

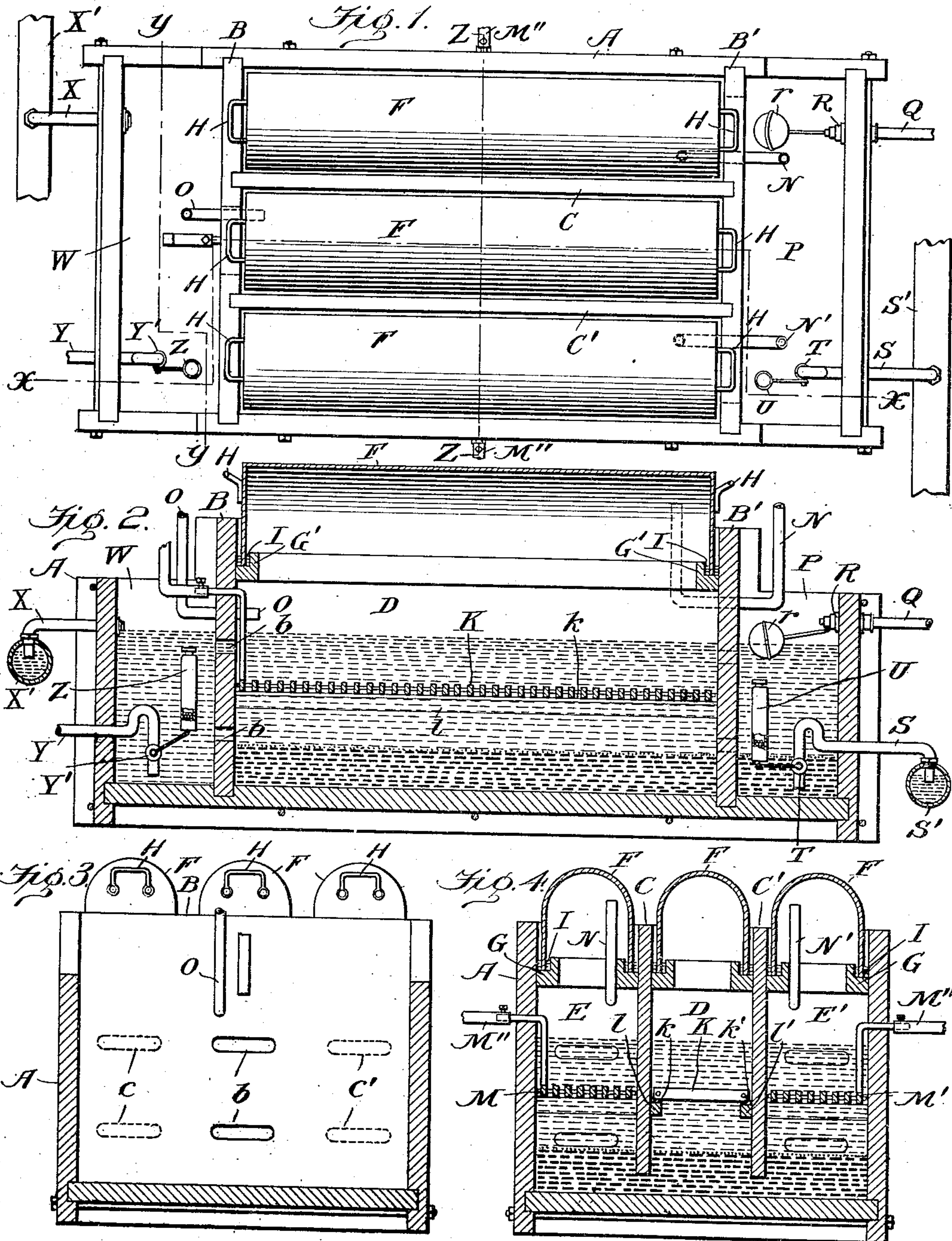
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H. S. BLACKMORE.

PROCESS FOR THE ELECTROLYSIS OF FLUID SALTS OR COMPOUNDS.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, HENRY SPENCER BLACKMORE, a citizen of the United States, residing at Mount Vernon, in the county of Westchester and State of New York, have invented certain new and useful Improvements in Processes for the Electrolysis of Fluid Salts or Compounds, of which the following is a specification.

My invention relates to a process for dissociating alkali salts or compounds into their acid and basic constituents or elements by electrolysis, and has for its object to provide improved methods for effecting this result in such a manner that the said elements will not be contaminated by the salts being dissociated, and so that the ions or other products may be withdrawn from time to time without stopping the operation; to provide methods whereby the liquid salts may be supplied or submitted to the electrolytic action, as desired, and, where solutions of salts in some menstruum are employed that the depleted or weakened solution may be withdrawn and resaturated: to decrease resistance, thus economizing the electrical energy exerted to dissociate the salts and convey the ions to their respective electrodes, and further to prevent the contamination of the products with the salt being dissociated or electrolytic products thereof, by diffusion, by interposing between the electrolyte and products of electrolysis a heavier liquid diaphragm provided with a communicating elastic dialytic septum to prevent the diffusion of the heavier liquid diaphragm into or through the electrolyte or products thereof.

My invention consists in employing a body or bodies of liquid electrolyte or solution of salts to be dissociated and another independent body or bodies of liquid; in separating the bodies of electrolyte from the independent bodies of liquid through the agency of a liquid diaphragm of greater density than either of the said bodies and by the walls or partitions between the electrolyte and the independent bodies which extend below the surface of the said heavier liquid diaphragm or conveyer of ions; in providing the heavier liquid diaphragm at its point of communication with the liquid electrolyte and the independent bodies of liquid with an elastic pervious dialytic septum or other means for preventing the dif-

fusion of the heavy liquid of the diaphragm into the electrolyte or independent bodies of liquid or vice versa, whereby the density of the liquid diaphragm may be reduced or it may be contaminated with the electrolyte or its products, and in exposing the liquid electrolyte and the independent body or bodies of liquid to the action of an electric current through communicating electrodes, and automatically supplying and withdrawing the liquid electrolyte and independent liquid bodies with the absorbed or combined ions, by the action of the electric current actuated by change in density of the fluids employed and produced without stopping the operation.

This invention is an improvement on that forming the subject matter of my British Patent No. 24,630 of 1894, and includes new and novel features over those claimed in the aforesaid patent whereby the difficulties met with in reference to the diffusion of the liquid diaphragm and various liquids employed, and the contamination of products are obviated in a practical manner, and the continuous operation rendered feasible, actuated automatically by the electric current employed and the changes in density of the electrolyte and products produced during the operation.

The apparatus which I have employed to carry out this process is illustrated in the accompanying drawings in which like characters of reference designate corresponding parts throughout, and in which

Figure 1 is a top plan view; Fig. 2 is a longitudinal vertical section on the lines $x-x$, Fig. 1; Fig. 3 is a transverse vertical section on the lines $y-y$, Fig. 1; and Fig. 4 is a transverse vertical section on the lines $z-z$, Fig. 1.

The apparatus for producing caustic potash (potassium hydroxid) from potassium chlorid, consists of a main or common tank A divided transversely by the partitions B, B', into three compartments communicating through the slotted openings b, c, c' , Fig. 3, the space within the tank between the partitions B, B', being longitudinally divided into three compartments by the partitions C, C', Fig. 4, and extending nearly to the bottom thereof, sufficient space being left beneath the same for the communicating heavy liquid diaphragm which separates the electrolyte from the independent bodies of liquid during the operation of the process. These

dividing partitions C, C', divide the tank into three compartments, viz., anode compartment D and the cathode compartments E, E'.

