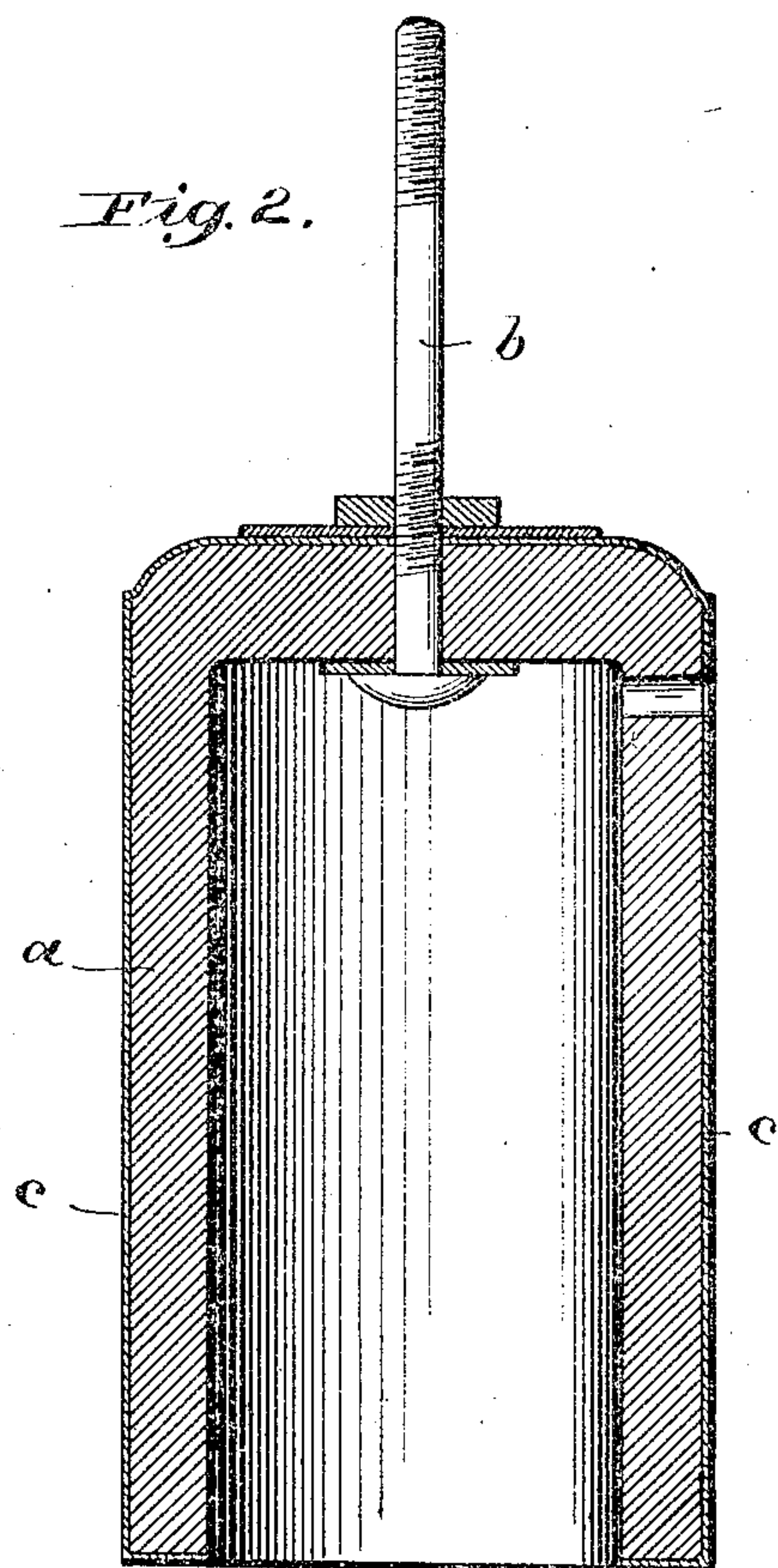
