

No. 707,835.

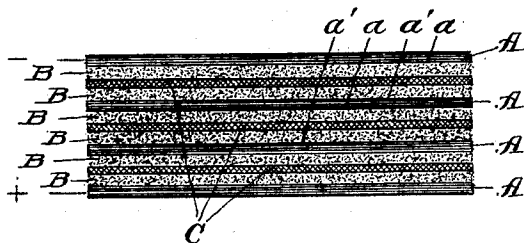
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H. H. DOW.

MEANS FOR GENERATING COUNTER ELECTROMOTIVE FORCE.

(Application filed Apr. 21, 1900.)

(No Model.)



Witnesses

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# UNITED STATES PATENT OFFICE.

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## MEANS FOR GENERATING COUNTER ELECTROMOTIVE FORCE.

SPECIFICATION forming part of Letters Patent No. 707,835, dated August 26, 1902.

Application filed April 21, 1900. Serial No. 13,707. (No model.)

*To all whom it may concern:*

Be it known that I, HERBERT H. DOW, 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 Means for Generating Counter Electromotive Force, 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.

My invention relates to devices for setting up a counter electromotive force in an electrical circuit, and particularly to that class of such devices in which the counter electromotive force is set up as a result of the polarization which may be caused to take place upon an electrode or the electrodes of a voltaic battery.

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

In said annexed drawing the figure represents a diagrammatic cross-section of a polarizing-battery constructed in accordance with my invention.

My said invention consists of a series of juxtaposed voltaic elements, each of which comprises two carbon plates or sheets A, whose opposing faces *a* and *a'*, respectively, are covered with a layer of granular material B, such as powdered or granular carbon, forming opposing electrode-faces upon electrodes of opposite signs. As the carbon plates and the faces thereof are respectively solid and granular in form, although of the same material, (carbon,) said plates and their faces may be said to be of similar material or of a character similar to each other, the term "similar" being used to express the fact that the two materials are similar to each other, excepting as to the form in which they are applied. Such layers are respectively imposed upon opposite faces of a sheet of bibulous material C, which is saturated with a suitable electrolyte, such as calcium chlorid, (CaCl<sub>2</sub>.) The opposite faces *a* and *a'* of each

electrode are similarly of granular formation, each constituting an electrode of adjacent voltaic elements and being of opposite sign, the one hence constituting the anode of one element and the other the cathode of the adjacent element of which they are respectively electrodes. Such opposition of signs of the opposite electrode-faces is a result of the passing of the current from one face of an electrode to the opposite face of the same electrode, the carbon plate of such electrode being an analogue of a connecting wire conductor of an ordinary two-electrode battery. The device hence consists of a series of juxtaposed voltaic elements each consisting of two electrodes and intermediate electrolyte, the positive electrode of one element being connected with the negative of the next through the intermediate carbon plate, upon whose opposite faces these electrodes are formed.

The granular or powdered material being in contact with the surface of the carbon plate, such material constitutes the principal part of the surface of the electrode. Inasmuch as polarization takes place only upon the surface of the electrode and the polarizing capacity of the cell or element is proportional to such surface, it is seen that by reason of the greatly-increased area obtained by using the comminuted material upon and near the electrodes' surfaces such capacity is increased enormously over that which is obtained in a battery in which such feature is not present.

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

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

1. A voltaic element comprising electrodes and a suitable electrolyte, the opposing faces of said electrodes being of opposite sign and of a granular construction, said electrodes and their faces being of similar material.

2. A voltaic element comprising electrodes and a suitable electrolyte, such electrodes having their respective opposing faces of op-

posite sign and provided with a covering of granular material, said electrodes and covering being of similar material.

3. A voltaic element comprising electrodes  
5 and a suitable electrolyte, such electrodes consisting of sheets of carbon having their opposing faces provided with a covering of granular carbon, said faces being of opposite sign.

4. A voltaic element comprising electrodes,  
10 a suitable electrolyte and bibulous material, opposing faces of such electrodes being of opposite sign and having a granular construction and in contact with opposite faces of such bibulous material, said electrodes and  
15 their faces being of similar material.

5. A voltaic element comprising electrodes, a suitable electrolyte and bibulous material, such electrodes consisting of sheets of carbon having their opposing faces of opposite  
20 sign and formed of a covering of granular material of a character similar to that of the electrodes, such material being in contact with opposite faces of such bibulous material.

6. A series of voltaic elements each comprising electrodes and an electrolyte, opposing faces of adjacent electrodes being of opposite signs and formed with a covering of granular material of a character similar to that of the electrodes, opposite faces of such electrodes constituting the anode and cathode  
30 respectively of two adjacent elements.

7. A series of voltaic elements each comprising electrodes, an electrolyte and bibulous material, opposing faces of adjacent electrodes being of opposite signs and formed  
35 with a covering of granular material of a character similar to that of the electrodes upon opposite sides of said bibulous material, opposite surfaces of such electrodes constituting the anode and cathode respectively of two adjacent  
40 elements.

Signed by me this 17th day of April, 1900.  
HERBERT H. DOW.

Attest:

THOS. GRISWOLD, Jr.,  
E. W. BENNETT.