

E. O. BARSTOW.
ELECTROLYTIC CELL.
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1,053,266.

Patented Feb. 18, 1913.

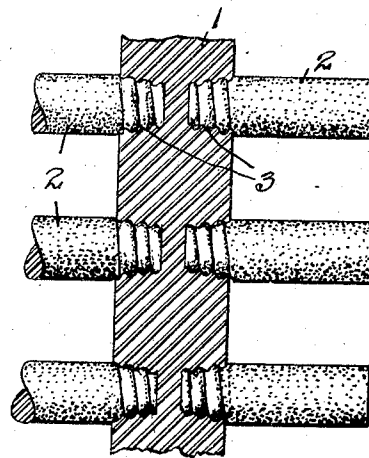
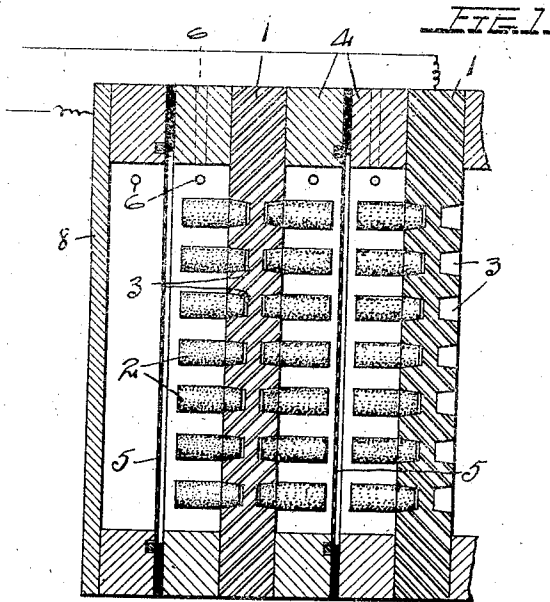
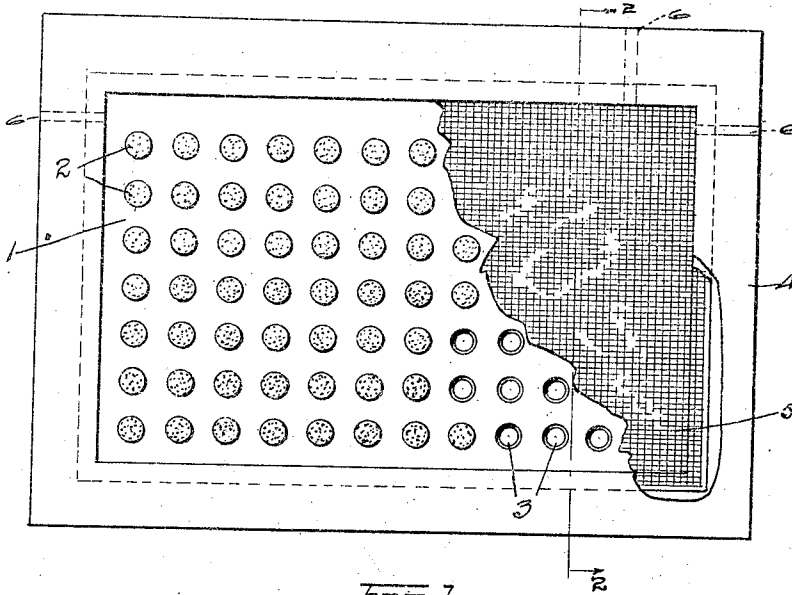


FIG. 2.

FIG. 3.

Witnesses.
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UNITED STATES PATENT OFFICE.

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ELECTROLYTIC CELL.

1,053,266.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, EDWIN O. BARSTOW, a citizen of the United States, and a resident of Midland, county of Midland, and State of Michigan, have invented a new and useful Improvement in Electrolytic Cells, of which the following is a specification, the principle of the invention being herein explained and the best mode in which I have contemplated applying that principle, so as to distinguish it from other inventions.

In the construction of bi-polar electrodes for use in electrolytic cells of the kind illustrated, for example, in U. S. Patent No. 987,717 to Thomas Griswold, Jr., dated March 28, 1911, it has been found relatively expensive to obtain the electrodes in the form of large integral blocks or plates, such as are there shown for the reason that they require to be especially manufactured. Furthermore, owing to the wearing away of such blocks, despite the fact that this wearing is confined to the anode side, their term of service is more or less limited and a good portion of the carbon constituting them remains a dead loss in the cast away portions.

