J. H. GUGLER.

BATTERY CONTACT.

APPLICATION FILED JULY 25, 1908.

928,963. Patented July 27, 1909.

Fig. 1

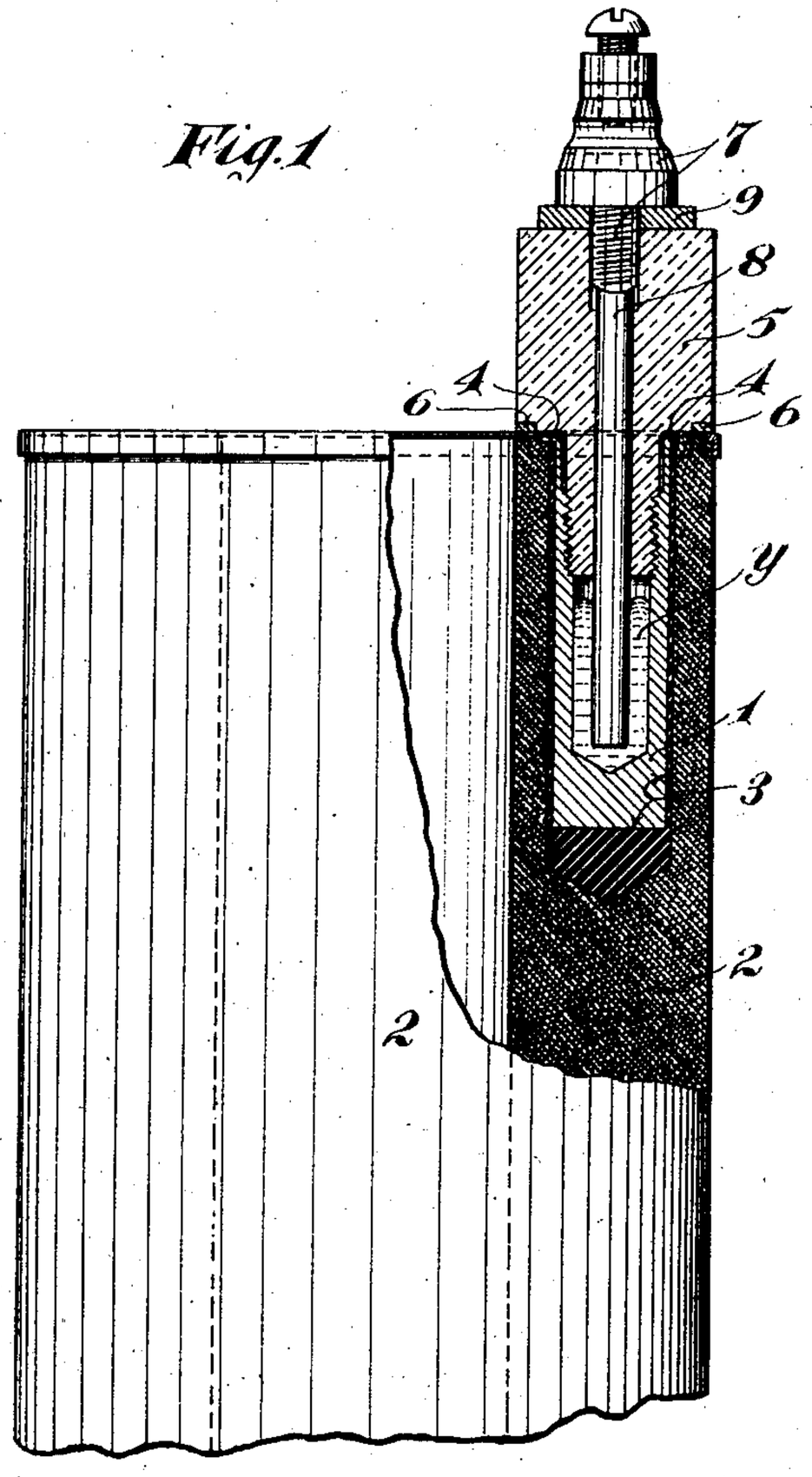
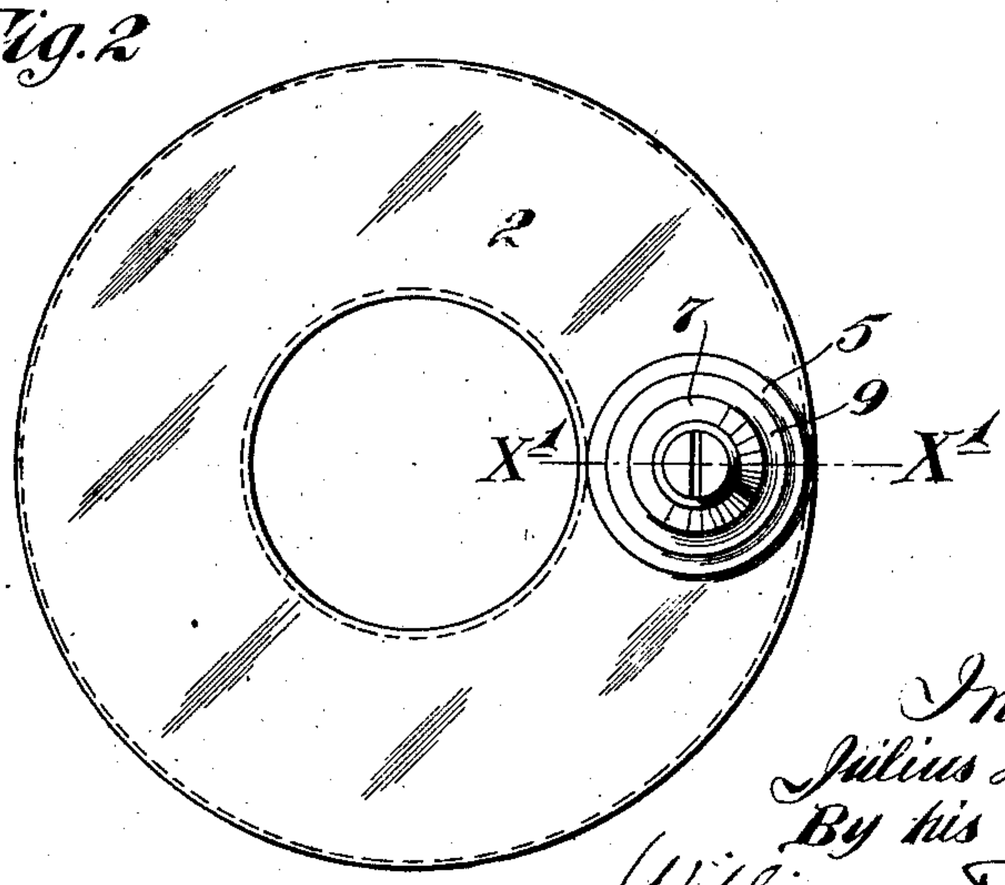


