

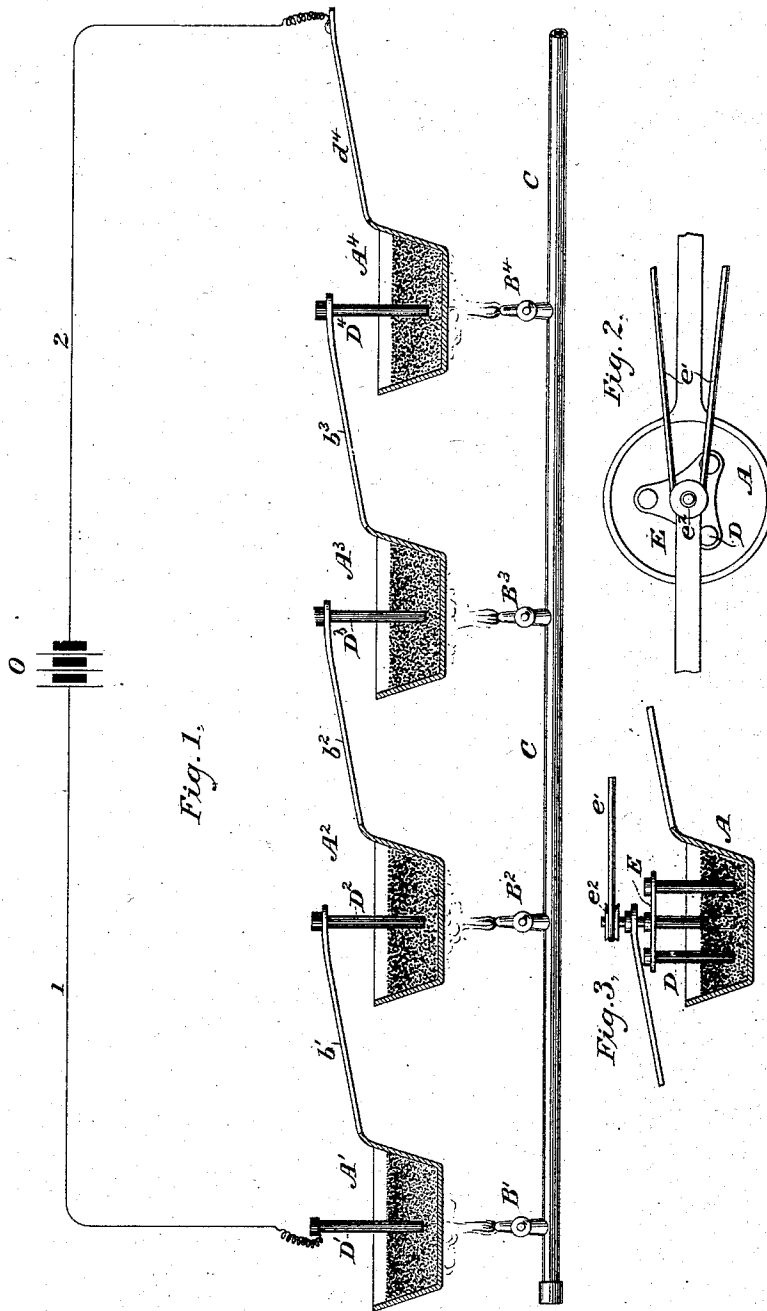
(No Model.)

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APPARATUS FOR OBTAINING ALUMINIUM.

No. 315.266.

Patented Apr. 7, 1885.



Witnesses

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APPARATUS FOR OBTAINING ALUMINIUM.

SPECIFICATION forming part of Letters Patent No. 315,266, dated April 7, 1885.

Application filed January 20, 1885. (No model.)

To all whom it may concern:

Be it known that I, MOSES G. FARMER, a citizen of the United States, residing in New York, in the county and State of New York, have invented certain new and useful Improvements in Apparatus for Obtaining Aluminium, of which the following is a specification.

The invention relates to the class of electrical apparatus employed for obtaining pure metals from their natural or artificial compounds.