Over the anode compartment D and the cathode compartments E, E' are placed the domes F which consist preferably of sheet lead and rest upon oblong and sectionally angular frames or peripheral shoulders G secured to the projections and to the sides of the tank near the top and provided with a continuous upwardly projecting flange G' thereon, the said domes being provided at their ends with the handles H whereby the same may be readily removed or replaced from or over the various compartments D—E, or E', the bottom of the domes being sealed by a fluid such as carbon tetrachlorid located in the channel I within which it rests, thus rendering the compartments D—E, E', substantially closed when the domes are in position except as to their regular inlet or outlet ducts.

Located within the anode compartment D is the anode K which consists of a number of strips of carbon fastened together with carbon connections in such manner as to form a grid the space between each carbon strip of which allows the gaseous products evolved during the process of electrolysis to escape in an upward direction. These carbon grids are placed in the anode compartment D transversely and rest upon the electrical conductor consisting of two longitudinal strips *k, k'*, resting upon the supports *l, l'*, Fig. 4, which electrical conductor communicates at one end with the electrical conductor K', Fig. 2. Within the cathode compartments E, E', is located a grid M, M', which consists of strips of copper located longitudinally of the compartment and communicating with the electrical connections M'', which copper grid constitutes the cathode during the process of electrolysis. Communicating with the cathode compartments are the outlet pipes or ducts N, N', through which the hydrogen or other gaseous products evolved in the cathode compartment during the process of electrolysis are discharged, while communicating with the anode compartment is the outlet pipe or duct O through which chlorine or other gaseous electro-negative product evolved in the anode compartment is discharged. Communicating with the cathode compartments E, E', through the slotted openings *c, c'*, is the supply and discharge compartment P, Fig. 2, communicating with which is the water inlet Q controlled by the float valve *r* and the discharge valve S controlled by the valve T actuated by the balance float U, the supply and discharge valves being so regulated that as the liquid in the lower part of the compartment P increases in density by reason of the formation of caustic potash which accumulates therein, the balance float U rises and opens the valve T, allow-

ing the heavy caustic potash solution to pass out through the discharge pipe S and through the conduit S'; at the same time the heavy caustic potash solution is discharged from the compartment P, the level of the liquid in the compartment is lowered, which results in the dropping of the float *r* which opens the valve R and admits a supply of water, thus automatically maintaining the level of the fluid in the compartment, as the heavier caustic potash solution is automatically withdrawn. When the caustic potash solution has been withdrawn to its normal level, the balance float U will again have fallen, thus reclosing the discharge valve T. By the actuation of the discharge and supply valves T, *r*, the liquid is maintained in the cathode compartments at a uniform level while the caustic potash solution formed is automatically discharged therefrom as it forms.

The balance float valve U consists of a metal air-tube provided with a cap and loaded or weighted by introducing a substance, such as shot or mercury, in such proportion that when submerged in the liquid it will float upon a caustic potash solution of calculated density and sink below the surrounding fluid of less density while carrying the arm which actuates the opening and closing of the valve T. This float valve may be regulated in such a manner as to be actuated by any heavy fluid of a predetermined density with relation to it.

Communicating with the anode compartment D through the slotted openings *b* is the supply and discharge compartment W, Fig. 2, provided with the overflow pipe X communicating with the conduit X', and the electrolyte supply pipe Y controlled by the valve Y' actuated by the balance float valve Z, which float valve is so regulated that, as the density of the solution of electrolyte, such as potassium chlorid supplied to the anode compartment from the compartment W through the slotted openings *b*, becomes depleted by electrolytic action, resulting in the discharge of chlorine at the anode which passes up through the liquid and off through the discharge pipe or duct O, and the formation of caustic potash at the cathode by the electrolytic separation of potassium from the electrolyte, resulting in the lowering of the density of the electrolyte solution in the compartment W, the said balance float falls, thereby opening the valve Y', and allowing a graduated portion of the electrolyte or potassium chlorid solution to enter the compartment W and thereby supply fresh electrolyte for that removed by electrolytic dissociation. As the fresh electrolyte solution enters the compartment W, thereby increasing its density, the graduated float valve naturally rises and automatically shuts off the supply of electrolyte solution as the density increases. Simultaneously with the supply of the fresh

electrolyte solution, the depleted or weakened electrolyte solution is automatically discharged through the overflow pipe or duct X and the conduit X'. By this means a solution of electrolyte of uniform density is maintained in the anode compartment with the simultaneous discharge of the depleted electrolyte solution automatically with the process of electrolytic dissociation.

10 In carrying out my invention for the production of caustic potash and chlorin from potassium chlorid, I proceed as follows: I first make a solution of caustic potash approximately 48° B., and place the same in the lower part of the tank A, as shown in Fig. 4, until it shall have reached a point just below the level of the slotted inlets of the anode and cathode compartments b, c, c'. Upon this solution of caustic potash I place a film of powdered cannel coal or carbonized silicon or silicon carbide the gravity of which has been reduced by heating with carbonaceous material. This heavy caustic potash solution in the bottom of the tank A forms a liquid diaphragm and seal between the anode and cathode compartments by reason of the partitions C, C', terminating below the surface thereof. A solution of potassium chlorid of about 24° B., is then supplied to the anode compartment and a solution of caustic potash of like density supplied to the cathode compartment until the two solutions shall stand in the various compartments at a uniform level resting upon the lower heavy solution of caustic potash which acts as a liquid diaphragm during electrolytic action.

The fine dust of powdered cannel coal or carbonized silicon is so prepared that it will sink in the lighter solutions in the various compartments and remain resting upon the heavy caustic potash solution or diaphragm. This film of substance resting upon the heavy liquid caustic potash diaphragm forms a sort of skin or elastic medium whereby the diffusion of the separate liquids into each other is prevented or largely obviated. This thin skin or film of dialytic substance merely constitutes a means whereby the osmosis of the various liquids is prevented or largely obviated whereby their density is substantially uniformly maintained. This dialytic film is more or less elastic in its character so that any disturbance of the fluids by agitation largely prevents them from mixing with each other.

When the various fluids have been introduced into the apparatus as aforesaid, the electrolyte supply pipe Y is put in communication with the tank containing a supply of electrolyte of uniform density while the supply pipe Q is put in communication with a water supply. A current of electricity is then passed through the apparatus, through the electric connections M'' and K', in such a manner that the electrode K will con-

stitute the anode and the electrodes M, M', will constitute the cathode. Electrolytic action then at once starts and chlorin is liberated in the anode compartment, which, passing up through the electrolyte accumulates above the liquid between it and the dome F over the anode compartment and passes out through the discharge pipe O through which it is conveyed to a gasometer or bleach chamber. At the same time the potassium ion passes through the heavy caustic potash diaphragm to the cathodes M, M', where it forms caustic potash with the liberation of hydrogen gas, which hydrogen gas passes up through the liquid and accumulates between it and the domes F over the cathode compartments, passing out through the discharge pipes N, N', to a gasometer (not shown).

