

(No Model.)

E. L. DESSOLLE.

PROCESS OF AND APPARATUS FOR ELECTRODEPOSITING.

No. 602,212.

Patented Apr. 12, 1898.

-FIG. 3-

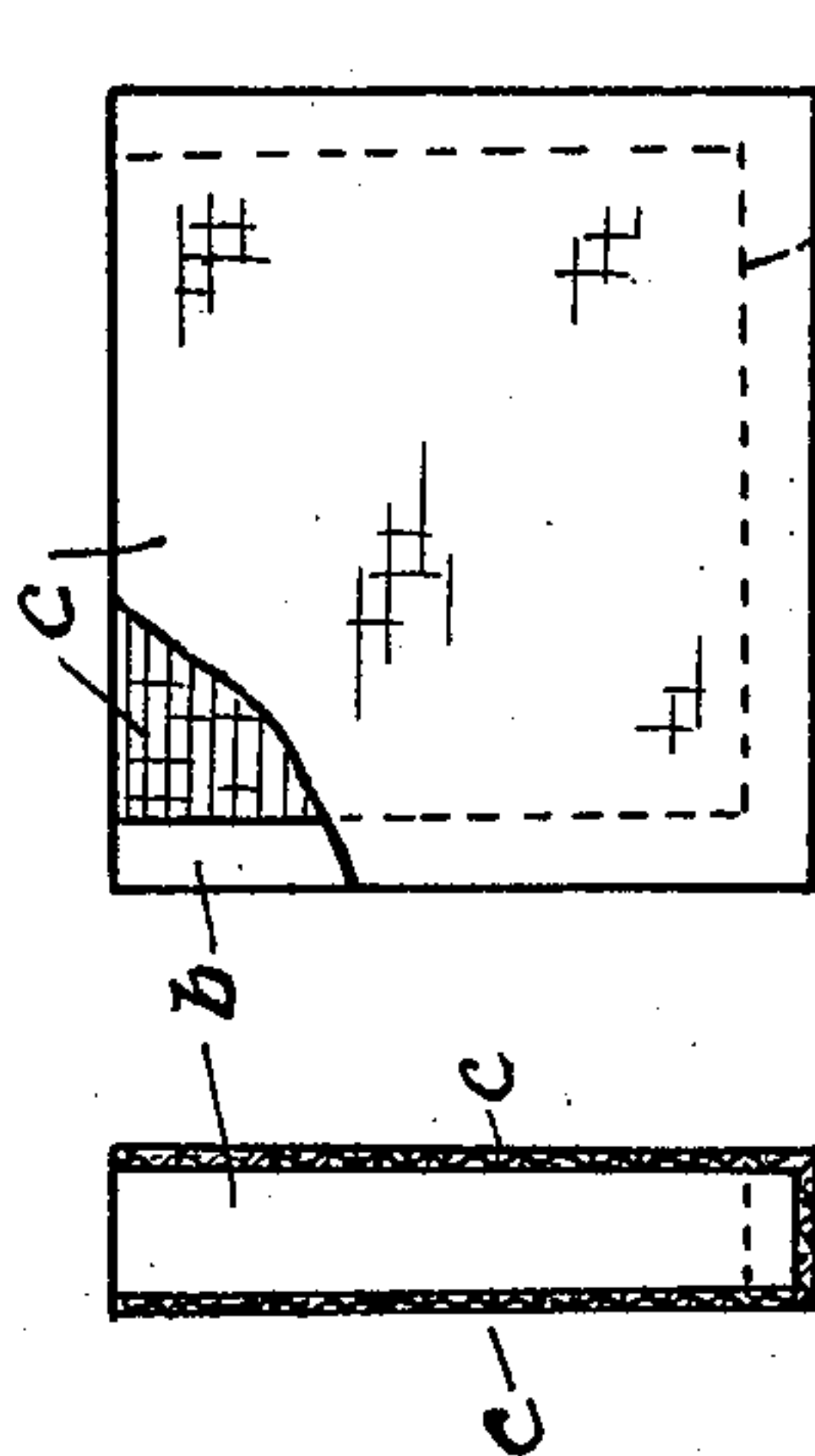
