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C. E. LOCKWOOD & G. A. LUTZ.

PRIMARY BATTERY.

APPLICATION FILED MAR. 29, 1905.

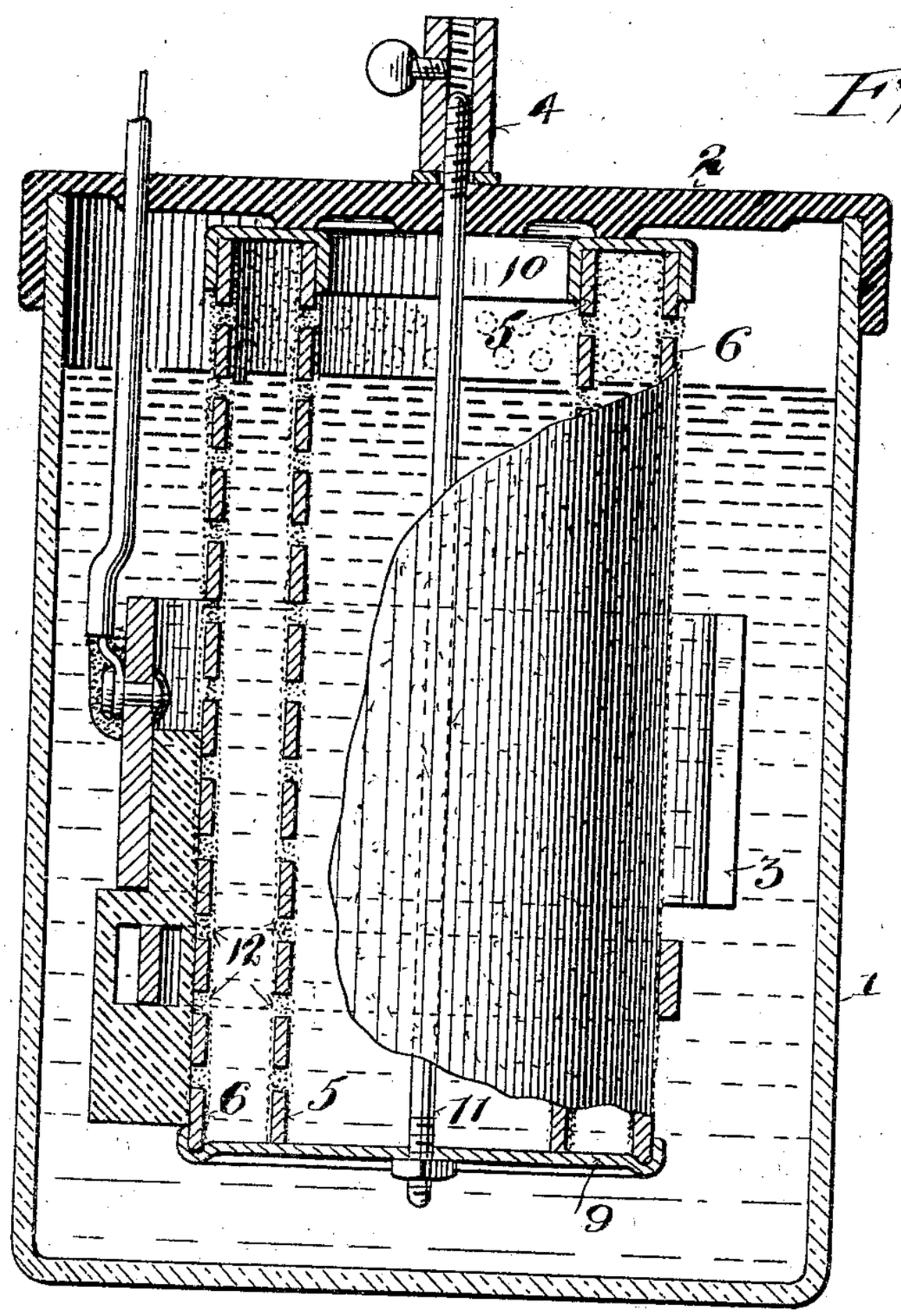

Fig. 1.

