

(No Model.)

E. A. LE SUEUR.

CARBON ELECTRODE FOR ELECTRIC BATTERIES.

No. 450,105.

Patented Apr. 7, 1891.

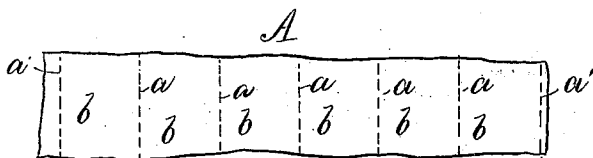


Fig. 1.



Fig. 2.

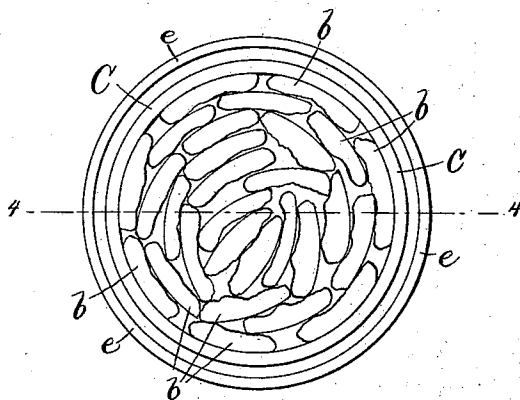


Fig. 3.

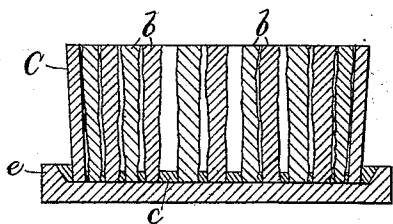


Fig. 4.

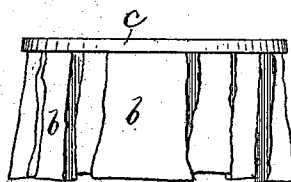


Fig. 5.

WITNESSES.

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CARBON ELECTRODE FOR ELECTRIC BATTERIES.

SPECIFICATION forming part of Letters Patent No. 450,105, dated April 7, 1891.

Application filed October 14, 1890. Serial No. 368,120. (No model.)

To all whom it may concern:

Be it known that I, ERNEST ARTHUR LE SUEUR, of Ottawa, Province of Ontario, Dominion of Canada, have invented certain new and useful Improvements in Carbon Electrodes and the Method of Making the Same, of which the following is a specification.

Carbon electrodes composed of sticks of carbon secured to a lead backing or conductor have hitherto, so far as known to me, been made by forming the carbon into sticks or short rods of cylindrical or other regular form, and this renders such electrodes comparatively expensive. By the method hereinafter described I am enabled to produce a carbon electrode at very small expense, and at the same time obtain an electrode of high efficiency; and my invention consists in a carbon electrode formed of rough-sided pieces of carbon of substantially equal length embedded in a metallic backing, and, further, in the process of making the same, consisting, first, in sawing or cutting pieces preferably of gas-graphite—that is, graphite which has been taken from the inside of a gas-retort—into pieces of equal length, placing these pieces in a suitable holder, then embedding the pieces at one end in lead or other suitable metal and removing the holder, leaving a metal plate or backing with a number of irregularly-shaped pieces of carbon of equal or substantially equal length cast therein.

The invention will be clear from the following description, in which reference is made to the drawings accompanying this specification, and which form a part hereof.

In the drawings, Figure 1 represents a piece of gas-graphite, such as is taken from the inside of a gas-retort. Fig. 2 is a transverse section thereof. Fig. 3 is a plan view showing the pieces of graphite placed in a cylindrical holder, and also showing the shallow vessel which contains the metal in which one end of each piece of graphite is embedded. Fig. 4 is a section on line 4 4, Fig. 3. Fig. 5 is a side elevation of a finished electrode.

A represents an irregularly-shaped piece of gas-graphite, such as is knocked off of the inside of a gas-retort, and which is exceedingly

hard and difficult to cut. This piece is separated by transverse cuts *a* into pieces of equal length, the cut ends being smooth, or substantially so. The end pieces are cut, as shown at *a'*, to trim them off so that they may be smooth and true at both ends. These pieces, which are marked *b*, are then set on end and packed tightly into the metal holder *C*, which preferably flares slightly—that is, which is slightly of frusto-conical or frusto-pyramidal shape. The shape of the holder will obviously depend upon the shape of electrode desired. The one shown in the drawings is substantially circular in horizontal section, and the holder is therefore cylindrical or frusto-conical in shape. Wedges may be inserted, if required, to secure the pieces within the holder, and the holder and pieces of carbon contained within it are placed in a shallow vessel *e*, which contains molten lead or other suitable metal *c*. The lead is then allowed to cool. The vessel *e* is taken off and the carbons and their lead backing *c* are separated from the holder *C* by turning the holder over and knocking the lead and carbons out through the top thereof. It is to enable the lead and carbons to be thus more readily separated from the holder that the holder is made flaring—that is, of greater diameter at the top than at the bottom. The electrode composed of the carbon pieces cast into the lead backing is then ready for use. The carbon pieces are of irregular shape, thus presenting a large surface, which is desirable, and by my method they may be prepared for use with a minimum of cutting and at a relatively very low cost. I prefer to place the carbon pieces in the molten lead, as described, instead of arranging them in the disk *e* and pouring the lead around them. The latter method might be practiced, but it is apt to produce a backing of irregular thickness and of insufficient strength, and is therefore objectionable.

I am aware that carbon electrodes have been constructed from lumps or fragments of carbon held together at one end by metal or alloy into which the ends are cast. The lumps or fragments so employed were of un-

equal length, and are not cut so as to have flat and substantially smooth ends. I do not claim such a construction.

What I claim is—

- 5 An electrode for an electrolytic cell consisting of a number of pieces of rough carbon cut to equal lengths and having rough uncut

sides, and a metallic backing in which said carbon pieces are embedded at one end, substantially as shown and described.

ERNEST ARTHUR LE SUEUR.

Witnesses:

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