(No Model.)

E. B. CUTTEN.

APPARATUS FOR ELECTROLYTICALLY PRODUCING SODA AND CHLORINE.

No. 510,900. Patented Dec. 19, 1893.

Fig. 1.

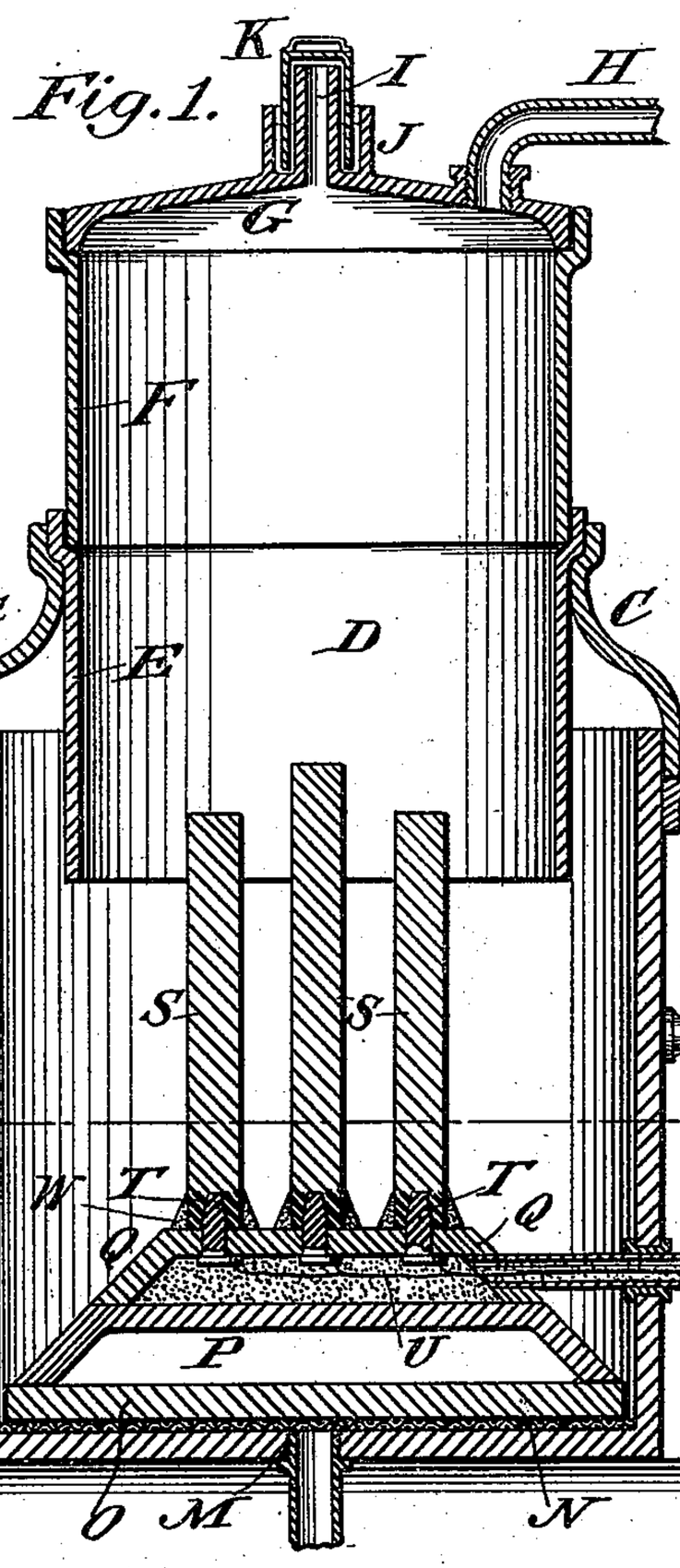
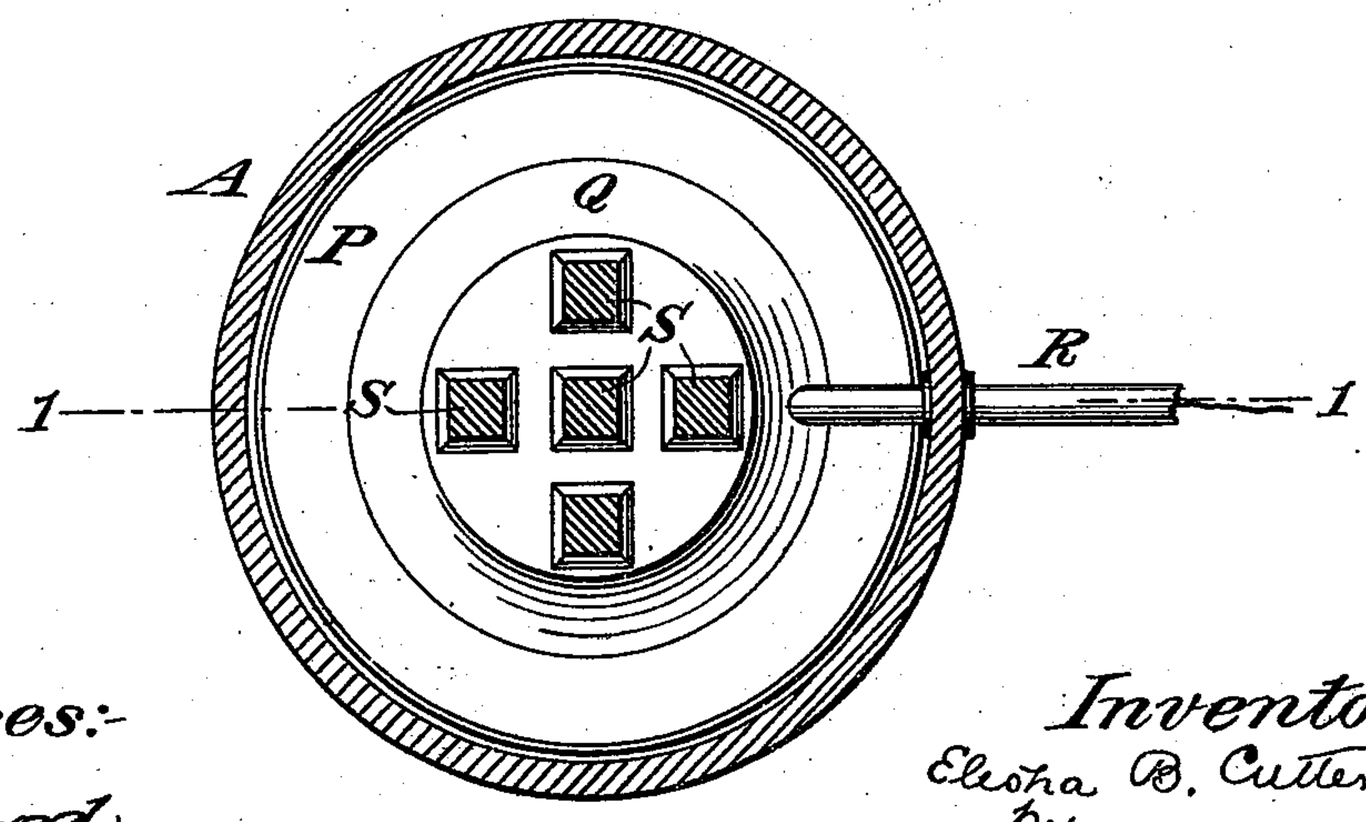


