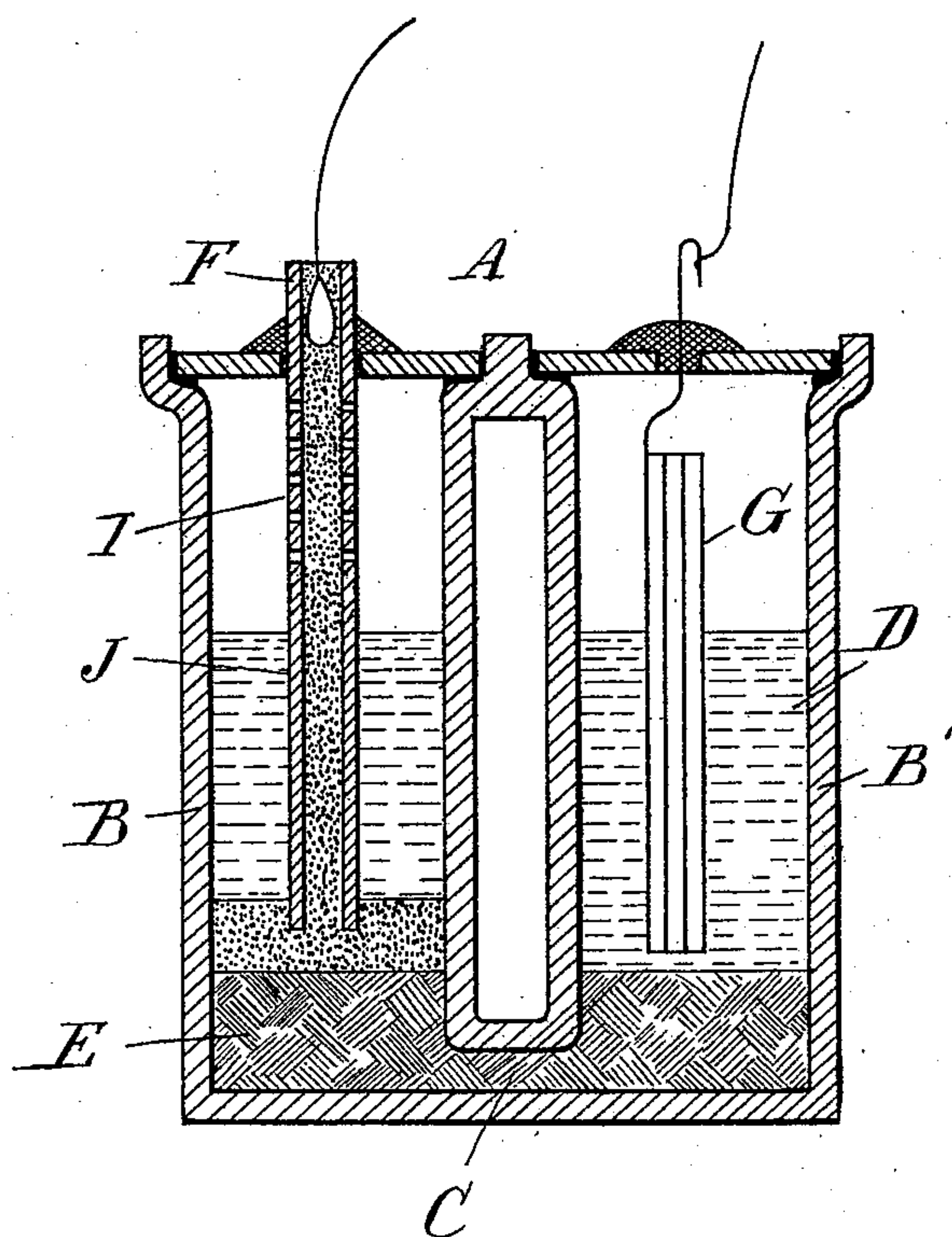


(No Model.)

T. CRANEY.
ELECTROLYTIC APPARATUS.

No. 496,865.

Patented May 9, 1893.



Witnesses:

Otto Barthel

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Inventor:

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UNITED STATES PATENT OFFICE.

THOMAS CRANEY, OF BAY CITY, MICHIGAN.