Fig. 2



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UNITED STATES PATENT OFFICE

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BATTERY-CONTACT.

No. 928,963. Specification of Letters Patent. Patented July 27, 1909.

Application filed July 25, 1908. Serial No. 445,394.

To all whom it may concern:

Be it known that I, JULIUS H. GUGLER, a citizen of the United States, residing at Minneapolis, in the county of Hennepin and State of Minnesota, have invented certain new and useful Improvements in Battery-Contacts; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My present invention relates to lead or binding post construction of primary batteries, or to that type of battery in which a carbon or graphite electrode is used. Such electrodes are subject to this serious defect, that there is a rapid and injurious disintegration of the connecting lead or binding post by electrolytic and acid action on the metallic parts which results in abnormally high resistance between the metallic lead or binding post of a carbon or graphite electrode.

The object of my invention is to eliminate the electrolytic and corrosive disintegration of the metallic connecting lead or binding post of a carbon or graphite battery electrode, without changing the shape of such electrode; and, further, to reduce to a minimum the resistance between such connecting lead or binding post and carbon or graphite electrode.

To the above ends, the invention consists of the novel devices and combinations of devices hereinafter described and defined in the claims. As carried out in practice, the objects of the invention have been accomplished by seating a metallic cup in the carbon or graphite electrode and partly filling the said cup with mercury and dipping the contact lead into the said mercury. Preferably the cup is constructed of nickel, but may be made of any metal that will not readily alloy with mercury.

In the accompanying drawings, which illustrate the invention, like characters indicate like parts throughout the several views.

Referring to the drawings; Figure 1 is a view, partly in side elevation and partly in vertical section, on the line x^1 x^1 of Fig. 2, some parts being broken away, showing a carbon or graphite electrode constructed in accordance with my invention; and Fig. 2 is a plan view of the same.

