

means of partitions extending downwards into the solution to within a short distance of the bottom of the tank. These cells contain alternately the positive and negative electrodes, the positive or anode cells being covered to retain the gases liberated therein, while the negative or cathode cells are not necessarily covered, for the products of decomposition next the cathode which it is desired to save—namely, caustic soda—have a downward tendency. The partitions extending into the solution to a depth slightly below the bottom of the electrodes will be found sufficient to prevent recombination in the tank.

In applying my invention to such apparatus, the tank is provided with double sides, between which are channels or chambers extending along on either side of the tank.

These chambers, which may, if desired, be divided longitudinally by horizontal divisions, communicate with the compartments of the electrolytic tank through suitably arranged apertures.

A supply of solution to be electrolysed is admitted through the chamber communicating with the anode compartments, while the caustic liquor is drawn off by a chamber or channel in communication with the cathode compartments near the bottom of the tank.

The gases liberated at the electrodes escape also into chambers or channels communicating with the space above the level of the solution in each compartment of the tank.

A tank embodying the present improvements is illustrated in the accompanying drawings, wherein Fig. 1 is a longitudinal section; Fig. 2 is a transverse section in the line XX of Fig. 1; Fig. 3 is a plan view; Fig. 4 is a transverse section on the line yy of Fig. 1; and Fig. 5 is a similar view, merely intended to indicate a modified form of the negative electrode.

A is the tank, of slate or other suitable material, divided into any convenient number of compartments or cells by transverse partitions extending downwardly into the solution to be electrolysed, *a* are the anode cells, which are covered; *b* are the cathode cells, which are not (in the illustration) covered.

The cells *a* communicate by holes *c*, arranged above the level of the solution (see Fig. 2), with a closed outside chamber C, which extends the whole length of the tank. This chamber C serves to lead away the gas given off at the positive electrode or anode during the progress of the electrolytic decomposition. The anode-chambers communicate also with a supply of fresh solution of chloride of sodium or potassium, which may be conveyed, through holes *c'* a little below the level of the solution in the tank, from a chamber or channel C' (see Fig. 2) running the entire length of the tank.

The products of electrolysis, which are formed at the cathode, and have a downward tendency so as to stratify at the bottom of the tank, are led off by an aperture or apertures *d* communicating with the passage D, which leads to any suitable receptacle.

In many cases the supply of fresh solution to the anode cells, and the removal of the gas formed therein, may be effected through one and the same passage, and in that case there are two holes in the passage at different levels, one above the level of the solution for the removal of the gas, the other just below the level for admitting a fresh supply of liquid.

The cathode passage D will be as before explained.

In the electrolysis of chloride of sodium solution the fresh supply may be derived in the following manner: The chamber C' may be charged with common salt, which will be taken up by the solution as it becomes weaker during the progress of the decomposition, and water may be added to maintain the level of the solution. In this way a saturated solution may be maintained.

In the accompanying drawing I have illustrated means whereby the electrodes may be raised or lowered in the solution as required, which is a convenience under some circumstances.

The chambers or passages communicating with the anode and cathode cells are, by preference, built in one structure with the tank, so as to effect an economy in the construction.

In the accompanying drawing the passages are formed by providing double sides upon a single base for the whole structure, covers or horizontal divisions for the spaces between the double sides being provided as required.

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

A tank to be used in the electrical decomposition of chloride of sodium or potassium in solution, having any convenient number of anode and cathode cells, formed by dividing the tank transversely by partitions extending downwardly from the covers of the anode cells to a depth somewhat below the level of the electrodes, and having passages communicating respectively with the said cells for removing the products of decomposition and supplying fresh electrolyte, substantially as explained with reference to the accompanying drawings.

Dated this 15th day of October, 1894.

TREVENEN J. HOLLAND.

IMPROVEMENTS IN MAKING POTASSIC CYANIDE AND APPARATUS THEREFOR.

I, William McDonnell MacKey, of 32, Victoria Chambers, South Parade, Leeds, in the County of York, England, analytical chemist, do hereby declare the nature of my invention for "Improvements in making Potassic Cyanide and Apparatus therefor," and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

It is known that by treatment of alkaline compounds, such as those of potassium and carbonaceous matter, in a furnace with an air blast an alkaline cyanide such as potassic cyanide is formed, but it has hitherto been found difficult to produce it economically when the process is carried on as a furnace operation on a large or commercial scale.

This invention relates to means of producing and collecting potassic cyanide, which is affected as follows:—

A furnace is provided, preferably vertical, in the form of a cupola, such as is illustrated by the accompanying drawing, showing a vertical section. This furnace, which by preference has a basic