H. LACROIX.

ELECTROLYTIC CELL FOR SEPARATING CONSTITUENTS OF A MIXTURE OF METAL OR AN ALLOY.

APPLICATION FILED JULY 2, 1908.

912,859. Patented Feb. 16, 1909.

Fig. 1.

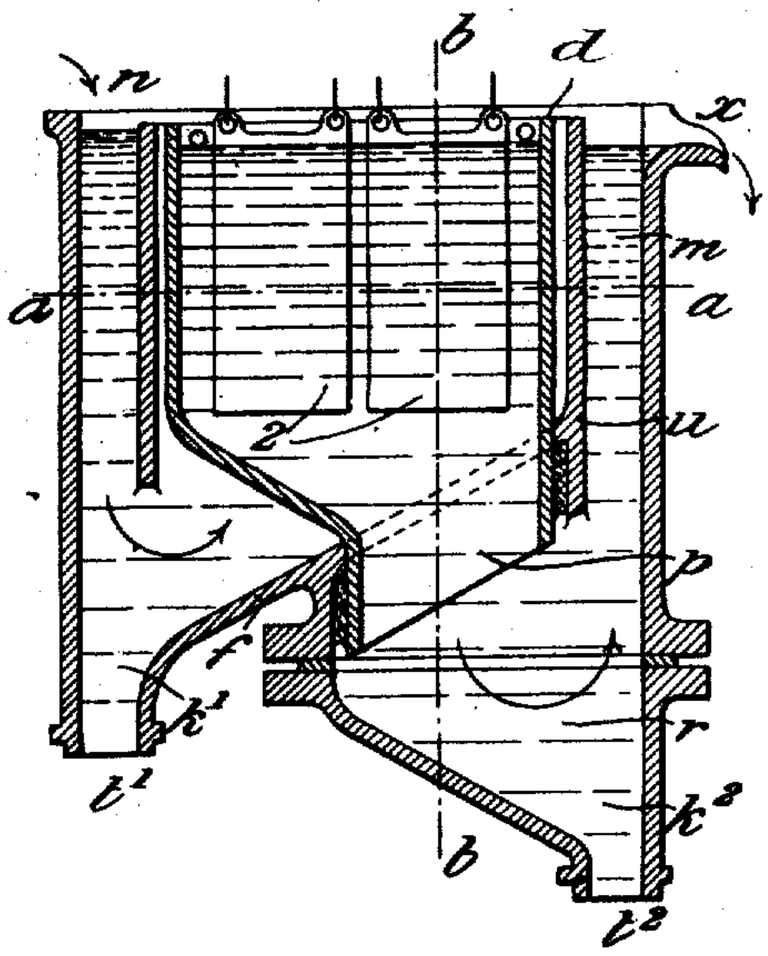


Fig. 3.

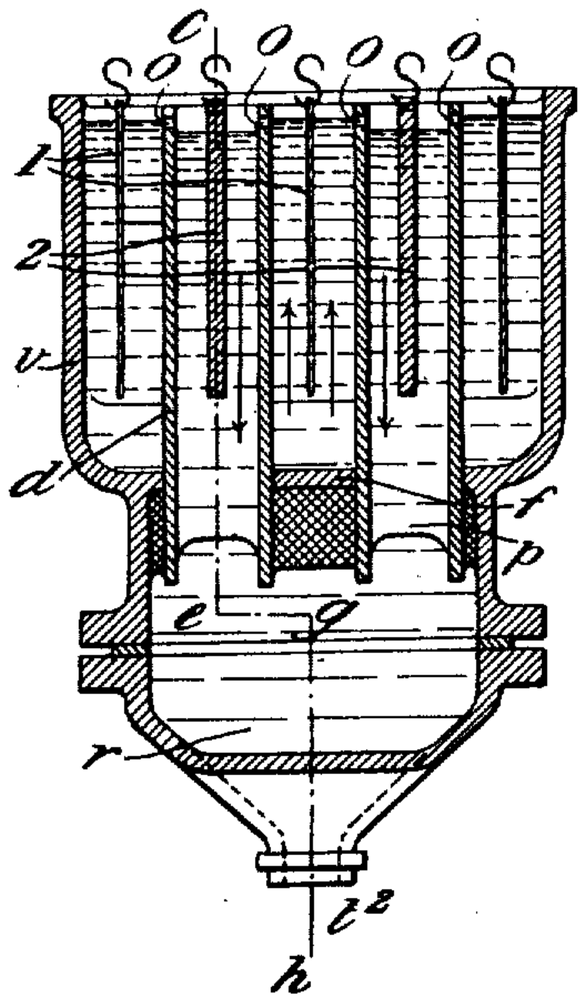
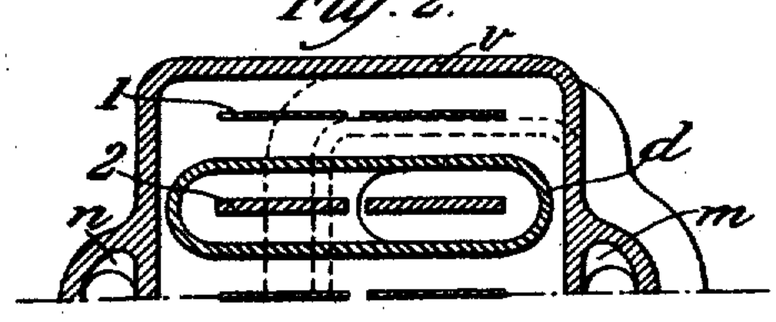


Fig. 2.



