H. M. KORETZKY.

DRY BATTERY CELL.

APPLICATION FILED SEPT. 18, 1919.

1,395,281.

Patented Nov. 1, 1921.

2 SHEETS—SHEET 1.

Fig. 1.

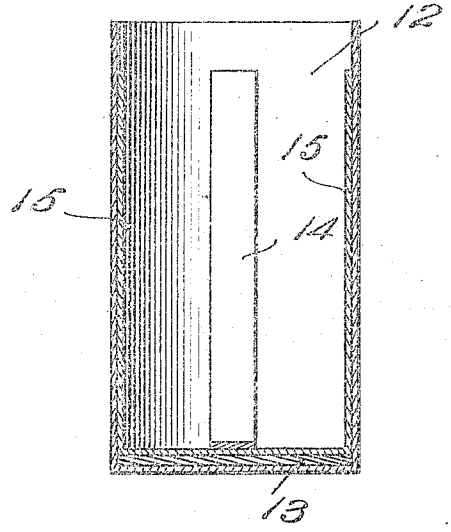


Fig. 3.

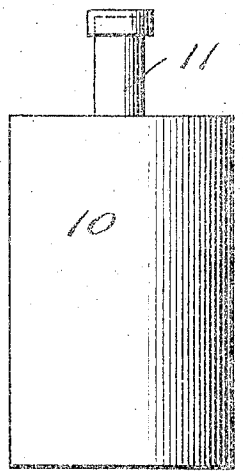


Fig. 2.

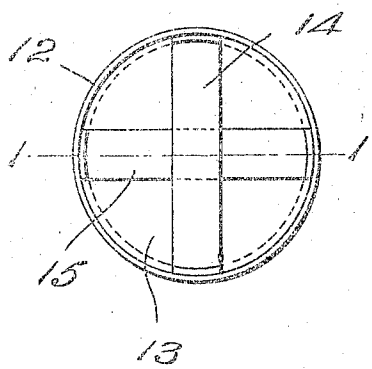
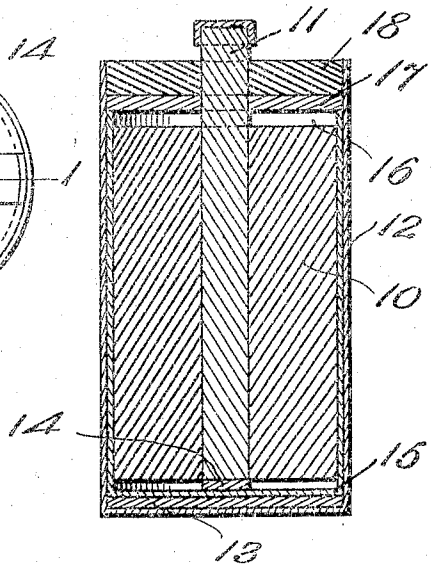


Fig. 4.



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2 SHEETS—SHEET 2.

Fig. 5.

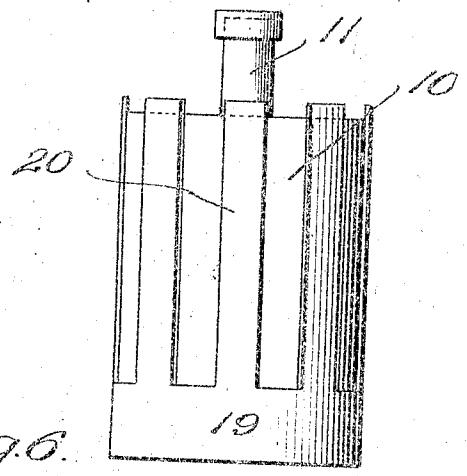


Fig. 6.

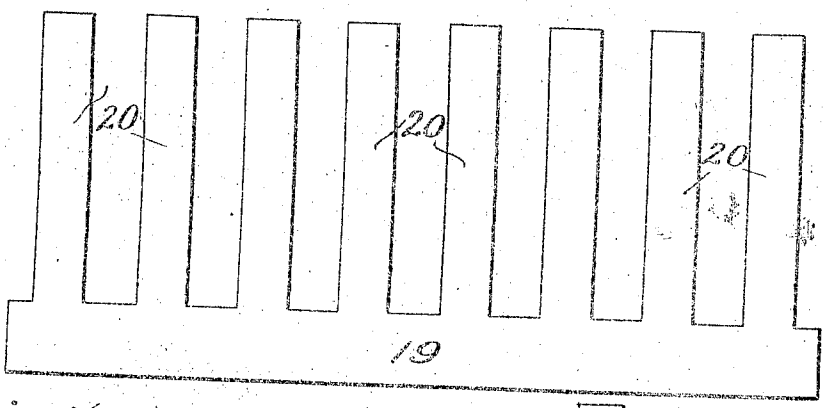


Fig. 7.

