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WITHDRAWAL OF VAPORS AND GASES FROM GALVANO TECHNICAL TANKS

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Fig. 1.

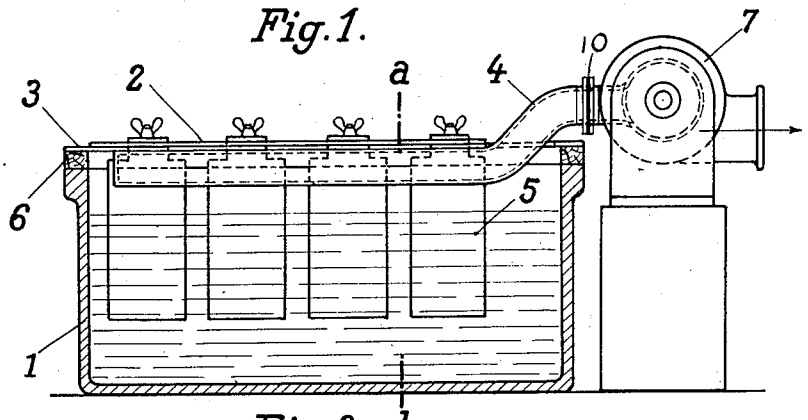


Fig. 3.

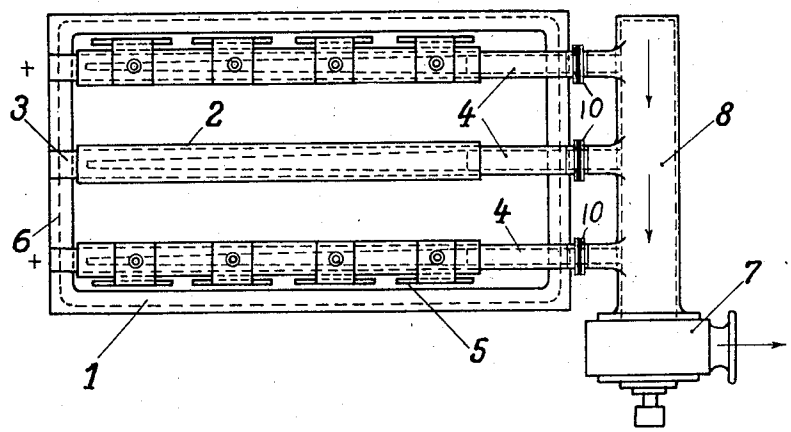
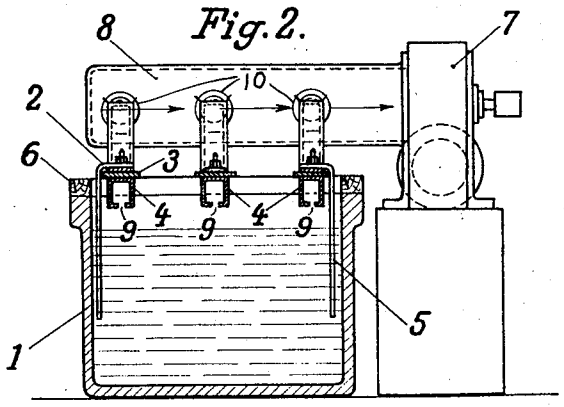


Fig. 2.



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UNITED STATES PATENT OFFICE.

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WITHDRAWAL OF VAPORS AND GASES FROM GALVANOTECHNICAL TANKS.

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My invention relates to electrolytic apparatus and it has particular relation to means for withdrawing the deleterious vapors or gases which are formed in such an apparatus during the process.

In the electrolysis of dilute solutions by currents of high densities, vapors, mists, and gases are formed which are frequently injurious to the persons employed in the vicinity of the apparatus and which also deleteriously affect the operation of the apparatus by increasing the contact resistance at the electrode leads. The vigorous development of gases at the electrodes results in the formation of a finely divided mist above the surface of the bath, which mist adversely affects the breathing organs of the operator.

It is the purpose of my invention to eliminate the injurious effect of the gases and vapors thus formed. Various means have previously been suggested to collect the gases which are liberated near the electrodes, such means comprising in some instances small tubes at the bottom of the bath, and in other instances of troughs which extend downwardly into the electrolyte for the purpose of collecting the gases. Moreover, it has been suggested that the electrodes be enclosed within a wire netting over which is placed a bag of asbestos.