As the process of electrolysis proceeds the caustic potash produced in the cathode compartments naturally increases the density of the liquid therein while the continuous decomposition or depletion of the potassium chlorid in the anode compartment reduces its density. As this process proceeds and the electrolyte solution in the anode compartment becomes depleted, the balance valved float Z in compartment W, Fig. 2, drops or falls by reason of the decreasing density of the fluid therein and by so doing automatically opens the valve Y' and allows a portion of solution of potassium chlorid to enter the compartment W through the supply pipe Y from the reservoir with which it communicates until the density has become so increased that the float valve again rises and shuts off the supply of potassium chlorid solution. Simultaneously with the supply of fresh electrolyte solution the lighter depleted remaining electrolyte is discharged through overflow pipe X and the conduit X' to a reservoir where it can be recharged with more potassium chlorid for the further continuance of the process. Simultaneously with the supply of fresh electrolyte for the depleted solution in the anode compartment, is the discharge of the caustic potash solution formed in the cathode compartment and supply thereto of fresh water as the heavier solution of caustic is discharged. This is controlled and regulated in the compartment P communicating with the cathode compartments through the slotted openings c, c', by the balance float valve U controlling the valve T. As the caustic potash solution accumulates in the cathode compartment it passes out into the communicating compartment P, and being of increasing density it raises the float valve U, thereby opening the valve T and allowing the heavy caustic potash solution to be discharged through the pipe S and conduit S'. As the electrically produced caustic potash solution is thus discharged the level of the liquid in the

cathode compartment P is simultaneously lowered and with such lowering the float *r* falls and opens the valve R thus admitting a portion of water in volume equal to that of the caustic potash solution discharged, thereby maintaining an automatic discharge of the caustic potash solution as electrically produced and an automatic supply of water therefor to maintain the level of the liquid therein.

The openings between the cathode compartment and the supply and discharge compartment P, and the anode compartment and the supply and discharge compartment W, are all slotted or of elongated form so that the liquids can be supplied to and discharged from the various compartments with as little disturbance as possible to the liquids within the said compartments, thereby facilitating the supply and discharge of fluids without disturbing to any appreciable extent the heavy caustic potash solution which acts as a diaphragm in the lower part of the apparatus. It can be therefore seen from the foregoing description, that my process consists in forming caustic potash and chlorin from potassium chlorid solutions and supplying and discharging the electrolyte and the products produced, automatically with and by the amount of electric current supplied, actuated by the varying densities of the electrolyte and products of electrolytic dissociation, through the medium of graduated mechanical devices so located and adjusted that the varying densities of the fluids, supply and discharge, the electrolyte thereto and the products of dissociation therefrom, automatically with the electrolytic action.

It should be noted that the septum or septi employed for the purpose of preventing the diffusion of the electrolyte, independent body or bodies of liquid, or heavy liquid diaphragm from diffusing into each other, whereby the products might become contaminated, or the gravity of the various liquids so reduced or altered that the process could not be successfully carried on without producing contaminated products, consists of a thin film of elastic substance located between the liquids in such a manner that an outside disturbance of the fluids would not cause the diffusion of the various liquids into each other to an injurious degree. This septum or septi, which may be located between the heavy liquid diaphragm and the liquid in the cathode compartment, the heavy liquid diaphragm and the liquid in the anode compartment, or both as the case may be, or may consist only of a few interposed particles of a substance which will interrupt, neutralize, or destroy any vibratory or undulating motion communicated to the fluids; and the septum or septi as employed is in no sense to be considered as a separate and

distinct diaphragm from the heavy liquid diaphragm as employed in the process, but simply as a means for preventing or minimizing the diffusion of the various liquids into each other.

The septum or septi may also consist of a series of strips, rings, or spirals, without departing from the spirit of my invention; so arranged as to have an intervening space or channel communicating with the liquids of various densities between the separate or interposed strips, rings, or spirals in such a manner that the surface of the heavy liquid in communication with the lighter liquids is so proportionally reduced that any movement of the lighter liquids will not agitate the heavier separating liquid diaphragm to any injurious degree, and which septum or septi while allowing fluid communication between the liquids of different density, acts as a medium to interrupt, neutralize or destroy any vibratory, undulating or other movement between the fluids whereby the density of either might be altered or injuriously changed.

The material which I prefer to employ as septum or septi, between the fluids of varying density, for prevention of agitation, circulation, or diffusion thereof, is pulverulent carbon, or carbon containing substance such as lignite, cannel coal, or other bituminous variety or anthracite, or other coal (preferably anthracite or the grade of bituminous known as cannel coal) for the reason that it is practically inert to the electrolyte or electrolytic products, or by-products thereof, or other fluids or substances present, a non-conductor of electricity, and is naturally of such selective density, as to remain normally interposed between the fluids of lesser and greater density. Instead of coal I can employ inert carbids, animal or bone charcoal, or other carbon containing substance, the carbon of which may be either chemically or physically combined, or both, which may be available for use under the existing conditions or character of the substance employed, or formed during the operation of the process. The apparatus and process therefore includes as an important and distinguishing feature a fluid or liquid diaphragm consisting of an ion conveying fluid provided with a means such as a normally interposed pervious septum or septi containing solid, semi-solid, or inert substance preferably of pulverulent or elastic nature, suspended, interposed, or interpoised, between the fluids of varying density to prevent circulatory diffusion, or osmosis, during the process of electrolysis. The movable or elastic nature of the septum or septi, when solids are employed, may be designated as a fluid solid, or anti-osmotic or anti-diffusion fluid; for the reason that the inert particles may move or flow on or about each other

within the anti-osmotic or anti-diffusion zone, without material interference, while absorbing, dispersing, or neutralizing the circulatory energy of the electrolyte or other fluid present, whereby diffusion of the compatible, or mixable fluids or liquids present, such as the liquefied salts employed as electrolyte or products produced, of solvent menstruum in which liquefied, either employed as electrolyte or obtained as product produced, with the mixable separating fluid or liquid diaphragm is largely prevented, thus admitting of the ready employment of mixable liquids or fluids of varying density without increasing or decreasing the density of either by diffusion or contamination of the product during the operation of the process.

The term "liquid" used in this specification and claims, with relation to the character of the materials employed, is intended to include any fluid form of the substance which may exist normally, under ordinary circumstances or conditions, as fluid, or which is or has been liquefied by pressure, refrigeration, solution in solvent menstruum, heat or otherwise, which may be adaptable or employed for the purpose set forth.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:—

1. The process for electrolysis of fluid salts or compounds, which consists in providing a body of electrolyte and an independent body of fluid, separating said fluids from each other by a fluid of greater density, capable of acting as a conveyer of ions, and a communicating or intervening septum or septi for preventing the diffusion of the fluids into each other, and passing a current of electricity from and to suitable electrodes, communicating with the electrolyte and the independent body of fluid, through portions of the electrolyte, the independent body of fluid, and the separating fluid of greater density and its intervening anti-diffusion septum or septi.

2. The process for electrolysis of fluid salts or compounds, which consists in providing a body of electrolyte and an independent body of fluid, separating said fluids from each other by a mixable fluid of greater density, capable of acting as a conveyer of ions, and a communicating or intervening septum or septi for preventing the diffusion of the fluids into each other, and passing a current of electricity from and to suitable electrodes, communicating with the electrolyte and the independent body of fluid, through portions of the electrolyte, the independent body of fluid, and the separating mixable fluid of greater density and its intervening anti-diffusion septum or septi.

3. The process for electrolysis of fluid salts or compounds, which consists in providing a plurality of bodies of electrolyte and

independent bodies of fluid, separating the bodies of fluid from each other by a body or bodies of fluid of greater density capable of acting as a conveyer of ions, and a communicating or intervening septum or septi for preventing the diffusion of the fluids into each other, and passing a current of electricity from and to suitable electrodes, communicating with the electrolyte and the independent bodies of fluid, through portions of the electrolyte, the independent body or bodies of fluid, and the separating fluid of greater density and its intervening anti-diffusion septum or septi.

