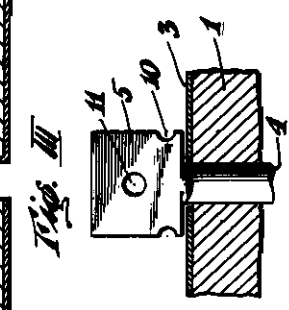
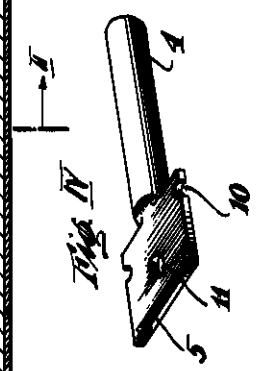
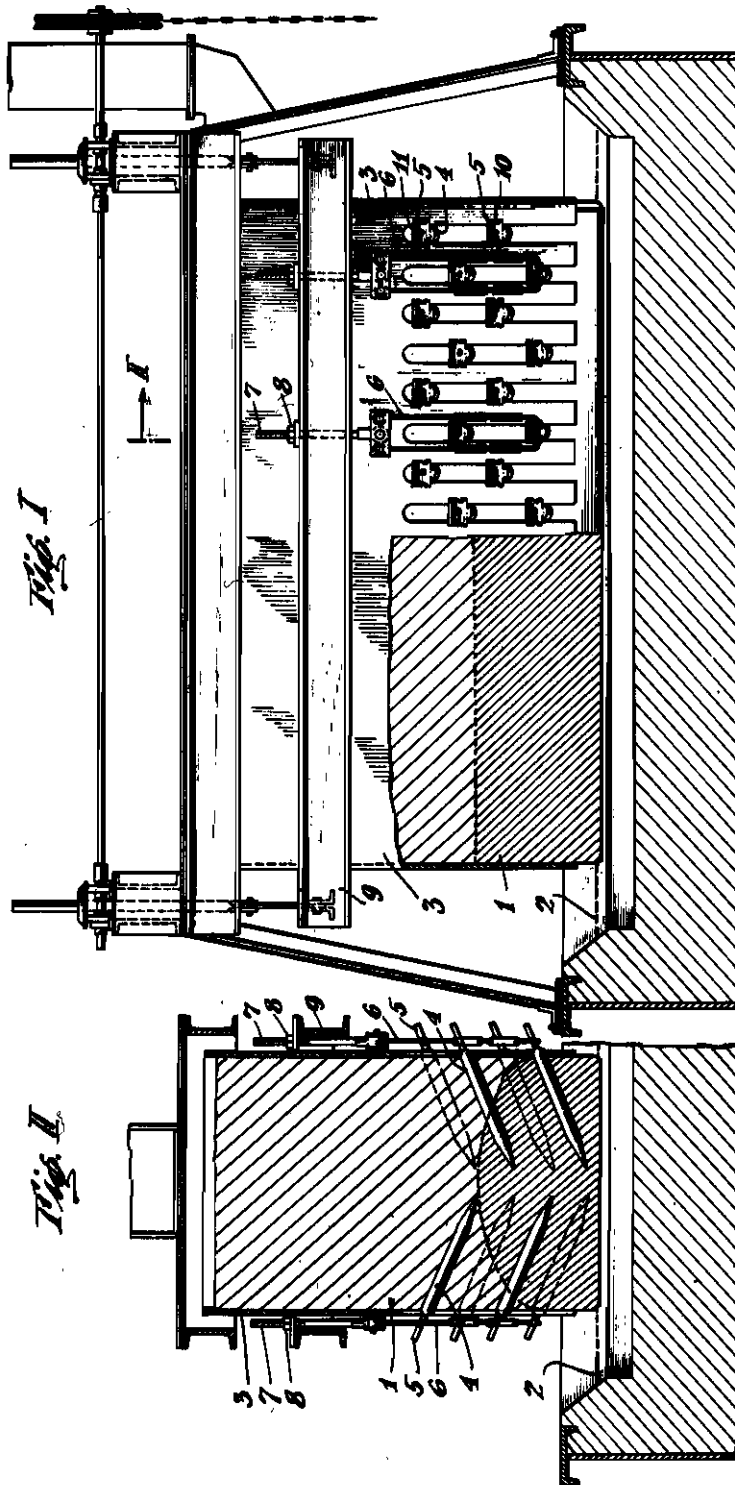


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ARRANGEMENT IN SELFBAKING ELECTRODES
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ALIEN PROPERTY CUSTODIAN

ARRANGEMENT IN SELFBAKING ELECTRODES

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Applicants have in a series of earlier patents protected processes for production of oblong Söderberg Electrodes. In these patents applicants have mentioned the difficulty caused by the fact that the upper part of the Söderberg Electrodes consists of raw and soft electrode paste which on account of the hydrostatic pressure prevailing in this part of the electrode will deform the electrode so that it will approach a cylindrical shape if no precautions are taken to prevent such deformation. In U. S. Patent No. 2,073,356 the deformation is prevented by means of a frame construction surrounding the electrode and being sufficiently rigid to withstand the hydrostatic pressure from the electrode paste.

