the openings in the web 8 of the members 5, 4, and receiving thereover a pipe section 16, which extends through the open-

ings of the webs of the bells and each of which carries a nut 17 on its inner end adapted to clamp the insulating sleeve 15 firmly in place. The outer end of the pipe sections 16 carry a threaded cap 18 through which the terminal rods 9 pass, a suitable insulated washer 20 being placed within the bore of said cap. The washer 20 is held in place by a cap 21 by means of a nut 22 mounted upon the threaded end of the terminal rod. This construction affords a very simple means for connecting and insulating the terminal rods.

The outermost cell members 4 have the same construction as the members 5 except that the outer wall 23 thereof extends to a point slightly below the lower edges of the electrode plates 13 whereas the side walls 6 of the members or elements 5 extend a comparatively short distance downward over the electrode plates. The outermost elements 4 are also provided with ears 24 to receive suitable clamp rods indicated at 25 in Fig. 1, by means of which the elements composing the cell are securely clamped together. Said rods also form supports for the intermediate cell members 5 which are provided with integral lugs 26 to rest thereon. In assembling the cell as many intermediate elements 5 as may be required to make up a cell of the desired capacity, are placed flat-wise against each other between the outermost elements 4 and are clamped together in this relation by the clamp rods 25. Interposed, however, between each cell element is a curtain of asbestos 27 which in practice preferably extends into the space between the side walls 6 of the adjacent cell elements and also to a point somewhat below the lower edges of the electrode plates 13. These asbestos curtains are clamped at their ends between the extended portions or fingers 7 formed at the ends of the elements 5, these extensions or fingers being provided for this purpose. In this manner the asbestos curtains are maintained in proper position and relation. Of course, it will be understood that in place of asbestos sheets, other suitable porous material may be employed. My invention, therefore, is not to be confined or restricted in respect to the material used for the porous separators between adjacent cell elements.

In the use of an electrolytic cell, constructed as above described, the terminal rods 9 of the alternate cell members are connected to the pole of one sign of the source of current while the terminal rods of the intermediate elements are connected to the pole of opposite sign of the source of current, with the result that in the case of the decomposition of water, for instance, the hydrogen gas is evolved from one electrode plate of two adjacent cell elements and is

collected within the bell of said element, 65 while oxygen is evolved from the electrode plate of the other of said adjacent elements and is collected in the bell of its element, the porous curtains 27 preventing the gas evolved from one electrode plate from gaining access to that evolved from the plate in the adjacent cell element. In this manner, the two gases are maintained in a state of separation and are separately collected and conducted to separate storage tanks, gasometers or service pipes in the usual manner.

Having now set forth the object and nature of my invention and a construction of electrolytic cell embodying the principles thereof, what I claim as new and useful and 80 of my own invention and desire to secure by Letters Patent is:—

1. In an electrolytic cell, the combination with cell elements in the form of inverted bells, assembled together in flat-wise relation against each other, said cell elements having extended portions or fingers at their ends, and a porous diaphragm interposed between adjacent cell elements and clamped and held in place between the end portions 90 or fingers of the cell elements.

2. In an electrolytic cell, cell elements in the form of inverted bells, placed flat-wise against each other, the depending side walls of said elements being beveled, said elements 95 having end portions or fingers extending beyond the side walls thereof, an electrode plate supported within each bell and extending beyond the edges of the side walls thereof, and porous diaphragms interposed between adjacent elements and held and clamped at their ends between said end fingers.

3. In an electrolytic cell, cell members in the form of inverted bells, assembled and 105 held together one against another in flat-wise relation, the outermost element having an extended side portion extending below the side walls of the intermediate elements.

4. In an electrolytic cell, a series of inverted bell shaped members, each having an 110 electrode plate supported therein, the outermost of said members having ears and the intermediate members having supporting lugs at the ends thereof, and rods engaging said ears to clamp the assembled bells together, said clamping rods forming supports upon which the lugs of the intermediate 115 members rest.

5. In an electrolytic cell, a cell element in 120 the form of an inverted bell, an electrode plate extending into said bell, said bell having openings through the base thereof, terminal rods passing through said openings and secured to the upper edge of the electrode plate, an insulating sleeve insulating 125 said rods, a pipe section inclosing each rod and carrying a nut for clamping said in-

insulating sleeve in place, an insulating washer insulating said rod, a nut for clamping the same in place, and a delivery pipe connection also extending through said base portion.

In testimony whereof I have hereunto set my hand in the presence of the subscribing

witnesses, on this first day of November A. D. 1912.

JOHN B. BURDETT.

Witnesses:

L. M. SHIELDS,
E. H. JOHNSON.