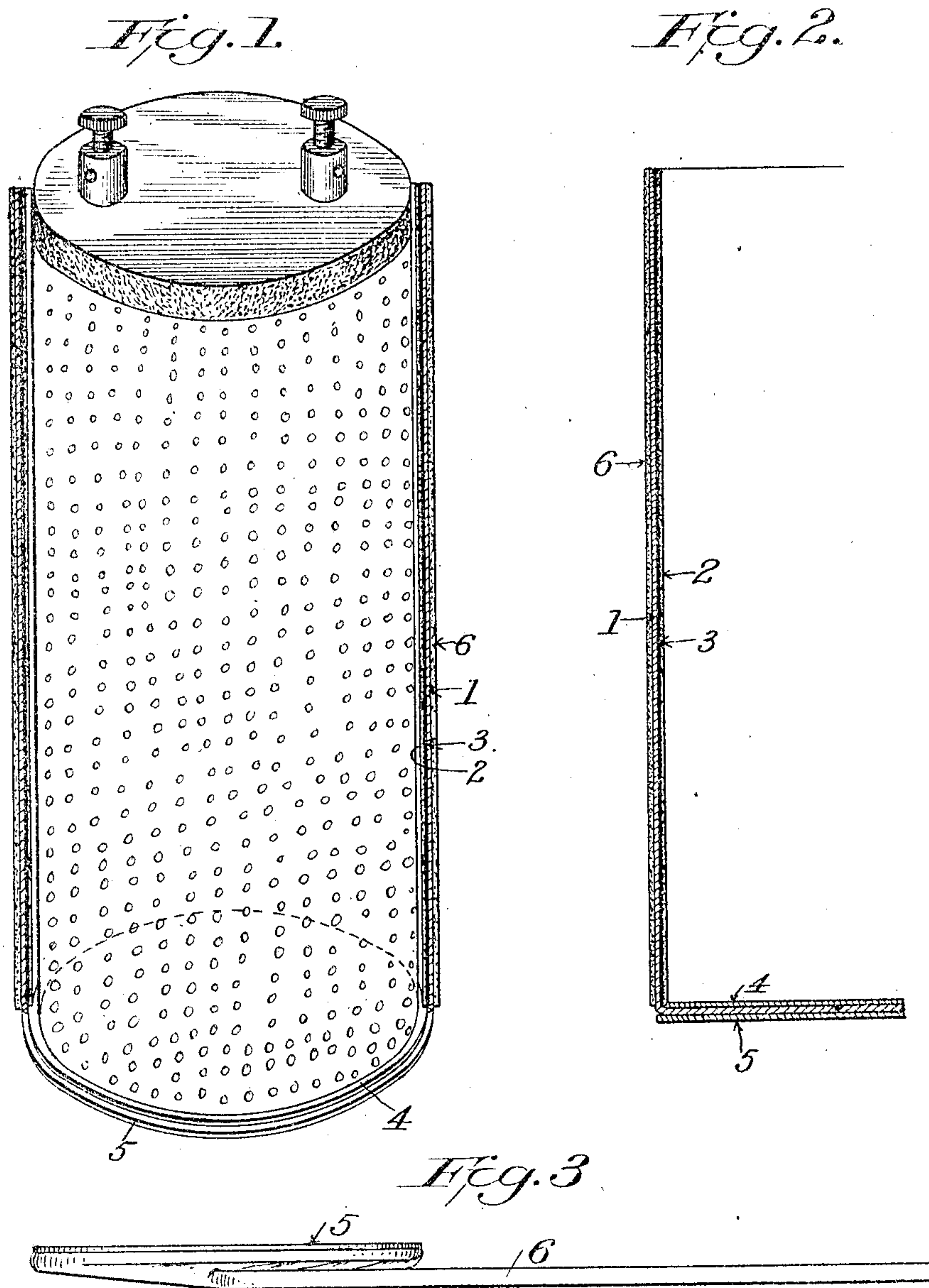


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METHOD AND APPARATUS FOR REVIVIFYING DRY CELL BATTERIES.  
APPLICATION FILED JUNE 30, 1908.

913,563.

Patented Feb. 23, 1909.



Witnesses

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# UNITED STATES PATENT OFFICE.

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## METHOD AND APPARATUS FOR REVIVIFYING DRY-CELL BATTERIES.

No. 913,563.

Specification of Letters Patent.

Patented Feb. 23, 1909.

Application filed June 30, 1908. Serial No. 441,080.

*To all whom it may concern:*

Be it known that I, HORACE B. RAMEY, a citizen of the United States, residing at Alexandria, in the county of Alexandria and State of Virginia, have invented certain new and useful Improvements in Methods and Apparatus for Revivifying Dry-Cell Batteries, of which the following is a specification.

My invention relates to a method of and means for revivifying dry battery cells when the same have become worn out or used up so that they no longer give a sufficient voltage to be of any practical use.

The object of my invention is to provide an inexpensive means whereby the user of dry cells can revivify the same with very little trouble, so that the life of the cells can be more than doubled, whereby a very material saving is accomplished.