The present application relates to another way of preventing such deformation and which is either employed without connection with the iron constructions described in above mentioned application or in combination therewith whereby the iron constructions may be made materially simpler and cheaper. Applicants have based their invention on the fact that the current carrying contact bolts inserted from the outside of the electrode will already at an early stage become fixed to the baked part of the electrode at their lower ends. The contact bolts are therefore used for fixing the electrode surface, the contacts being provided with projections registering with the electrode surface and preventing outward movement thereof after the lower (inner) end of the contact has become fixed in the electrode paste. A contact bolt completely baked into the electrode paste will sit so tight that a pull of 10-20 tons will be required to remove the contact from the electrode. It will therefore be understood that such fixing of the electrode surface is very effective when correctly made and at the same time very simple.

The practical application of the process may vary within wide limits. Generally the contacts are placed in horizontal rows in the electrode as described in above mentioned U. S. Patent No. 2,073,356. The vertical distance between contacts is for instance 20 cm. The two lower rows of contacts will then usually be solidly fixed in the electrode paste. Also the third row of contacts has its lower (inner) end in a part of the electrode which is already quite well baked so that also this row will help to fix the electrode surface. Only the fourth and fifth (if present) row of contacts (usually only 4-5 rows are employed) are surrounded by soft paste. When in this way the electrode surface has been connected with the baked part of the electrode by

means of the three lower rows of contacts, deformation can only take place at one or two of the upper rows, and then other precautions must be taken to prevent deformation. In practice this may be achieved by employing a permanent mould surrounding the electrode top as described in U. S. Patent No. 2,169,563. This mould envelops the electrode down to the upper row of contacts. It may easily be made more rigid so that deformation of the electrode is prevented in that part of the electrode which is enveloped by the mould. Such means for reinforcing the mould may be placed outside the casing or both long sides of the casing may be connected by means of crossbars running all through the electrode in its upper soft part. The connection may consist in an iron plate, suitably of a shape corresponding to that of the upper part of the baked electrode. It may also for instance be made of wire. If made of aluminium it may connect up the aluminium armature and go with it into the furnace. In practice only 20-40 cm. of the electrode length will be subjected to the danger of deformation. As the electrode surface, as mentioned above, is provided with a casing of aluminium, this casing will also by suitable thickness to a great extent prevent deformation also of this section of the electrode. The casing which is usually situated inside the permanent part will at its upper edge be held tight against the electrode by the permanent mould and at its lower edge by the current carrying contacts mentioned herein. To a suitable extent the electrode may, however, also be provided with external means for reinforcing, consisting in iron plates or iron constructions limiting the electrode surface at this point. It is also possible to let prolongations of the permanent mould project downwards between the contact rows until a section is reached which is sufficiently fixed by means of the contacts herein described.

In connection with this form of application of the invention it should be mentioned that instead of employing an aluminium casing a casing consisting of sheet iron, for instance 1/2 mm. thick, may be used. The sheet iron is usually removed from the electrode surface before it reaches the aluminium bath either by tearing it off, for instance in strips 10-20 cm. high or by unrolling. The iron protection may also be made of plates, for instance 5 mm thick and 100-200 mm high placed one above the other or side by side on those parts of the electrode which are provided with contacts. The plates are preferably placed inside the permanent mould. They follow the

electrode downwards toward the bath surface and are provided with holes through which the contacts are inserted. Below the guiding mantle the holes should be closed, for instance by means of a thin aluminium plate. The iron plates may be removed from the electrode as soon as the corresponding contacts have been extracted. They are easy to handle and may also easily be straightened out if deformed during handling.

In Fig. I an arrangement is shown where the electrode 1 is surrounded by an aluminum casing 2 attached to the electrode. The electrode is further at its upper end enveloped by a permanent casing 3 which on the contactless sides of the electrode is prolonged to form pieces projecting toward the bath surface. The permanent casing is between the contacts prolonged downwards to form slots in which the contacts may move toward the bath as described in U. S. Patent No. 2,169,563. The electrode is provided with contact bolts 4 which are inserted into the electrode, and the upper end 5 of the contact, where the current is supplied, is wrought out in such a way as to form projections registering with the armature. The suspension of the electrode is effected by means of the contacts 4 which are connected with a round iron rod 7 by means of a chain 6 said rod 7 being connected with the movable suspension frame 8 by means of the wedge 8. The changing of the suspension device from one contact row to the following is effected according to known methods.

In connection with the projections in the contacts and the above mentioned prolongations of the permanent casing the lower ends of these

may be provided with a stop-arrangement for instance iron pieces welded to them which register with the projections of the contacts and thus prevent further downward movement of the electrode. The projections on the contacts may suitably be so made as to give the contacts the right angle in the electrode paste.

Fig. II shows the contact bolt 4 in detail with the upper end 5 registering with the prolongation of the permanent casing 3. Inside thereof is shown the aluminium casing 2 and the electrode 1.

The drawings herein described are only meant as examples and must in no way be taken as a limitation of the idea in question. Several modes of application may be conceived of and as an example may be mentioned that instead of providing the contacts with projections they may be left cylindrical and provided with cross-pins either inserted through the cylinder or welded thereto and projecting on both sides of the contact.

It should be noted that neither in Fig. I nor in Fig. II is any arrangement shown for supply of current to the contacts in order not to confuse the figures. It is assumed that the current supply is effected in known way.

For the same reason the suspension of the electrode is only illustrated by means of 2 contact bolts on half of one side of the electrode. There is of course no objections against making use of more contact bolts.

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