4. The process for electrolysis of fluid salts or compounds, which consists in providing a plurality of bodies of electrolyte and independent bodies of fluid, separating the bodies of fluid from each other by a body or bodies of mixable fluid of greater density, capable of acting as a conveyer of ions, and a communicating or intervening septum or septi for preventing the diffusion of the fluids into each other, and passing a current of electricity from and to suitable electrodes, communicating with the electrolyte, and the independent bodies of fluid, through portions of the electrolyte, the independent body or bodies of fluid, and the separating mixable fluid of greater density and its intervening anti-diffusion septum or septi.

5. The process for electrolysis of fluid salts or compounds, which consists in providing a body of electrolyte and an independent body of fluid, separating said fluids from each other by a fluid of greater density, capable of acting as a conveyer of ions, and a communicating or intervening permeable septum or septi for preventing the diffusion of the fluids into each other, and passing a current of electricity from and to suitable electrodes, communicating with the electrolyte and the independent body of fluid, through portions of the electrolyte, the independent body of fluid, and the separating fluid of greater density and its intervening anti-diffusion septum or septi.

6. The process for electrolysis of fluid salts or compounds, which consists in providing a body of electrolyte and an independent body of fluid, separating said fluids from each other by a mixable fluid of greater density, capable of acting as a conveyer of ions, and a communicating or intervening permeable septum or septi for preventing the diffusion of the fluids into each other, and passing a current of electricity from and to suitable electrodes, communicating with the electrolyte and the independent body of fluid, through portions of the electrolyte, the independent body of fluid, and the separating mixable fluid of greater density and its intervening anti-diffusion septum or septi.

7. The process for electrolysis of fluid salts or compounds, which consists in pro-

viding a plurality of bodies of electrolyte and independent bodies of fluid, separating the bodies of fluid from each other by a body or bodies of fluid of greater density, capable of
 5 acting as a conveyer of ions, and a communicating or intervening permeable septum or septi for preventing the diffusion of the fluids into each other and passing a current of electricity from and to suitable electrodes,
 10 communicating with the electrolyte and the independent bodies of fluid, through portions of the electrolyte, the independent body of fluid, and the separating fluid of greater density and its intervening anti-diffusion septum
 15 or septi.

8. The process for electrolysis of fluid salts or compounds, which consists in providing a plurality of bodies of electrolyte and independent bodies of fluid, separating the
 20 bodies of fluid from each other by a body or bodies of mixable fluid of greater density, capable of acting as a conveyer of ions, and a communicating or intervening permeable septum or septi for preventing the diffusion
 25 of the fluids into each other and passing a current of electricity from and to suitable electrodes, communicating with the electrolyte and the independent bodies of fluid, through portions of the electrolyte, the independent body of fluid and the separating
 30 fluid of greater density and its intervening anti-diffusion septum or septi.

9. The process for electrolysis of fluid salts or compounds, which consists in providing a
 35 body of electrolyte and an independent body of fluid, separating said fluids from each other by a fluid of greater density, capable of acting as a conveyer of ions, and a communicating or intervening elastic septum or septi
 40 for preventing the diffusion of the fluids into each other, and passing a current of electricity from and to suitable electrodes, communicating with the electrolyte and the independent body of fluid, through portions of
 45 the electrolyte, the independent body of fluid, and the separating fluid of greater density and its intervening anti-diffusion septum or septi.

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65 11. The process for electrolysis of fluid

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 75 bodies of fluid, through portions of the electrolyte, the independent body of fluid, and the separating fluid of greater density and its intervening anti-diffusion septum or
 80 septi.

12. The process for electrolysis of fluid salts or compounds, which consists in providing a plurality of bodies of electrolyte and independent bodies of fluid, separating the
 85 bodies of fluid from each other by a body or bodies of mixable fluid of greater density, capable of acting as a conveyer of ions, and a communicating or intervening elastic septum or septi for preventing the diffusion of the
 90 fluids into each other, and passing a current of electricity from and to suitable electrodes, communicating with the electrolyte and the independent bodies of fluid, through portions of the electrolyte, the independent body of
 95 fluid, and the separating fluid of greater density and its intervening anti-diffusion, septum or septi.

13. The process for electrolysis of fluid salts or compounds, which consists in providing a body of electrolyte and an independent
 100 body of fluid, separating said fluids from each other by a fluid of greater density, capable of acting as a conveyer of ions, and a communication or intervening carbonaceous septum or septi for preventing the diffusion
 105 of the fluids into each other, and passing a current of electricity from and to suitable electrodes, communicating with the electrolyte and the independent body of fluid, through portions of the electrolyte, the independent
 110 body of fluid, and the separating fluid of greater density and its intervening anti-diffusion septum or septi.

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 120 communicating or intervening carbonaceous septum or septi for preventing the diffusion of the fluids into each other, and passing a current of electricity from and to suitable electrodes, communicating with the electrolyte and the independent body of fluid,
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15. The process for electrolysis of fluid salts or compounds, which consists in providing a plurality of bodies of electrolyte and independent bodies of fluid, separating the bodies of fluid from each other by a body or bodies of fluid of greater density, capable of acting as a conveyer of ions, and a communicating or intervening carbonaceous septum or septi for preventing the diffusion of the fluids into each other, and passing a current of electricity from and to suitable electrodes, communicating with the electrolyte and the independent bodies of fluid, through portions of the electrolyte, the independent body of fluid, and the separating fluid of greater density and its intervening anti-diffusion septum or septi.

16. The process for electrolysis of fluid salts or compounds, which consists in providing a plurality of bodies of electrolyte and independent bodies of fluid, separating the bodies of fluid from each other by a body or bodies of mixable fluid of greater density, capable of acting as a conveyer of ions, and a communicating or intervening carbonaceous septum or septi for preventing the diffusion of the fluids into each other, and passing a current of electricity from and to suitable electrodes, communicating with the electrolyte and the independent bodies of fluid, through portions of the electrolyte, the independent body of fluid, and the separating mixable fluid of greater density and its intervening anti-diffusion septum or septi.

17. The process for electrolysis of fluid salts or compounds, which consists in providing a body of electrolyte and an independent body of fluid, separating said fluids from each other by a fluid of greater density, capable of acting as a conveyer of ions, and a communicating or intervening carbon containing septum or septi for preventing the diffusion of the fluids into each other, and passing a current of electricity from and to suitable electrodes communicating with the electrolyte and the independent body of fluid, through portions of the electrolyte, the independent body of fluid, and the separating fluid of greater density and its intervening anti-diffusion septum or septi.

18. The process for electrolysis of fluid salts or compounds, which consists in providing a body of electrolyte and an independent body of fluid, separating said fluids from each other by a mixable fluid of greater density, capable of acting as a conveyer of ions, and a communicating or intervening carbon containing septum or septi for preventing the diffusion of the fluids into each other, and passing a current of electricity from and to suitable electrodes, communicating with the electrolyte and the independent body of fluid, through portions of the electrolyte, the independent body of fluid, and the separating mixable fluid of

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19. The process for electrolysis of fluid salts or compounds, which consists in providing a plurality of bodies of electrolyte and independent bodies of fluid, separating the bodies of fluid from each other by a body or bodies of fluid of greater density, capable of acting as a conveyer of ions, and a communicating or intervening carbon containing septum or septi for preventing the diffusion of the fluids into each other, and passing a current of electricity from and to suitable electrodes, communicating with the electrolyte and the independent bodies of fluid, through portions of the electrolyte, the independent body or bodies of fluid, and the separating fluid of greater density and its intervening anti-diffusion septum or septi.