It is well known that batteries of the class in question commence to deteriorate from the time they are made and that therefore it is always a matter of uncertainty, in purchasing a cell whether it will continue to be efficient for several months or only for a few days. At the present time, as soon as the voltage of such a cell falls below a certain amount, the cell must be discarded and a new one bought. It is, as has been stated, the purpose of my invention to enable such a cell to be revivified with very little trouble and slight expense so that its period of usefulness will be extended for a length of time at least equal to that for which it could be used if put in service immediately after its manufacture.

My invention consists, broadly speaking in applying to the exterior of the cell a casing carrying a dry electrolyte which, upon the application of moisture, sets up a chemical action with the exterior zinc surface of the cell and, the latter being perforated, causes electrical action to be again produced.

I will first describe the casing or cup, which constitutes a part of my invention and by means of which the revivification of the cells is performed, reference being had to the accompanying drawing in which—

Figure 1, is a perspective view, showing in vertical section one of these cups with a cell to be revivified in place therein. Fig. 2, is a part vertical section of one of the cups; and Fig. 3, is a side view of the cup collapsed.

The cup consists essentially of an external

waterproof casing 1, and an internal absorbent lining 2 which is impregnated with chemicals suitable to form an electrolyte. The outer casing 1, is preferably made of paper or similar cheap material and the lining 2 is preferably of paper but of the kind which is bibulous or absorbent in its nature.

The preferred method of making the cup is as follows: A sheet of the absorbent paper of the proper size, to form a cylinder of the desired diameter, is impregnated with a solution containing ten parts of muriate of ammonia, four parts of bichromate of potash and ten parts of chlorid of sodium. This sheet is then dried, preferably by passing it between rollers which serve to incorporate the said chemicals firmly therein and to extrude the excess of water therefrom, and is wrapped around a wooden cylinder of appropriate diameter. It is then coated externally with a waterproofing paste, indicated at 3. Around this is then wrapped a coating 1 of Manila paper or the like, which may be doubled, the end of the cup being formed by placing a disk or disks 4, of similar paper at the end of the cylinder in the inside and folding thereover the sheet of Manila paper 1; a disk or disks 5 is then placed in the bottom of the cup, the whole being secured by the paste or glue above mentioned. When dry the cup may be dipped in melted paraffin, indicated at 6, in the drawing, so as to form a water tight external coating thereon.

The method of using the cup to revivify a worn-out dry cell is as follows: The usual external casing of paper is removed from the cell and the external zinc surface of the same is then cleaned, as by placing it in a weak lye solution and letting it stand therein for several hours. After wiping off the surface the zinc is perforated in a number of places with a small sharp instrument and the coal tar in the top of the cell is removed by tapping around the edge with a hammer. The cell is then placed within the cup and the top is filled with clean water, preferably rain water. Chemical action will then immediately be produced between the outer surface of the zinc and the electrolyte contained in the porous lining of the cup and the terminals of the cell will show practically the same voltage as they did when the cell was new. By replenishing the water from time to time, say once a month for example, the life of the cell can be prolonged for a considerable



longer period than the average life of a cell bought upon the market.

It is to be noted that while the battery cell is practically used up and lifeless, it can however, by my invention be made active again and its life greatly prolonged. Furthermore, by cleaning the external zinc surface of the cell, and supplying a fresh electrolyte thereto the same conditions are set up on the outside that existed when the battery was newly made.

In addition to the advantages obtained by my invention, which I have mentioned above, the fact that the cup is collapsible and can be kept indefinitely without deterioration is a very material one taken in connection with the fact that they can be made and sold at a price materially less than the first cost of a dry cell.

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

1. The process of revivifying a dry battery, which consists in perforating the outer zinc casing of the same and surrounding it with an imperviously coated absorbent material impregnated with an electrolyte.

2. The process of revivifying a dry battery which consists in removing the wrapper therefrom, cleaning the zinc surface and perforating the same, and surrounding it with an absorbent material containing a dry electrolytic substance.

3. The process of revivifying a dry battery which consists in removing the wrapper therefrom, cleaning the zinc surface and perforating it in a plurality of places, and surrounding it with an absorbent material containing an electrolyte.

4. The process of revivifying a dry battery, which consists in cleaning and perforating the zinc casing of the same, surrounding it with an imperviously coated absorbent ma-

terial impregnated with an electrolyte and supplying water in the top of the cell.

5. The process of revivifying a dry battery, which consists in removing the wrapper from around the same and the sealing material from the top of the same, cleaning the external zinc surface and puncturing it with a number of holes, placing the cell thus prepared within a receptacle of imperviously coated absorbent material impregnated with an electrolyte, and pouring water into the top of the cell.

6. For use with a dry cell, an electrolyte, and a collapsible receptacle of imperviously coated absorbent material impregnated with said electrolyte.

7. In a dry cell, an electrolyte, a collapsible cup for the purpose described, consisting of a water-proofed casing and a lining of absorbent material impregnated with said electrolyte.

8. A cup for the purpose described, and an electrolyte, said cup consisting of a water-proof casing and a lining secured thereto by an impervious glue, said lining consisting of absorbent paper impregnated with said electrolyte.

9. In combination, an electrolyte a receptacle for the purpose described consisting of an impervious casing and lining of absorbent material impregnated with said electrolyte, and a cell inclosed in said receptacle perforated for supplying water to the electrolyte whereby the lifeless cell and electrolyte are made active for the purpose and substantially as described.

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

HORACE B. RAMEY.

Witnesses:

M. E. SHAFFER,  
JULIUS PELTON.