No. 688,077. Patented Dec. 3, 1901.

G. T. EYANSON.

POROUS DIAPHRAGM FOR BATTERIES.

(Application filed May 17, 1901.)

(No Model.)

Fig. 3.

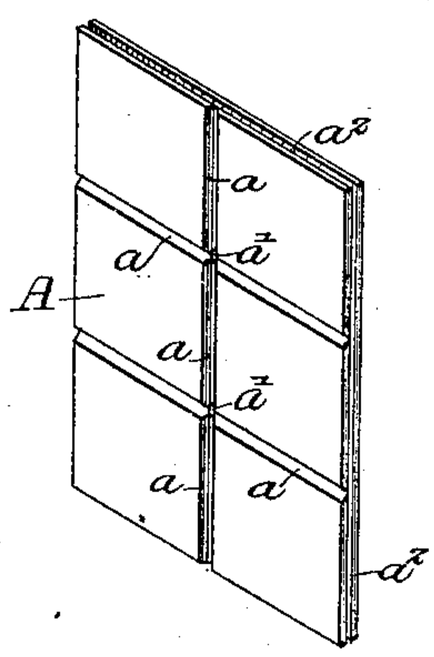


Fig. 4.

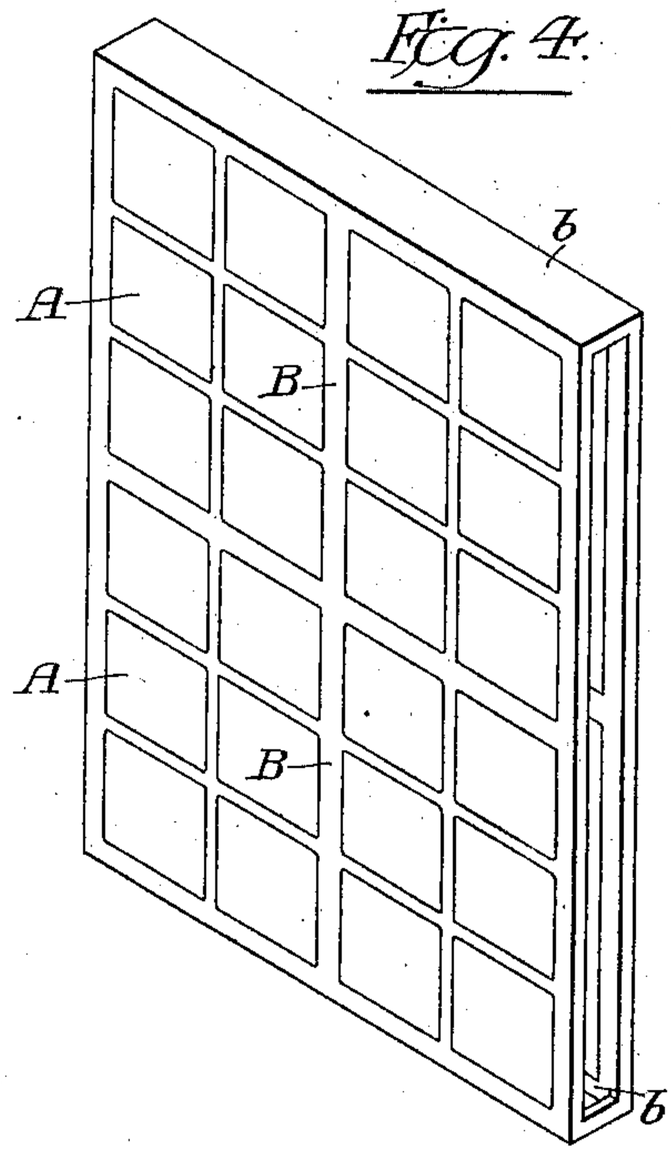


Fig. 5.