WITNESSES

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UNITED STATES PATENT OFFICE.

HENRY LACROIX, OF GENEVA, SWITZERLAND, ASSIGNOR TO USINE GENEVOISE DE DEGROSSISSAGE D'OR, OF GENEVA, SWITZERLAND.

ELECTROLYTIC CELL FOR SEPARATING CONSTITUENTS OF A MIXTURE OF METAL OR AN ALLOY.

No. 912,859. Specification of Letters Patent. Patented Feb. 16, 1909.

Application filed July 2, 1908. Serial No. 441,709.

To all whom it may concern:

Be it known that I, HENRY LACROIX, a citizen of the Republic of Switzerland, residing at Usine Genevoise de Degrossissage d'Or, Geneva, Switzerland, engineer, have invented certain new and useful Improvements in Electrolytic Cells for Separating the Constituents of a Mixture of Metal or an Alloy, of which the following is a specification.

This invention relates to an electrolytic cell applicable for separating from a mixture of metals or an alloy, used as an anode, one or more of its constituents, either for the purpose of purifying the alloy or for winning the said constituents. The cell is so constructed that the material which drops from the anode or anodes is collected separately from that which drops from the cathode or cathodes and for this purpose one of the electrodes or sets of electrodes is surrounded by a diaphragm the lower end of which opens into a chamber separate from the rest of the body of the cell.

One form of cell according to the invention is shown in the accompanying drawings in which—

Figure 1 is a vertical section on line *c*, *e*, *g*, *h* of Fig. 3; Fig. 2 is one half of a horizontal section on line *a*—*a* of Fig. 1 and Fig. 3 is a vertical section on line *b*—*b* of Fig. 1.

The cell comprises two compartments, one of which, containing the cathodes 1, is bounded by the walls of the cellular diaphragm *d* and the walls *u*, *v* and the inclined bottom *f* of the cell; at the bottom this compartment terminates in a funnel-shaped portion *k'* connected at *t'* with a pipe. The other compartment, containing the anodes 2, consists of the space within the diaphragm *d* and the lower chamber *r* into which the diaphragms extend and the inclined bottom of which forms a funnel-shaped part k^2 connected with a pipe t^2. An upward extension *m* of this chamber serves as an overflow *x*. Suitable packing around the lower parts of the diaphragms separates the two chambers.

The electrolyte is introduced through the channel *n* so that it has to enter the lower part of the cathode compartment and to rise along the cathode in order to flow through openings *o* in diaphragm *d* into the top of the anode compartment, namely the top part of the cellular diaphragms. The liquid flows downward in the latter, leaving the surfaces of the anodes, and thus passes through the passage *p* into the chamber *r*, thence to ascend the extension *m* to flow away at *x*. After filtration, if necessary the electrolyte is then returned to the cell at *n*, and so on. The heavier particles which the electrolysis detaches from the cathodes fall on to the inclined bottom *f* and collect in the pocket *k'* whence they may be withdrawn through the pipe at *t'*. The heavier particles that are detached by the electrolysis from the anodes fall through the passages *p* into the chamber *r*, whence they separate by gravity from the electrolyte, which ascends through *m;* these particles may be withdrawn through the pipe at t^2. Owing to the speed of the liquid in the extension *m* the lighter particles detached from the anodes remain in suspension and are carried away, they may be caught by a filter following the overflow.

The particles collected in the parts *k'* and k^2 may be removed in any suitable manner adapted for removing them at any moment without interrupting the circulation of the liquid or the operation of the apparatus, and without varying the level of the liquid in the cell or agitating the liquid.

By constantly feeding the cell at *n* there is attained a compulsory circulation of the liquid along the electrodes, thus maintaining a regular concentration and obtaining a uniform deposit and attack respectively over their whole surface.

In the particular form illustrated there are only two diaphragms; it is evident, however, that there may be any number; the cathodes may also be placed within diaphragms.

Having thus described the nature of this invention and the best means I know of carrying the same into practical effect, I claim:—

1. An electrolytic cell comprising an outer compartment containing an electrode and provided with a pocket adapted to receive materials liberated from the said electrode, a cellular diaphragm forming a second compartment to contain a second electrode, a chamber separated from the rest of the body of the cell and adapted to receive the lower part of the diaphragm and materials liberated from the said second electrode, and means permitting the circulation of an electrolyte along the electrodes from the lower

part of one of the compartments into the upper part of the other compartment, substantially as described.

2. An electrolytic cell comprising an outer compartment containing an electrode and having a bottom sloping downwardly to form a funnel-shaped pocket adapted to receive separately materials liberated from the said electrode, a cellular diaphragm forming a second compartment to contain a second electrode, and a chamber separated from the rest of the body of the cell and adapted to receive the lower part of the diaphragm and having a bottom sloping downwardly to form a funnel-shaped pocket adapted to receive separately the materials liberated from the said electrode, substantially as described.

3. An electrolytic cell comprising an outer compartment containing an electrode and having a bottom sloping downwardly to form a funnel-shaped pocket adapted to receive separately materials liberated from the said electrode, a cellular diaphragm forming a second compartment to contain a second electrode, and a chamber separated from the rest of the body of the cell and adapted to receive the lower part of the diaphragm and having a bottom sloping downwardly to form a funnel-shaped pocket adapted to receive separately the materials liberated from the said second electrode, with means permitting the circulation of an electrolyte along the electrodes from the lower part of one of the compartments into the upper part of the other compartment, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

HENRY LACROIX.

Witnesses:
LOUIS H. MUNIER,
AUGUSTE E. BONNA.