

(No Model.)

I. L. ROBERTS.

DIAPHRAGM FOR GALVANIC BATTERIES.

No. 414,081.

Patented Oct. 29, 1889.

Fig 1

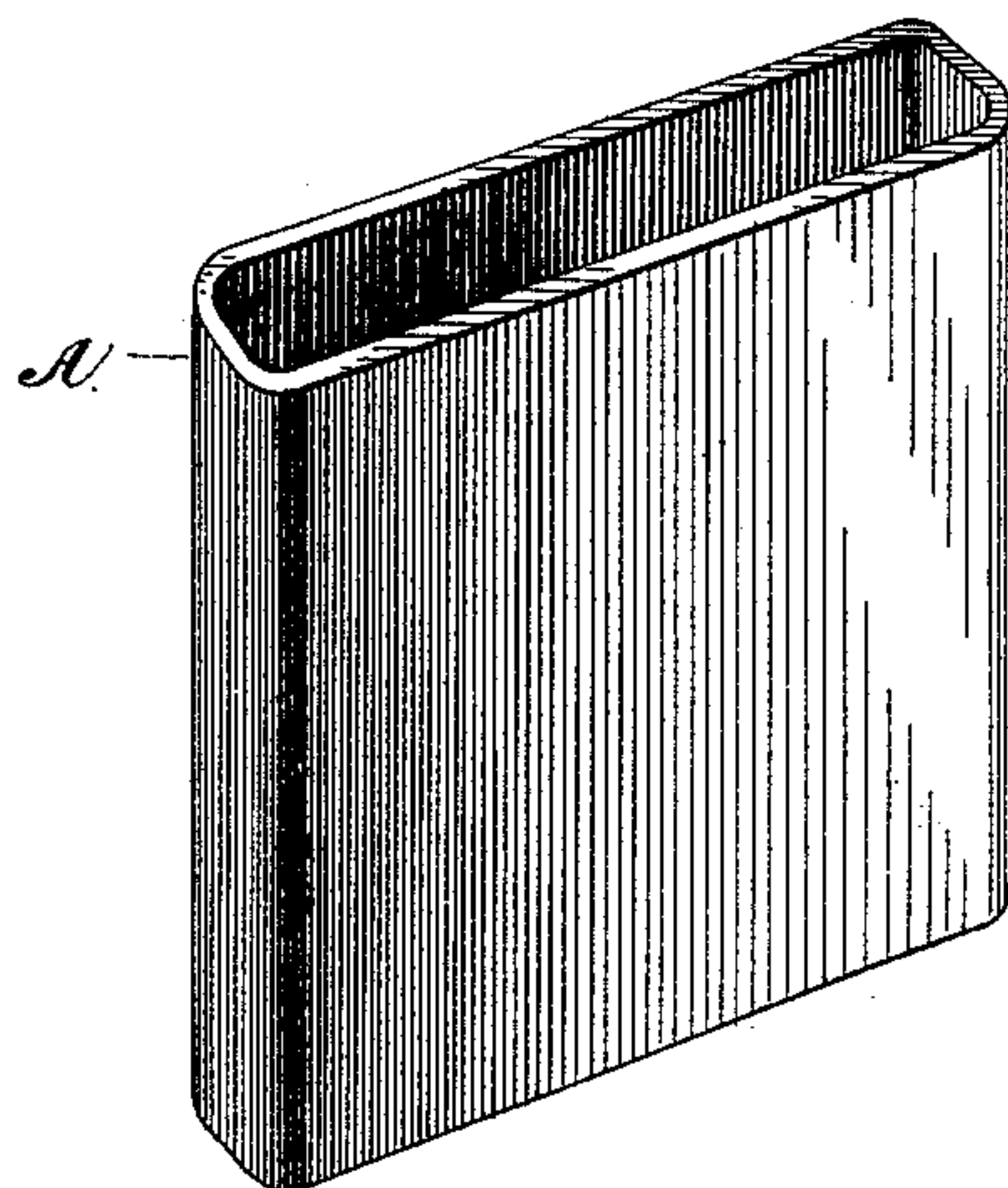
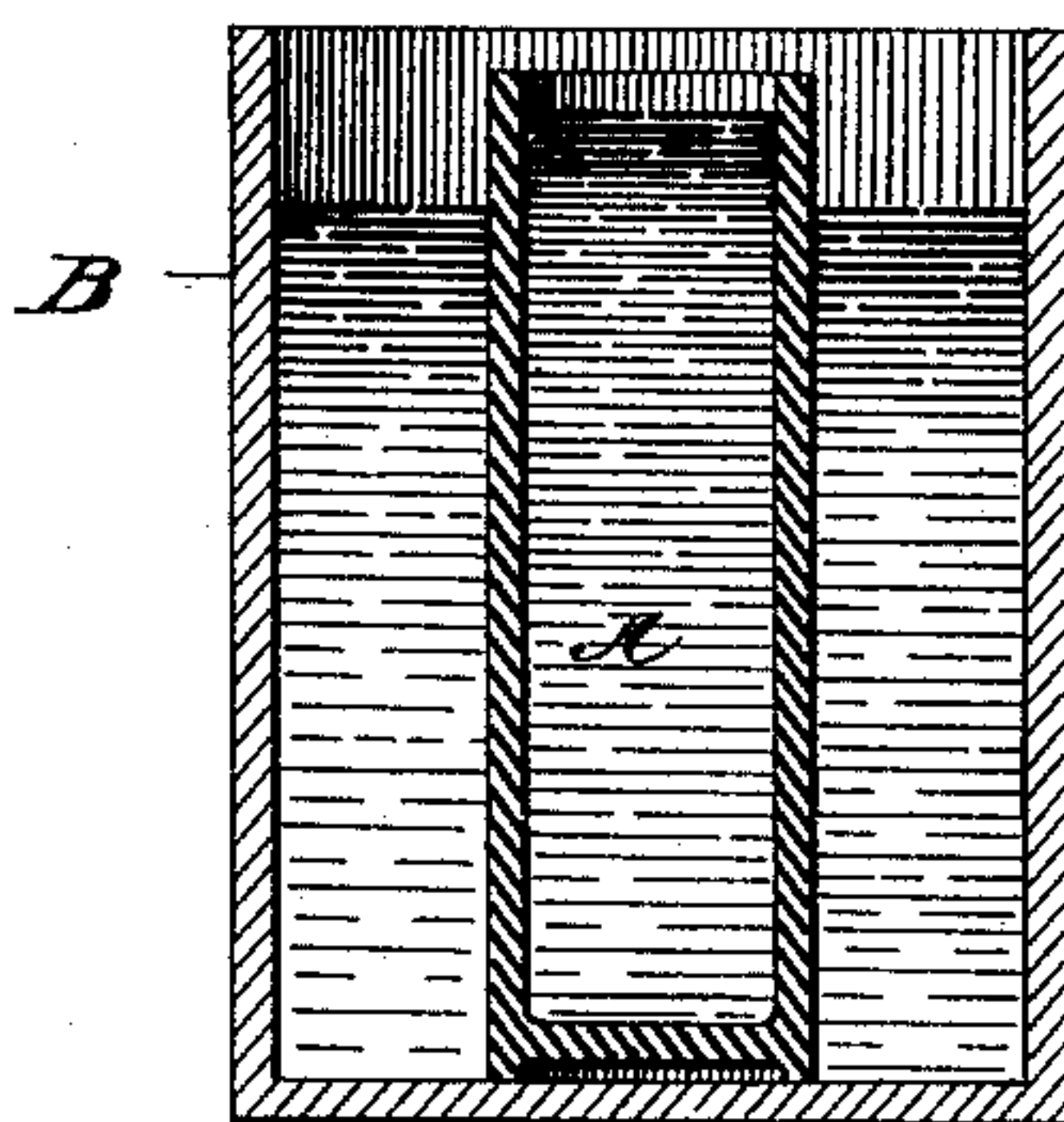


