Mar. 20, 1923. 1,449,008

T. KOLKIN

ELECTRODE FOR ELECTROLYZING FUSED MATERIALS

Filed June 27, 1921

Fig. 1

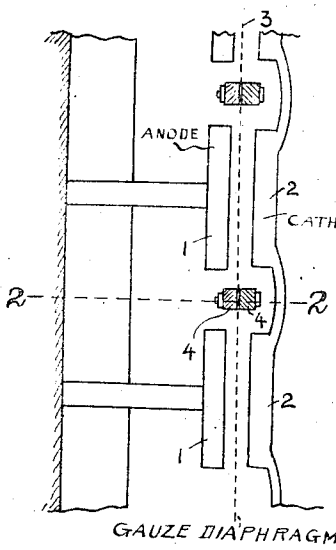


Fig. 3

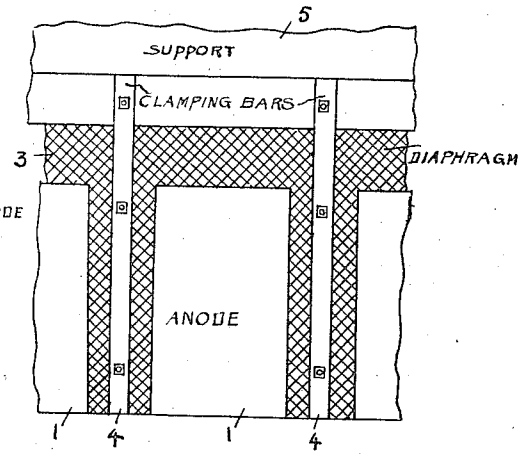


Fig. 4

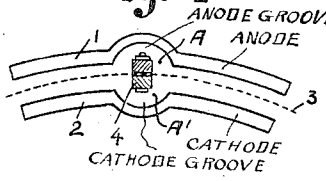


Fig. 2

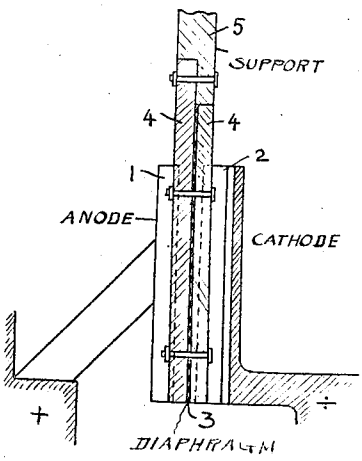
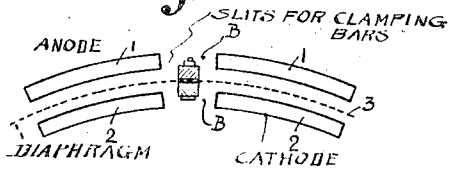


Fig. 5



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UNITED STATES PATENT OFFICE.

TORJUS KOLKIN, OF VADHEIM, IN SOGN, NORWAY.

ELECTRODE FOR ELECTROLYZING FUSED MATERIALS.

Application filed June 27, 1921. Serial No. 480,800.

To all whom it may concern:

Be it known that I, TORJUS KOLKIN, engineer, a subject of the King of Norway, and residing at Vadheim, in Sogn, Norway, have invented certain new and useful Improvements in Electrodes for Electrolyzing Fused Materials (for which I have filed an application in Norway September 21, 1918), of which the following is a specification.

The present invention relates to improvements in the arrangement and construction of electrodes in apparatus for electrolyzing fused materials and has more particularly for its object to provide a suitable arrangement of the supports for a diaphragm between the electrodes.

In the manufacture, for instance, of metallic sodium by electrolyzing fused caustic soda, it has been found difficult to provide a durable and satisfactory diaphragm (gauze netting) and to obtain an adequate, high current density on the surface of the electrodes by using smooth continuous surfaces as for instance in the case of the Castner cell.

The present invention comprises an arrangement of the electrodes by which these drawbacks are avoided. In accordance with the invention the surfaces of the electrodes are divided into elements by means of grooves or splits, for the purpose of providing spaces for supports for the gauze netting, at the same time reducing the surface area and thereby increasing the current density.

On account of the provision of these grooves or splits and the use of the net supports resulting in a rigid system, the electrodes can be placed so close together that the current density, without undue increase in voltage, can be considerably increased, which is of great importance for the heat balance in the cell.

The invention is illustrated in the enclosed drawing in which:

Fig. 1 is a partly sectional plan view of an arrangement according to one form of the invention.

Fig. 2 shows a section upon the line 2—2, Fig. 1.

Fig. 3 is a side view looking from the outside of the anodes as shown in Fig. 1, the supporting parts of the anodes being dispensed with.

Figs. 4 and 5 show plan views of modified forms.

In the drawing 1 designates the anodes and 2 the cathodes. In Fig. 1, the electrodes are arranged parallel to each other, the several anodes being separated from each other, the cathode being composed by several parts connected by means of connecting parts conveniently arranged so as to provide a groove between same.

Between the anodes and the cathode, according to Fig. 1, is supported a diaphragm 3 formed by a wire gauze. This diaphragm is supported by means of corresponding clamping bars 4 connected to each other and to the wire gauze by means of clamping screws, one set of the bars having an extension by means of which it is connected to a support 5, as shown in Figs 2 and 3.

As clearly shown, the clamping bars are placed on one side into the space between two anodes and on the other side in the groove between the cathode parts.

According to Figs. 4 and 5 the electrodes are cylindrical as well as the diaphragm.

According to Fig. 4, the several parts of the anodes as well as the cathodes are connected to each other by means of connecting pieces as those shown in the cathodes according to Fig. 1, so that grooves A are obtained on the cathode side as well as the anode side in which the clamping bars 4 may be placed.

According to Fig. 5, the anode as well as the cathodes consists of several parts separated by means of slits B in which the clamping bars 4 may be placed.

By the said arrangement of either grooves or slits, or grooves and slits, for taking up the supports for the diaphragm, a rigid construction is obtained in which the electrodes may be arranged sufficiently close to each other to give the desired density of current without undue increase of the voltage.

Having now particularly described and ascertained the nature of my said invention, and in what manner the same is to be performed, I declare that what I claim is:

1. In an apparatus of the class for electrolyzing fused materials, a particular ar-

rangement of the electrodes characterized in that the surfaces of the electrodes are divided into a plurality of elements by means of grooves or splits providing spaces for readily supporting the gauze net, in order to permit of the electrodes being mounted so close together that a suitable current density can be obtained without increasing the usual voltage.

2. An apparatus according to claim 1, wherein the surfaces of the electrodes are divided partly by splits and partly by grooves.

In testimony whereof I affix my signature in presence of two witnesses.

TORJUS KOLKIN.

Witnesses:
ENEST S. HODGE,
SIG. E. TALL.