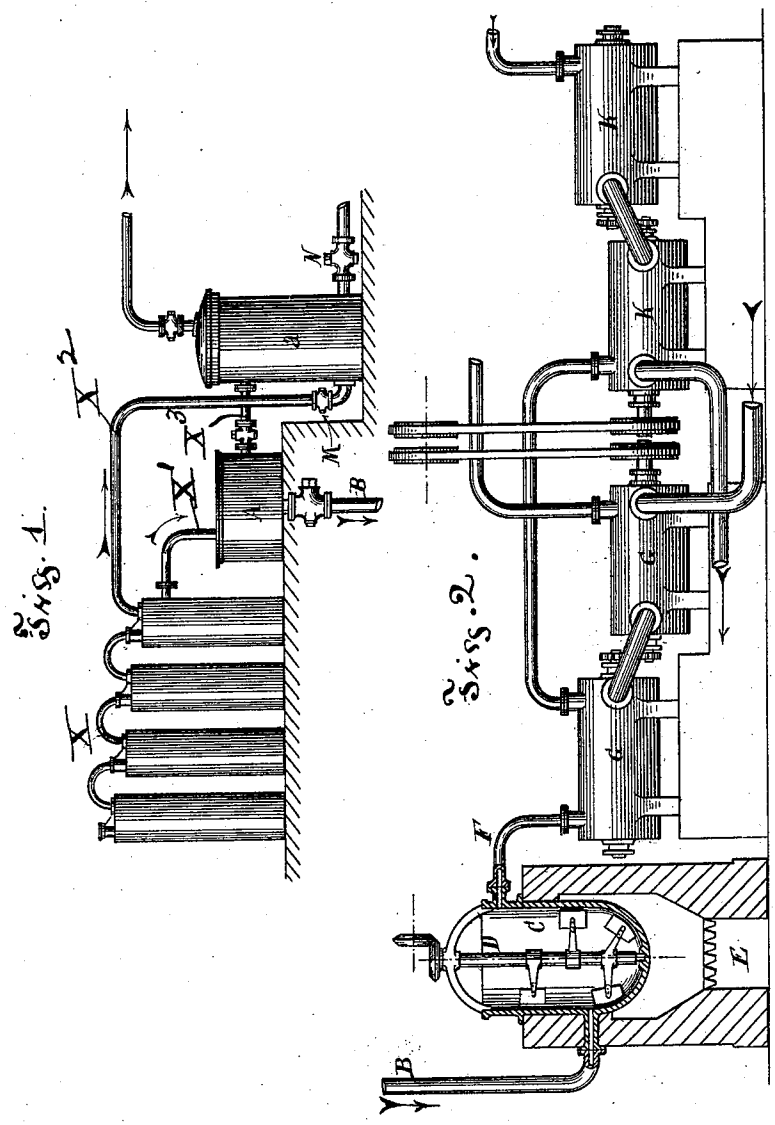
(No Model.) 2 Sheets—Sheet 1.

J. MEYRUEIS.

TREATMENT OF SODIUM CHLORID.

No. 560,518. Patented May 19, 1896.



Witnesses

Arthur Goodj.

Inventor.

Jules Meyrueis

(No Model.) 2 Sheets—Sheet 2.

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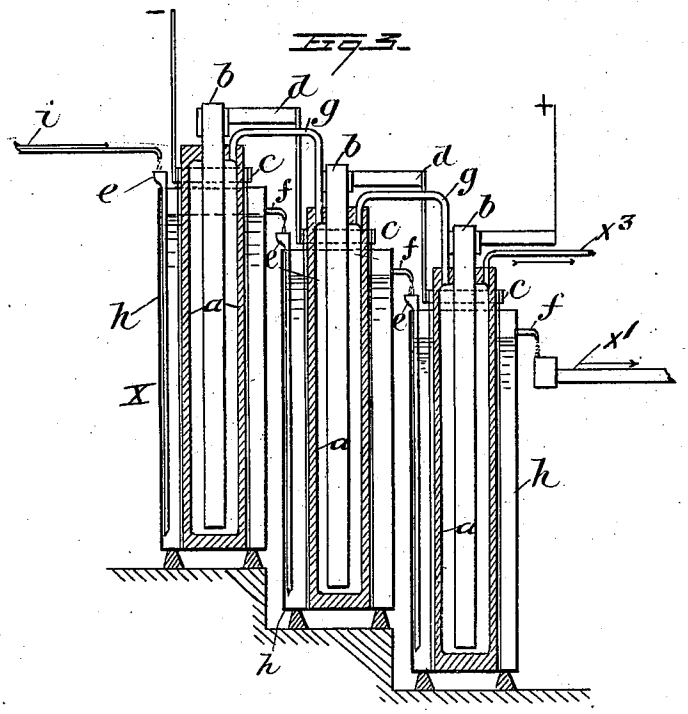

Witnesses
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UNITED STATES PATENT OFFICE.

