

No. 775,752.

PATENTED NOV. 22, 1904.

F. JAHN.
MANUFACTURE OF BARIUM HYDRATE.

APPLICATION FILED SEPT. 5, 1903.

NO MODEL.

FIG. 1.

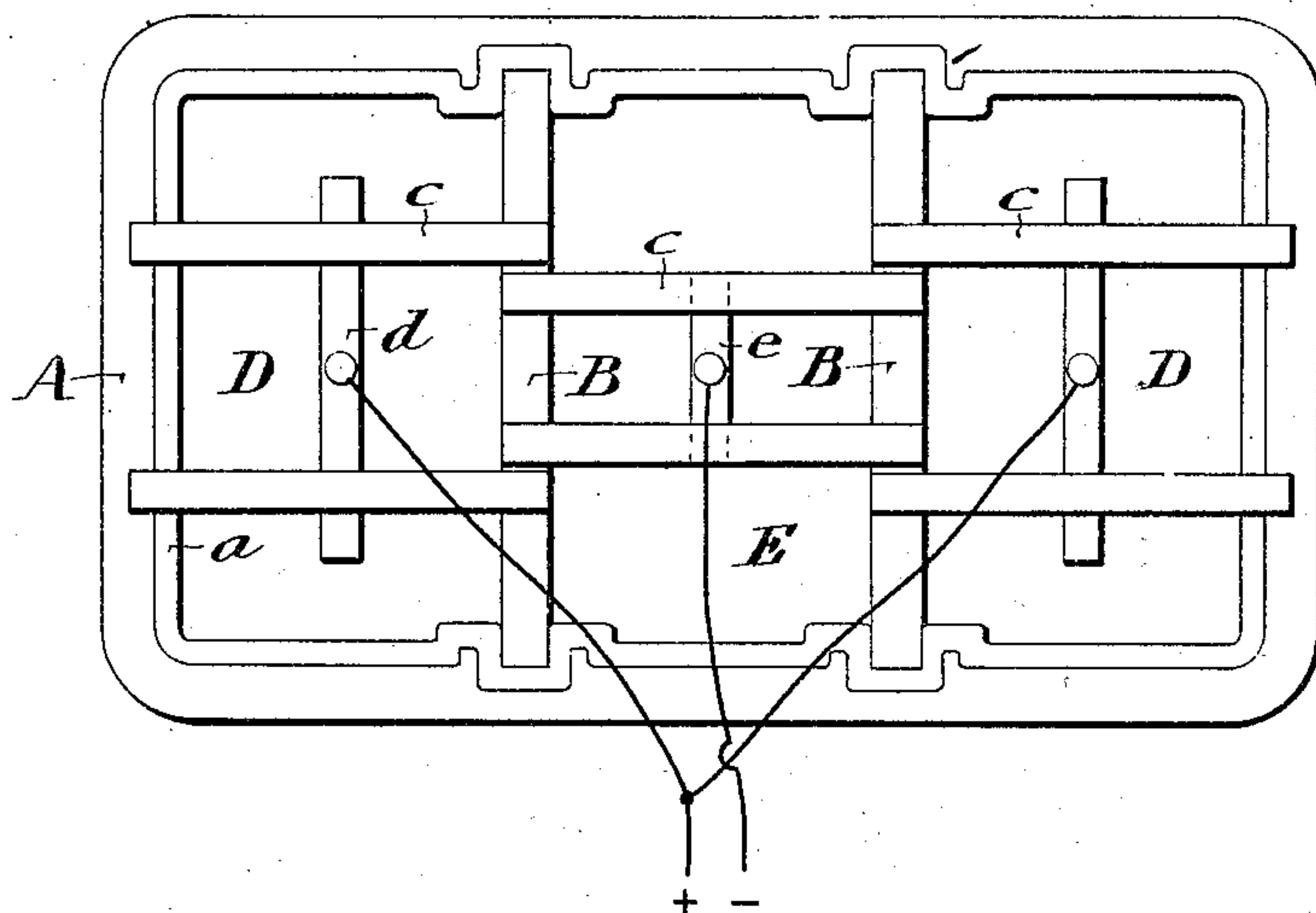
