

No. 744,920.

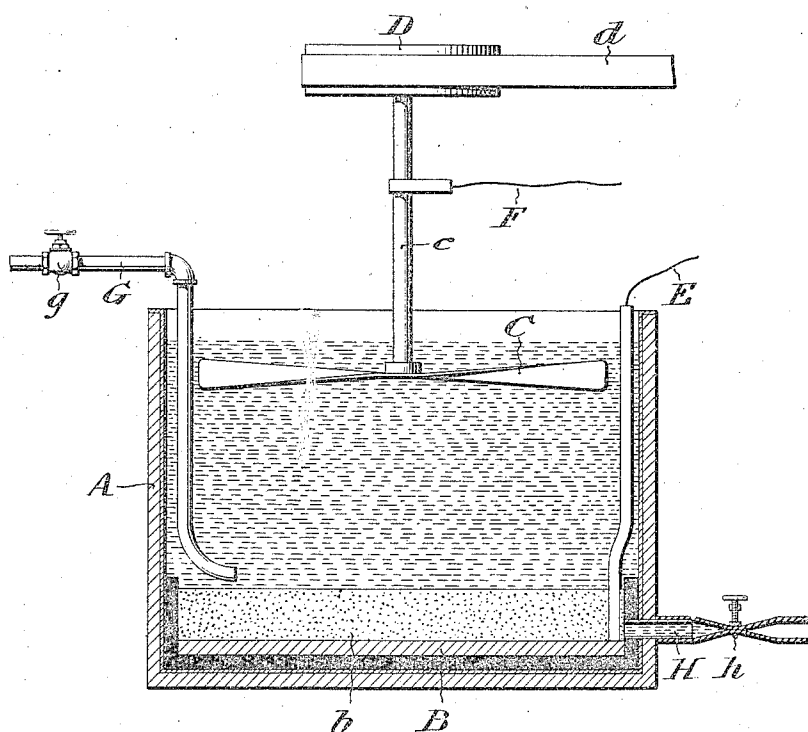
PATENTED NOV. 24, 1903.

F. JAHN.

PROCESS OF MANUFACTURING HYDRATES OF ALKALIES AND
ALKALI EARTHS

APPLICATION FILED FEB. 2, 1903.

NO MODEL.



WITNESSES:

Arthur E. Paige
James H. Bell

INVENTOR:

Fredrik Jahn,
By Tracy & Paul
attorneys

UNITED STATES PATENT OFFICE.

FREDRIK JAHN, OF RIDLEY PARK, PENNSYLVANIA, ASSIGNOR TO HARRISON BROS. & CO., INCORPORATED, OF PHILADELPHIA, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

PROCESS OF MANUFACTURING HYDRATES OF ALKALIES AND ALKALI EARTHS.

SPECIFICATION forming part of Letters Patent No. 744,920, dated November 24, 1903.

Application filed February 2, 1903. Serial No. 141,577. (No specimens.)

To all whom it may concern:

Be it known that I, FREDRIK JAHN, a subject of the King of Sweden and Norway, residing at No. 36 Ridley avenue, Ridley Park, Delaware county, and State of Pennsylvania, have invented a certain new and useful Process for the Manufacture of Hydrates of Alkalies and of Alkaline Earths, whereof the following is a specification, reference being had to the accompanying drawing, which represents a convenient, but not essential, type of apparatus adapted for the conduct of the process.

The object of my invention is to obtain the above-mentioned hydrates by electrolytic decomposition of the corresponding sulfids, and in describing my process I shall specify the application thereof to the decomposition of barium sulfid for the production of barium hydrate, since this is a practical embodiment which I consider very desirable.

The apparatus illustrated in vertical central section in the drawing consists of a cylindrical vessel A, of iron, wood lined with lead, or other suitable material adapted to electrolytic conditions. The bottom of the vessel and the sides for some distance above the bottom are provided with an internal lining of brickwork or cement so constructed as to constitute an insulated support for the anode B. The anode may be a disk-shaped piece of heavy iron resting upon the bottom lining and fitting snugly within the sides. Upon the anode B is placed a mass *b* of iron-turnings or other porous body of iron having an extended surface. The cathode C may conveniently be constructed in the form of a thin perforated wrought-iron plate rotatably mounted upon a depending shaft *c*, having a driving-pulley D and actuating-belt *d*, so that a stirring action may be readily obtained.

The electrical connections for the anode and cathode are indicated at E and F, respectively, the former being insulated from the electrolyte by means of a rubber tube or other proper covering extending above the level of the liquid.

The vessel A is provided with a steam-inlet pipe G, having a valve *g*, and a discharge-

pipe H, controlled by a clamp or stop-cock *h* at *h*.

The operation is as follows: The vessel having been filled with an aqueous solution of barium sulfid to a level above that of the cathode, an electric current is supplied from any suitable source, the cathode being slowly rotated during the electrolysis. It is desirable, of course, to avoid crystallization during the conduct of the process, and hence at the commencement of the operation steam may be admitted, by means of the pipe G, to raise the temperature of the electrolyte. After the action has got fully under way, however, it will generally be found that the heat incidentally developed by the electrolysis will suffice to prevent the formation of crystals. The sulfur liberated from its original combination unites with the porous mass of iron-turnings, whose extended surface facilitates this result, so that the decomposition of the whole barium-sulfid content can be readily effected, the level of the electrolyte being maintained by additions of water until the action is complete. Thereupon the liquor, which is now wholly an aqueous solution of barium hydrate, is drawn off and boiled down to the proper density for ready crystallization, which should be conducted in closed receptacles to avoid the access of air.

Having thus described my invention, I would point out that its underlying principle is the electrolytic decomposition of a sulfid in the presence of an anode capable of forming a stable sulfur compound insoluble in the electrolyte and not tending to destructive recombination therewith, such anode being of such physical constitution and arrangement as to present a relatively extended surface to the action of the sulfur ions. While, therefore, I have specified and shall hereinafter claim the particular application of the process to the manufacture of barium hydrate, I do not desire to be understood as limiting my claims to such application.

I claim—

1. The process of obtaining hydrates of alkalies and alkaline earths, which consists in subjecting the sulfids thereof, in aqueous so-

lution, to electrolytic action in the presence of an extended porous anode mass of material whose sulfid is physically and chemically resistant to the action of the residual electrolyte, substantially as set forth.

5 2. The process of obtaining barium hydrate, which consists in subjecting sulfid of barium, in aqueous solution to electrolytic action in the presence of an extended anode mass of
10 material whose sulfid is physically and chemically resistant to the action of the residual electrolyte, substantially as set forth.

3. The process of obtaining barium hydrate,

which consists in subjecting sulfid of barium, in aqueous solution to electrolytic action, in
15 the presence of an anode mass of finely-divided iron, substantially as set forth.

In testimony whereof I have signed my name to this specification, this 26th day of January, 1903, in the presence of two sub-
20 scribing witnesses.

FREDRIK JAHN.

Witnesses:

JAMES H. BELL,
C. BRADFORD FRALEY.