JULES MEYRUEIS, OF PARIS, FRANCE.

TREATMENT OF SODIUM CHLORID.

SPECIFICATION forming part of Letters Patent No. 560,518, dated May 19, 1896.

Application filed July 24, 1893. Serial No. 481,371. (No specimens.) Patented in France January 31, 1893, No. 227,540.

To all whom it may concern:

Be it known that I, JULES MEYRUEIS, of the Compagnie Electro-Chimique de St. Béron, a citizen of the French Republic, and a resident of Paris, Department of the Seine, France, have invented a certain new and useful Improvement in the Treatment of Sodium Chlorid for the Production of White Lead, Soda, and Chlorin, (for which a patent has been granted in France, No. 227,540, dated January 31, 1893,) of which the following is a specification.

The purpose of this invention is to provide a method of treating sodium chlorid so that various products may be obtained therefrom—namely, white lead, bicarbonate of soda, and chlorin.

Reference being made to the annexed drawings, Figure 1 is an elevational diagram of part of the apparatus. Fig. 2 is a similar view, partly in section, of the remainder of the apparatus. Fig. 3 shows part of the apparatus—namely, the electrolyzing-cells—in section.

According to the present invention the sodium chlorid in solution in water is subjected to the electrolytic action of an electric current in a cell or series of cells X, divided by a porous diaphragm *a*, separating the electrolyte in which the anode dips from that in which the cathode is situated. This series of cells X is shown in Fig. 3, in which, as aforesaid, *a* represents the porous diaphragms in the form of closed vessels; *b b b*, the anodes; *c c c*, the cathodes; *d d d*, the metallic connections between the anodes and the cathodes of the series of cells; *e e e*, the pipes with thistle-tops receiving the solution for the cathodes in each cell and carrying said solution first to the bottom of the cell.

f f f are the delivery-pipes for the overplus of solution from the cells, the last of which empties into the pipe X′, by which the solution is carried to vessel A for further treatment, as hereinafter explained.

g g g are pipes for connecting the interior spaces of the porous cells *a a a* together at their upper parts, the last porous cell communicating with the pipe X^3, by which, as hereinafter described, the chlorin gas developed in the porous cells *a* is carried off. *h h h* represent the exterior cells of the battery or series X.

i is the pipe supplying the last-mentioned electrolyte to the first thistle-tube *e*. The former electrolyte is left at rest and consists of a solution of chlorid of sodium kept always concentrated and also acidified by addition of hydrochloric acid. The latter electrolyte for the cathode is composed of a solution of chlorid of sodium more or less concentrated and is kept in movement. The chlorin gas given off from the former solution when the electric current is passed through the battery is drawn off and serves for use, as hereinafter shown, while the second solution becomes constantly more and more saturated with hydrate of soda. It is this gradual enrichment of the solution with sodium hydrate and the faculty of drawing off the solution continuously or otherwise, just as it contains the desired percentage of sodium hydrate, that enable the products before mentioned to be obtained.

The apparatus is regulated to deliver a liquor having about one hundred and twenty grams of caustic soda in each liter of solution. This liquid, received as before in the vessel A, is run off continuously through pipe B to the vessel or boiler C, in which is the mechanical mixer D. This boiler will have been previously partially filled with a charge of litharge. A furnace E is placed under the boiler C, since heat assists the solution of the litharge in the liquor. This hot solution runs off continuously at the pipe F into carbonators or carbonating vessels G G, traversed by a current of carbonic acid. The white lead being insoluble separates as a precipitate and may be removed by passing the solution through a filter-press. The alkaline liquor remaining is then similarly passed through the carbonators K K. The bicarbonate of soda then formed being almost insoluble in solution of the chlorid of soda also separates in the form of crystals, which may be separated from the mother liquor on evaporation. The mother liquor is returned to the electrodialyzing apparatus X for use again. The bicarbonate of soda can be transformed into the carbonate, if desired.

Without any further treatment the afore-

said electrodialyzing process produces chlorin suitable for bleaching, and a solution more or less concentrated of sodium hydrate suitable as a lye in many manufactures—for instance, in paper-mills and wool and cloth works.

I claim as my invention—

The method of manufacturing chlorin, white lead, and bicarbonate of soda consisting in exposing to an electric current an alkaline solution of chlorid of sodium circulating in negative cells and an acidulated solution of chlorid of sodium and hydrochloric acid at rest in positive cells, said negative and positive cells being separated from each other by porous diaphragms; drawing off the chlorin from said positive cells and the solution of sodium chlorid with hydrate of soda from said negative cells, obtaining white lead by dissolving litharge in said solution and treating the resultant solution with carbonic acid; and obtaining bicarbonate of soda by treatment of said solution after removal of the white lead with carbonic acid.

In testimony that I claim the foregoing as my invention I have signed my name, in presence of two witnesses, this 1st day of July, 1893.

JULES MEYRUEIS.

Witnesses:
ROBT. M. HOOPER,
ARTHUR GOOD.