E. C. SMITH.

DRY CELL.

APPLICATION FILED OCT. 18, 1912.

1,137,030. Patented Apr. 27, 1915.

FIG. 1.

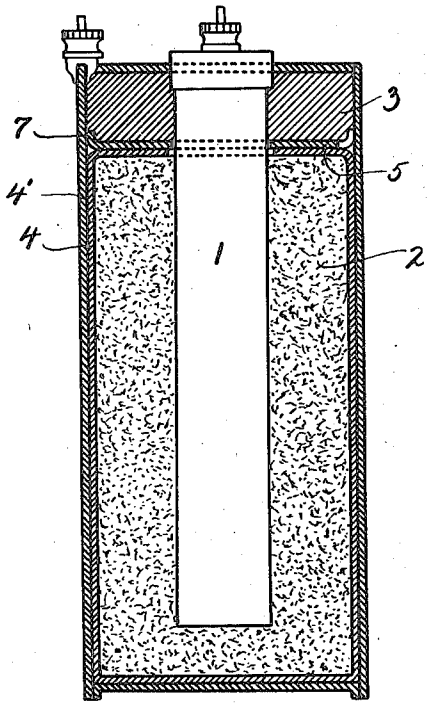


FIG. 4.

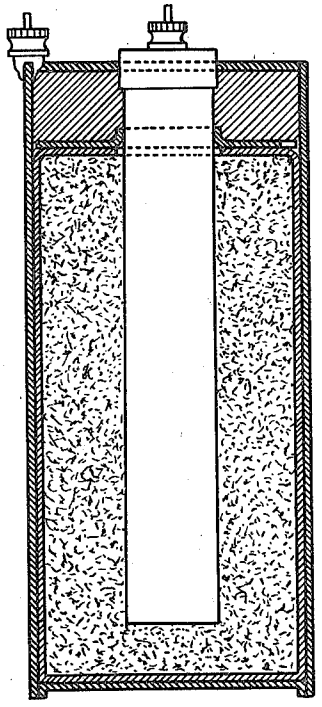


FIG. 2.

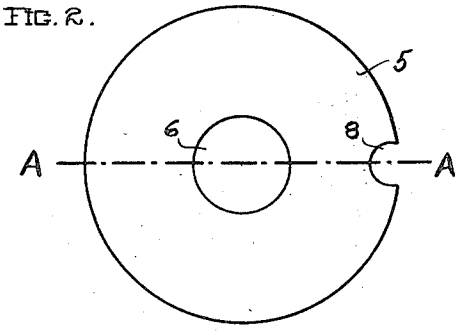
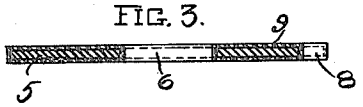


FIG. 3.



WITNESSES

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EDWARD C. SMITH, OF TORONTO, ONTARIO, CANADA, ASSIGNOR TO NATIONAL CARBON COMPANY, OF CLEVELAND, OHIO, A CORPORATION OF NEW JERSEY.

DRY CELL.

1,137,030. Specification of Letters Patent. Patented Apr. 27, 1915.

Application filed October 18, 1912. Serial No. 726,419.

To all whom it may concern:

Be it known that I, EDWARD C. SMITH, a citizen of the United States, and a resident of Toronto, in the county of York, Ontario, Canada, have invented new and useful Improvements in Dry-Cells, of which the following is a clear and exact description.

This invention relates to "dry cells" and the object is to securely hold the compressed mix in place in the cell so that the internal resistance may not be increased by the loosening of the mix.

In the process of manufacture of dry cells the battery mix is tamped in the containers around the carbon electrodes by machine or by hand, and the cells are usually carted to various places in the factory to have additional work performed on them before the final asphaltum or other seal is added. In this process of handling, the mix is liable to be jarred loose and cause an increase in the internal resistance. In shipping or in the use of the cells after the usual seal is applied the mix is liable to be jarred loose and cause the same trouble.

