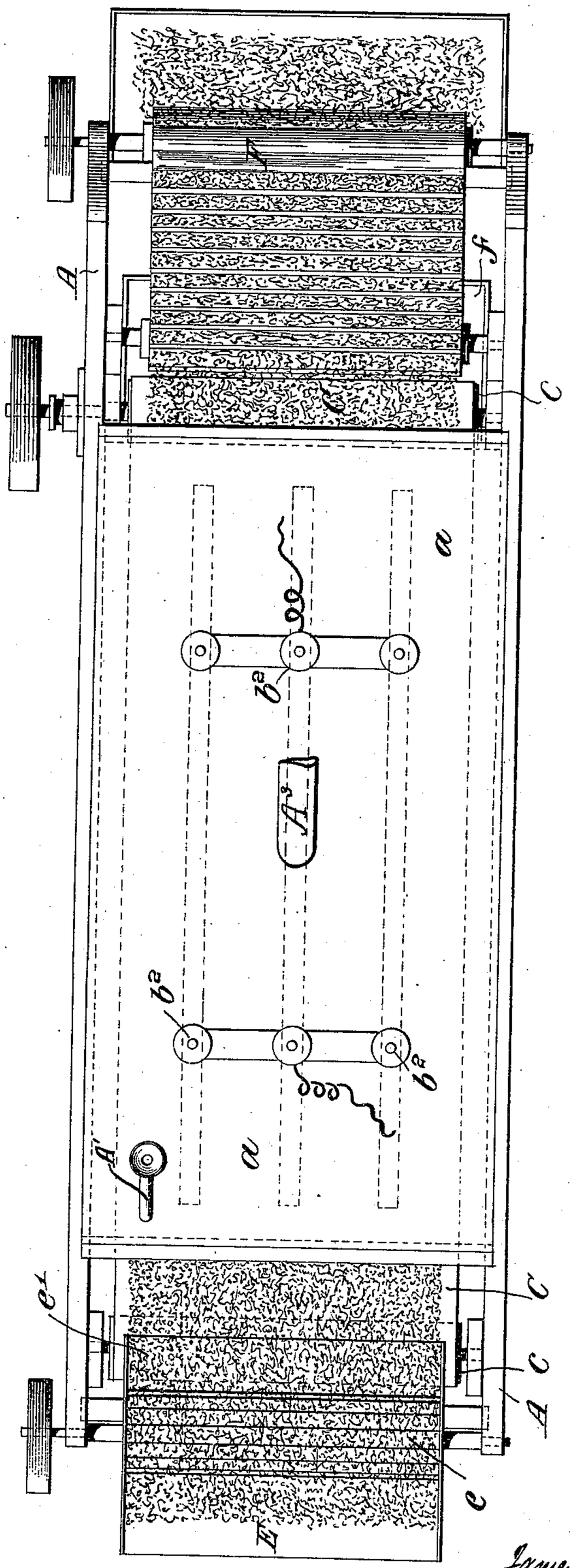
(No Model.) 2 Sheets—Sheet 1.

J. C. RICHARDSON.

APPARATUS FOR DEPOLARIZING IN ELECTROLYSIS.

No. 501,628. Patented July 18, 1893.

FIG. I.



Witnesses:-
George Barry.
C. L. Sundgren

Inventor:-
James Charles Richardson
by attorneys
Brown & Seward

(No Model.) 2 Sheets—Sheet 2.