ELECTROLYTIC APPARATUS.

SPECIFICATION forming part of Letters Patent No. 496,865, dated May 9, 1893.

Application filed August 18, 1892. Serial No. 443,417. (No model.)

To all whom it may concern:

Be it known that I, THOMAS CRANEY, a citizen of the United States, residing at Bay City, in the county of Bay and State of Michigan, have invented certain new and useful Improvements in Electrolytic Apparatus, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to the improved construction of an electrolytic apparatus for electrolyzing salts in solution, and the invention consists in the peculiar construction of the anode, all as more fully hereinafter set forth and shown in the accompanying drawings, wherein I show a vertical central section of an electrolytic cell embodying my invention.

A represents the cell formed of stoneware or glassware or other suitable material applicable for the purpose, preferably of the form shown which shows it to consist of two vessels B and B' communicating at or near the bottom through a hollow trunk C.

D represents the body of the solution of the salt contained in each compartment.

E represents a porous substance covering the bottom of the compartment above the height of the communicating trunk between the vessels, and F and G represent the anode and cathode contained in the compartments and to which the respective circuit of the terminals are connected. The cathode and anode are supported in suitable apertures in the covers H with which the compartments are hermetically closed with the additional use of some suitable cement. The cathode preferably consists of a sheet of metal loosely rolled so as to expose a large surface to the solution in the compartment, but may be of any known construction.

My invention consists in the construction of the anode which is composed of an open ended tubular outer casing I of suitable indestructible material such as stone-ware, porcelain or glass, and adapted to form a protecting outer casing and support for a body of carbon J contained therein, and which may be either in the form of a solid body of carbon or preferably of a powdered carbon, of a suitable degree of compactness to form a good electric conductor at the lower end. This carbon-filled tube projects into a body of carbon supported upon the porous substance

which forms the electrolytic diaphragm on the bottom of the cell. This body of carbon is in direct electrical contact with the carbon contained in the tube, and is exposed on the surface to the body of the solution contained in the compartment. Above the height of the solution in the compartment within the same, the tube is provided with perforations. The usual inlet and outlet openings into and from the compartments are provided for the introduction of the solution to be electrolyzed and for the escape and the removal of the products of decomposition.

The peculiar advantages of my construction of anode are; first, the carbon being contained and supported in an outer casing is permanently protected against destructive action incidental to the electrolytic process and which permanency is otherwise very difficult to maintain while an ample contact between the liquid and the contacting carbon is provided by the mass of carbon at the bottom. As the tubular portion of the anode projects to a certain distance within said body, the wearing away or disintegration of such body cannot effect the permanency of the anode, while at the same time it will not interfere with the action of the electrolytic diaphragm providing such body of carbon is suitably porous. Second, by means of the perforations in the outer casing I have overcome the annoyance of having the electric conductivity of the anode destroyed by any accumulation of gas generated within the tubular portion of the anode and which would by the hydrostatic pressure force up through the carbon interrupting or destroying by its chemical action, the electric connection between the carbon and the terminal. The perforations in the casing will now allow any gases generated to find a free exit into the upper part of the compartment from which they escape in the usual manner through the apertures provided.

My anode is especially adapted and devised for use in apparatus for the commercial manufacture of alkaline solutions from metallic salts, such as chloride of ammonia for instance, in which the chemical action of the products is especially destructive, and in which it is held to maintain any degree of permanency of the cathode.

What I claim as my invention is—

1. In an electrolytic apparatus containing an anode in a separate compartment communicating with the cathode compartment
5 through an electrolytic diaphragm contained in the bottom thereof, an anode consisting of a body of carbon contained in an outer protective casing and a body of carbon contained in the bottom portion of the compartment and
10 extending above the lower edge of said protective casing, substantially as described.
2. In an electrolytic cell an anode consisting

of a body of carbon having an outer protective casing inclosing and protecting said carbon and provided with perforations in its upper portion, in such position as to be above the height of the liquid in the cell, substantially as described. 15

In testimony whereof I affix my signature in presence of two witnesses.

THOMAS CRANEY.

Witnesses:

M. B. O'DOGHERTY,
S. M. HULBERT.