20. The process for electrolysis of fluid salts or compounds, which consists in providing a plurality of bodies of electrolyte and independent bodies of fluid, separating the bodies of fluid from each other by a body or bodies of mixable fluid of greater density, capable of acting as a conveyer of ions, and a communicating or intervening carbon containing septum or septi for preventing the diffusion of the fluids into each other, and passing a current of electricity from and to suitable electrodes, communicating with the electrolyte and the independent bodies of fluid, through portions of the electrolyte, the independent body or bodies of fluid, and the separating mixable fluid of greater density and its intervening anti-diffusion septum or septi.

21. The process for electrolysis of fluid salts or compounds, which consists in providing a body of electrolyte and an independent body of fluid, separating said fluids from each other by a fluid of greater density, capable of acting as a conveyer of ions, and a communicating or intervening septum or septi of pervious carbon for preventing the diffusion of the fluids into each other, and passing a current of electricity from and to suitable electrodes, communicating with the electrolyte and the independent body of fluid, through portions of the electrolyte, the independent body of fluid and the separating fluid of greater density and its intervening anti-diffusion septum or septi.

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23. The process for electrolysis of fluid salts or compounds, which consists in providing a plurality of bodies of electrolyte and independent bodies of fluid, separating the bodies of fluid from each other by a body or bodies of fluid of greater density, capable of acting as a conveyer of ions, and a communicating or intervening pervious septum or septi containing coal for preventing the diffusion of the fluids into each other, and passing a current of electricity from and to suitable electrodes, communicating with the electrolyte and the independent bodies of fluid, through portions of the electrolyte, the independent body of fluid, and the separating fluid of greater density and its intervening anti-diffusion septum or septi.

24. The process for electrolysis of fluid salts or compounds, which consists in providing a plurality of bodies of electrolyte and independent bodies of fluid, separating the bodies of fluid from each other by a body or bodies of mixable fluid of greater density, capable of acting as a conveyer of ions, and a communicating or intervening septum or septi of pervious carbon for preventing the diffusion of the fluids into each other, and passing a current of electricity from and to suitable electrodes, communicating with the electrolyte and the independent bodies of fluid, through portions of the electrolyte, the independent bodies of fluid, and the separating mixable fluid of greater density and its intervening anti-diffusion septum or septi.

25. The process for electrolysis of fluid salts or compounds, which consists in providing a body of electrolyte and an independent body of fluid, separating said fluids from each other by a fluid of greater density, capable of acting as a conveyer of ions, and a communicating or intervening pervious septum or septi containing coal for preventing the diffusion of the fluids into each other, and passing a current of electricity from and to suitable electrodes, communicating with the electrolyte and the independent body of fluid, through portions of the electrolyte, the independent body of fluid, and the separating fluid of greater density and its intervening anti-diffusion septum or septi.

26. The process for electrolysis of fluid salts or compounds, which consists in providing a body of electrolyte and an independent body of fluid, separating said fluids from each other by a mixable fluid of greater density, capable of acting as a conveyer of ions, and a communicating or intervening pervious septum or septi containing coal for preventing the diffusion of the fluids into each other, and passing a current of electricity from and to suitable electrodes, communicating with the

electrolyte and the independent body of fluid, through portions of the electrolyte, the independent body of fluid, and the separating mixable fluid of greater density and its intervening anti-diffusion septum or septi.

27. The process of electrolysis of fluid salts or compounds, which consists in providing a plurality of bodies of electrolyte and independent bodies of fluid, separating the bodies of fluid from each other by a body or bodies of fluid, of greater density, capable of acting as a conveyer of ions, and a communicating or intervening pervious septum or septi containing coal for preventing the diffusion of the fluids into each other, and passing a current of electricity from and to suitable electrodes, communicating with the electrolyte and the independent bodies of fluid, through portions of the electrolyte, the independent body or bodies of fluid, and the separating fluid of greater density and its intervening anti-diffusion septum or septi.

28. The process for electrolysis of fluid salts or compounds, which consists in providing a plurality of bodies of electrolyte and independent bodies of fluid, separating the bodies of fluid from each other by a body or bodies of mixable fluid of greater density, capable of acting as a conveyer of ions, and a communicating or intervening pervious septum or septi containing coal for preventing the diffusion of the fluids into each other, and passing a current of electricity from and to suitable electrodes, communicating with the electrolyte and the independent bodies of fluid, through portions of the electrolyte, the independent body or bodies of fluid, and the separating mixable fluid of greater density and its intervening anti-diffusion septum or septi.

29. The process for electrolysis of fluid salts or compounds, which consists in providing a body of electrolyte and an independent body of fluid, separating said fluids from each other by a fluid of greater density, capable of acting as a conveyer of ions, and a communicating or intervening septum or septi containing canal coal for preventing the diffusion of the fluids into each other, and passing a current of electricity from and to suitable electrodes, communicating with the electrolyte and the independent body of fluid, through portions of the electrolyte, the independent body of fluid, and the separating fluid of greater density and its intervening anti-diffusion septum or septi.

30. The process for electrolysis of fluid salts or compounds, which consists in providing a body of electrolyte and an independent body of fluid, separating said fluids from each other by a mixable fluid of greater density, capable of acting as a conveyer of ions, and a communicating or intervening septum or septi containing canal coal for preventing the diffusion of the fluids into each other,

and passing a current of electricity from and to suitable electrodes, communicating with the electrolyte and the independent body of fluid, through portions of the electrolyte, the independent body of fluid, and the separating mixable fluid of greater density and its intervening anti-diffusion septum or septi.

31. The process for electrolysis of fluid salts or compounds, which consists in providing a plurality of bodies of electrolyte and independent bodies of fluid, separating the bodies of fluid from each other by a body or bodies of fluid of greater density, capable of acting as a conveyer of ions, and a communicating or intervening septum or septi containing cannel coal for preventing the diffusion of the fluids into each other, and passing a current of electricity from and to suitable electrodes, communicating with the electrolyte and the independent bodies of fluid, through portions of the electrolyte, the independent body or bodies of fluid, and the separating fluid of greater density and its intervening anti-diffusion septum or septi.

32. The process for electrolysis of fluid salts or compounds, which consists in providing a plurality of bodies of electrolyte and independent bodies of fluid, separating the bodies of fluid from each other by a body or bodies of mixable fluid of greater density, capable of acting as a conveyer of ions, and a communicating or intervening septum or septi containing cannel coal for preventing the diffusion of the fluids into each other, and passing a current of electricity from and to suitable electrodes, communicating with the electrolyte and the independent body or bodies of fluid, through portions of the electrolyte, the independent body or bodies of fluid, and the separating mixable fluid of greater density and its intervening anti-diffusion septum or septi.

33. The process for electrolysis of fluid salts or compounds, which consists in providing a body of electrolyte and an independent body of fluid, separating said fluids from each other by a fluid of greater density, capable of acting as a conveyer of ions, and a communicating or intervening septum or septi containing an electrically non-conductive substance for preventing the diffusion of the fluids into each other, and passing a current of electricity from and to suitable electrodes, communicating with the electrolyte and the independent body of fluid, through portions of the electrolyte, the independent body of fluid, and the separating fluid of greater density and its intervening anti-diffusion septum or septi.

34. The process for electrolysis of fluid salts or compounds, which consists in providing a body of electrolyte and an independent body of fluid, separating said fluids from each other by a mixable fluid of greater density, capable of acting as a conveyer of ions, and a

communicating or intervening septum or septi containing an electrically non-conductive substance for preventing the diffusion of the fluids into each other, and passing a current of electricity from and to suitable electrodes, communicating with the electrolyte and the independent body of fluid, through portions of the electrolyte, the independent body of fluid, and the separating mixable fluid of greater density and its intervening anti-diffusion septum or septi.