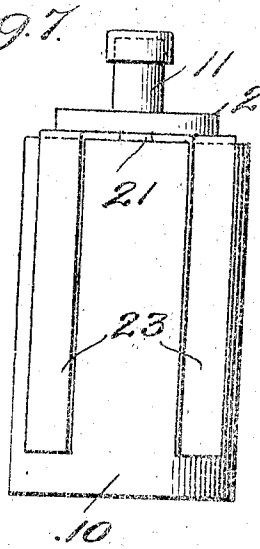
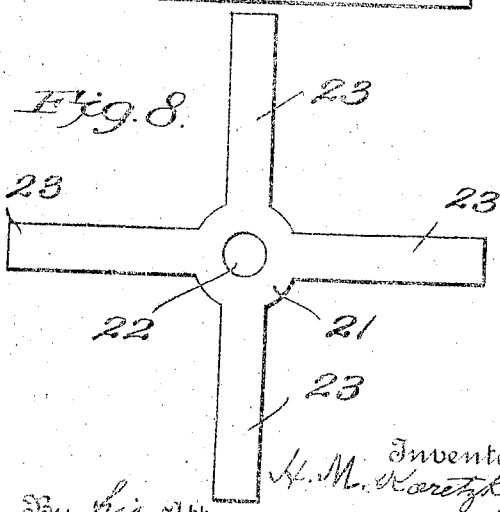


Fig. 8.



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UNITED STATES PATENT OFFICE.

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DRY BATTERY-CELL.

1,395,281. Specification of Letters Patent. Patented Nov. 1, 1921.

Application filed September 18, 1919. Serial No. 324,567.

To all whom it may concern:

Be it known that I, HARRY M. KORETZKY, a citizen of the United States, residing in New York city, State of New York, have invented a certain Improvement in Dry Battery-Cells, of which the following is a specification.

The improvements in question are particularly adapted to the manufacture of battery cells for use in portable flash lights, telephone equipment, and the like, but my invention is not limited to such applications.

One of the principal objects of this invention is the provision of a method of manufacture whereby a considerable saving of labor is achieved, while at the same time uniform, efficient and reliable cells are produced by simple and inexpensive means.

It is important that the spacing device should extend substantially the entire length of the core, and should be fitted snugly between the core and the outer cup, in order to exert a gripping pressure on the core in place of the binding hitherto used around it. This pressure preserves the form of the core under the accidents of use and prevents rise of electrical resistance due to the particles constituting the core coming loose.

My invention is capable of being embodied in a great variety of modifications, certain preferred examples of which are illustrated in the accompanying drawings, wherein Figure 1 is a vertical sectional view of an empty cell cup with the spacing device in place, Fig. 2 is a top plan view of the same, Fig. 3 is a side elevation of the central electrode with its attached depolarizing mixture, Fig. 4 is a vertical sectional view of a completed cell, Fig. 5 is a side elevation showing the spacing device applied to the depolarizing core, Fig. 6 shows a development of the spacing device shown in its normal position in Fig. 5, Fig. 7 is a side elevation of a modified form, and Fig. 8 is a plan view of the spacing device as used in the form shown in Fig. 7.

This invention relates to an improvement in that type of battery cell wherein one of the electrodes or poles surrounds the other, the latter being centrally placed and being surrounded by the electrolyte and the depolarizing agent. I shall describe the invention as applied to a very common example of this type wherein a central carbon electrode is placed with the electrolyte and the depolarizer within a zinc cup which constitutes the outer electrode. Cells of this kind are practically of universal use in connection with portable electric lamps known as "flash lights."

In manufacturing cells of this kind it has been customary to mold the depolarizing agent or mixture around the carbon electrode, binding the same in place by means of textile material tied around it. This envelop holds the mixture in place and absorbs some of the electrolyte which surrounds the core thus produced.

The carbon electrode, thus combined with the depolarizer is placed centrally within the zinc cup, and is combined with a moist electrolytic substance in a variety of ways. My invention makes it possible to dispense with the skilled hand labor necessary for producing the bound up or covered form of core above alluded to.

In carrying out my improved process of manufacture I apply the depolarizing mixture 10 in a pasty form to the electrode 11, imparting a cylindrical form to the body 10 of the mixture, in a mold or otherwise. The compound core thus formed is then hardened by thorough drying, and forms an integral member which can be freely handled in the course of further steps in the process of manufacture.

