J. B. BURDETT.

LARGE CAPACITY CELL FOR GENERATING HYDROGEN AND OXYGEN.

APPLICATION FILED SEPT. 27, 1920.

1,368,206. **Patented Feb. 8, 1921.**

2 SHEETS—SHEET 1.

Fig. 1

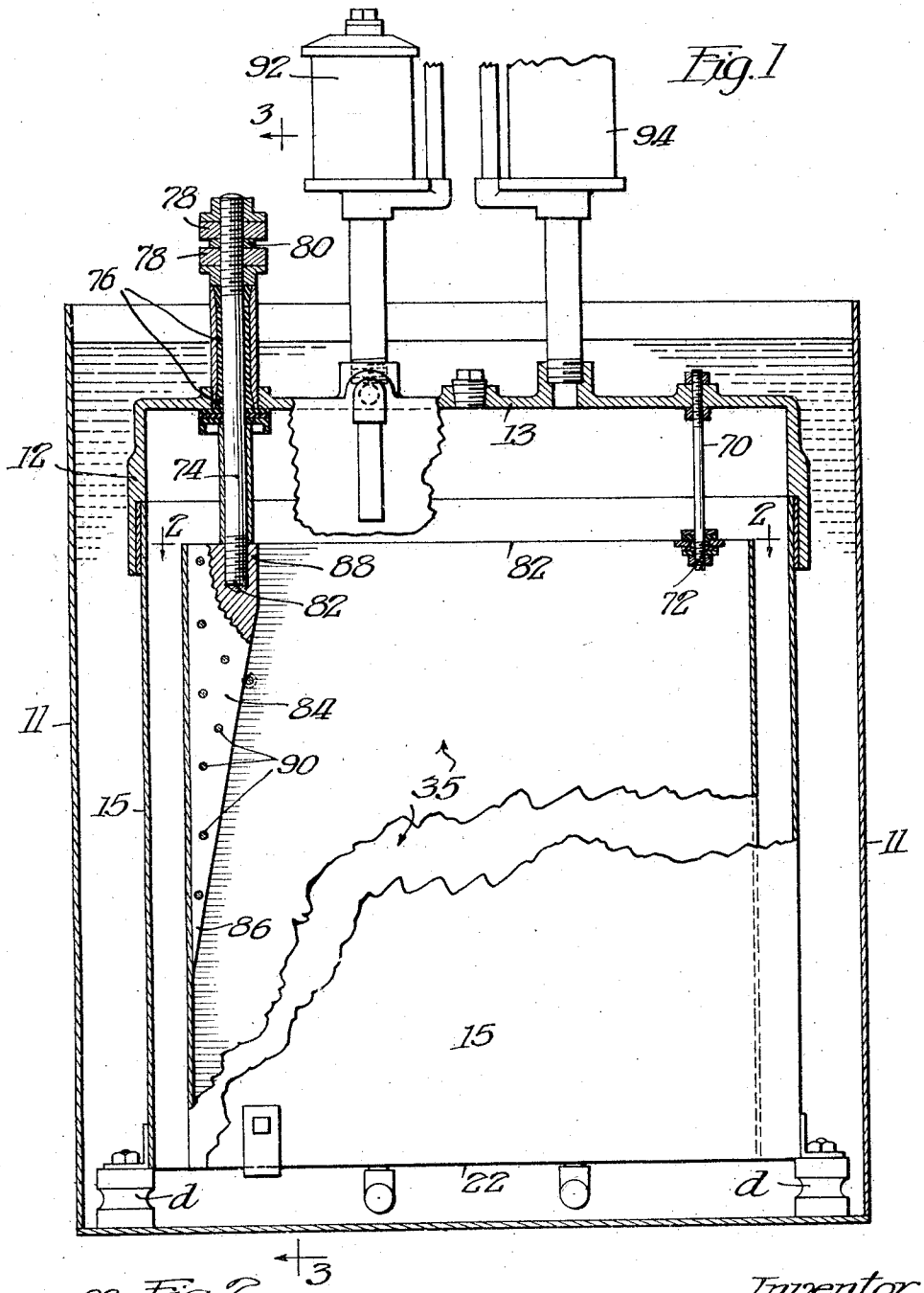
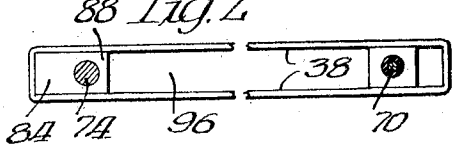


Fig. 2



Inventor:
John B. Burdett,
By Cheever & Cox
Attys.