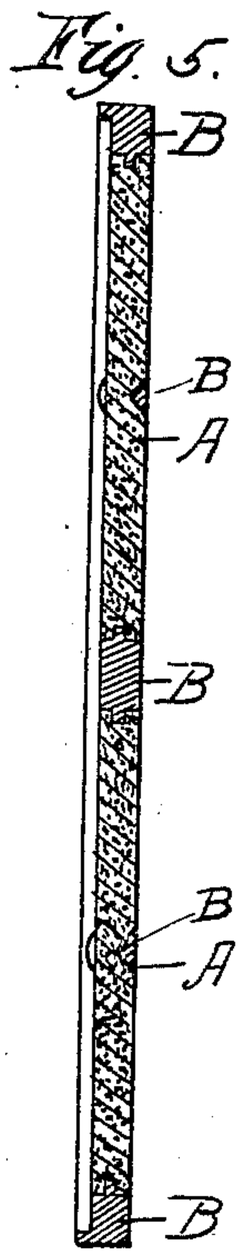


Fig. 2.

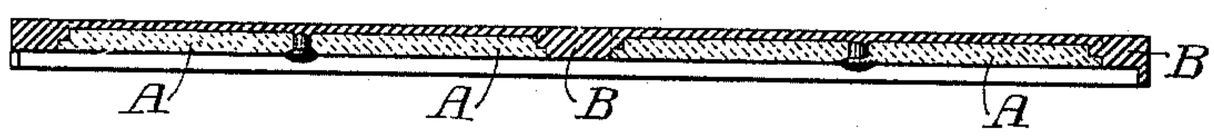
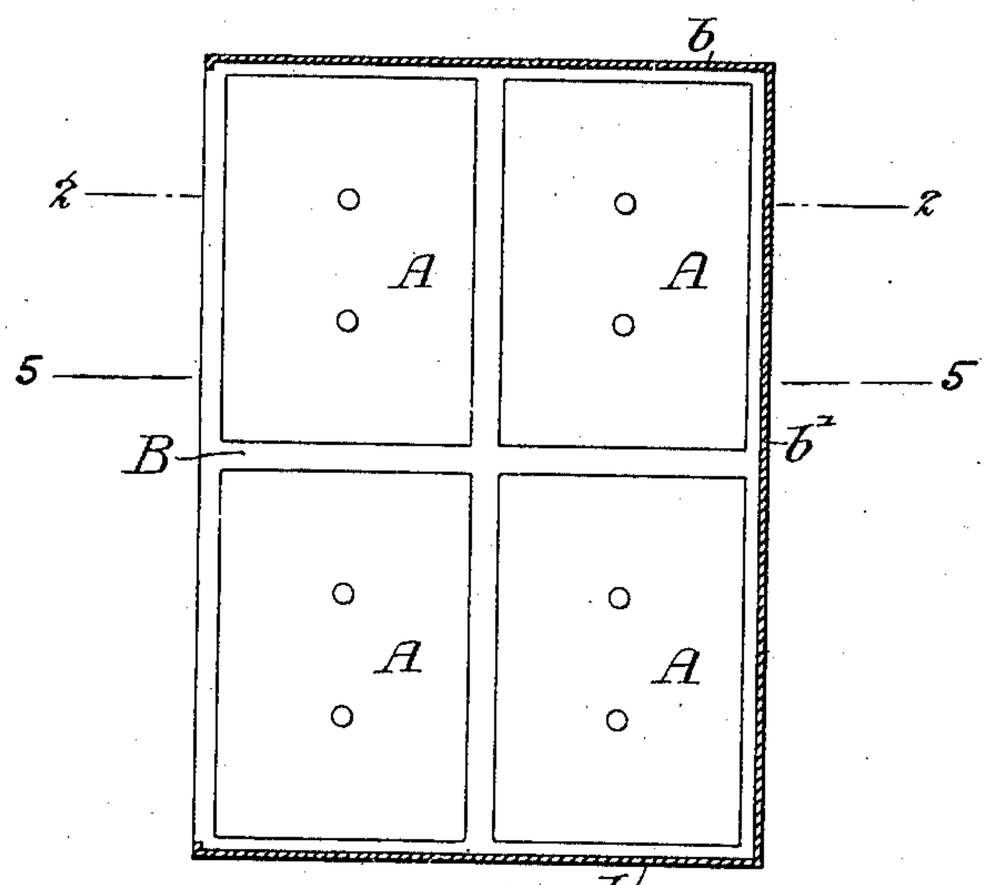


Fig. 1.