This core is then inserted into the outer zinc cup 12, together with a spacing device, which holds the core in a central position while leaving a sufficient space around it to accommodate the electrolyte. The spacing device may take a variety of forms and may be made of various materials, although an absorbent material such as blotting paper or thick cloth is preferred. This spacing device may be applied primarily either to the core or to the inside of the outer cup, as shown in the drawings.

In Fig. 1 is shown an empty zinc cup 12, provided with the usual bottom washer 13, and with the spacing device shown in place ready for insertion of the core 10, 11. In this particular form, the spacing device comprises two flexible absorbent strips, 14 and 15 folded as shown in Figs. 1 and 2, so as to cross on the bottom of the cup, and to be close against the interior of the upright cylindrical wall of the cup on four sides. The number of strips is, of course, not essential.

The cup having been thus prepared, the core 10, 11, is inserted, as shown in Fig. 4. As there made clear, I prefer to have the strips 14, 15 extend a certain distance above the top of the molded body 10, for the purpose of providing a space 16 for the accommodation of generated gases. If desired this space may be more or less filled with powdered charcoal or other gas-absorbing material, in which case a protective washer should be used to prevent this powder from finding its way into the lower part of the cell.

The core having been thus inserted, the usual electrolytic solution is poured into the cup until the space around the body 10 is filled with such solution. The level of the solution should not be higher than the top of the body 10.

The next step in the process of manufacture is to heat the cell in a water bath, in a well known manner, until the electrolytic solution takes on a gelatinous or semi-solid condition. I prefer to use in this connection any suitably proportioned solution of zinc chlorid and sal ammoniac, with bichlorid of mercury.

When the electrolyte has been thus solidified, it thoroughly fills every space around the core 10, 11, and assists the spacing device in keeping the core in a central position.

The next step is to insert a tight washer 17, pressing it down until it rests upon the tops of the upturned strips 14, 15 and inclosing the gas accommodating space 16, after which the usual sealing material 18 is poured in, and the cell is ready for use.

If desired, the spacing device may be applied to the body 10 before it is inserted into the cup 12, instead of applying such device to the empty cup itself. This may be done in a variety of ways. For instance, a flexible and absorbent sheet 19, preferably of blotting paper may be cut with slots to give it a comb like form, as shown in Fig. 6, and this sheet may then be wrapped around the body 10, as shown in Fig. 5, the extensions 20 rising a little above the body to help adjust the washer 17 when the latter is inserted, as already described with respect to Fig. 3.

In Fig. 7 is shown a form wherein the spacing device, instead of being wrapped around the body 10, is bent down upon it from above. For this purpose the spacing sheet may be cut out as shown in Fig. 8, with a central area 21 perforated centrally at 22 and having radial arms 23. In applying this device to the core, the hole 22 is slipped over the electrode 11 until the central area 21 lies flat upon the top of the body 10, the ends of the arms 23 being bent down so as to extend along the cylindrical surface of said body, as shown in Fig. 7.

When the form last described is used, the washer 17 may be forced all the way down upon the central flat area 21, in which case the space for accommodation of gases would lie between the divergent arms 23 over the body 10. I prefer, however, to provide a more extensive space than this construction would afford, and for this purpose I provide a spacing washer 24 around the electrode 11. The washer 17 can then be forced down until it is stopped by the washer 24, after which the sealing material 18 is poured into place.

Many changes may be made in the device described without departing from the scope of my invention, and I do not limit myself to the method of manufacture or to the details of construction herein shown and described.

What I claim is:—

1. A battery cell comprising an external cupshaped electrode a core composed of a central electrode surrounded by a self-supporting bare body of depolarizing material molded thereon, a separate spacing device extending substantially the entire length of said core, lying flat against said core and compressed between the outer electrode and the core at intervals around the same so as to hold the core together during use, and an electrolyte in the unoccupied spaces around the core.

2. A battery cell of the general character set forth in claim 1 hereof wherein a closing washer is fitted within the external cup and is held a short distance above the top of the electrolytic material by contact with the spacing device.

3. A battery cell of the general character set forth in claim 2 hereof wherein spacing strips are provided at the sides extending above the top of the electrolyte and making contact with the under surface of the closing washer.

4. In a battery cell of the general character described, a central electrode, a bare depolarizing mixture molded against the same and a spacing means comprising crossed strips folded over one end of the depolarizing body and extending along the outer surface for substantially the entire length of said body.

5. In a battery cell, a central electrode in combination with a self-supporting bare body of depolarizing material applied to the same by molding under pressure.

In testimony whereof I have hereto set my hand on this 13th day of September, 1919.

HARRY M. KORETZKY.