Fig. 2.



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ELISHA BARTON CUTTEN, OF NEW YORK, N. Y.

APPARATUS FOR ELECTROLYTICALLY PRODUCING SODA AND CHLORINE.

SPECIFICATION forming part of Letters Patent No. 510,900, dated December 19, 1893.

Application filed March 30, 1893. Serial No. 468,283. (No model.)

To all whom it may concern:

Be it known that I, ELISHA BARTON CUTTEN, of the city, county, and State of New York, have invented a new and useful Improvement in Apparatus for Electrolytically Producing Soda and Chlorine, of which the following is a specification.

In Letters Patent No. 491,700, granted to me February 14, 1893, I have fully described my method of electrolytically producing caustic soda and chlorine, which, briefly described, consists in electrolyzing an aqueous solution of sodium chloride to produce chlorine and soda, withdrawing the chlorine from the body of the solution and allowing the soda to accumulate, by its own gravity, at the bottom of the containing vessel.

My present invention is an improved form of apparatus for carrying this method into practical effect, more conveniently and economically; and my invention consists in the construction and arrangement of such apparatus as hereinafter more particularly described and set forth in the claims.

In the accompanying drawings, Figure 1 is a vertical section of my improved apparatus, on the line 1, 1 of Fig. 2, and Fig. 2 is a horizontal section on the line 2, 2 of Fig. 1.

Similar letters of reference indicate like parts.