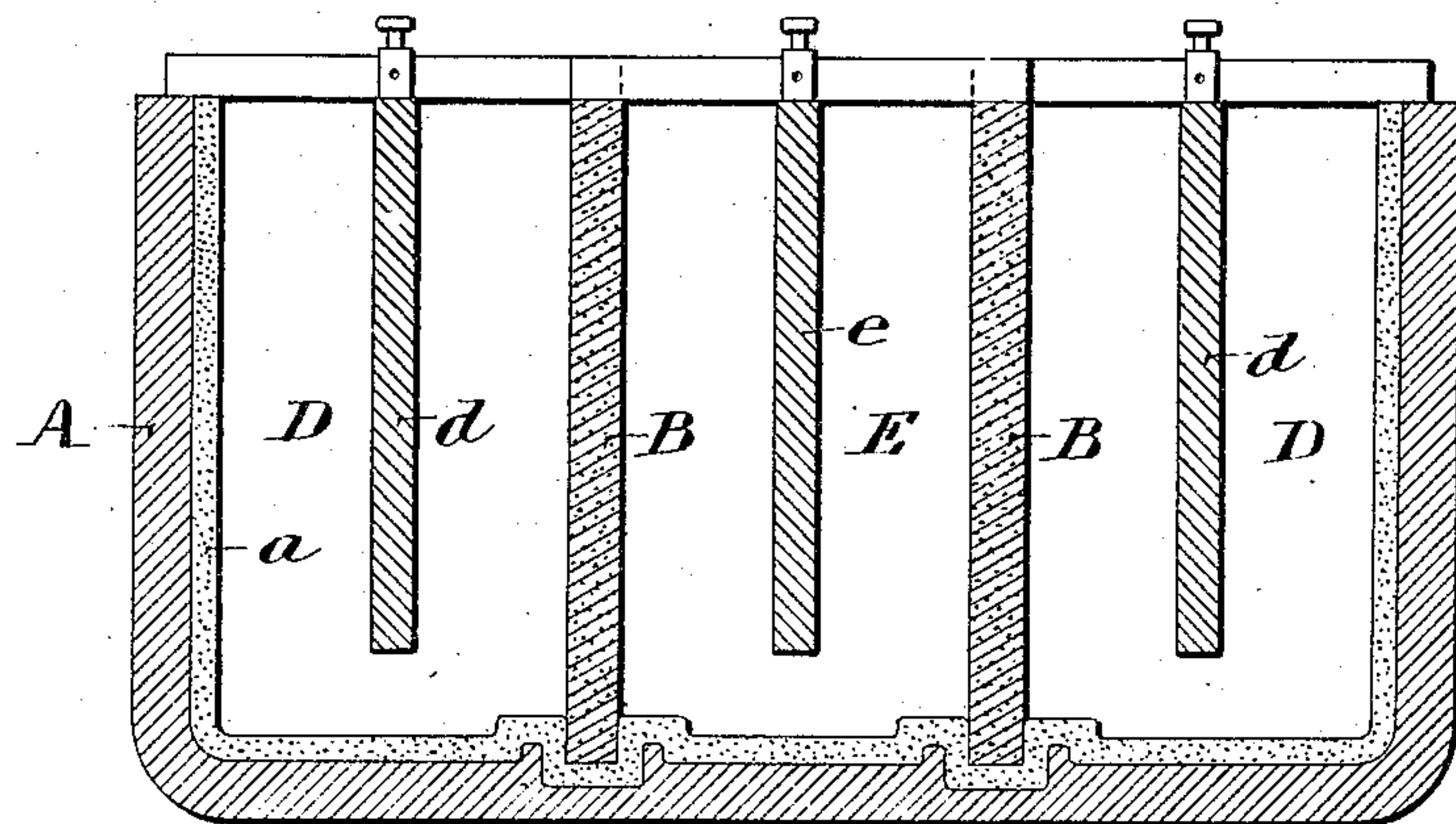


FIG. 2.



WITNESSES:

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

MANUFACTURE OF BARIUM HYDRATE.