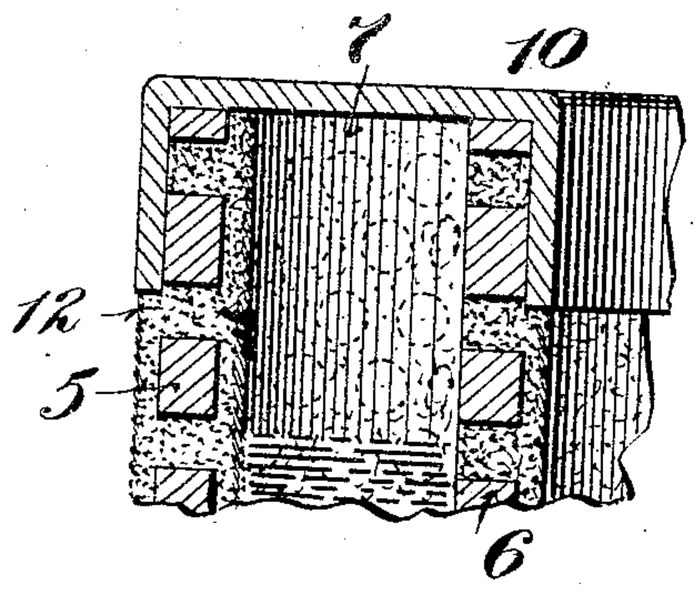

Fig. 2.

Witnesses
C. F. Benjamin.
M. Hollingshead.

Inventors
C. E. Lockwood.
G. A. Lutz
By their Attorney
T. F. Bourne

UNITED STATES PATENT OFFICE.

CHARLES E. LOCKWOOD AND GEORGE A. LUTZ, OF NEW YORK, N. Y.

PRIMARY BATTERY.

No. 812,505. Specification of Letters Patent. Patented Feb. 13, 1906.

Original application filed July 18, 1904, Serial No. 217,063. Divided and this application filed March 29, 1905. Serial No. 252,783.

To all whom it may concern:

Be it known that we, CHARLES E. LOCKWOOD, residing in New York city, borough of Manhattan, and GEORGE A. LUTZ, residing in New York city, borough of Brooklyn, New York, citizens of the United States, have invented certain new and useful Improvements in Primary Batteries, of which the following is a specification.

This application is a division of our application, filed July 18, 1904, Serial No. 217,063, for improvements in primary batteries, which has reference to using perforated retainers containing a depolarizer—such, for instance, as cupric oxid—with means to prevent the depolarizer from sifting through the perforations of the retainer during transportation and handling.

In carrying out our present invention we apply a binder to the wall of the retainer to close or fill the perforations in the retainer, which binder is soluble in the liquid or solution used in the cell, and such binder so applied to the retainer prevents the particles of the depolarizer from passing through the apertures of the retainer, whereby retainers may be charged with depolarizer, shipped to the place of use without loss of the depolarizer, and then the old retainer may be removed from a cell and the new retainer inserted in its place, thereby overcoming the necessity of removing a retainer, cleaning out the refuse depolarizer, recharging the retainer with new depolarizer, and replacing the retainer in the cell.

The invention also comprises the novel details of improvement that will be more fully hereinafter set forth and then pointed out in the claims.

Reference is to be had to the accompanying drawings, forming part hereof, wherein—

Figure 1 is a vertical section of a primary battery embodying our invention, part of the wall of the retainer being shown unbroken and covered with the binder; and Fig. 2 is an enlarged detail sectional view of the retainer.