A is the containing vessel, which is of iron. On the outside of the vessel A and near the upper edge thereof, is a flanged collar, B, which serves as a support for the brackets C. The brackets C support the bell D. This bell is made of earthenware, and may be constructed in sections, E and F, jointed together, as shown. The upper end of the bell is closed by a dome, G, with which communicates the outlet pipe H for the chlorine. With the outlet pipe H is connected any suitable form of pump or exhauster; also in the dome H is the tubular opening I, surrounded by the circular flange J. In the annular space formed between the tubular opening I and the flange J is disposed the lower edge of the small bell or cylinder K, which serves as a cover for the opening I. The space inside the flange J is filled with water so as to seal the joint between the cylinder K and the pump G. The object of the tubular opening I is to allow brine to be conveniently introduced into the apparatus, for which purpose the cylinder or cover K is of course removed.

In the bottom of the vessel A is an opening, M, communicating with an outlet pipe. Above this opening and covering the bottom of the cell, is a layer of wire netting or gauze, N, above which rests a steel plate, O. On this steel plate is placed a support, P, in the shape of the frustum of a cone and made of earthenware. Above the support P is a flanged disk, Q, the flanges resting upon the upper surface of the earthenware support P. The flanged disk Q is also of earthenware. It has an aperture in its flange, in which enters an earthenware pipe, R, which pipe extends through the wall of vessel A. The entire space between the flanged disk Q and the support P, and also the interior of the pipe R, is filled with an insulating material, preferably a mixture of paraffine and gutta-percha. In the disk Q is a number of openings, above each of which is vertically disposed a bar, S, of gas carbon. The bars S are supported on the disk Q by means of pins, T, also of carbon, which are inserted in the bottom of said carbon bars S and also in the apertures in the disk Q. The pins T are of carbon thoroughly impregnated with paraffine. The joints between the carbon bars and the disk Q are inclosed in envelopes, W, of insulating material, such as paraffine or paraffine and gutta-percha.

The pins T are all connected by a wire, U, in multiple arc relation, and said wire U extends through the space between the disk Q and the support P, and out through the tube R. The carbon bars S are therefore at the anodes of the cell. The vessel A is at the cathode and is connected to the other terminal of the source of current by means of the binding-post V.

The operation of the apparatus, in accordance with my method set forth in my Patent No. 491,700, already referred to, is as follows: The vessel A being filled with an aqueous solution of sodium chloride above the level of the lower edge of the bell D, current is established and the exhauster or pump communicating with the pipe H is set in operation. The liquid is then electrolyzed, chlorine being produced at the anodes, which is drawn out of the liquid in gaseous form through pipe H by means of the pump or exhauster. The

caustic soda, also produced by the electrolysis forms at the inner or cathode surface of the vessel A, and descends, by its own gravity, along the sides thereof, filters through the wire gauze N, and finally escapes at the pipe M.

The construction of the anode herein set forth is fully described and claimed in another application for Letters Patent filed by me March 28, 1893, Serial No. 467,926.

I claim—

1. In an apparatus for the electrolysis of salt solutions and in combination with the containing vessel A forming the cathode, and having the outlet M, a body, N, of wire netting, gauze, or similar material on the bottom of said vessel, and resting upon said body N, a support, Q, of insulating material and two or more vertical carbon anodes, S, held by said support, substantially as described.

2. In an apparatus for the electrolysis of salt solutions, the combination of the flanged disk Q of insulating material, the vertical carbon anodes S supported thereon and the carbon pins T entering said anodes and also apertures in said disk, substantially as described.

3. In an apparatus for the electrolysis of salt solutions, the combination of the containing vessel A having the outlet M, the metallic plate O supported above the bottom of said vessel, the support P Q of insulated material on said plate O, the vertical carbon anodes S held on the upper side of said support, and a chamber, U, within said support inclosing the leading-in wires to said anodes and filled with paraffine or equivalent insulating material, substantially as described.

4. In an apparatus for the electrolysis of salt solutions, the combination of the containing vessel A forming the cathode having the outlet M, the bell-shaped vessel D made in two or more sections, as E and F, and provided with the outlet H, the brackets C supporting said vessel D, and the anode S supported within said vessel A, substantially as described.

5. In an apparatus for the electrolysis of salt solutions, the combination of the cathode vessel A having the flanged supporting ring B, brackets, C, resting upon said ring B, bell D composed of two or more jointed sections, as E, F, supported by said brackets C and provided with a dome, G, having openings, H and I, and anodes, S, supported within said vessel A, substantially as described.

ELISHA BARTON CUTTEN.

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