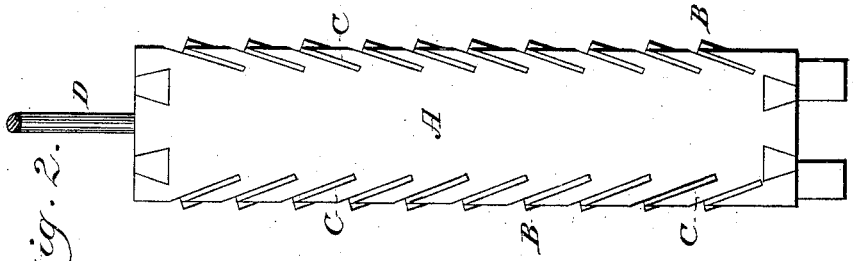
(No Model.) 2 Sheets—Sheet 1.

J. PITKIN.

ELECTRODE FOR BATTERIES.

No. 265,861. Patented Oct. 10, 1882.

Fig. 2.



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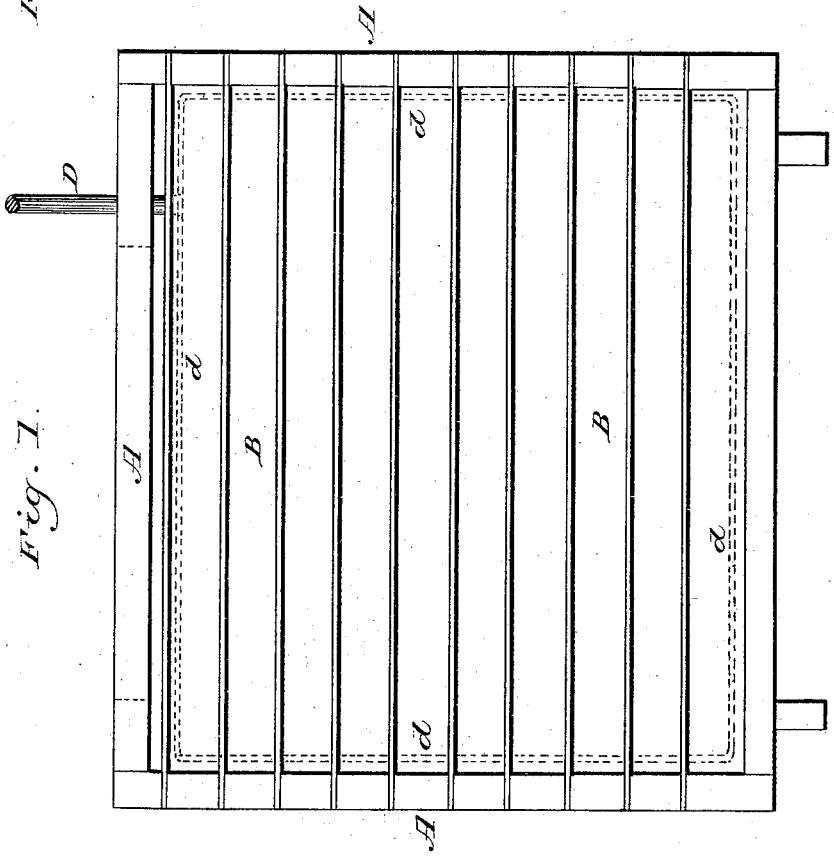

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(No Model.) 2 Sheets—Sheet 2.

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Fig. 3.

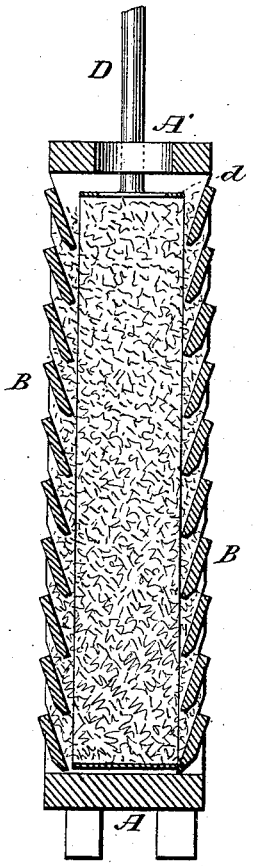
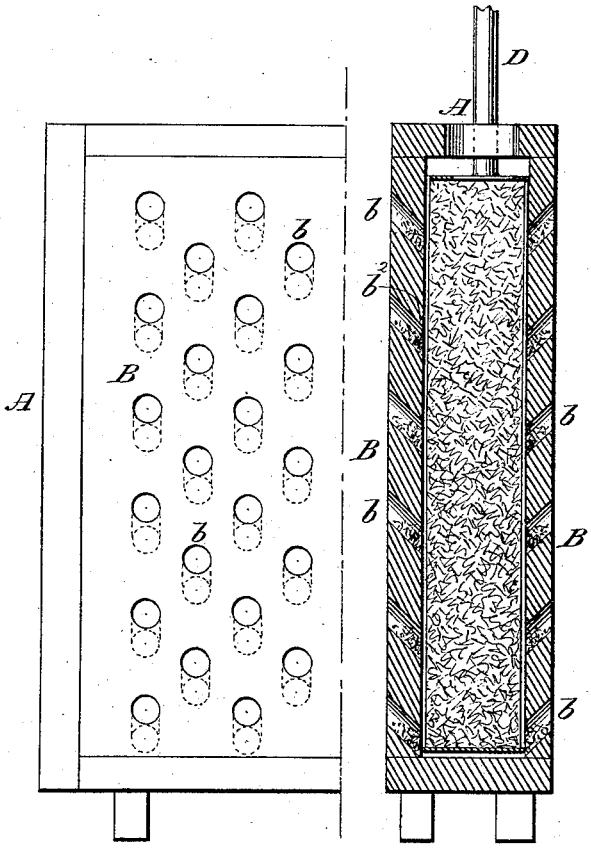


