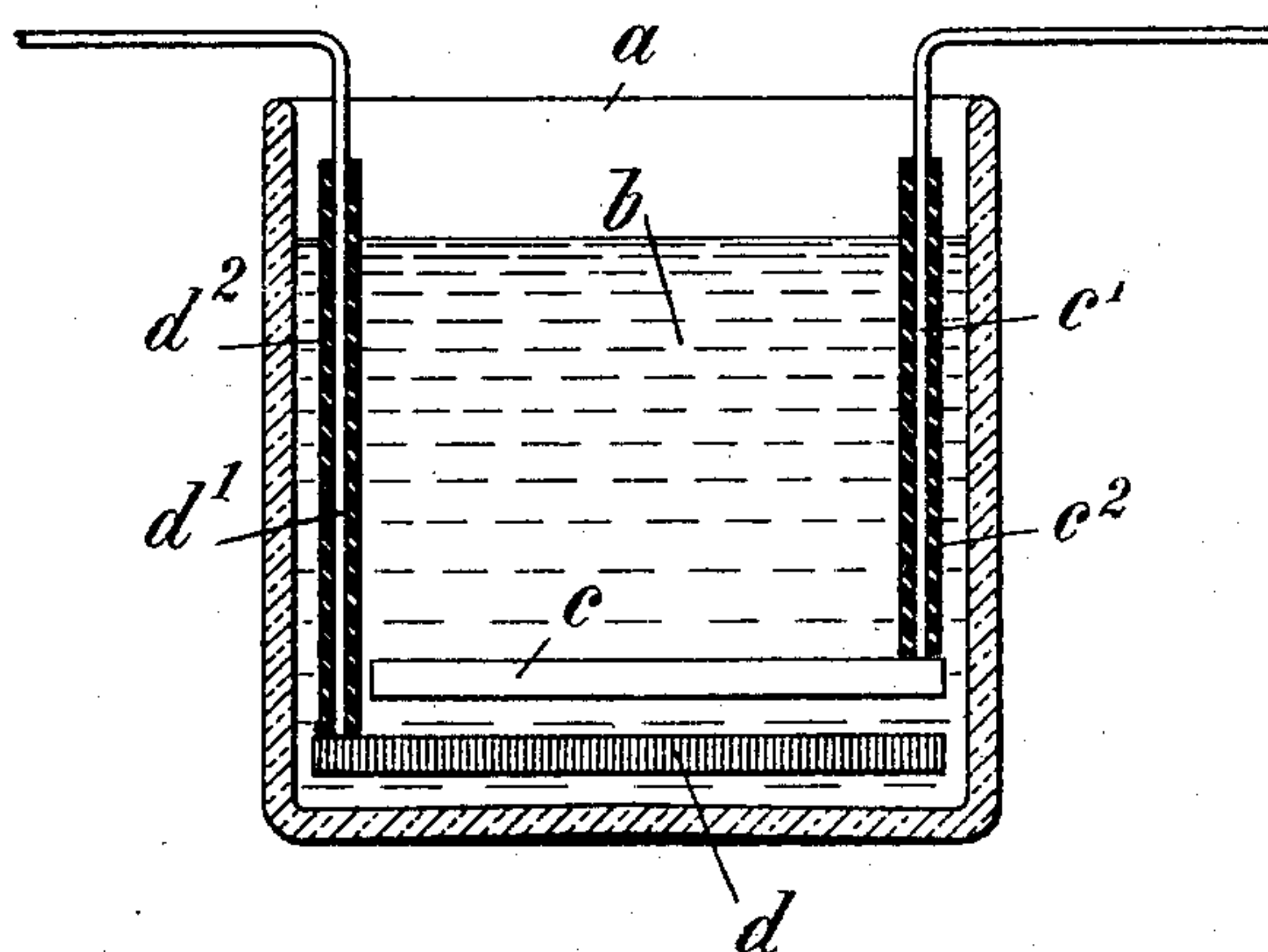


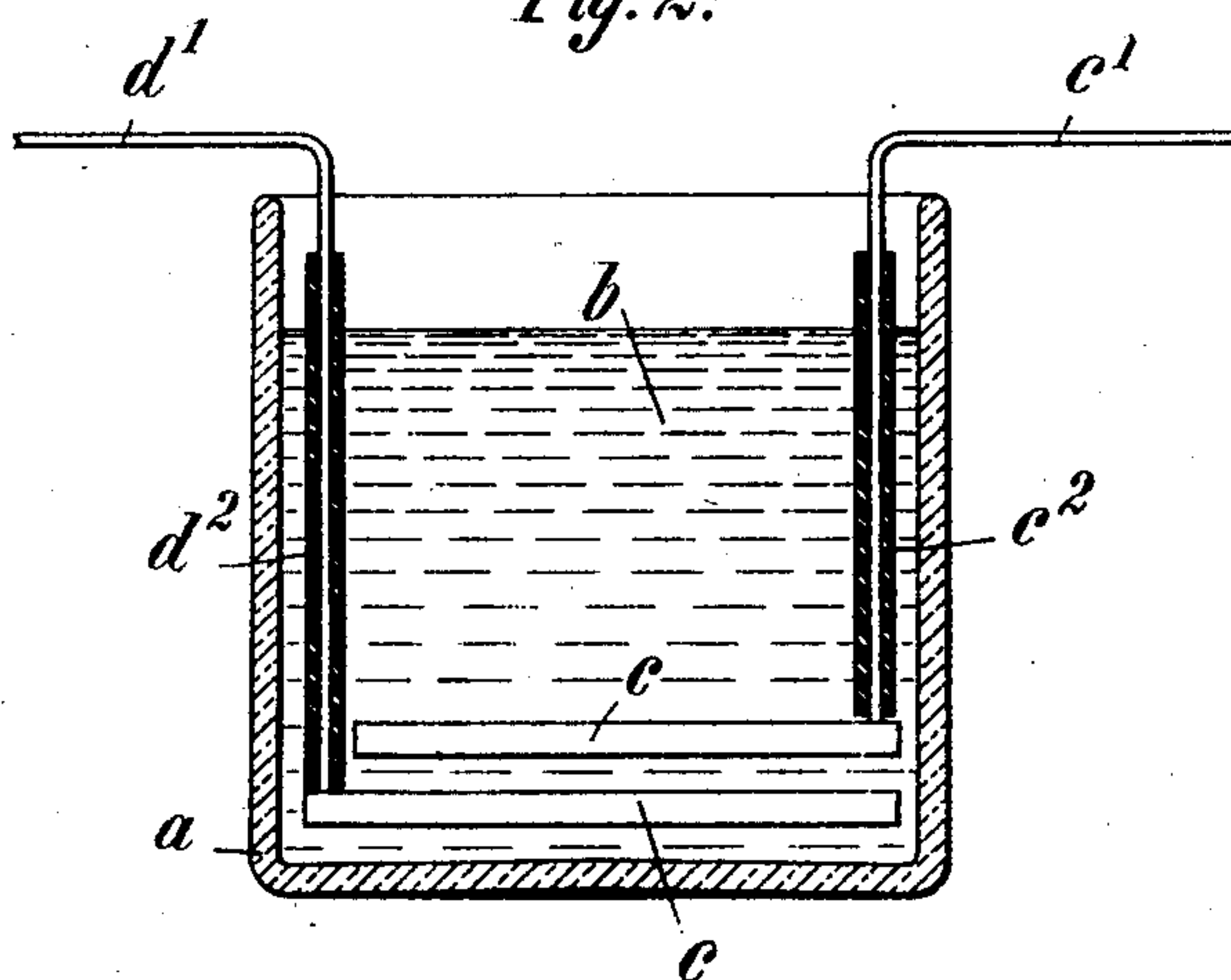
R. GRISSON.  
ELECTROLYTIC CELL.  
APPLICATION FILED DEC. 8, 1902.

NO MODEL.

*Fig. 1.*



*Fig. 2.*



*Witnesses:*  
*Hoher.*  
*W. Sommer*

*Inventor,*  
*Robert Grisson.*  
*By*  
*New Orth*  
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# UNITED STATES PATENT OFFICE.

ROBERT GRISSON, OF HAMBURG, GERMANY.

## ELECTROLYTIC CELL.

SPECIFICATION forming part of Letters Patent No. 719,791, dated February 3, 1903.

Application filed December 8, 1902. Serial No. 134,356. (No model.)

*To all whom it may concern:*

Be it known that I, ROBERT GRISSON, a subject of the German Emperor, and a resident of Hamburg, in the German Empire, have invented certain new and useful Improvements in Electrolytic Cells, of which the following is a specification.

