

UNITED STATES PATENT OFFICE.

CHARLES N. WAITE, OF NEWTON, MASSACHUSETTS.

ELECTRICAL DIAPHRAGM.

SPECIFICATION forming part of Letters Patent No. 489,551, dated January 10, 1893.

Application filed March 16, 1892. Serial No. 425,165. (No specimens.)

To all whom it may concern:

Be it known that I, CHARLES N. WAITE, a citizen of the United States, residing at Newton, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Electrical Diaphragms, of which the following is a specification.

My invention has for its object to provide an improved diaphragm for electrolytic cells designed to be used in the electrolysis of alkaline haloids and it consists in a diaphragm composed of a sheet or layer of asbestos or other acid resisting fibrous material having its pores filled with bi-chromatized gelatine all as hereinafter set forth and as is more particularly pointed out in the claim which is appended hereto and made a part hereof.

Bi-chromatized gelatine alone or when combined with vegetable or other destructible fiber cannot be used for the purposes of a diaphragm because by the action of the chlorine, bromine and the like, the chromium oxide is rapidly converted into chromic acid, which readily destroys the fiber. If bi-chromatized gelatine alone be used its tenacity is not sufficient. If however bi-chromatized gelatine be strengthened by use of a fiber like asbestos a serviceable and very effective diaphragm may be produced. The nature of my improved diaphragm will be readily understood from the following description of the method in which it is made. I dissolve glue or isinglass in the smallest possible quantity of water and add to the solution a quantity

of bi-chromate of potash equal in amount preferably to fifteen or twenty per cent. of the glue employed. The bi-chromate of potash may be dissolved in a small quantity of water before adding it to the glue solution. After the ingredients are thoroughly mixed I add the asbestos or other strengthening material either by stirring the fiber into the mass and then forming the mass into sheets or layers or the solution may be brushed or painted onto the ordinary asbestos paper. After the sheet has been formed in either of these ways it is carefully dried and exposed to strong sun light before using, or the sheet may be passed through a bath of hypo-sulphite of soda or other reducing substance. This renders the glue insoluble, binding the strengthening fiber firmly and produces a durable sheet or diaphragm of sufficient tenacity which is very efficient in preventing the diffusion of liquids in the cell while at the same time offering but slight resistance to the passage of the electric current.

What I claim is:—

An electrical diaphragm consisting of a sheet or layer of acid resisting fibrous material and bi-chromatized gelatine, substantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

CHARLES N. WAITE.

Witnesses:

WM. A. MACLEOD,
ROBT. WALLACE.