SPECIFICATION forming part of Letters Patent No. 775,752, dated November 22, 1904.

Application filed September 5, 1903. Serial No. 172,167. (No specimens.)

To all whom it may concern:

Be it known that I, FREDRIK JAHN, a subject of the King of Sweden and Norway, now 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 Barium Hydrate, whereof the following is a specification, reference being had to the accompanying drawings.

The object of my invention is to obtain barium hydrate by the electrolytic decomposition of barium sulfid. I accomplish this by electrolyzing a solution of barium sulfid in a cell of which the anode-plate is very much larger than the cathode-plate and with the interposition of a porous diaphragm, whereby the cell is divided into an anode and cathode compartment, the formation of hydrate being chiefly effected in the former compartment.

My process is not dependent upon any particular form of apparatus; but I have illustrated in the drawings and will describe a conveniently-arranged apparatus in which my invention may be practiced.

In said drawings, Figure 1 represents a plan view, and Fig. 2 a central longitudinal section, of such a cell.

The cell A, which may be a vessel of iron or other suitable material, is furnished with a lining *a*, of insulating material, such as cement, and is preferably divided into three compartments by the porous partitions B B. Within these compartments the respective electrodes, which are preferably iron plates, are suspended from insulating cross-bars *c c*. I have found that the relative size of the electrodes plays an important part in the process and that the anode-plate should have a much larger surface than the cathode-plate. Good results are obtained by using an anode which is about four times as large as the cathode. To provide for this, it is convenient to employ the two end compartments D D as anode-compartments and the central compartment E as cathode-compartments. Within the cathode-compartment is suspended a small cathode-plate *e*, while within the anode-compartment

are suspended two anodes *d d*, each having at least twice the area of the cathode.

Into the anode compartment or compartments I introduce a strong solution of sulfid of barium, (say about thirty-five per cent.,) and into the cathode-compartment I introduce a weak solution of barium hydrate. It is desirable to cover the surfaces of the solutions with a thin layer of coal-oil to exclude the air. The current density should be rather high—say nine to fifteen amperes per square foot of anode-surface and forty to seventy amperes per square foot of cathode-surface. As a result of the electrolytic process set up by the current sulfur is precipitated at the anode in an insoluble state, thereby converting the barium sulfid into barium hydrate.

At the beginning of the process the sulfur that is precipitated at the anode is redissolved by the sulfid liquor with formation of polysulfids until the whole of the sulfid is thus converted. When this has occurred, thereafter the sulfur is precipitated and not redissolved. When the anode liquor contains from seventy-five to eighty per cent. of the dissolved barium as hydrate, the electrolysis is stopped.

By using electrodes of which the relative sizes are about as above specified I find that about thirty per cent. of the hydrate which is formed may be obtained from the cathode-compartment in a very pure state, the other seventy per cent. of the hydrate being at the anode. From the anode liquor containing sulfur as polysulfids the hydrate is readily obtained by crystallization. The precipitated sulfur may also be obtained from the anode-compartment and be utilized.

Having thus described my invention, I claim—

1. The process of obtaining barium hydrate which consists in electrolyzing a strong solution of barium sulfid in an anode-compartment, which is separated from its corresponding cathode-compartment by a porous partition, and with employment of a large anode and a small cathode, whereby there is obtained in said anode-compartment barium hydrate

with polysulfids; and thereafter separating and recovering the hydrate from the polysulfids, substantially as described.

2. The process of obtaining barium hydrate
5 from barium sulfid which consists in electrolyzing a solution of the latter between electrodes of which the anode is larger than the cathode with interposition of a porous partition, whereby some of the barium hydrate
10 is formed in the cathode-compartment, while the remainder and greater part is formed along with polysulfids in the solution in the

anode-compartment; and thereafter recovering the hydrate from the solution in the latter compartment, substantially as described. 15

In testimony whereof I have signed my name to this specification, this 28th day of August, A. D. 1903, in the presence of two subscribing witnesses.

FREDRIK JAHN.

Witnesses:

JAMES H. BELL,
M. K. TRUMBORE.