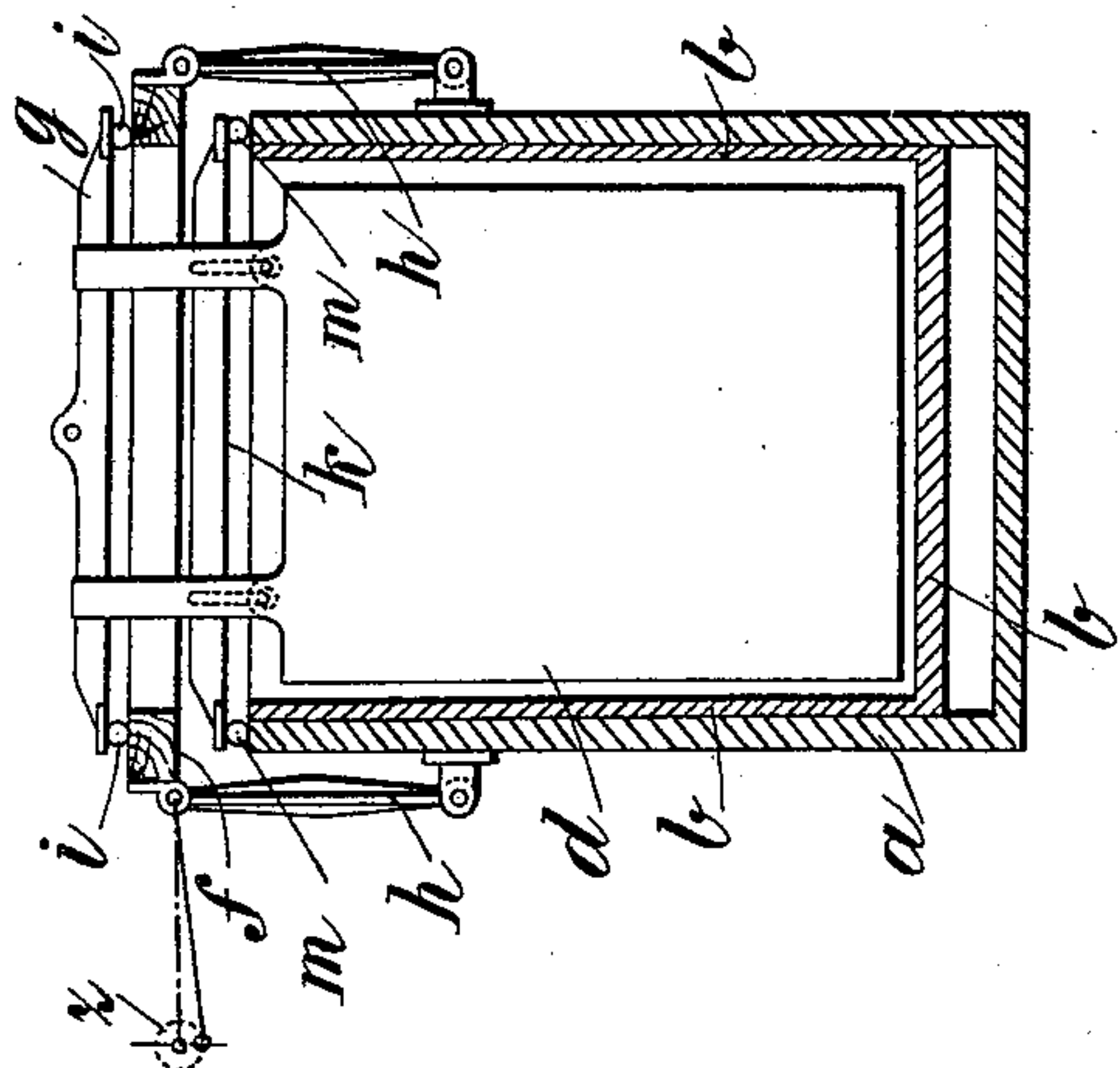
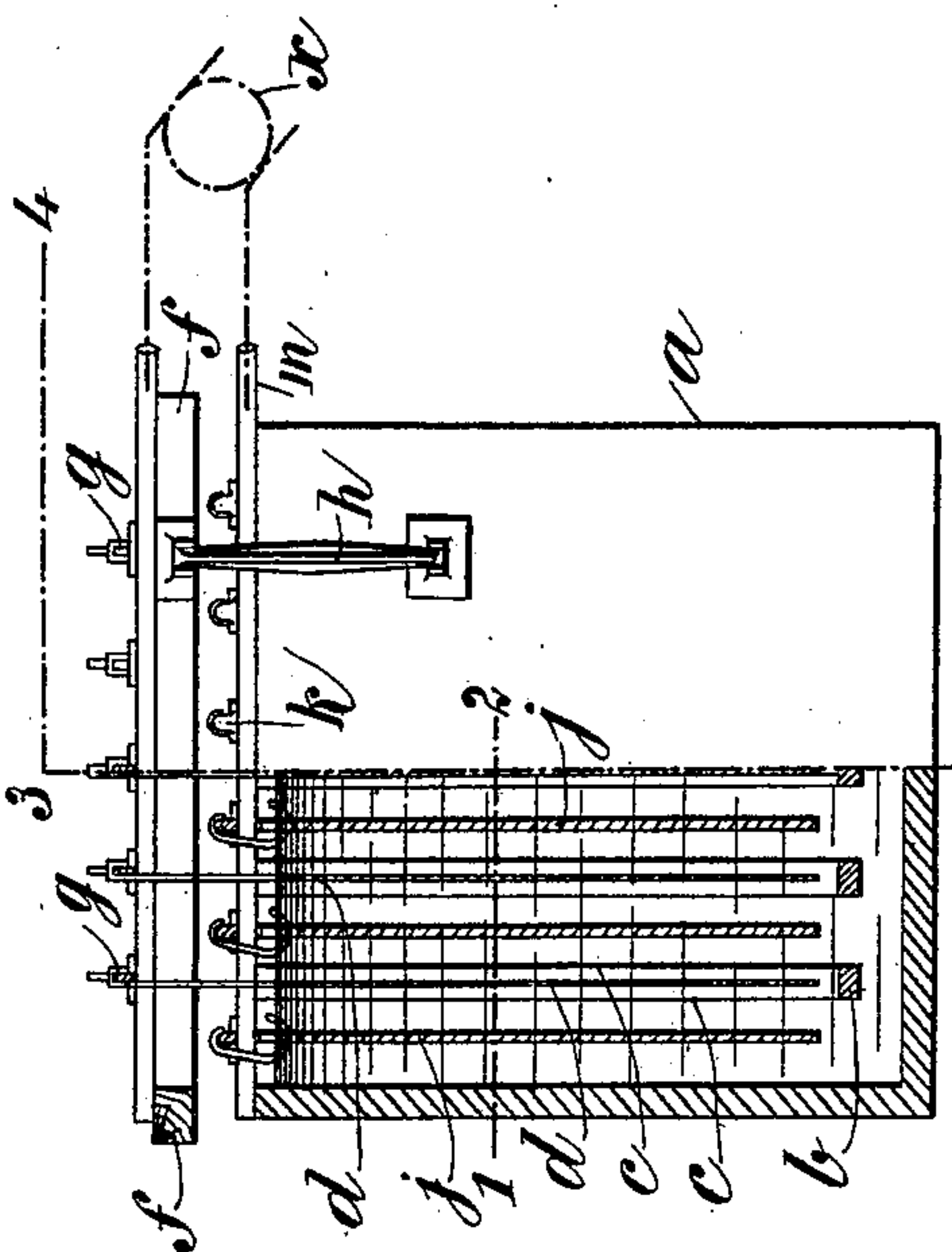