35. The process for electrolysis of fluid salts or compounds, which consists in providing a plurality of bodies of electrolyte and independent bodies of fluid, separating the bodies of fluid from each other by a body or bodies of fluid of greater density, capable of acting as a conveyer of ions, and a communicating or intervening septum or septi containing an electrically non-conductive substance for preventing the diffusion of the fluids into each other, and passing a current of electricity from and to suitable electrodes, communicating with the electrolyte and the independent bodies of fluid, through portions of the electrolyte, the independent body or bodies of fluid, and the separating fluid of greater density and its intervening anti-diffusion septum or septi.

36. The process for electrolysis of fluid salts or compounds, which consists in providing a plurality of bodies of electrolyte and independent bodies of fluid, separating the bodies of fluid from each other by a body or bodies of mixable fluid of greater density, capable of acting as a conveyer of ions, and a communicating or intervening septum or septi containing an electrically non-conductive substance for preventing the diffusion of the fluids into each other, and passing a current of electricity from and to suitable electrodes, communicating with the electrolyte and the independent bodies of fluid, through portions of the electrolyte, the independent body or bodies of fluid, and the separating mixable fluid of greater density and its intervening anti-diffusion septum or septi.

37. The process for electrolysis of fluid salts or compounds, which consists in providing a body of electrolyte and an independent body of fluid, separating said fluids from each other by a fluid of greater density, capable of acting as a conveyer of ions, and a communicating or intervening septum or septi for preventing the diffusion of the fluids into each other, supplying fresh electrolyte from time to time, and passing a current of electricity through the electrolyte and bodies of fluid from and to suitable communicating electrodes.

38. The process for electrolysis of fluid salts or compounds, which consists in providing a body of electrolyte and an independent body of fluid, separating said fluids from each other by a fluid of greater density, capable of

acting as a conveyer of ions, and a communicating or intervening septum or septi for preventing the diffusion of the fluids into each other, supplying fresh fluid to the independent body or bodies of fluid and withdrawing the said fluid with absorbed or combined ions continuously or from time to time, as required, and passing a current of electricity through the bodies of electrolyte and independent body or bodies of fluid from and to suitable communicating electrodes.

39. The process for electrolysis of fluid salts or compounds, which consists in providing a body of electrolyte and an independent body of fluid, separating said fluids from each other by a fluid of greater density, capable of acting as a conveyer of ions, and a communicating or intervening septum or septi for preventing the diffusion of the fluids into each other, supplying fresh electrolyte and fresh fluid to the independent body or bodies of fluid continuously or from time to time, as required, and passing a current of electricity through the electrolyte and bodies of fluid from and to suitable communicating electrodes.

40. The process for the electrolysis of fluid salts or compounds, which consists in employing a circulating body or bodies of fluid electrolyte and a circulating independent body or bodies of fluid, separating said circulating fluids from each other by a substantially quiescent body of fluid having greater density, capable of acting as a conveyer of ions, and an intervening septum or septi for preventing the diffusion of the circulating and quiescent fluids into each other and passing a current of electricity through the electrolyte and bodies of fluid from and to suitable communicating electrodes.

41. The process for the electrolysis of liquid or liquefied salts or compounds, which consists in employing a liquid or liquefied electrolyte and an independent liquid, separating the fluids thus employed from each other by a fluid having greater density, capable of acting as a conveyer of ions, and an intervening septum or septi for preventing the diffusion of the liquid or liquefied substances into each other, and passing a current of electricity, through the electrolyte and fluid substances, to and from suitable communicating electrodes.

42. The process for electrolysis of liquid salts or compounds, which consists in providing a body of electrolyte and an independent body of liquid, separating said liquids from each other by a liquid of greater density, capable of acting as a conveyer of ions, and a communicating or intervening septum or septi for preventing the diffusion of the liquids into each other, and passing a current of electricity from and to suitable electrodes, communicating with the electrolyte and the independent body of liquid,

through portions of the electrolyte, the independent body of liquid and the separating liquid of greater density and its intervening anti-diffusion septum or septi.

43. The process for electrolysis of liquid salts or compounds which consists in providing a body of electrolyte and an independent body of liquid, separating said liquids from each other by a mixable liquid of greater density, capable of acting as a conveyer of ions, and a communicating or intervening septum or septi for preventing the diffusion of the liquids into each other, and passing a current of electricity from and to suitable electrodes, communicating with the electrolyte and the independent body of liquid, through portions of the electrolyte, the independent body of liquid and the separating mixable liquid of greater density and its intervening anti-diffusion septum or septi.

44. The process for electrolysis of liquid salts or compounds, which consists of providing a plurality of bodies of electrolyte and independent bodies of liquid, separating the bodies of liquid from each other by a body or bodies of liquid of greater density capable of acting as a conveyer of ions, and a communicating or intervening septum or septi for preventing the diffusion of the liquids into each other, and passing a current of electricity from and to suitable electrodes, communicating with the electrolyte and the independent bodies of liquid, through portions of the electrolyte, the independent body or bodies of liquid, and the separating liquid of greater density and its intervening anti-diffusion septum or septi.

45. The process for electrolysis of liquid salts or compounds, which consists of providing a plurality of bodies of electrolyte and independent bodies of liquid, separating the bodies of liquid from each other by a body or bodies of mixable liquid of greater density, capable of acting as a conveyer of ions, and a communicating or intervening septum or septi for preventing the diffusion of the liquids into each other, and passing a current of electricity from and to suitable electrodes, communicating with the electrolyte and the independent bodies of liquid, through portions of the electrolyte, the independent body or bodies of liquid, and the separating mixable liquid of greater density and its intervening anti-diffusion septum or septi.

46. The process for electrolysis of liquid salts or compounds, which consists in providing a body of electrolyte and an independent body of liquid, separating said liquids from each other by a liquid of greater density, capable of acting as a conveyer of ions, and a communicating or intervening permeable septum or septi for preventing the diffusion of the liquids into each other, and passing a current of electricity from and to

suitable electrodes, communicating with the electrolyte and the independent body of liquid, through portions of the electrolyte, the independent body of liquid, and the separating liquid of greater density and its intervening anti-diffusion septum or septi.

47. The process for electrolysis of liquid salts or compounds, which consists in providing a body of electrolyte and an independent body of liquid, separating said liquids from each other by a mixable liquid of greater density, capable of acting as a conveyer of ions, and a communicating or intervening permeable septum or septi for preventing the diffusion of the liquids into each other, and passing a current of electricity from and to suitable electrodes, communicating with the electrolyte and the independent body of liquid, through portions of the electrolyte, the independent body of liquid, and the separating mixable liquid of greater density and its intervening anti-diffusion septum or septi.

48. The process for electrolysis of liquid salts or compounds, which consists in providing a plurality of bodies of electrolyte and independent bodies of liquid, separating the bodies of liquid from each other by a body or bodies of liquid of greater density, capable of acting as a conveyer of ions, and a communicating or intervening permeable septum or septi for preventing the diffusion of the liquids into each other, and passing a current of electricity from and to suitable electrodes, communicating with the electrolyte and the independent bodies of liquid, through portions of the electrolyte, the independent body of liquid, and the separating liquid of greater density and its intervening anti-diffusion septum or septi.