Fig. 4.



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UNITED STATES PATENT OFFICE.

JAMES PITKIN, OF CLERKENWELL, COUNTY OF MIDDLESEX, ENGLAND.

ELECTRODE FOR BATTERIES.

SPECIFICATION forming part of Letters Patent No. 265,861, dated October 10, 1882.

Application filed July 13, 1882. (No model.)

To all whom it may concern:

Be it known that I, JAMES PITKIN, of Clerkenwell, in the county of Middlesex, England, have invented a new and useful Improvement in Electrodes for Batteries; and I do hereby declare that the following is a full, clear, and exact description of the same.

My invention relates to improvements in the construction of secondary batteries, but it is also applicable to primary batteries; and it consists in an improved construction of holder or frame to contain turnings or other shreds of lead of which the electrode is made, without the use of any inclosing fabric, which augments the internal resistance of the battery and is otherwise objectionable.

My improved holder is so constructed as to allow free access of the electrolytic liquid to the element and yet prevent the lead peroxide or spongy lead (into which the lead turnings, &c., become converted) falling out, and it may consist of inclosing-surfaces formed of louver-like strips or laths of ebonite, wood, or other suitable material fixed across the two sides of a suitable rectangular or other frame, the laths being placed obliquely and slightly overlapping one another, so as to leave interstices, through which the liquid has free access, and the laths of the two sets being inclined inwardly and downwardly. They may be fixed by having their ends inserted in inclined slits in the side bars of the frame, or in any other convenient manner. Between these two oppositely-inclined series of laths the lead turnings or other thin shreds of lead of which the electrode is made are packed; or the inclosing-surfaces of the holder may be thin plates of wood, ebonite, or other material, perforated as closely as possible over their whole surface with holes or apertures of any shape, but inclined downward and inward at such an angle as, having regard to their size and thickness of plate through which they are made, to afford little or no direct horizontal aperture for the lead oxide or spongy lead to fall out at.

In the accompanying drawings I have represented examples of my invention.

Figure 1 is a face view, Fig. 2 an edge view, and Fig. 3 a cross-section, of the louver-like holder. Fig. 4 shows a part face view and part cross-section of a holder having inclined perforations.

A is a frame of wood or ebonite, and B are laths or strips of the same material, fixed obliquely to the opposite sides of the frame, as shown, and overlapping sufficiently, while leaving interstices between them to prevent the escape of the lead oxide or spongy lead. In the example shown these laths are fixed by having their ends held in inclined slits C in the edges of frame A.

An opening may be made in the top bar of frame A, at which to introduce the lead turnings, &c., of which the electrode is made.

D is a lead wire conductor, to which is soldered a band of lead, *d*, which is carried round the four sides of the frame A in contact with the mass of turnings or shavings, &c., packed therein. This band may also be divided at intervals into branches or strips, which are bent inward and embedded in the mass of turnings, &c.

In Fig. 4, B are plates inclosing the space within the frame A. They are made with inwardly and downwardly inclined apertures *b*, of such dimensions and at such an angle that the lower edge, *b'*, of an aperture on the outer surface of the plate shall be as high, or nearly so, as the upper edge, b^2, of the same hole on the inner surface of said plate. These holes or apertures may be made in any convenient way.

The two forms of inclosing-surface herein described may be combined in the same holder, or with other arrangements in which interstices or apertures inclined as herein described are provided.

The holder stands upright on edge, as represented in the drawings, when in the battery, and two or more of them are coupled together in the ordinary way of constructing such batteries.

What I claim as my invention is—

1. In a battery, the combination, with an electrode composed of a mass of finely-comminuted metal, of a holder for said mass, constructed of series of louver-like laths arranged across the opposite sides of a frame, and having inter-

stices between them, substantially as shown and described.

2. The combination, with an electrode composed of a mass of finely-comminuted metal, of inclosing-plates having downwardly and inwardly inclined apertures and fixed to opposite sides of an inclosing-frame, as shown and described.

The foregoing specification of my invention for improvements in secondary and primary batteries signed by me the 21st day of June, A. D. 1882.

JAMES PITKIN.

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