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UNITED STATES PATENT OFFICE.

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POROUS DIAPHRAGM FOR BATTERIES.

SPECIFICATION forming part of Letters Patent No. 688,077, dated December 3, 1901.

Application filed May 17, 1901. Serial No. 60,703. (No model.)

To all whom it may concern:

Be it known that I, GEORGE T. EYANSON, a citizen of the United States, residing in Philadelphia, Pennsylvania, have invented certain Improvements in Porous Diaphragms for Batteries, of which the following is a specification.

My invention relates to certain improvements in porous partitions or diaphragms for batteries, having for its object the provision of a device of the character described which while being relatively light shall at the same time be structurally strong and durable. This object I attain as hereinafter set forth, reference being had to the accompanying drawings, in which—

Figure 1 is a side view of a porous plate made according to my invention, showing four porous sections held in a suitable frame. Fig. 2 is an enlarged sectional view on the line 2 2, Fig. 1. Fig. 3 is a perspective view of one of the porous sections of which the plate shown in Fig. 1 is composed. Fig. 4 is a perspective view of a porous vessel or cup for a battery, the same having its front and rear sides made of plates similar to that shown in Fig. 1. Fig. 5 is an enlarged sectional view on line 5 5, Fig. 1.

In the drawings, A A are plate-sections of a porous electrically non-conducting material—as for instance, unglazed porcelain or other earthenware. These sections have grooves *a a* running across their flat surface, preferably only on one side, as shown in the figures, and wherever these intersect a hole *a'* is made through the plate, there being two of these points in the section illustrated. The edges of the plate-section are also made with a groove a^2, and around the whole is cast a frame B. This frame is preferably made of lead and extends into the groove a^2. It also enters the grooves *a a* and passes through the holes *a'*, which may, if desired, be made countersunk on the side opposite to the grooves, as shown in Fig. 2. In making up a complete plate the edges of several plate-sections are burned together, forming a partition or diaphragm of the appearance illustrated in Fig. 1. Two of these composite diaphragms may be joined by end pieces *b b* and a back piece *b'*, the same being of lead and united to the frames B B by burning. Within the cup or vessel formed one of the zinc elements of a battery is placed, being held out of contact with the lead frame and end plates by means of suitable insulators.

It will be understood that my invention may be used not only to form the sides of a porous cup, but also as a simple dividing-partition to separate a battery-cell into compartments. For this purpose the size of the porous-plate section A may be varied, there being a greater or less number of the grooves *a a*, according to the size of the said section and varying numbers of plate-sections to the completed diaphragm.

I claim as my invention—

1. The combination of a plate of electrically non-conducting porous material, having grooves running across its surface and a frame surrounding said plate and extending into said grooves, substantially as described.

2. The combination of an electrically non-conducting porous plate, grooves in the edges and other grooves extending across the flat surface thereof, holes through the plate and a frame extending around said plate, entering the grooves thereof and extending into said holes, substantially as described.

3. A diaphragm for a battery, the same consisting of a number of porous, electrically non-conducting plates, grooves in the edges and across the flat faces of said plates, holes through the plates at points of intersection of the grooves, and a metallic frame surrounding the plates, the same having parts extending into the grooves and entering the holes, substantially as described.

4. A porous vessel for batteries, the same consisting of solid ends and a bottom, with sides, the said sides consisting of plates of porous, electrically non-conducting material, having grooves in their flat surfaces, the said plates being held together by a framework extending into the grooves and joined to the said ends and bottom, substantially as described.

5. As a new article of manufacture, a porous

vessel for batteries, the same consisting of a box-like structure having in its sides grooved plates of porous electrically non-conducting material, the material from the sides of said box-like structure extending in the grooves from side to side across the surface of said plates, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

GEORGE T. EYANSON.

Witnesses:

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JOS. H. KLEIN.