

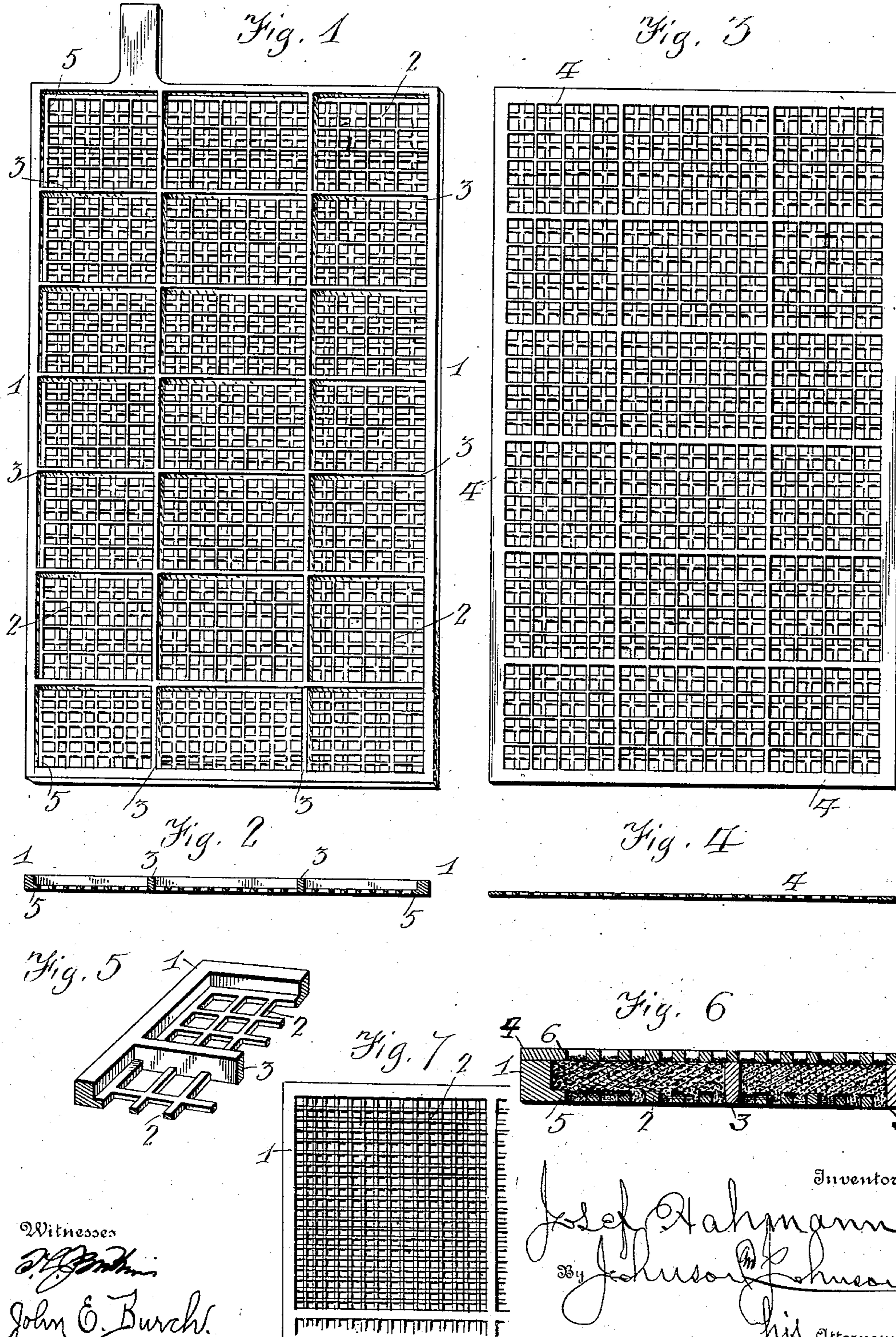
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PATENTED APR. 7, 1903.

J. HAHMANN.
SECONDARY BATTERY ELECTRODE.

APPLICATION FILED JULY 19, 1902.

NO MODEL.



Witnesses
John E. Burch
John E. Burch.

Inventor
Josef Hahmann
By *Johnson & Johnson*
his Attorneys

UNITED STATES PATENT OFFICE.

JOSEF HAHMANN, OF BERLIN, GERMANY.

SECONDARY-BATTERY ELECTRODE.

SPECIFICATION forming part of Letters Patent No. 724,856, dated April 7, 1903.

Application filed July 19, 1902. Serial No. 116,157. (No model.)

To all whom it may concern:

Be it known that I, JOSEF HAHMANN, a subject of the Emperor of Germany, residing at Waldstrasse 18, city of Berlin, Prussia, Empire of Germany, have invented certain new and useful Improvements in Secondary-Battery Electrodes, of which the following is a specification.

For secondary batteries I have produced a thin, light, and durable holder for the active material, and in the claim I will point out the precise improvement.