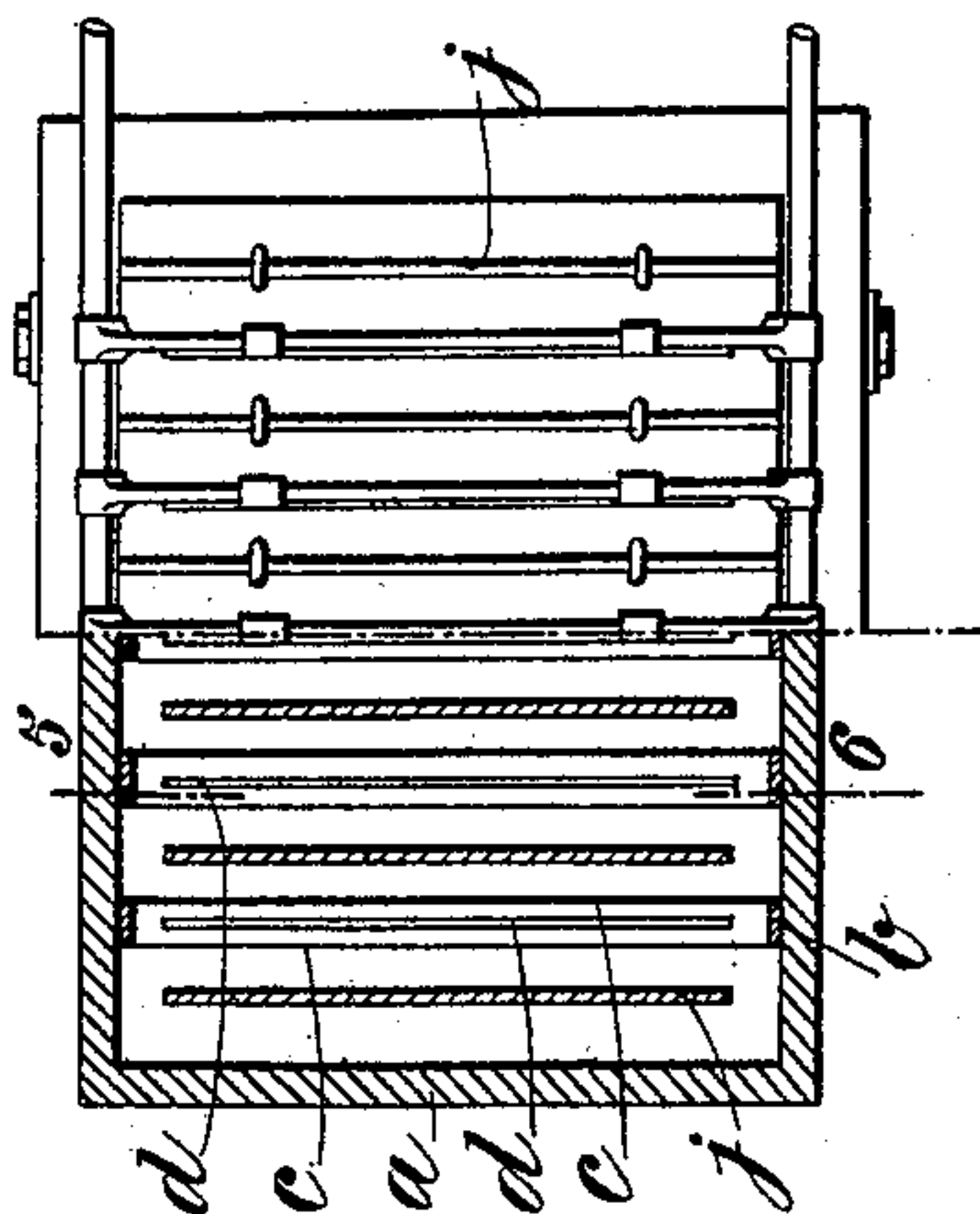
FIG. 4-

FIG. 5-

-FIG. 1-



-FIG. 2-



Witnesses:  
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# UNITED STATES PATENT OFFICE.

EMILE LOUIS DESSOLLE, OF EPINAY SUR SEINE, FRANCE.

## PROCESS OF AND APPARATUS FOR ELECTRODEPOSITING.

SPECIFICATION forming part of Letters Patent No. 602,212, dated April 12, 1898.

Application filed August 25, 1897. Serial No. 649,461. (No specimens.)

*To all whom it may concern:*

Be it known that I, EMILE LOUIS DESSOLLE, a citizen of the Republic of France, residing at Epinay sur Seine, France, have invented a certain new and useful Process of and Apparatus for Manufacturing Electrodeposited Articles, of which the following is a specification.

This invention relates to an improved system of manufacture for the direct production by electrolysis in the bath without supplementary labor of finished or polished sheets of metal as well as objects or tools of any kind—for instance, reflector-shades, saucepans—covered or not with a precious or other metal—as, for instance, gold or silver. These products or objects are obtained by the use of cathodes especially prepared in order that the deposit formed thereon does not adhere, and also by the use of a vat arranged in such a manner that the deposit forming therein is sound and regular.

In the annexed drawings, Figure 1 shows the vat half in vertical section and half in elevation. Fig. 2 shows the apparatus half in horizontal section, half in plan view, as seen on the lines 1 2 3 4 of Fig. 1. Fig. 3 is a transverse section on line 5 6 of Fig. 2. Fig. 4 is a side view, and Fig. 5 an edge view, of the cathode-holding case.

The cathodes used have any form convenient for the objects to be made. In order to prepare them, I take any metal or alloy, on which I deposit another metal which is not attackable by the solution in which I shall have to operate subsequently. Thus, for instance, in order to deposit and to form an object of copper I make, preferably, a deposit of platinum on my cathodes. For an object of silver I make a previous deposit of nickel or of gold on my cathodes.