Fig 2



WITNESSES:

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DIAPHRAGM FOR GALVANIC BATTERIES.

SPECIFICATION forming part of Letters Patent No. 414,081, dated October 29, 1889.

Application filed May 5, 1887. Serial No. 237,259. (No model.)

To all whom it may concern:

Be it known that I, ISAIAH L. ROBERTS, a resident of the city of Brooklyn, county of Kings, and State of New York, and a citizen of the United States, have made a new and useful Improvement in Electric Batteries, of which the following is such a full, clear, and exact description as will enable others skilled in the art to practice the same.

In conjunction with Henry L. Brevoort, I have filed an application for Letters Patent, May 1, 1886, Serial No. 200,847, for improvement in electric batteries, consisting, mainly, of a separating partition or diaphragm, upon opposite sides of which the liquids of a two-fluid battery can be placed, and through which diaphragm or partition the liquids, as such, will not to an injurious extent in practice physically pass, although in and through the substance of the diaphragm chemical action may take place. For this purpose we made the diaphragm or partition partially or wholly of a gelatinous or jelly-like character, the action of which we believe to be thus explained. Such a partition forms a non-porous substantially-solid homogeneous wall, whose particles, while sufficiently solid and compact to maintain their own positions and so prevent for practical purposes any transmission of fluids between or through them, are yet themselves able to act as electrolytes and suffer such decompositions and recombinations as are essential to the electrolytic transmission of electric force.

My present invention consists in making these gelatinous or jelly-like partitions or diaphragms with the aid of mineral substances from which materials of gelatine character can be produced. I preferably saturate or impregnate a suitable support or holder with these mineral gelatinous substances, or I use them alone, employing as a support or holder preferably a porous cup or a sheet of wool or fur felt, so that the pores of the separating-diaphragm are closed by the mineral gelatine. I prefer cup-shaped diaphragms or partitions, because they do not require to be fastened to the walls or bottom of the vessel which is to be divided into compartments. Thus a porous cup of baked earthenware or a cup of felt stretched over a frame I find convenient.

Such a cup may be of any well-known form—such, for instance, as that illustrated in the accompanying drawings, in which—

Figure 1 is a perspective view of the cup or separating-diaphragm A, and Fig. 2 is a vertical section of a two-cell battery B, containing the cup or separating-diaphragm A, but without the electrodes.

It is known in practical chemistry that certain mineral substances can be turned into what are known as “gelatinous substances.” Thus silicate of soda or of potash can by treatment with an acid or metallic salt be turned into a gelatinous mass. So, also, the salts of tin—such as the stannates and chlorides—can be gelatinized, the stannates by treatment with an acid, the chlorides by treatment with an alkali, thus in both cases precipitating in gelatinous form the stannic or stannous oxides. The salts of aluminium may also be gelatinized by treatment with an alkali. The various mineral substances which can be gelatinized are numerous, and works on chemistry will give an account of them. I need not therefore mention them at length.

As one method of carrying my invention into effect, I take a porous cup, preferably of baked earthenware, very porous, and I saturate this by soaking it, say, for from two to ten hours (the longer the better) in an aqueous solution of silicate of soda or potash. The solution should be just thin enough to enable it to penetrate the pores of the cup. Heat may be used to hasten the saturation of the cup. When the cup is thoroughly saturated, I dip it—say for an hour—in muriatic acid, which I prefer, or the salts of a metal, such as chloride of iron. These substances cause the silicate to deposit silica in the shape of a gelatinous mass in the pores of the holder. When this is accomplished, the separating-partition is formed by the walls of the porous cup having its pores closed with the mineral gelatinous mass. The gelatinous material may be formed and held between supporting-sheets of cloth or other material, which, while offering but little resistance to the electric current, will serve to hold the gelatinous mass in position. It is evident that this can be done with all of the various substances which form what I call “mineral gelatinous masses.” Now,

my invention includes all such substances, and, though I prefer to use the silicates of soda or potash and I prefer to use a porous holder in the pores of which the gelatinous material is formed, I do not limit myself to forming the gelatinous mass in the pores of the supporting or holding substance, for it may be introduced between or into such substances in various ways which will be evident to the skilled chemist.

I do not wish to limit myself to any particular form or construction of holder or support, or to any particular mineral substance which can be gelatinized, or to any particular method of gelatinizing the substance. The gelatinous material may be formed between supports into a cup form without having any holder or support when in the battery, and these cups can then be used. Sheets of the material may also be so made; but I prefer to use a holder or support.

I do not herein claim a separating-partition for an electric battery consisting of earthenware having its pores closed with gelatinous material, or such a partition consisting of earthenware having its pores closed with ge-

latinized silicate of soda or potash, because I have just made those matters the subject of claim in another application, No. 280,976, filed July 25, 1888, patented December 18, 1888, No. 394,613.

I claim as my invention—

1. A separating diaphragm or partition for an electric battery partially or wholly of mineral gelatinous material, substantially as described.

2. A separating partition or diaphragm for an electric battery, consisting of mineral gelatinous material combined with a holder, substantially as described.

3. A separating partition or diaphragm for an electric battery, consisting of a porous substance impregnated with mineral gelatinous material.

4. A separating partition or diaphragm for an electric battery, consisting of a porous substance having its pores closed with gelatinized silicate of soda or potash.

ISAIAH L. ROBERTS.

Witnesses:

GEO. W. WEIFFENBACH,
HENRY L. BREVOORT.