In the accompanying drawings, in which similar numerals of reference indicate corresponding parts in the views, the numeral 1 indicates the jar, 2 its cover, 3 the zinc, and 4 the binding-post connected with the retainer or cylinders for the depolarizer, all of which may be of usual construction. The retainer or holder we have shown for the depolarizer or cupric oxid is in the form of two perforated shells or cylinders 5 6, one within the other, the depolarizer or cupric oxid being located in the space 7 between said cylinders, the ends of the space 7 being closed by covers 9 10, to which the cylinders 5 6 are attached. The rod 11 is shown connecting the cover 9 with the binding-post 4, whereby the retainer is supported from cover 2. A binder (indicated at 12) to retain the depolarizer within space 7 is applied to the cylinders 5 6 so as to close the apertures therein, and this may be done by filling said apertures with the binder or by pasting the binder along the walls of the retainer, either inside or outside, or both, whereby the loose particles of the depolarizer will be retained within the space 7 and kept from passing through the apertures during transportation and handling. The binder we use is such that is soluble in the liquid or solution used in the cell without materially affecting the electrical efficiency of the battery or cell, and for this purpose we may use sugar or similar saccharine matter, which when dissolved in the solution permits access of the solution to the depolarizer in usual manner.

The retainers provided with the binder closing the apertures and charged with the depolarizer, as set forth, are to be furnished ready for use, so that when a cell is to be recharged with depolarizer it will be merely necessary to remove the old retainer, which may be discarded, and apply a new retainer charged with the depolarizer, as stated, by passing the rod 11 through it in and attaching the rod to the binding-post 4. By charging the retainers and applying the binder at the factory in the manner stated they may be shipped without danger that the depolarizer will be lost therefrom, and the loss of time and annoyance required in removing used-up or exhausted depolarizer from retainers, cleaning out the retainers, and recharging the latter with depolarizer is avoided.

While we have referred to the use of cupric oxid as a depolarizer, it will be understood that our invention is not limited to the use of such oxid, as any other well-known corresponding depolarizer may be used, according to the character of the battery.

Having now described our invention, what we claim is—

1. A battery element comprising a perforated retainer containing a depolarizer and having a binder soluble in a battery liquid or solution applied to the wall of the retainer closing the perforations therein to prevent

such depolarizer from passing through the perforations in the retainer, said binder being of a character to not materially affect the electrical efficiency of the battery, substantially as described.

2. A battery element comprising perforated shells disposed one within another, providing a space between the shells, a depolarizer within said space, and a binder soluble in a battery liquid or solution applied to said shells, closing the perforations therein to prevent the depolarizer from passing through the perforations of the shells, said binder being of a character to not materially affect the electrical efficiency of the battery, substantially as described.

3. A battery element comprising perforated shells disposed one within another, providing a space closed at opposite ends, a depolarizer within said space, and a binder soluble in a battery liquid or solution applied along the walls of said shells covering the perforations therein to prevent such depolarizer from passing through the perforations, said binder being of a character to not materially affect the electrical efficiency of the battery, substantially as described.

4. In a battery, the combination of a liquid-holding jar, a perforated retainer therein containing a depolarizer, a binder applied to the wall of the retainer closing the perforations therein to prevent the depolarizer from passing through the perforations in the retainer, said binder being soluble in the battery liquid or solution and of a character to not materially affect the electrical efficiency of the battery, and a negative element in the jar adjacent said retainer, substantially as described.

5. In a battery, the combination of a liquid-holding jar, a retainer therein having inner and outer perforated walls providing a space, a depolarizer in said space, a binder applied to the walls of the retainer closing the perforations therein to prevent the depolarizer from passing through the perforations in the retainer, said binder being soluble in the battery liquid or solution and of a character to not materially affect the efficiency of the battery, and a negative element in the jar adjacent said retainer, substantially as described.

6. In a battery, the combination of a liquid-holding jar, a perforated retainer therein, a depolarizer in the retainer, a zinc between the retainer and the wall of the jar, a caustic solution in the jar, and a binder applied to the wall of the retainer closing the perforations therein, said binder being soluble in said solution and of a character to not materially affect the electrical efficiency of the battery, substantially as described.

CHARLES E. LOCKWOOD.
GEO. A. LUTZ.

Witnesses:
T. F. BOURNE,
M. HOLLINGSHEAD.