No. 793,077. PATENTED JUNE 27, 1905.

H. C. HUBBELL.

CATHODE PLATE FOR BATTERIES.

APPLICATION FILED OCT. 3, 1904.

Fig. 1.

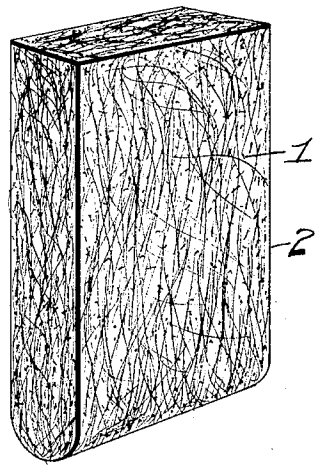
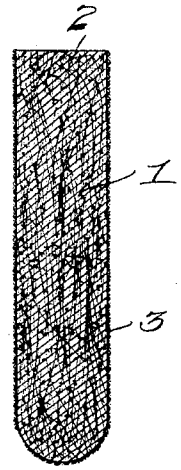


Fig. 2.



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No. 793,077. Patented June 27, 1905.

UNITED STATES PATENT OFFICE.

HARRY C. HUBBELL, OF JERSEY CITY, NEW JERSEY.

CATHODE-PLATE FOR BATTERIES.

SPECIFICATION forming part of Letters Patent No. 793,077, dated June 27, 1905.

Application filed October 3, 1904. Serial No. 227,066.

To all whom it may concern:

Be it known that I, HARRY C. HUBBELL, a citizen of the United States, residing at Jersey City, in the county of Hudson and State of New Jersey, have invented new and useful Improvements in Cathode-Plates for Batteries, of which the following is a specification.

This invention relates to cathode-plates for galvanic batteries, and more particularly to that type of plate designed for use in reversible batteries in which an electrolyte is employed of stable and unchangeable conditions in use and which serves only as a conductor for the current and those alkaline electrolytes which are decomposed by the action of metallic zinc when the battery is on discharge, the zinc being deposited upon the plate or holder when the battery is under charge.

It is one of the principal objects of my present invention to provide a battery-plate of low resistance and high conductivity which will be stable and permanent and which will oxidize freely and reduce readily. These and other objects are attained by means of the battery-plate illustrated in the accompanying drawings, in which—

Figure 1 is a perspective view of a cathode-plate made in accordance with my invention. Fig. 2 is a sectional view of a cathode-plate contained within a wire-cloth pocket or sack.

In making up my cathode-plate I use fine hair-like fibers or filaments of nickel, which may be produced in various ways, but which I preferably produce by means of electrolysis at a high voltage or amperage. These hair-like nickel fibers are mixed and intermingled with an oxid of nickel, which is moistened and formed into a dough-like or pasty plastic mass. The hair-like fibers are thoroughly incorporated with the oxid mass, the quantity of fibers preferably being greater both in weight and bulk than the oxid mass, the said fibers or filaments serving to gather and hold or bind the oxid mass into a mat-like or matted mass, cake, or brick, which may be formed or molded by kneading into any required shape. To give greater stability and permanency to the element, I prefer to place the matted material into pockets or bags made of iron or nickel-plated-iron wire cloth or gauze of fine mesh. In this manner a comparatively large quantity of material may be made to occupy but a small space, and thus affords a compact and stable battery-plate of great permanency and efficiency at a slight cost.

The hereinbefore-described fibrous structure which serves to hold the oxid mass together and form a mat-like structure is unimpaired and not disintegrated or disengaged in the bath and is not oxidizable or otherwise affected during charging or discharging.

It has been proposed to use sticks, flakes, or particles of graphite or other finely-divided carbon or comminuted particles of lead and certain other minerals with oxid of nickel; but owing to the different specific gravities of the two materials in this form separation and disintegration of the structure are liable to be soon accomplished. To overcome this defect in this character of battery-plates, I have provided the foregoing construction.

Referring to the drawings, the numeral 1 designates the intertwined hair-like nickel fibers, and 2 denotes the oxid-of-nickel mass. As shown, the filaments of nickel extend in all directions and interlock one strand with another and are held in a firm cake, mat, or brick like form with the plastic oxid.

In Fig. 2 I have shown a quantity of the cake or mat inserted in a wire-gauze pocket 3, said pocket being made of iron or nickel-plated-iron gauze or wire-cloth of fine mesh.

From the foregoing it will be obvious that my invention provides a permanent and durable battery cathode-plate which may be produced at comparatively slight cost and which has many advantages in use over the structures and materials commonly utilized for this purpose.

Having thus fully described my invention, what I desire to secure by Letters Patent and claim is—

1. A storage-battery cathode composed of hair-like fibers of nickel intertwined and embedded in a mass of nickel oxid, forming a plastic mat or cake.

2. A cathode comprising hair-like fibers of nickel and a mass of plastic nickel oxid formed into a mat-like body.

3. A battery-plate composed of nickel filaments interlocked in a mass of nickel oxid in a pasty or dough-like condition and forming a mat or cake.

4. A cathode consisting of hair-like nickel fibers mixed and intertwined with a mass of nickel oxid and inserted in a wire-gauze pocket or sack.

HARRY C. HUBBELL.

In presence of—
DUNCAN T. MCLAREN,
I. BAUM.