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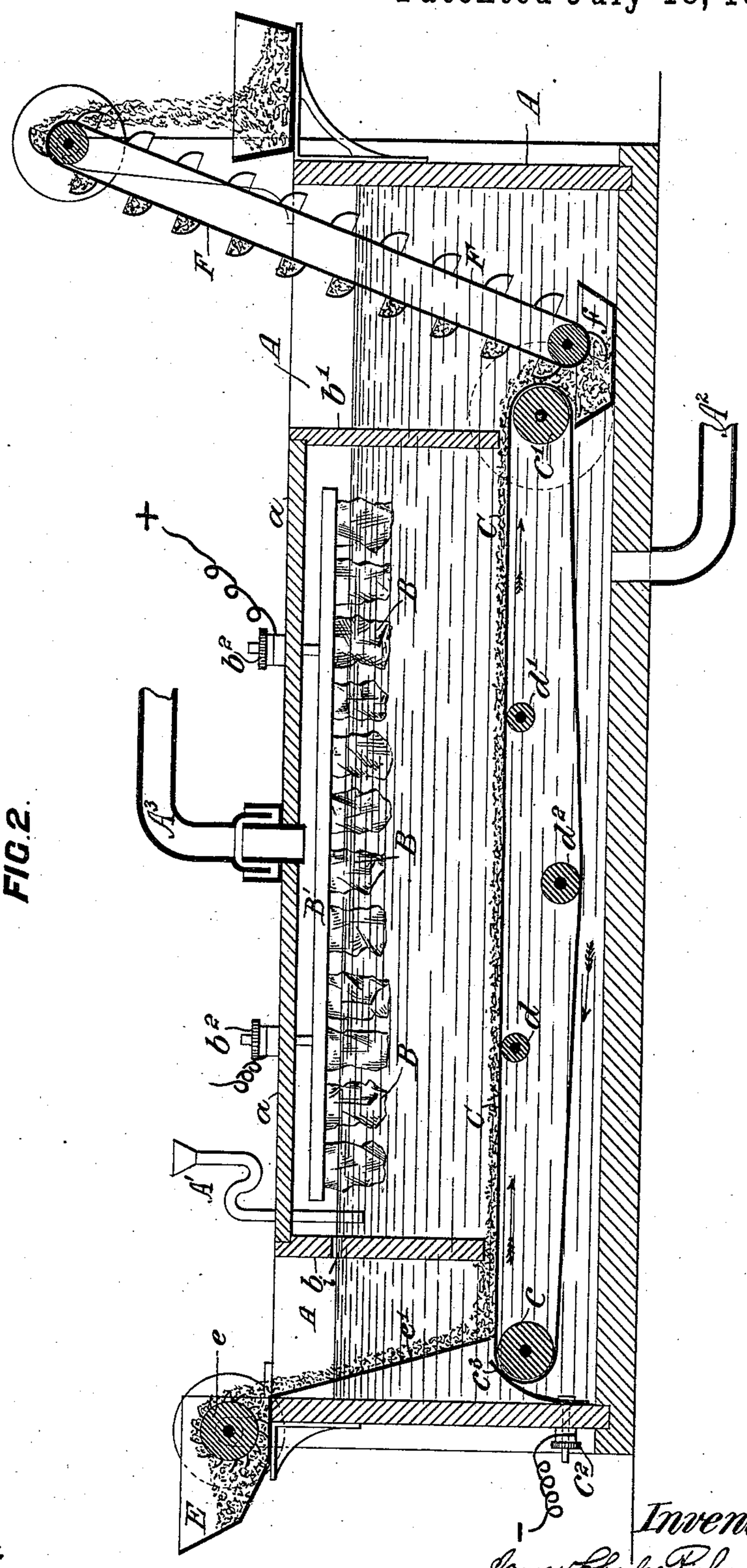

FIG. 2.

Witnesses:-
George Barry.
C. L. Sundgren

Inventor:-
James Charles Richardson
by attorneys
Brown & Seward

UNITED STATES PATENT OFFICE.

JAMES CHARLES RICHARDSON, OF LONDON, ENGLAND.

APPARATUS FOR DEPOLARIZING IN ELECTROLYSIS.

SPECIFICATION forming part of Letters Patent No. 501,628, dated July 18, 1893.

Application filed January 26, 1893. Serial No. 459,777. (No model.)

To all whom it may concern:

Be it known that I, JAMES CHARLES RICHARDSON, of 23 Claremont Square, Clerkenwell, London, England, have invented a new and useful Improvement in Apparatus for Depolarizing in Electrolysis, of which the following is a specification.