J. B. BURDETT.

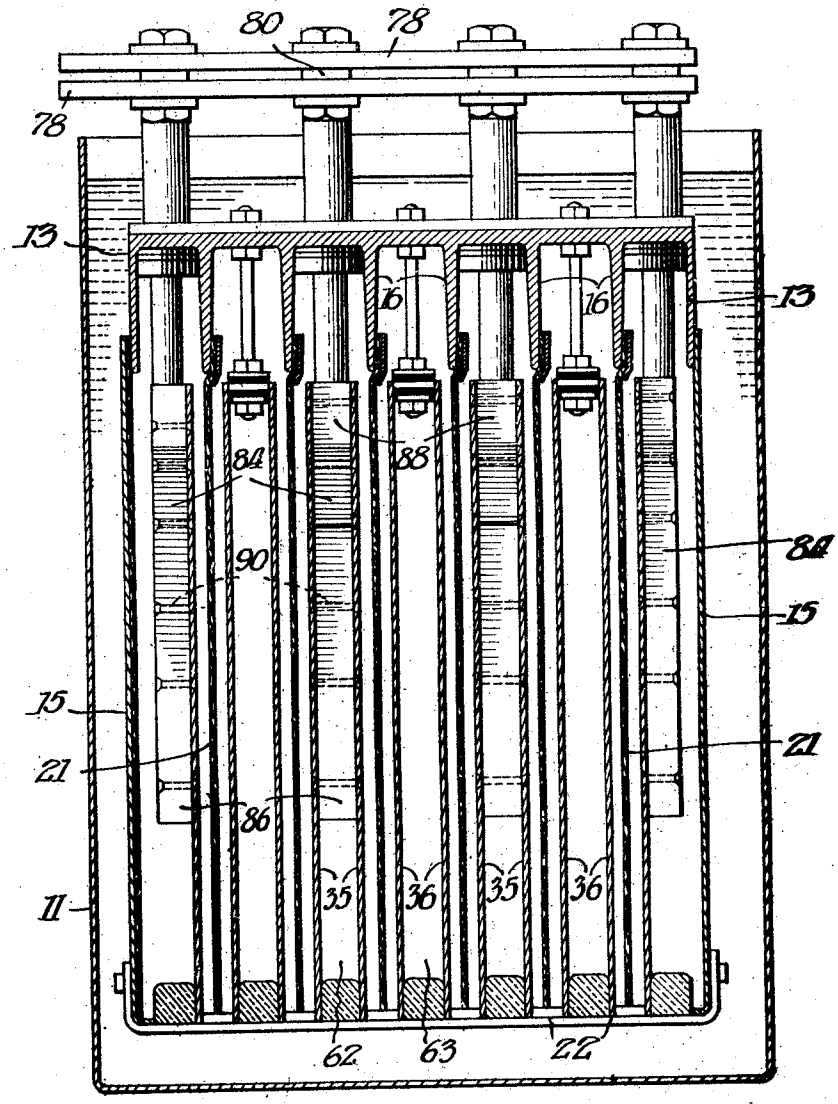
LARGE CAPACITY CELL FOR GENERATING HYDROGEN AND OXYGEN.

APPLICATION FILED SEPT. 27, 1920.

1,368,206. **Patented Feb. 8, 1921.**

2 SHEETS—SHEET 2.

Fig. 3



Inventor:
John B. Burdett.
By Cheever & Cox
attys.

UNITED STATES PATENT OFFICE.

JOHN B. BURDETT, OF GLENCOE, ILLINOIS, ASSIGNOR TO BURDETT MANUFACTURING COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF DELAWARE.