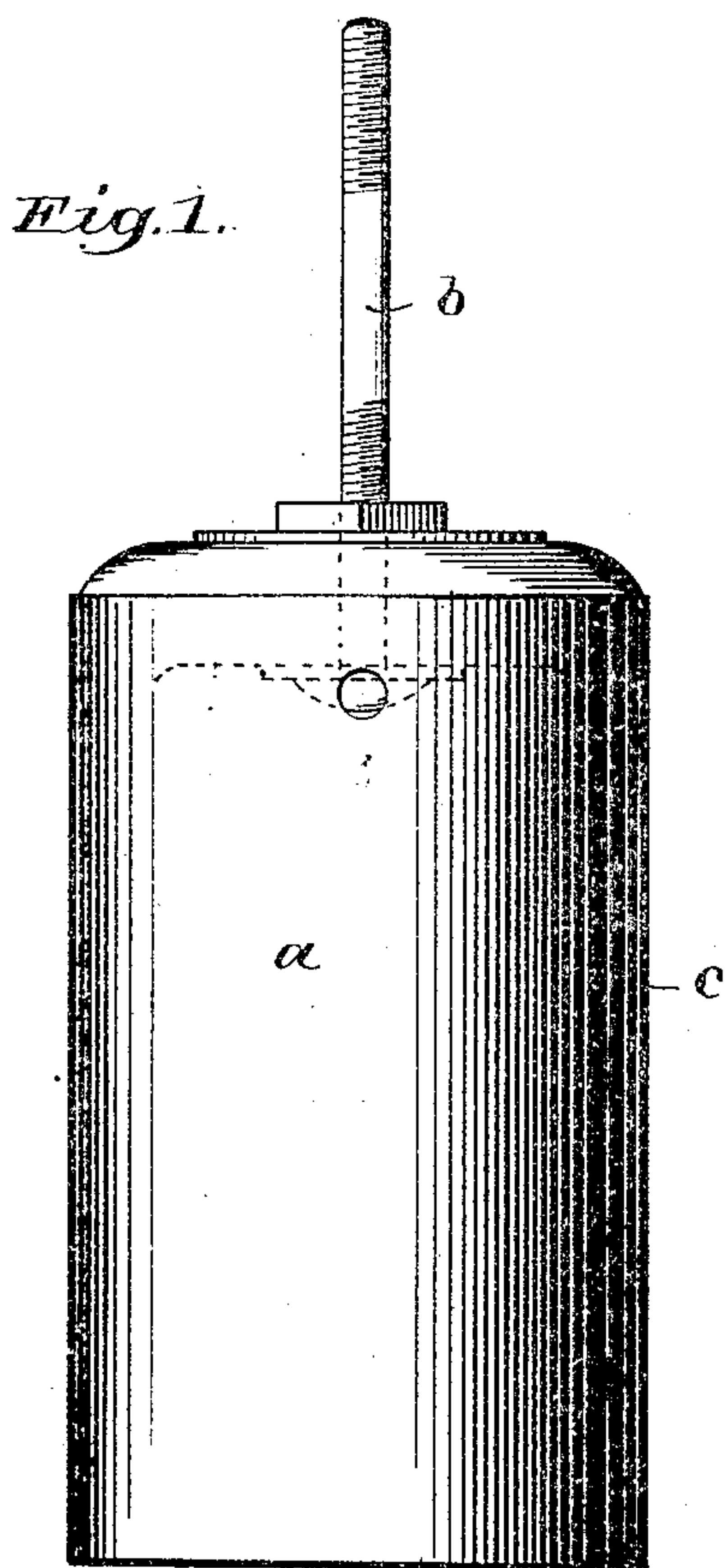