In the accompanying drawings, Figure 1 shows in perspective the reticulated plate which forms the basin or base-frame of my improved electrode. Fig. 2 is a cross-section of the same. Fig. 3 shows the reticulated cover-plate for the basin. Fig. 4 is a cross-section of the same. Fig. 5 shows in enlarged detail the corner part of the reticulated bottom base-frame. Fig. 6 shows enlarged a portion of the reticulated bottom base-frame, its reticulated cover-frame, and the active material in the closure formed by the basin and the cover. Fig. 7 shows the corner of the base-frame and the cast bottom strands without the frame-lip and in about the relative proportions of the mesh formed by the strands.

An oblong square frame 1 is molded or cast with a reticulated bottom surface or back 2 on one side, leaving the other side of the frame open or uncovered. This reticulated bottom surface is comparatively thin and is strengthened and stiffened by intermediate bars 3, dividing the thin bottom into compartments. The reticulated thin bottom or back 2 covers the area within the frame-border, and the crossed strands forming said screen-surface are molded or cast with the frame and with the intermediate cross-bars, so as to form a bottom screen-facing to the frame. The border of the base-frame stands above this screen-bottom and forms a sort of basin within the frame. The cross-bars 3 are flush with the border of the frame, as seen in Figs. 2 and 5, and divide the basin and its reticulated bottom or back into squares to support the bottom. Into the basin-closure formed by this frame and the reticulated bottom the active material is packed and retained therein by the reticulated cover-plate 4, the border

of which matches or registers with the border of the base-frame and is fastened to the latter, preferably by soldering. This cover-plate 4 is as thin as the reticulated bottom facing 2 of the base-frame, and its reticulations are formed by strands crossing at right angles within the border of the cover-frame. While the bottom screen-strands may be joined with the inner wall edges of the base-frame, I prefer to join them with a lip 5, projecting from the inner wall edges of the base-frame flush with the back surface of the plate, as in Figs. 2 and 6, so that the lip 5 and the screen-strands are on a plane with the face of the plate, and the lip will thereby serve to hold the active material in packing it around and against the inner walls of the base-frame, as in Fig. 6. The border of the cover-plate 4 is wide enough to extend or overhang the inner wall of the base-plate to form a lip 6 all around this wall corresponding with the lip 5 all around the base-frame, and thereby hold the active material within the base-frame all around its inner wall. I prefer to make the screen-forming strands square in cross-section, so that they will form symmetrical interstices, give greater rigidity to the frame and locks for the active mass, which will be pressed in the bottom interstices. The active material in the form of paste is packed in the base-frame upon its reticulated bottom or back and smoothed off and the cover-plate is placed on the open side of the base-frame, and the two border-frames are then soldered together, leaving the interstices of the cover-plate partially unfilled for the better circulation of the electrolyte fluid in the battery-cell. The reticulated bottom of strands crossing each other connect the edges of the cross-bars and the frame-border, and the cover-plate with its crossed strands closes the base-frame over its cross-bars and its reticulated bottom and holds the active material intact and gives an efficient action to the electrode.

The base-plate, with its reticulated bottom and cross-bars, and the reticulated thin cover-plate are molded or cast of an alloy of lead and antimony and form the current-collector in a way well understood in the art. As the electrode is used in the ordinary way and connected in the battery-cell by positive and

negative wires with the battery-poles in the usual way, an illustration of such use is deemed unnecessary.

I have shown and prefer to mold or cast the
5 base-plate with the cross-bars, because the
thin reticulated cover-plate can be soldered
to them, and thereby prevent the possible
bulging of the cover-plate, as in Fig. 6. I
prefer to make the screen-strands compara-
10 tively fine and the mesh about an eighth of
an inch. With a cover-plate of fine strands
the cross-bars are important to give the mesh
the required stiffness and strength, and for
this purpose the cross-bars are wide and di-
15 vide the mesh into squares. Were it not for
dividing the bottom mesh of fine strands by
the cross-bars they would be without support
and liable to break away from the border-
frame, so that it is the molding of the fine
20 mesh of the base-frame into compartments
and the cover into squares by the cross-bars
that allows the grid mesh to be formed of fine
strands, which gives the advantage of in-
creased current-collecting surface. Looking
25 at Fig. 1 it will be noted that the division of

the bottom of the basin into compartments
renders it possible to make the back of the
frame of a fine light mesh, because the cross-
bars form a frame-closure for each compart-
ment, giving its bottom the required strength 30
with lightness.

I claim—

An electrode for secondary batteries con-
sisting of a base-frame having a continuous
lip on its inner wall flush with one of its faces, 35
a back of strands connecting the continuous
lip, and cross-bars flush with both sides of the
frame connecting the back strands and divid-
ing the back into compartments, the mesh
bottom of each compartment bound and 40
braced by the cross-bars, and a cover formed
of a border, cross-bars and a mesh of fine
strands between the bars and providing a lip
overhanging the base-frame lip.

In testimony whereof I affix my signature 45
in presence of two witnesses.

JOSEF HAHMANN.

Witnesses:

A. E. H. JOHNSON,
II. L. FRANC.