In carrying out the invention I subject a quantity of anhydrous chloride or aluminium, the double chloride of aluminium and ammonium, the double chloride of aluminium and sodium, the double fluoride of aluminium and sodium or other similar compound of aluminium to the action of heat and electrolytic action simultaneously, and cause the metallic aluminium to be deposited upon a cathode, which consists of the cell or crucible in which the compound is contained. A number of these cells are placed in an electric circuit in series, and suitable means are applied thereto for raising the temperature of the compound contained therein to any required degree. The cathode of the first cell is connected with the anode of the second cell, and the cathode of the second cell with the anode of the third, and so on throughout the series. The fused compound containing the metal to be deposited constitutes the electrolyte.

The cells or retorts in which the compound is contained are constructed in the form of ladles, the handle of each of which constitutes the conductor for connecting the cell with the next succeeding anode. These ladles may be constructed of aluminium, platinum, or any suitable metal which will not be acted upon by the contents of the cell, or they may be of carbon. The anodes are preferably of carbon, but may be made of aluminium or other metal. By causing a strong current of electricity to traverse the cells in series while the contents are fused by heat applied to the separate cells the compound will be broken up and pure aluminium deposited upon the cells or retorts.

This patent is designed to cover the special arrangement and construction of apparatus, it not being broadly new to employ conducting-

cells in electrolysis, nor to apply heat to the cells.

In the accompanying drawings, Figure 1 is a diagram showing the general organization of apparatus for carrying out the invention. Figs. 2 and 3 illustrate a modified form of anode.

Referring to the drawings, A', A², A³, and A⁴ represent a series of ladles or retorts for containing the compound from which the aluminium is to be obtained. This may be an anhydrous chloride of aluminium or the double chloride of aluminium and ammonium, the double chloride of aluminium and sodium, the double fluoride of aluminium and sodium, or other equivalent compound.

The ladles are arranged above suitable heating apparatus—for instance, a series of Bunsen burners, B', B², B³, and B⁴, which are supplied with gas from a supply-pipe, C. Each ladle is preferably constructed with a handle, b', which serves both as a handle and a conductor for leading to the next cell of the series. The handle b' of the first ladle, B', supports an anode, D², for the second cell, A². Likewise the handle of the second cell, A², supports the third anode, D³, and the third cell, A³, is electrically connected by its handle with the fourth anode, D⁴. A conductor, 1, leads from the positive pole of a battery or generator, O, to the first anode, D', and a conductor, 2, leads from the last cathode or cell, A⁴, to the negative pole of the battery O. In this manner the several cells are connected in series.

The compound of aluminium, from which the metal is to be obtained, is preferably fused and then distributed through the different cells and constitutes the electrolyte. The heat from the burners maintains it in a fused condition, and while in this condition the electric current acts to deposit the pure aluminium upon the inner surfaces of the respective cells.

For the purpose of keeping the electrolyte in a state of motion, the anode may be constructed to move in the respective cells. For this purpose these may be supported upon suitable brackets, E, as shown in Figs. 2 and 3. These are capable of being revolved by means of a belt, e', and a pulley-wheel, e². By thus imparting to the anode-wheel a slow ro-

tary movement the three anodes shown in these figures may be moved slowly about the cell, causing the fused compound to be agitated. The electrical connection may in this instance
5 be maintained between the cathodes and anodes of the different cells by causing a suitable ring or shoulder, *f*, upon the support *E*, to rest against the handle *d'* of the ladle.

I claim as my invention—

10 An apparatus for obtaining aluminium, consisting of a series of conducting-cells, ladles, each ladle having a handle of conducting material integral therewith and adapted to extend

upward above the bowl of the next succeeding ladle, means, substantially such as described, 15 for applying heat to the separate cells of said series, and a series of anodes respectively applied to said cells, which anodes are respectively suspended from said handles.

In testimony whereof I have hereunto subscribed my name this 15th day of January, A. D. 1885. 20

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