No. 886,651.

PATENTED MAY 5, 1908.

C. B. SCHOENMEHL.
NEGATIVE ELEMENT FOR PRIMARY BATTERIES.

APPLICATION FILED JUNE 2, 1905.



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UNITED STATES PATENT OFFICE.

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NEGATIVE ELEMENT FOR PRIMARY BATTERIES.

No. 886,651.

Specification of Letters Patent.

Patented May 5, 1908.

Application filed June 2, 1905. Serial No. 263,379.

To all whom it may concern:

Be it known that I, CHARLES B. SCHOENMEHL, a citizen of the United States, and resident of Waterbury, in the county of New Haven and State of Connecticut, have invented certain new and useful Improvements in Negative Elements for Primary Batteries, of which the following is a specification.

My invention relates to negative elements or electrodes for electric batteries, composed of an oxid of metal, as for instance, copper or any similar and suitable oxid.

The object of my invention is to produce a superior oxid electrode of uniform conductivity and porosity, which will not readily become oxidized, and especially one which will operate to its fullest capacity at the beginning of the operation of the battery.

Oxid electrodes of the above class are manufactured in several forms, the two more popular styles being known as plates and cylinders; but for convenience of description I have shown a compressed element of the cylindrical type, upon the accompanying drawing forming a part of this specification. It will be obvious however that the particular shape or style of the element is not material since any form of an oxid agglomerate may be treated with beneficial results in accordance with my invention.

Figure 1, of the drawing shows a side elevation of a cylindrical form of oxid of copper element, adapted for use in one of my improved forms of batteries, and treated in accordance with my present invention. Fig. 2, of this drawing shows a central vertical cross-section of the cylinder shown in Fig. 1, and illustrating in an exaggerated manner the metallized surface.

Referring in detail to the reference characters upon the drawings *a* indicates the cylinder *b* the supporting rod therefor and *c* the metal covered surface.

It is the practice in the state of the art to preliminarily reduce the surface of copper oxid electrodes, which I find produces very unsatisfactory results as to conductivity and porosity as in the operation a very large percentage oxidize thereby losing their conductivity; and, as the liability to over-reduce is great, the over-reduced electrodes vary greatly in their porosity. The above relative to porosity is equally true when electrodes are subjected to a coating of metal by electro-deposition.

I find that all of the above mentioned difficulties are obviated by first metallizing the mass of oxid in any suitable way, as by reduction or electrolysis, then re-oxidizing said metallized mass in any suitable way. As for instance, by heat or electrolysis, until the compressed oxid electrodes become sufficiently and uniformly porous. I then treat this uniformly porous mass with a coating of pure metal of the oxid in a finely divided state in any suitable way; as for instance, by brushing on or rubbing on the compressed, agglomerated, metallized and re-oxidized mass of oxid. Said electrodes being exceedingly porous, the finely powdered or divided metal adheres very tenaciously to the electrode and renders the compressed mass of oxid more conductive than if the mass were copper oxid with its surface coated with a film of other material. I do not wish to be understood as confining myself strictly to the above description of making oxid electrodes as I find satisfactory results can be obtained by dispensing with the afore mentioned method of metallizing and re-oxidizing the oxid mass, by taking a mass of suitable oxid of the desired shape or form and coating the surface of said shape or form with finely divided metal of said oxid as already herein described.

I find that by my method of coating oxid electrodes with metallic powder of the oxid of the electrode in a finely divided state they do not oxidize as readily as a reduced electrode, and consequently, are more desirable, inasmuch as they are rendered uniformly conductive. The oxids can be obtained in any suitable way; as for instance if oxid of copper is preferred I can make the same by precipitating pure metallic copper, from solution of copper, then washing and drying said precipitate, thereby producing a finely divided conductive red copper powder in metallic form, which is then subjected to sufficient heat to thoroughly oxidize the same, which produces a pure finely divided black oxid of copper of superior quality; and I also find that by treating a mass of black oxid of copper made in the above manner with a coating of pure precipitated metallic copper I obtain superior results although it is obvious that any other suitable method may be used to obtain the desired form of comminution of either the oxid or metallic powders.

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

1. A compressed metal oxid battery element having its surface coated with finely divided particles of the same metal as contained in the oxid.

2. A compressed oxid of copper battery element comprising an agglomerated mass, having its surface coated with finely divided particles of metallic copper.

3. An agglomerated mass of black oxid of copper having its surface metallized and oxidized, and said surface coated with finely divided particles of metallic copper. 11

Signed at Bridgeport in the county of Fairfield and State of Connecticut this 25th day of May A. D., 1905.

CHARLES B. SCHOENMEHL.

Witnesses:

C. M. NEWMAN,
RUTH RAYMOND.