In electrical decomposition of solutions where a depolarizer is employed, as in the electrical decomposition of chloride of sodium or potassium, in solution, with oxide of copper next the cathode, for taking up the nascent hydrogen before it has time to create a disturbance in the solution, it is necessary, from time to time, to stop the process of electrolysis, for renewal of the depolarizing agent.

The object of the present invention is to render the electrolysis more continuous, and to avoid the interruptions which perforce occur while the reduced or spent depolarizer is being removed and replaced by fresh.

According to my invention, I introduce the depolarizer, which will be an insoluble metallic oxide, in a more or less finely divided state, continually, or at regular intervals, into the electrolytic tank, where it falls onto a traveling apron, which conveys it slowly from one end of the tank to the other, arriving thither in a reduced condition, ready for removal by means of an elevator.

In the accompanying drawings, I have shown an electrolytic tank suitable for decomposing a solution of salt, illustrating my invention.

Figure 1 is a plan view and Fig. 2 is a longitudinal section.

A is the body of the tank, of slate or other suitable material.

a is a cover of the same width as the tank, but somewhat less in length, so as to leave a space uncovered at either end.

b b' are solid partitions extending from side to side of the tank, and from the cover downward into the solution, to about three quarters the depth of the tank, so as to make an inclosed compartment for the anodes B immersed in solution. The anodes are made of pieces of retort carbon, secured by casting into bars B' of lead or other suitable material supported from the cover *a*.

The cathode or negative electrode is situated in the bottom of the tank below the level of the lowest edge of the partitions *b b'*.

In the drawings, C is the cathode, as well as the traveling apron for traversing the depolarizer through the solution in contact with itself.

The traveling apron C consists of an endless band of suitable sheet metal, of a width nearly equal to the breadth of the tank. This endless band is strained over two rolls *c*, *c'*, mounted in bearings in the tank. The shaft of the roller *c* extends through the side of the tank, where there is a stuffing box to prevent the escape of the solution; and terminates in a pulley, to which rotation is communicated, to advance the apron at a slow pace in any convenient manner.

d d' d² are rollers which serve to support the band, and keep it tight at the middle of its length.

b^2 are terminals for making electrical connection with the anodes, and c^2 is a terminal for making connection, by the aid of the contact strip or brush c^3, with the cathode.

E is a hopper containing the depolarizing agent, and *e* is a feed roller, which, by its rotation, continually discharges small quantities down the chute *e'*, which delivers onto the apron C.

The speed of travel of the apron C is regulated, so that any given portion of depolarizer on completing its passage through the tank, falls from the apron in a condition as fully reduced or spent as possible, so that when it is removed by the elevator F, there may be little or no depolarizing properties left in it.

f is a tray, into which the spent depolarizer falls from the apron, and into which the elevator F dips.

The tank is provided with an inlet pipe A' and an outlet pipe A^2 for the solution and with a pipe A^3 for the escape of gas. In the partition *b* there is an opening *i* which provides a way for the escape of imprisoned air while the tank is being filled. The said opening also helps to maintain the level of the solution in the two compartments.

The elevator F may consist of an endless chain of buckets, as illustrated in the drawings.

From the foregoing, it will be seen, that the

depolarizer is constantly being renewed as fast as it is removed in a reduced condition. Thus, it will be unnecessary to stop the electrolytic process, as has hitherto been necessary, while the reduced depolarizer is removed and reoxidized in the usual way.

What I claim is—

In apparatus for use in the electrolysis of solutions, the combination with a tank having an anode compartment substantially as illustrated, of a movable cathode arranged to carry depolarizing material and provided with means for advancing it through the tank, and means for delivering and removing the depolarizing material, as and for the purpose forth.

JAMES CHARLES RICHARDSON.

Witnesses:

H. K. WHITE,

H. F. C. GOLTZ.