The cathodes being prepared, as hereinbefore indicated—that is to say, platinized, nickelized, gilded, or coated with other metal capable of sufficiently occluding hydrogen for the purpose specified, platinum, nickel, or gold being suitable, according to the case—they are saturated at their surface with hydrogen before putting them into use in order to prevent the deposit of metal which will be made subsequently from adhering to

them. For this purpose I place them in a receiver containing an acidulated or alkalinated solution. They are at the negative pole, and I surround them with anodes insoluble in the bath and connected with the positive pole. I then pass during two or three hours a current the difference of potential of which must be of at least two and one-half to three volts. At the end of this period of immersion the cathodes are taken out and polished. They are then finally ready to be used.

In the figures of the drawings the cathodes *d d* are flat—that is to say, they have the desired form for obtaining sheets of metal. For obtaining the latter, as well as objects of any forms, I use a receiver or vat *a*, in which there are arranged receivers, formed by a wooden framing *b* and flannels *c c*. A cathode *d* is placed in the interior of each of these receivers, which are intended to prevent any foreign bodies in suspension in the bath from attaching themselves to the cathode, and consequently producing faults in the deposit.

The cathodes *d d* are each suspended on one of the metallic cross-bars *g g*, resting at their extremities on electrical conductors of the same pole *i i*, (negative pole,) resting themselves on a framing *f*, mounted on rods *h h*, in order that they may receive a to-and-fro movement by means of any mechanism—*z*, for instance. While it is preferred to connect both rods or conduction *i* to the dynamo, this is not essential. This arrangement allowing of the to-and-fro movement prevents the polarization on the cathodes and prevents also the gas disengaged in the bath from attaching itself thereon, which would have as a result the formation of a deposit of granular surface.

The anodes *j*, placed on each side of the cathodes, are suspended on the metal cross-bars *k*, resting at their extremities on the electric conductors of the same pole *m m*, (positive pole.)

The conductors *i i m m* are connected to any source of electricity *x*.

For the formation of an object of only one metal it is sufficient to allow the deposit to accumulate a more or less long time, according to the thickness which this object is to have.



For obtaining an object in silver-plated metal and polished I take a cathode polished and prepared by the before-indicated means. I dip it into a silvering-bath contained in a vat similar to that described, and I leave the cathode a more or less long time in this bath, according to the thickness of the silver layer which is to cover the non-precious metal. When the thickness of the silver is obtained, I take the cathode from the silvering-bath, wash it, and dip it then into the bath of the non-precious metal to form the body of the object, and this immersion will also be more or less prolonged, according to the thickness of the object. The cathode is then taken out, washed, then again silver-plated to obtain two silver-plated faces, or simply washed, then dried, if one side is to be kept uncovered with precious metal. When dried, the deposit is then taken from the cathode with the same facility as one could take a wet sheet of paper off a glass plate. One has only to trim the borders in order to have the object ready for the market.

For the manufacture of hollow bodies the form of which would oppose the removal of the cathode I use for forming the body of the cathode a metal or alloy fusible at a low temperature. Then by electrolysis I coat this cathode with a light layer of copper, which I cover then with nickel or platinum or any other metal not attackable by the baths which I shall have to use subsequently. I operate then as is indicated previously for the finishing of the preparation of the cathode and for the deposit of the metal to form the object. In order to remove the cathode, I melt the fusible metal or alloy at a low temperature and tear out the coating of copper and nickel or of platinum left in the interior of the object.

Having now described my invention, I claim in a process of direct manufacture by

electrolysis of sheets or objects of polished metals—

1. The method of preparation of the cathodes consisting of depositing on them a thin layer of a metal capable of occluding hydrogen which is not attackable by the solution in which the cathode will be subsequently employed; subsequently saturating with hydrogen the surface of the thin layer of the metal, with which one has previously coated the cathodes in order to prevent the adherence of the metallic deposit to be afterward made, and lastly polishing the surface of the cathodes in order to obtain deposits equally polished.

2. The process which consists in first saturating the surface of a cathode which is of metal capable of occluding hydrogen with hydrogen, electrocoating the cathode with metal, and then stripping the deposit from the cathode.

3. The combination of a vat, anodes, one or more cathodes suspended on cross-bar *g*, conductors *i* on which bars *g* rest, a vibratory frame supporting conductors *i*, and means for vibrating said frame.

4. The process consisting in coating a cathode of metal fusible at a low temperature with copper, coating the copper with a metal capable of occluding hydrogen and not attackable by subsequent baths to be used, hydrogenating and polishing the surface of the cathode, electrodepositing metal thereon, removing the fusible core by melting, and stripping the layers of metal first deposited on the cathode from the layer on said first layers.

In witness whereof I have signed this specification in presence of two witnesses.

EMILE LOUIS DESSOLLE.

Witnesses:

EDWARD P. MACLEAN,  
LEON BORANIET.