

UNITED STATES PATENT OFFICE.

CHARLES N. WAITE, OF NEWTON, MASSACHUSETTS.

DIAPHRAGM FOR ELECTRICAL CELLS.

SPECIFICATION forming part of Letters Patent No. 469,428, dated February 23, 1892.

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To all whom it may concern:

Be it known that I, CHARLES N. WAITE, of Newton, county of Middlesex, State of Massachusetts, have invented certain new and useful Improvements in Diaphragms for Electrical Cells and the Process of Making Such Diaphragms, of which the following is a specification.

My invention has for its main object to produce a diaphragm of low resistance and of great durability. The diaphragm hereinafter described is more particularly adapted and designed for electrolytic cells; but I do not desire to limit it to that use.

The nature of my invention and in what it consists is more fully set forth in the following description, and is pointed out in the claims which are appended hereto and made a part hereof.

A description of the process of making my improved diaphragm will fully disclose the character thereof. I prefer to proceed as follows: I dissolve albumen in water, using the proportion substantially of six parts of albumen to ten parts of cold water. I then form a sheet or film or layer of any desired thickness wholly of the albumen thus prepared, or I spread a film or layer thereof upon a sheet or backing of paper, cloth, asbestos paper, or similar material, or I may incorporate with the layer or sheet of albumen, when a backing is not used, suitable fibrous material which has been separated into fibers or threads, and this incorporation may be made either before the albumen is spread into a sheet or layer or afterward. The sheet or layer or film thus formed is then carefully dried in such manner as not to coagulate the albumen, and then dipped in a solution of a metallic or earthy salt—such, for example, as tartrate of antimony, chloride of tin, sulphate of alumina, or

similar salts. As a result of this dipping, an insoluble albuminate of the metal is obtained in a dense compact form and in a sheet or film or layer which substantially adapts it for use as a diaphragm. I have found that a diaphragm thus constructed is of particular advantage for use in separating highly-corrosive liquids—such as chlorine-water—by electrolytic action, owing to the fact that the chlorine will unite with the metallic or earthy oxide which is in combination with the albumen before attacking the albumen itself. This prolongs the life of the diaphragm, which is effective so long as the albumen is not attacked. It is important to observe that in constructing this diaphragm as above set forth the albumen should be dried before it is subjected to the action of the metallic or earthy salt, else it will not have the proper cohesion to render it effective and useful.

What I claim is—

1. A diaphragm for an electrical cell, consisting of a dense and compact layer, sheet, or film composed of a metallic albuminate, substantially as set forth.

2. A diaphragm for an electrical cell, consisting of a dense and compact layer, sheet, or film composed of a metallic albuminate, combined with a sheet of supporting and strengthening material, substantially as set forth.

3. The process of making a diaphragm for an electrical cell, consisting in first drying a layer, sheet, or film of albumen and then subjecting it to the action of an earthy or metallic salt, substantially as set forth.

CHARLES N. WAITE.

Witnesses:

WM. A. MACLEOD,
ROBT. WALLACE.