The purpose of my invention is to obviate to a greater extent these difficulties. The manner in which this is accomplished is given in the appended description, reference also being had to the drawings in which;

Figure 1 is a sectional view of a cell with my invention applied. Fig. 2 is a plan view of the clamping disk used to retain the mix in place. Fig. 3 is a section taken on the line A—A of Fig. 2. Fig. 4 is a modified form of the invention.

Referring to Fig. 1, 1 represents the carbon electrode in an ordinary dry cell. 2 is the battery mix compacted about the electrode 1. 3 is the pitch seal, 4′ is the container which is also the positive electrode and 4 is the lining of the cell. 5 is the device which embodies my invention. It consists of a disk of pulpboard or other suitable material, of circular or any other suitable form, which is placed upon the top of the cell after the mix has been tamped about the electrode and the lining turned over. This disk has a central hole 6, here represented as a circular hole which allows the disk to be slipped over the round electrode 1, and driven down about it and over the lining of the cell which has been turned over the mix. This disk is of such a size that it binds against the side of the container, either by its edge or by that part of its lower surface which may be upturned against the side of the container as shown at 7. The disk 5 may have a slot or notch 8 cut at the edge to permit the escape of gas from the cell.

In Fig. 4 a slightly different arrangement is shown to accomplish the same result. In this case the disk 5 has a central hole that tightly fits the electrode. Preferably the hole should be small enough for part of the disk to be upturned as shown in this figure. If desired the disk may be made so that it can bind both on the container and on the electrode. However, since the electrode is not always exactly in the center it will be found best to have the disk bind only on one of the parts.

In prior construction of dry cells, sand or sawdust has been put upon the tops of dry cells, and the seal poured upon them. This construction leaves a region of loose yielding material above the mix and lining and below the seal. Any blow or jar which the cell so constructed may receive will tend to loosen the mix about the electrode, because the mass of the mix can yield and compress the loose material above it. In yielding to such blows and jars, the bond between the mix and electrode is broken to a greater or less extent, which increases the internal resistance, consequently lowering the initial amperage of the cell. Such damage often occurs to cells by rough handling either during manufacture or in transit or in use as previously explained. In order to prevent this damage of loosening the battery mix and consequent loss in efficiency, I have invented the disk described above. By driving said disk down upon the compacted mix a surface binding against the container is introduced which will resist the tendency of the mix to be driven upward by jars, and prevent the loosening of the mix from the electrode and consequent loss of efficiency of the cell.

The disk which embodies my invention may be made of paper, pulpboard, fiber, or any other suitable material which is a non-conductor of electricity, and which has sufficient rigidity to hold its shape while it binds against the side of the container with its edge, and sufficient elasticity to permit its bending without breaking at the edge if the disk is made so large that the edge is upturned against the container. Ordinary

pulpboard is absorbent and will become wet and lose its rigidity if used for the retaining disk. The disk if made of absorbent material should therefore be coated or treated with pitch, paraffin, paint or other material to prevent it becoming moist. The preferred method is to apply a coating of pitch paint 9 to the disk and also the upper part of the electrode and container. Then when the pitch seal is poured on top it will adhere to the disk, container and electrode to form a very rigid seal.

It is not new to use a paper lining under the pitch seal, but all such linings are absorbent and furthermore fit loosely in the cell. So far as I know I am the first to use a non-absorbent disk tightly compressed in the cell to aid the pitch seal in retaining the mix in place. With the seal applied directly upon this disk the mix in the cell is locked in place with no space occupied by yielding material to permit loosening.

Having described my invention, what I claim is:

1. In a dry cell, a container electrode, a mix compressed therein, a second electrode in the mix, and a rigid disk having a hole therethrough and having an edge upturned against one of said electrodes to retain the mix in place.

2. In a dry cell, a container electrode, a mix compressed therein, a second electrode in the mix, a rigid disk binding tightly against said electrodes and packed against the top of the mix and a pitch seal on top of said disk.

3. In a dry cell, a container electrode, a lining within the container having a mix therein, and having the upper portion of the lining folded over the mix, a second electrode in the mix and a rigid disk binding tightly against one of said electrodes to retain the mix and folded portion of the lining.

In testimony whereof I have hereunto signed my name.

EDWARD C. SMITH.

In the presence of—
D. S. TOVELL,
A. E. COOPER.