LARGE-CAPACITY CELL FOR GENERATING HYDROGEN AND OXYGEN.

1,368,206. Specification of Letters Patent. Patented Feb. 8, 1921.

Application filed September 27, 1920. Serial No. 413,089.

To all whom it may concern:

Be it known that I, JOHN B. BURDETT, a citizen of the United States, residing at Glencoe, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Large-Capacity Cells for Generating Hydrogen and Oxygen, of which the following is a specification.

This invention relates to apparatus for the electrolytic production of hydrogen and oxygen gas; its object is to greatly increase the productive capacity of the cell of my prior United States Patent Number 1,086,804 without changing the dimensions of the great majority of the parts thereof. The invention consists in means for delivering to and through the electrodes of said cell a much larger electric current than is possible in the device as shown in said patent. More specifically the invention consists in means providing large electric conductors leading to the electrodes combined with improved means for making efficient electric connection between said conductors and the electrode without in any way destroying the efficiency of the device or increasing the size of the electrodes or adjacent parts. The invention further consists in many features and details of construction hereafter more fully set forth in the specification and claims.

Referring to the drawings in which like numerals denote like parts throughout the several views,

Figure 1 is a sectional view of mechanism illustrating this invention in its preferred form, more particularly one of the electrodes and the means for making large capacity electrical connection therewith.

Fig. 2 is a plan view taken on the line 2—2 of Fig. 1.

Fig. 3 is an end sectional view taken on the line 3—3 of Fig. 1.

The cell shown in the drawings is conventionally of the same form as that of said prior patent, the same numerals of reference being for convenience used. It includes in a general a case 11 containing the electrode element 12 consisting of a casting 13 provided with ends 14 and sides 15. The element is suitably supported with its open end downward upon insulators *d*. The casting 13 consists of a box like structure divided into a number of compartments by partitions 16 parallel to each other, extending from end to end of the casting 13. The partitions 16 each carry a diaphragm 21 of asbestos or other suitable material extending to the bottom level 22 of the element 12, whereby a plurality of chambers 62 and 63 are formed constituting cathode and anode compartments of the cell in which are placed the electrodes 35 and 36 just as in said prior patent. Each electrode is made in rectangular form with two spaced apart broad, thin, metal plates 36 parallel to each other, forming the passage 96 between them. Each electrode is supported from the casting 13 by two suspension devices one in each end. The smaller of these, a rod 70, is merely a suspension device insulated from the electrode at 72 in any well known manner and does not enter directly into this invention. The other suspension which is very important consists in a relatively large conductor rod 74 insulated throughout its length and particularly from the casting 13 by the insulating packing 76. It is provided at its top with connecting means for the bus bars 78 separated by a spacing washer 80 to allow for ventilation. The lower end of this rod 74 extends some distance below the upper edge 82 of the electrode 35 or 36, as the case may be, and is thoroughly connected in the present case here illustrated, by screw threads at 82 into the triangular or wedge shaped contact block 84 of electrical conducting material which has its pointed end 86 extending well down the end wall of the electrode while its widest part or base 88 is at the top of the electrode. The shape of the block may be varied within limits without departing from the invention. This block 84 is both riveted in place by bolts or rivets 90 and is in addition preferably welded to the side and end walls of the electrode, the idea being to make an electrical connection of sufficient current carrying capacity between the relatively large rod 74 and the spread out plates forming the sides and ends of the electrode. In other words the intention is that the carrying capacity of the rod 74, the wedge and the plates 38 shall be about the same. So far as this invention is concerned the electrodes 35 and 36 are exactly alike except that the cathodes have the large conductors 74 at one end while the anodes have them at the other.