The object of the present invention is the provision of an electrode which shall consist essentially of the desired plate-like form but shall be so constructed as to permit of its anode face, or at least of the active portion of such face, being removed without the necessity of renewing or replacing the main carrying member.

To the accomplishment of this and related ends, the invention, then, consists of the means hereinafter fully described and particularly pointed out in the claims.

The annexed drawing and the following description set forth in detail certain mechanism embodying the invention, such disclosed means constituting, however, but one of various mechanical forms in which the principle of the invention may be used.

In said annexed drawings:—Figure 1 represents an elevational view of an electrode constructed in accordance with the present invention, a broken section of the diaphragm normally associated with such electrode, appearing therewith; Fig. 2 is a transverse section of a series of cells built up of electrodes such as illustrated in Fig. 1; and Fig. 3 represents in similar, but slightly larger, section, a modified construction of electrode.

As in the construction of electrolytic cell described in the aforesaid patent, the present electrode consists essentially of a plate 1 of carbon, or graphitic carbon, which in the present case may be termed a carrying member, since it is studded on one or both of its faces with pin-like projections 2, also of carbon. These projections may be pins, rods or pencils of the material in question, which are fitted into holes 3 provided for their reception in the main body or carrying member of the electrode. Such pins or projections may be secured in the carrying member by making them a tapered fit in the holes 3, as is shown in Figs. 1 and 2; or they may be accurately fitted in any other convenient manner, another method being illustrated in Fig. 3, where the pins will be seen to be threaded in the apertures which are however tapered in order to insure a tight fit. The joint, of course, between the pins and the carrying member, or back, must be very close and offer a negligible resistance to the passage of the current so that the composite electrode acts as if it were really composed of one solid piece, back and pins inclusive.

It is of course, quite immaterial what form be given to the frames 4 which separate the successive carrying members 1 of the composite electrodes; so too, while a diaphragm 5 is shown as secured in position between successive electrodes, or rather between the pairs of interposed separating members 4 as the frames may, for the sake of simplicity, be termed said diaphragm forms no feature of the present invention and may or may not be used as found desirable in actual practice. Suitable openings 6 are likewise shown as being provided for the inlet and outlet of the electrolyte and for the escape of the gaseous products resulting from the electrolysis of the same, or for such other purposes as may be desired, but the manner in which the cell is thus fed, or in which the products, resulting from the electrolysis carried on therein, are removed, constitutes no part of the invention, the arrangements for these several purposes, that are thus illustrated, being merely typical.

As indicated at the right in Fig. 2, one of the electrodes may be used to form the outer wall of the terminal cell of the series, or a separate plate 8 may be employed for this purpose, as illustrated at the left in the same figure. It has been already explained that

it is the anodes that corrode, or deteriorate, the more rapidly and thus afford occasion for the renewal or repair to which the present improved construction of electrode is particularly adapted; the arrangement of Fig. 2, in which an electrode of the present improved construction constitutes the terminal anode of the series of cells, while a plain plate forms the terminal cathode, is hence a preferred arrangement. Moreover in the intermediate electrodes of the series entering into the construction of the cells, it is not necessary to the principle of this invention that both sides of the carrying members 1 be provided with the working pencils or projections 2, but only that the sides which are used as the anodes be so provided. The cathode sides of these members may remain flat, or be corrugated or otherwise formed as illustrated, for example, in the patent already cited, so as to present a suitable area and a character of surface adapted for the particular use to which the cell is to be put.

25 The studding of either or both faces of the carrying member, in the fashion described, with a multiplicity of projections or pins has the advantage that the corresponding face of the carrying member is either partially or entirely removed from electrolytic action, such action being confined to the projections and particularly to the ends of the latter. These pencils, when

worn, may be withdrawn and replaced without the necessity of renewing the main carrying member. 35

Other modes of applying the principle of my invention may be employed instead of the one explained, change being made as regards the mechanism herein disclosed, provided the means stated by any of the following claims or the equivalent of such means be employed. 40

I therefore particularly point out and distinctly claim as my invention:— 45

1. An electrode for electrolytic cells and the like, consisting of a plate of conducting material, and a plurality of pins of the same material removably mounted in one face of said plate. 50

2. A bipolar electrode for electrolytic cells and the like, consisting of a plate of carbon and a plurality of independent carbon pins mounted on either face of said plate. 55

3. A bipolar electrode for electrolytic cells and the like, consisting of a carbon plate and independent carbon pins having conical ends removably engaging correspondingly formed holes in either face of said carbon plate. 60

Signed by me this 12 day of June, 1911.

EDWIN O. BARSTOW.

Attested by—

THOS. GRISWOLD, JR.

CLARA TURNER.