

UNITED STATES PATENT OFFICE.

FRANZ VON KÜGELGEN, OF HOLCOMBS ROCK, VIRGINIA, AND GEORGE O. SEWARD, OF NEW YORK, N. Y.

PROCESS OF ELECTROLYZING AQUEOUS SOLUTIONS OF STANNIC CHLORID.

No. 883,140.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that we, FRANZ VON KÜGELGEN, a subject of the Emperor of Germany, residing at Holcombs Rock, Virginia, and
5 GEORGE O. SEWARD, a citizen of the United States, residing at New York city, New York, have invented certain new and useful Improvements in Processes of Electrolyzing Aqueous Solutions of Stannic Chlorid, of
10 which the following is a specification.

In detinning tin-plate scrap by the action of anhydrous chlorin, the tin is recovered as liquid stannic chlorid. This product may be
15 effectively decomposed into tin and chlorin by dissolving it in water and electrolyzing the aqueous solution in a diaphragm cell, with insoluble anodes. Such electrolysis
proceeds smoothly at first, but after a time the anolyte becomes basic and the catholyte
20 acid, decreasing the current efficiency, while a gelatinous precipitate may deposit in the anode compartment. This result is due to the fact that stannic chlorid is partially hydrolyzed by water, with the production of
25 stannic hydroxid and hydrochloric acid, which are therefore present in the electrolyte. The difference in the ionic velocities causes the concentration of the base and acid in the cell compartments to gradually change
30 during electrolysis, until the amount of stannic hydroxid in the anode compartment is in excess of that which will remain in solution in the hydrated stannic chlorid.

According to the present invention, an
35 aqueous solution of stannic chlorid is electrolyzed in a diaphragm cell, but the electrolysis is not carried so far as to cause the stannic hydroxid to precipitate in the anode compartment. Before this result occurs and
40 when the current-efficiency begins to notably drop, the electrolyte is discharged from both compartments of the cell; the anolyte containing stannic hydroxid and catholyte containing hydrochloric acid are mixed, and the
45 mixture is concentrated by boiling it down to a density of about 1.4° to 1.5° Baumé, whereby the stannic hydroxid and hydrochloric acid are combined with the production of stannic chlorid. The resultant solution is then returned to the electrolytic cell and supplied, either at intervals or continuously, to its several compartments.

We claim:

1. The process of electrolyzing aqueous solutions of stannic chlorid, which consists in
55 conducting the electrolysis in a diaphragm cell and combining the stannic hydroxid and hydrochloric acid present in the anolyte and catholyte, respectively.

2. The process of electrolyzing aqueous
60 solutions of stannic chlorid, which consists in conducting the electrolysis in a diaphragm cell until stannic hydroxid and hydrochloric acid accumulate in the anolyte and catholyte, respectively, removing the electrolyte
65 from the cell, and combining the accumulated stannic hydroxid and hydrochloric acid with the production of stannic chlorid.

3. The process of electrolyzing aqueous solutions of stannic chlorid, which consists in
70 conducting the electrolysis in a diaphragm cell until stannic hydroxid and hydrochloric acid accumulate in the anolyte and catholyte, respectively, removing the electrolyte
75 from the cell, and combining the accumulated stannic hydroxid and hydrochloric acid with the production of stannic chlorid by mixing the anolyte and catholyte and evaporating the mixture.

4. The process of electrolyzing aqueous
80 solutions of stannic chlorid, which consists in conducting the electrolysis in a diaphragm cell until stannic hydroxid and hydrochloric acid accumulate in the anolyte and catholyte, respectively, removing the electrolyte
85 from the cell, and combining the accumulated stannic hydroxid and hydrochloric acid with the production of stannic chlorid by mixing the anolyte and catholyte and evaporating the mixture to a density of about 1.4
90 to 1.5 degrees Baumé.

5. The process of electrolyzing aqueous solutions of stannic chlorid, which consists in
conducting the electrolysis in a diaphragm
95 cell until stannic hydroxid and hydrochloric acid accumulate in the anolyte and catholyte, respectively, removing the electrolyte from the cell, combining the accumulated stannic hydroxid and hydrochloric acid with the production of stannic chlorid by mixing
100 the anolyte and catholyte and evaporating the mixture, and returning the product to the electrolytic cell.

6. The process of electrolyzing aqueous

solutions of stannic chlorid, which consists in
conducting the electrolysis in a diaphragm
cell until stannic hydroxid and hydrochloric
acid accumulate in the anolyte and catholyte,
5 respectively, removing the electrolyte from
the cell, combining the accumulated stannic
hydroxid and hydrochloric acid with the
production of stannic chlorid by mixing the
anolyte and catholyte and evaporating the
10 mixture to a density of about 1.4 to 1.5 de-
grees Baumé, and returning the product to
the electrolytic cell.

In testimony whereof we affix our signa-
tures in presence of witnesses.

FRANZ VON KÜGELGEN.

GEORGE O. SEWARD.

Witnesses as to the signature of Franz von
Kügelgen:

HARRY RILEY LEE,

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Witnesses as to the signature of George O.
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