49. The process for electrolysis of liquid salts or compounds, which consists in providing a plurality of bodies of electrolyte and independent bodies of liquid, separating the bodies of liquid from each other by a body or bodies of mixable liquid of greater density, capable of acting as a conveyer of ions, and a communicating or intervening permeable septum or septi for preventing the diffusion of the liquids into each other and passing a current of electricity from and to suitable electrodes communicating with the electrolyte and the independent bodies of liquid, through portions of the electrolyte and the independent body of liquid, and the separating mixable liquid of greater density and its intervening anti-diffusion septum or septi.

50. The process for electrolysis of liquid salts or compounds, which consists in providing a body of electrolyte and an independent body of liquid, separating said liquids from each other by a liquid of greater density, capable of acting as a conveyer of ions, and a communicating or intervening elastic septum or septi for preventing the diffusion of the liquids into each other, and passing a current of

electricity from and to suitable electrodes, communicating with the electrolyte and the independent body of liquid, through portions of the electrolyte, the independent body of liquid, and the separating liquid of greater density and its intervening anti-diffusion septum or septi.

51. The process for electrolysis of liquid salts or compounds, which consists in providing a body of electrolyte and an independent body of liquid, separating said liquids from each other by a mixable liquid of greater density, capable of acting as a conveyer of ions, and a communicating or intervening elastic septum or septi for preventing the diffusion of the liquids into each other, and passing a current of electricity from and to suitable electrodes, communicating with the electrolyte and the independent body of liquid, through portions of the electrolyte, the independent body of liquid, and the separating mixable liquid of greater density and its intervening anti-diffusion septum or septi.

52. The process for electrolysis of liquid salts or compounds, which consists in providing a plurality of bodies of electrolyte and independent bodies of liquid, separating the bodies of liquid from each other by a body or bodies of liquid of greater density, capable of acting as a conveyer of ions, and a communicating or intervening elastic septum or septi for preventing the diffusion of the liquids into each other and passing a current of electricity from and to suitable electrodes, communicating with the electrolyte and the independent bodies of liquid, through portions of the electrolyte, the independent body of liquid, and the separating liquid of greater density and its intervening anti-diffusion septum or septi.

53. The process for electrolysis of liquid salts or compounds, which consists in providing a plurality of bodies of electrolyte and independent bodies of liquid, separating the bodies of liquid from each other by a body or bodies of mixable liquid of greater density, capable of acting as a conveyer of ions, and a communicating or intervening elastic septum or septi for preventing the diffusion of the liquids into each other, and passing a current of electricity from and to suitable electrodes, communicating with the electrolyte and the independent bodies of liquid, through portions of the electrolyte, the independent body of liquid, and the separating liquid of greater density and its intervening anti-diffusion septum or septi.

54. The process for electrolysis of liquid salts or compounds, which consists in providing a body of electrolyte and an independent body of liquid, separating said liquids from each other by liquid of greater density, capable of acting as a conveyer of ions, and a communication or intervening carbonaceous septum or septi for preventing the diffusion

of the liquids into each other, and passing a current of electricity from and to suitable electrodes, communicating with the electrolyte and the independent body of liquid, through portions of the electrolyte, the independent body of liquid, and the separating liquid of greater density and its intervening anti-diffusion septum or septi.

55. The process for electrolysis of liquid salts or compounds, which consists in providing a body of electrolyte and an independent body of liquid, separating said liquids from each other by a mixable liquid of greater density, capable of acting as a conveyer of ions, and a communicating or intervening carbonaceous septum or septi for preventing the diffusion of the liquids into each other, and passing a current of electricity from and to suitable electrodes, communicating with the electrolyte and the independent body of liquid, through portions of the electrolyte, the independent body of liquid, and the separating mixable liquid of greater density and its intervening anti-diffusion septum or septi.

56. The process for electrolysis of liquid salts or compounds, which consists in providing a plurality of bodies of electrolyte and independent bodies of liquid, separating the bodies of liquid from each other by a body or bodies of liquid of greater density, capable of acting as a conveyer of ions, and a communicating or intervening carbonaceous septum or septi for preventing the diffusion of the liquids into each other, and passing a current of electricity from and to suitable electrodes, communicating with the electrolyte and the independent bodies of liquid, through portions of the electrolyte, the independent body of liquid, and the separating liquid of greater density and its intervening anti-diffusion septum or septi.

57. The process for electrolysis of liquid salts or compounds, which consist in providing a plurality of bodies of electrolyte and independent bodies of liquid, separating the bodies of liquid from each other by a body or bodies of mixable liquid of greater density, capable of acting as a conveyer of ions, and a communicating or intervening carbonaceous septum or septi for preventing the diffusion of the liquids into each other, and passing a current of electricity from and to suitable electrodes, communicating with the electrolyte and the independent bodies of liquids through portions of the electrolyte, the independent body of liquid, and the separating mixable liquid of greater density and its intervening anti-diffusion septum or septi.

58. The process for electrolysis of liquid salts or compounds, which consists in providing a body of electrolyte and an independent body of liquid, separating said liquids from each other by a liquid of greater density, capable of acting as a conveyer of ions, and

a communicating or intervening carbon containing septum or septi for preventing the diffusion of the liquids into each other, and passing a current of electricity from and to suitable electrodes, communicating with the electrolyte and the independent body of liquid, through portions of the electrolyte and the independent body of liquid, and the separating liquid of greater density and its intervening anti-diffusion septum or septi.

59. The process for electrolysis of liquid salts or compounds, which consists in providing a body of electrolyte and an independent body of liquid, separating said liquids from each other by a mixable liquid of greater density, capable of acting as a conveyer of ions, and a communicating or intervening carbon containing septum or septi for preventing the diffusion of the liquids into each other, and passing a current of electricity from and to suitable electrodes, communicating with the electrolyte and the independent body of liquid, through portions of the electrolyte, the independent body of liquid, and the separating mixable liquid of greater density and its intervening anti-diffusion septum or septi.

60. The process for electrolysis of liquid salts or compounds, which consists in providing a plurality of bodies of electrolyte and independent bodies of liquid, separating the bodies of liquid from each other by a body or bodies of liquid of greater density, capable of acting as a conveyer of ions, and a communicating or intervening carbon containing septum or septi for preventing the diffusion of the liquids into each other, and passing a current of electricity from and to suitable electrodes, communicating with the electrolyte and the independent bodies of liquid, through portions of the electrolyte, the independent body or bodies of liquid, and the separating liquid of greater density and its intervening anti-diffusion septum or septi.

61. The process for electrolysis of liquid salts or compounds, which consists in providing a plurality of bodies of electrolyte and independent bodies of liquid, separating the bodies of liquid from each other by a body or bodies of mixable liquid of greater density, capable of acting as a conveyer of ions, and a communicating or intervening carbon containing septum or septi for preventing the diffusion of the liquids into each other, and passing a current of electricity from and to suitable electrodes, communicating with the electrolyte and the independent bodies of liquid, through portions of the electrolyte, the independent body or bodies of liquid, and the separating mixable liquid of greater density and its intervening anti-diffusion septum or septi.

62. The process for electrolysis of liquid salts or compounds, which consists in providing a body of electrolyte and an independ-

ent body of liquid, separating said liquids from each other by a liquid of greater density capable of acting as a conveyer of ions, and a communicating or intervening septum or
 5 septi of pervious carbon for preventing the diffusion of the liquids into each other, and passing a current of electricity from and to suitable electrodes, communicating with the electrolyte and the independent body of
 10 liquid, through portions of the electrolyte, the independent body of liquid, and the separating liquid of greater density and its intervening anti-diffusion septum or septi.