It is important to notice that in the operation of the cell of this class the passage of the electric current from one electrode as

35 to the adjacent electrode 36, through the intervening diaphragm 21 decomposes the water surrounding electrodes into hydrogen and oxygen as fully explained in said prior patent. These gas bubbles form rapidly on the outside surfaces of the plates 38 forming the sides of the box-like electrode 35 or 36, as the case may be, and rise to the surface and are collected in gas chambers 92 or 94 as the case may be, provided for the purpose. In order to assist these bubbles to rise rapidly and therefore increase the efficiency of the battery, it is important to have water in the battery above the upper edges 82 of the electrode so that water rising with the bubbles can flow over the top 82 and return down interior passage 96 where there are no bubbles, *i. e.* no gas being formed. In order that this operation may be carried out efficiently it is necessary that the area at the top of the electrode, of the opening leading to the passage 94, shall be of maximum capacity to allow for rapid flow of the water over the top of the electrode and down the center passage 96. This absolutely requires that the large capacity conducting blocks 84 be shaped as shown and located at the extreme end of the electrode. To partially or wholly close the top of the electrode for the purpose of securing good electrical connections at that point with the conductor 74 would be fatal to the proper operation of the device.

Having thus described my invention what I claim as new and desire to secure by Letters Patent, is:—

1. In a cell of the class described, an electrode having vertical spaced apart plates, a conductor leading to the top thereof and an intervening connecting block secured to a plate, the electrode and block being of substantially equal current carrying capacity.

2. In a cell of the class described, an electrode having vertical spaced apart plates, a conductor leading to the top thereof and an intervening connecting block of current capacity about equal to the current capacity of the plates secured on the inside face of a plate.

3. In a cell of the class described, an electrode having vertical spaced apart plates, a current carrying member leading thereto and connecting devices attached to the carrying member and attached to the plates in vertical lines extending below the upper edges of the plates.

4. In a cell of the class described, an electrode having spaced apart side walls, a conductor leading to the upper end thereof and a connecting block of greater vertical than horizontal length attached to the conductor and to an interior wall of the electrode.

5. In a cell of the class described, an electrode having spaced apart side walls, a conductor leading to the upper end thereof and a connecting block of greater vertical than horizontal length, the width of the block being substantially less than the transverse width of the side plates, attached to the conductor and to an interior wall of the electrode.

6. In a device of the class described, a hollow electrode comprising parallel side walls and connecting end parts, open top and bottom for the passage of liquid from top to bottom of the electrode, a large capacity electric conductor entering one end of the electrode from the top and a wedge shaped conductor connector attached to said conductor part, with the base of the wedge at the top of the electrode and its point at the end of the electrode and near the bottom thereof, and means for electrically connecting said wedge block to the interior of the wall of the electrode.

7. In a device of the class described, a hollow electrode comprising parallel side walls and connecting end parts, open top and bottom for the passage of liquid from top to bottom of the electrode, a large capacity electric conductor entering one end of the electrode from the top and a wedge shaped conductor connector attached to said conductor part, with the base of the wedge at the top of the electrode and its point at the end of the electrode and near the bottom thereof, and welding means for electrically connecting said wedge block to the interior of the wall of the electrode.

8. As an article of manufacture, an electrode consisting of two parallel separated metal plates of relative large area, spaced apart at their ends their being interposed between said plates at one end of the electrode a downwardly pointed wedge shaped block welded thereto, said wedge being adapted at its upper end for electric connection with a current carrying rod of very substantial capacity.

9. In a battery cell, an electrode having spaced apart plates, a conductor, and a connecting block electrically connecting the plates and conductor, said block having substantially the current carrying capacity of the entire plates where joined therewith.

10. In a battery cell, an electrode having spaced apart plates, a conductor, and a connecting block disposed between and engaging the inner faces of the plates and electrically connecting the plates and conductor, said block having substantially the current carrying capacity of the entire plates where joined therewith.

11. In a battery cell, an electrode having upright spaced apart walls, a conductor, and a connecting block electrically connecting said conductor and walls and having the upright dimension of its place of engage-

ment with said walls in excess of the horizontal dimension of its place of engagement with said walls.

12. In a battery cell, an electrode having upright spaced apart plates, a conductor, and a connecting block disposed between and engaging the inner faces of the plates and electrically connecting said conductor and plates and having the upright dimension of its place of engagement with said plates in excess of the horizontal dimension of its place of engagement with said plates.

In witness whereof I have hereunto subscribed my name in the presence of two witnesses.

JOHN B. BURDETT.

Witnesses:
DWIGHT B. CHEEVER,
ANNA ROSENTHAL.