According to my invention, however, the deleterious gases are positively withdrawn from the bath by the use of a suction means connected to an exhausting device. As hereinafter more fully pointed out, I employ hollow members which support the electrodes and carry the electrode leads, these members extending across the path above the level of the electrolyte and being provided in their under surfaces with holes through which the vapors or gases evolved at the several electrodes are withdrawn into the hollow members; said members being connected to a suction pipe disposed outside the tank and a suction pressure existing in this pipe through the connection of the latter to the exhauster.

For a better understanding of my invention reference may be had to the accompanying drawing wherein:

Figure 1 is an elevational sectional view of a tank used in electrolytic operations;

Figure 2 is a cross-section taken on the line *a*—*b* of Fig. 1; and

Figure 3 is a plan view of the apparatus shown in Figure 1.

The apparatus comprises a tank 1 containing the electrolyte into which latter the electrodes dip. Copper bars 2 serve for securing the electrodes, and supporting members 3 are adapted to carry the leads 2 and are made hollow so that suction passages are formed therein, these passages being connected to pipes 4. Electrodes 5 are supported from the members 3, as best shown in Fig. 2, said members resting on an insulating hollow frame 6.

An exhauster 7 is connected to a manifold pipe 8, to which latter are connected the suction pipes 4 so that when gases are generated at the electrodes—for instance oxygen being formed at the anodes and hydrogen at the cathodes—the gases can be drawn up through slots or openings 9 in the suction members 4. The possibility of these gases escaping over the edge of the tank or being mixed together is thereby avoided, and the gases themselves are drawn off positively by suction.

Insulating couplings 10 may be provided in the pipes 4, when these pipes are of conducting material and two or more of them that are associated with electrodes of different potentials are connected to a common manifold pipe 8 that is also of conducting material.

My invention is of particular advantage in processes where there is a vigorous development of gases in quantities, the gas being so eliminated that the operators around the machine are not affected. Again, the system of suction which I employ is of marked benefit where the gases formed are so heavy that they do not rise above the edge of the tank, although this latter is open.

The arrangement heretofore described for withdrawing the gases and vapors do not, in any manner, affect the usual operation of an electrolytic bath, and is of particular advantage in that the particular combination of suction pipes shown permits the maximum amount of space to be utilized for suspending the articles to be plated. Moreover, the device illustrated permits the easy removal of the articles after they have been so plated, which is not the case with those arrangements which have been suggested heretofore, since all the latter in some way provide means in the immediate vicinity of the electrodes themselves, thereby blanketing the latter and interfering seriously with the operation.

If it is desired to prevent the different gases formed at two electrodes from combining, for instance to prevent explosive mixtures, it is easy with my invention to withdraw adverse gases in separate pipes. For instance, the gases from all the cathodes may be collected in one separate pipe and drawn off by one exhauster, while the gases at the anodes may be collected in another pipe and drawn off by a second exhauster.

While I have described but two embodiments of my invention, it is obvious that many modifications will occur to those skilled in the art without departing from the spirit and scope of this invention, and therefore, I desire that my invention be limited only by the scope of the appended claims and the prior art.

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

1. In an electrolytic apparatus in which deleterious vapors and gases are developed during the operation of the process practiced therein, means comprising hollow members arranged above the electrolyte and having apertures permitting the reception of said gases, and means for positively insuring the collection of the gases developed and rising from said apparatus in said pipes.

2. In an electrolytic apparatus in which deleterious vapors and gases are developed during the operation of the process practiced therein, hollow members adapted to support the electrodes in said apparatus and extending across the latter above the electrolyte, said hollow members being provided with holes through which the gases evolved are drawn, and a suction pipe connected to said hollow members for eliminating said gases.

3. In an electrolytic apparatus in which deleterious vapors and gases are developed during the operation of the process practiced therein, hollow members adapted to support the electrodes in said apparatus and extending across the latter above the electrolyte, said hollow members being provided with holes through which the gases evolved are drawn, a suction pipe connected to said hollow members for eliminating said gases, and an exhausting apparatus connected to said suction pipe for removing said gases.

4. In an electrolytic apparatus in which deleterious vapors and gases are developed during the operation of the process practiced therein, means comprising hollow members positioned over the electrodes entirely above the submerged portions thereof so that the gases arising therefrom may be segregated in said members and prevented from mixing.

5. In an electrolytic apparatus in which deleterious vapors and gases are developed during the operation of the process practiced therein, means comprising hollow members positioned over the electrodes entirely above the submerged portions thereof so that the gases arising therefrom may be segregated in said members and prevented from mixing, and suction pipes attached to each of said electrode associated members to draw off separately the gases drawn thereinto.

In testimony whereof I affix my signature.

WILHELM ANTON FRANZ PFANHAUSER.