63. The process for electrolysis of liquid
 15 salts or compounds, which consists in providing a body of electrolyte, and an independent body of liquid, separating said liquids from each other by a mixable liquid of greater density, capable of acting as a con-
 20 veyer of ions, and a communicating or intervening septum or septi of pervious carbon for preventing the diffusion of the liquids into each other, and passing a current of electricity from and to suitable electrodes,
 25 communicating with the electrolyte and the independent body of liquid, through portions of the electrolyte, the independent body of liquid, and the separating mixable liquid of greater density and its intervening
 30 anti-diffusion septum or septi.

64. The process for electrolysis of liquid salts or compounds, which consists in providing a plurality of bodies of electrolyte and independent bodies of liquid, separating
 35 the bodies of liquid from each other by a body or bodies of liquid of greater density, capable of acting as a conveyer of ions, and a communicating or intervening septum or septi of pervious carbon for preventing the
 40 diffusion of the liquids into each other, and passing a current of electricity from and to suitable electrodes, communicating with the electrolyte and the independent bodies of liquid, through portions of the electrolyte, the
 45 independent body of liquid, and the separating liquid of greater density and its intervening anti-diffusion septum or septi.

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 50 bodies of liquid from each other by a body or bodies of mixable liquid of greater density, capable of acting as a conveyer of ions, and a communicating or intervening septum or septi of pervious carbon for preventing the
 55 diffusion of the liquids into each other, and passing a current of electricity from and to suitable electrodes, communicating with the electrolyte and the independent bodies of liquid, through portions of the electrolyte,
 60 the independent bodies of liquid, and the separating mixable liquids of greater density and its intervening anti-diffusion septum or
 65 septi.

66. The process for electrolysis of liquid salts or compounds, which consists in providing a body of electrolyte and an independent
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 70 capable of acting as a conveyer of ions, and a communicating or intervening pervious septum or septi containing coal for preventing the diffusion of the liquids into each other, and passing a current of electricity
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 80 its intervening anti-diffusion septum or septi.

67. The process for electrolysis of liquid salts or compounds, which consists in providing a body of electrolyte and an independent
 85 body of liquid, separating said liquids from each other by a mixable liquid of greater density, capable of acting as a conveyer of ions, and a communicating or intervening pervious septum or septi containing coal for
 90 preventing the diffusion of the liquids into each other, and passing a current of electricity from and to suitable electrodes communicating with the electrolyte and the independent body of liquid, through portions
 95 of the electrolyte, the independent body of liquid, and the separating mixable liquid of greater density and its intervening anti-diffusion septum or septi.

68. The process for electrolysis of liquid
 100 salts or compounds, which consists in providing a plurality of bodies of electrolyte and independent bodies of liquid, separating the bodies of liquid from each other by a body or bodies of liquid of greater density,
 105 capable of acting as a conveyer of ions, and a communicating or intervening pervious septum or septi containing coal for preventing the diffusion of the liquids into each other, and passing a current of electricity
 110 from and to suitable electrodes communicating with the electrolyte and the independent bodies of liquid, through portions of the electrolyte, the independent body or bodies of liquid, and the separating liquid
 115 of greater density and its intervening anti-diffusion septum or septi.

69. The process for electrolysis of liquid salts or compounds, which consists in providing a plurality of bodies of electrolyte and
 120 independent bodies of liquid, separating the bodies of liquid from each other by a body or bodies of mixable liquid of greater density, capable of acting as a conveyer of ions, and a communicating or intervening pervious sep-
 125 tum or septi containing coal for preventing the diffusion of the liquids into each other, and passing a current of electricity from and to suitable electrodes, communicating with the electrolyte and the independent bodies of
 130

liquid, through portions of the electrolyte, the independent body or bodies of liquid, and the separating mixable liquid of greater density and its intervening anti-diffusion septum or septi.

70. The process for electrolysis of liquid salts or compounds, which consists in providing a body of electrolyte and an independent body of liquid, separating said liquids from each other by a liquid of greater density, capable of acting as a conveyer of ions, and a communicating or intervening septum or septi containing cannel coal for preventing the diffusion of the liquids into each other, and passing a current of electricity from and to suitable electrodes, communicating with the electrolyte and the independent body of liquid, through portions of the electrolyte, the independent body of liquid, and the separating liquid of greater density and its intervening anti-diffusion septum or septi.

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and passing a current of electricity from and to suitable electrodes, communicating with the electrolyte and the independent body and bodies of liquid, through portions of the electrolyte, the independent body or bodies of liquid, and the separating mixable liquid of greater density and its intervening anti-diffusion septum or septi.

74. The process for electrolysis of liquid salts or compounds, which consists in providing a body of electrolyte and an independent body of liquid, separating said liquids from each other by a liquid of greater density, capable of acting as a conveyer of ions, and a communicating or intervening septum or septi containing an electrically non-conductive substance for preventing the diffusion of the liquids into each other and passing a current of electricity from and to suitable electrodes, communicating with the electrolyte and the independent body of liquid, through portions of the electrolyte, the independent body of liquid, and the separating liquid of greater density and its intervening anti-diffusion septum or septi.

75. The process for electrolysis of liquid salts or compounds, which consists in providing a body of electrolyte and an independent body of liquid, separating said liquids from each other by a mixable liquid of greater density, capable of acting as a conveyer of ions, and a communicating or intervening septum or septi containing an electrically non-conductive substance for preventing the diffusion of the liquids into each other, and passing a current of electricity from and to suitable electrodes, communicating with the electrolyte and the independent body of liquid, through portions of the electrolyte, the independent body of liquid, and the separating mixable liquid of greater density and its intervening anti-diffusion septum or septi.

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78. The process for electrolysis of liquid salts or compounds, which consists in providing a body of electrolyte and an independent body of liquid, separating said liquids from each other by a liquid of greater density, capable of acting as a conveyer of ions, and a communicating or intervening septum for preventing the diffusion of the liquids into each other, supplying fresh electrolyte from time to time, and passing a current of electricity through the electrolyte and bodies of liquid from and to suitable communicating electrodes.

79. The process for electrolysis of liquid salts or compounds, which consists in providing a body of electrolyte and an independent body of liquid, separating said liquids from each other by a liquid of greater density, capable of acting as a conveyer of ions, and a communicating or intervening septum or septi for preventing the diffusion of the liquids into each other, supplying fresh liquid to the independent body or bodies of liquid and withdrawing the said liquid with absorbed or combined ions continuously or from time to time, as required, and passing

a current of electricity through the bodies of electrolyte and independent body or bodies of liquid from and to suitable communicating electrodes.

80. The process for electrolysis of liquid salts or compounds, which consists in providing a body of electrolyte, and an independent body of liquid, separating said liquids from each other by a liquid of greater density, capable of acting as a conveyer of ions, and a communicating or intervening septum or septi for preventing the diffusion of the liquids into each other, supplying fresh electrolyte and fresh liquid to the independent body or bodies of liquid continuously or from time to time, as required, and passing a current of electricity through the electrolyte and bodies of liquid from and to suitable communicating electrodes.

81. The process for the electrolysis of liquid salts or compounds, which consists in employing a circulating body or bodies of liquid electrolyte and a circulating independent body or bodies of liquid, separating said circulating liquids from each other by a substantially quiescent body of liquid having greater density, capable of acting as a conveyer of ions, and an intervening septum or septi for preventing the diffusion of the circulating and quiescent liquids into each other, and passing a current of electricity through the electrolyte and bodies of liquid from and to suitable communicating electrodes.

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

HENRY SPENCER BLACKMORE.

Witnesses:

H. N. JENKINS,
C. M. FORREST.