The metallic cup 1 is preferably set in to the top of the primary battery electrode 2, with sufficient clearance to permit insulating material 3 to be placed entirely around said cup and under the bottom thereof. This insulation 3 may be a material such as tar, asphalt, beeswax, paraffin, or combinations thereof, or, in fact, any other suitable acid proof insulating compound, and the wall which surrounds the said metallic cup should be at least five one-hundredths of an inch in thickness. This insulating material serves to insulate the entire lower portion of the metallic cup and thus prevents any electrolytic action due to moisture, which is sometimes present, and further serves to securely hold the metallic cup 1 in position in its seat in the electrode. To facilitate the accomplishment of this result, the electrode 2 is preferably first heated to the melting point of the insulating compound and the entire surface of the seat formed in the said electrode for the metallic cup 1 is covered and saturated with the hot insulating material. The cup is also dipped into the hot insulating material, care being taken to prevent any of the compound from running into the cup. The cup is then forced into position while the insulating material is hot. At its upper edge, the cup 1 is provided with a thin out-turned flange 4 which is preferably set flush with the top surface of the electrode. The electrode, with the cup in position, is then allowed to cool. If, as will usually be the case, a plug is placed in the upper end of the cup while it is being dipped and placed in position, this plug should now be removed and the entire top edge of the cup flange 4 should be scraped so as to present a clean metallic surface. The upper edge of the electrode 2 should also be scraped clean so that any foreign material will be removed therefrom. The electrode, on its upper edge, in then nickel-plated or otherwise metallically electro-plated, and this electro-plate is extended on to and over the flange 4 of the metallic cup 1, the amount of surface electro-plated depending upon the class of service for which the electrode is constructed. For heavy ampere discharge, the entire top edge and a portion of the top sides downward from the top are plated. For low ampere discharges, a correspondingly smaller surface of the electrode should be plated, but in all cases, of course, this electro-plating should metallically connect the upper edge

or portion of the metallic cup 1 to the upper edge portion of the electrode. This electro-plating may be accomplished by using the usual electro-plating solution into which the carbon electrode with the applied metallic cup is dipped, and the depth of the immersion depending on the amount of surface to be plated. For the purpose of insuring a proper density of plating between the cup and the electrode, a small connecting wire may with advantage be temporarily soldered to the top edge of the metallic cup, and this, together with the electrode, should be electrically connected to the negative pole of the elctro-plating circuit. It is found by experience that nothing need be done to prevent the electro-plating from going into the cup, as it will not plate the interior of the cup to an extent that will interfere with its usefulness.

After a sufficient amount of metal is deposited, as above described, the electrode is removed from the plating solution and allowed to thoroughly dry. The connecting plating wire to the cup should then be removed, and the metal cup closed by a temporary plug or screw, and the head of the electrode should then be dipped in a hot insulating compound consisting preferably of beeswax and paraffin, or other suitable thin acid resisting insulating compound, and allowed to remain for a period of about two hours. This treatment prevents the acid of the cell from working up underneath the plating. The electrode is then allowed to cool and the temporary plug or screw is removed from the cup and a poreclain threaded plug 5, having an axial opening, is screwed into the cup, a soft rubber washer 6 being preferably placed between the metallic cup and the porcelain plug. The porcelain plug is then removed and the entire head of the electrode with the porcelain plug is dipped into a compound of hot tar and asphalt. To insure a perfect protective covering over the plated surface, the electrode will usually be dipped a third time, being allowed to partially cool between each dipping. The metallic cup 1 is then partly filled with mercury as indicated at Y. The binding post 7, with a depending nickel contact extension pin 8 is then screwed into the porcelain plug 5, a rubber washer 9 being preferably inserted between said plug 5 and the head of the said binding post.

What I claim and desire to secure is:

1. The combination with an electrode, of a metallic contact cup seated therein and insulated therefrom, except at the upper portion of said cup.

2. The combination with an electrode, of a metallic contact cup seated therein, and electro-plating forming a solid and permanent electrical connection between the said cup and electrode, substantially as described.

3. The combination with an electrode, of a metallic contact cup seated therein, and electro-plating electrically connecting the upper portion of said cup to the upper portion of said electrode.

4. The combination with a carbon or graphite battery electrode of a metallic contact cup seated in the body of said electrode and electrically connected therewith only at its upper end portion.

5. The combination with a carbon or graphite battery electrode of a metallic contact cup containing mercury, the body of the said cup being insulated from said electrode except at its upper edge, and an electro-plating electrically connecting the upper end portion of said cup to the upper portion of said electrode.

6. The combination with a carbon or graphite battery electrode, of a metallic contact cup seated in the said electrode containing mercury, the body of said cup being insulated from said electrode except at its upper edge, the said cup having at its upper extremity an outer flange, and an electro-plating electrically connecting the said outer flange of said contact cup to the upper end portion of said electrode, a plug of insulating material closing the upper end of said contact cup, and a lead element extending through said plug into said mercury.

7. The combination with a carbon or graphite battery electrode of a metallic contact cup containing mercury, the body of said cup being insulated from said electrode except at its upper edge, the said cup having an outer flange at its upper end, and an electro-plating connecting said flange to the upper end portion of said electrode, a plug of insulating material closing the upper end of said contact cup and the binding post having a stem extending downward through said plug and into said mercury.

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

JULIUS H. GUGLER.

Witnesses:
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JAS. C. PETERSON.