The present invention relates to improvements in electrolytic cells especially of that class provided with an electrode or electrodes of aluminium or an equivalent material. The object of the invention is to produce an improved electrolytic cell of the class mentioned in which a reformation of the deformed aluminium electrode or electrodes is constantly proceeding during the operation; and with this end in view my invention consists in certain novel features of construction and arrangements of parts, as will be hereinafter fully described with reference to the accompanying sheet of drawings, in which—

Figure 1 is a vertical section of an electrolytic cell having one aluminium electrode and one lead electrode constructed and arranged in accordance with and embodying my invention. Fig. 2 is a vertical section of a modification of the electrolytic cell provided with two aluminium electrodes.

Similar letters refer to similar parts throughout both figures.

Experience has shown that cells with aluminium electrodes as hitherto constructed have not attained any practical importance, because when they have been in use for a short time they afford a passage to the alternating current in both directions. Owing to the electrolytic action of the current, small holes are quickly formed in the electrodes vertically suspended in the electrolyte, and in working these increase in size, so that there is no longer an insulating stratum. As these defects increase so does the loss of energy, which may directly balance itself between the electrodes. It was therefore necessary to produce a cell in which a reformation of the deformed aluminium electrode or electrodes is constantly proceeding during the operation. This result is attained by avoiding any vertical active surfaces in the aluminium electrode. As a formation of aluminium with alternating current only takes

place with a weak current, a constant formation of the active surfaces during the operation or working of the cell is obtained, owing to the fact that upon those points of the electrode at which a passage of current takes place a gas-bubble is formed, which, if there are no vertical surfaces, cannot immediately escape, and thus prevents the passage of a strong current at this deformed point and permits of a reformation. The bubble escapes after the reformation slowly to one side or edge of the electrode and the process is repeated. It may be stated that the active surface of the aluminium electrode may not lie absolutely horizontal. It may be slightly inclined or be of the form of a spherical cap. The electrode must be formed in such a manner that the gas-bubbles produced reduce the passage of current at the deformed points to such an extent as to permit of reformation there.

The improved electrolytic cell with a horizontal or only slightly-inclined aluminium electrode or electrodes produces, as stated by careful experiments, a far better result, as the well-known electrolytic cells with a vertical aluminium electrode or electrodes.

The improved electrolytic cell may advantageously be employed or used as a rectifying-cell for transforming alternating currents into direct or continuous currents, as a locking or barring cell in charging accumulators, as an alternating-current condenser, &c.

In the electrolytic transforming-cell shown by Fig. 1 *a* represents a suitable jar or cup containing a suitable electrolyte *b*, into which are immersed an aluminium electrode *c* and an electrode *d* of lead or any other suitable material. The plate *c*, forming the aluminium electrode, is arranged in such a manner that vertical active faces are entirely or nearly entirely obviated. *c'* and *d'* are conducting wires or strips leading to and carrying or supporting the said electrodes *c* and *d*, respectively. In order to prevent direct contact between the electrolyte and the conducting-strips *c'* *d'*, the latter are surrounded or inclosed in suitable insulators *c<sup>2</sup>* and *d<sup>2</sup>*, respectively, made of glass or any other suitable insulating material. When the electrode *c* is connected with the positive pole of



a generator, current cannot pass, as is well known, from *c* to *d*; but should the current be reversed it may pass from *d* to *c*.

In the modified form of the improved cell represented by Fig. 2 two horizontally-arranged aluminium electrodes *c* are shown in the jar *a* containing a suitable electrolyte *b*. In this case current can pass, as is well known, in neither direction. The cell forms an electrolytic condensing-cell or condenser.

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

1. In a transforming or condensing cell, electrodes therein, and a suitable electrolyte, one of said electrodes of aluminium and having substantially no vertically-disposed active surfaces, for the purpose set forth.

2. In a transforming or condensing cell, electrodes therein, and a suitable electrolyte, one of said electrodes of aluminium and posi-

tioned to prevent the immediate escape of gas-bubbles formed on its surface, whereby the electrode is corroded and at such points a gas bubble or bubbles formed, thereby reducing the current thereunder sufficiently to enable a redeposit of aluminium, substantially as and for the purpose set forth.

3. In a transforming or condensing cell, aluminium electrodes therein, and a suitable electrolyte, both of said electrodes presenting surfaces to the electrolyte that do not readily release gas-bubbles formed therein, whereby the electrode is corroded and at such points a gas bubble or bubbles are formed, thereby reducing the current thereunder sufficiently to enable a redeposit of aluminium, substantially as and for the purpose set forth.

ROBERT GRISSON.

Witnesses:

MAX KAEMPFF,  
OTTO W. HELMRICH.