Sept. 30, 1930. A. ERGANG 1,776,787

NET CATHODE

Filed July 7, 1927

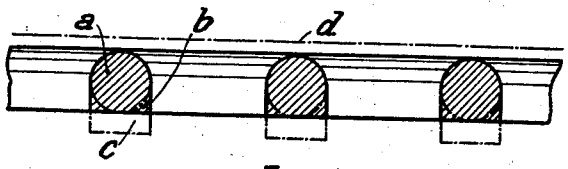


Fig. 1

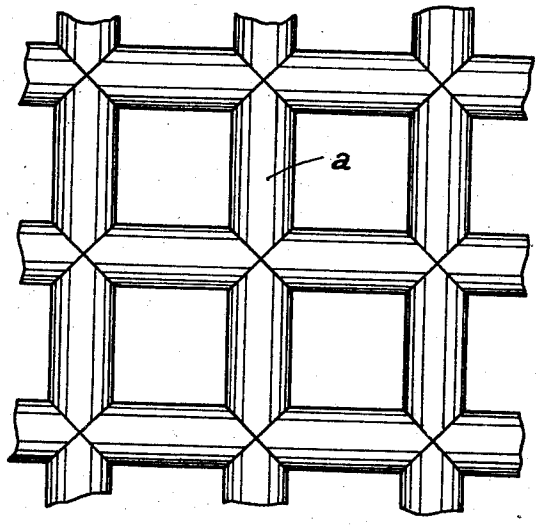
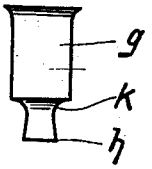


Fig. 2

Fig. 3



Fig. 4



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UNITED STATES PATENT OFFICE

ADOLF ERGANG, OF MAGDEBURG, GERMANY, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE RAGUHN-ANHALTER METALLLOCHEREI M. B. H., OF RAGUHN, I/ANHALT, GERMANY

NET CATHODE

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For electrolytic-baths or cells for electrolysis of chlorid-alkali in electro-chemistry net-shaped cathodes have been made from wire-gauze. These wire-gauze-cathodes present serious inconveniences. As the net is made of wires of circular cross section, these wires touch one another only at points. At these contact-points alterations of the resistance occur consequently, which cause the formation of sparks and lead consequently to burning of the net. As the formation of the wire-gauze is effected by bending the wires, not all the points of the surface of the net are in contact with the diaphragm above the same, whereby the electrolytic effect of the surface of the net becomes irregular, said surface becoming even ineffective at certain points. I am also aware that metallic cathode plates have ben made of sheet metal with elongated openings therethrough, and also with circular perforations. Cathode plates of such type have flat faces which are objectionable in that they buckle or bend and do not insure an effective contact. My invention provides an effective contact and the grid cathode, constructed as shown, maintains maximum rigidity, as the spaces through the plate or grid are bounded by portions and give effective contacts and greater area of surface, as the transverse and the longitudinal portions of the grid are circular in cross section.

This invention has for its object, to avoid these inconveniences connected with the commonly used wire-nets.

The longitudinal and transverse solid portion between the holes are rounded on the upper surface so that the contacting surface between the cathode-grid and a diaphragm becomes as small as possible as, owing to the junction of the solid portions with curved surfaces, grooves are produced at the points of intersection. The diaphragm therefore rests on the plane or flat surface of the grid.

This construction of the grid presents further advantage in use that the resistance conditions as a cathode are favorable as the solid portions extend in both longitudinal and transverse directions and participate at the same time in the flowing through the grid of the current, so that the electric resistance is the same in all portions of the grid, the longitudinal bars and the transverse bars participating uniformly in the passage of the current. As at no points variation of the resistance occurs, no burning of the grid can take place and as the contact-surface for the diaphragm is perfectly plane, this diaphragm is in uniform contact throughout.

The production of the grid from a plate of sheet-iron presents further the advantage that the cross section parts of the bars may be enlarged at will in comparison with wire nets.

An embodiment of the invention is illustrated, by way of example, in the accompanying drawings, in which:

Fig. 1 shows the net in cross section.

Fig. 2 is a top plan view of Fig. 1.

Fig. 3 shows the punch in a plan view seen from below.

Fig. 4 is a side elevation of the punch.

The circular cross section *a* in Fig. 1 corresponds to the cross section of a wire-gauze. When the height of the grid is the same in the sheet-metal-net as in the wire-net the surface *b* in Fig. 1 in the stamped net is further available as current conducting cross section. The cross section of the bars may however be further increased in downward direction by means of the surface *c* in Fig. 1, the useful top-surface being not altered thereby so that, with bars of the same width as wires, a considerably greater passage-cross section for the current is obtained than with wires.

The diaphragm *d* is in contact with each bar along a line so that almost the entire curved surface of the bar is free for the electrolytic-effect.

The improved net may be made from a plate of sheet-metal with the aid of a punch which, when punching the hole, produces simultaneously the curvature of the bar.

The punch is shown in Figs. 3 and 4.

It consists essentially of a square shaft *g* with an extension *h* of smaller cross section and slightly enlarged towards the point. The extension *h* merges into the shaft *g* gradually by a chamfer *k* designed to produce the curvature of the bar at the depression of the punch.

The cathodes made from sheet-metal pre-

sent the further advantage that they can be fixed in the bath in a simple manner by folding over the outer edges.

I claim:

1. A grid or lattice having longitudinal and transverse integral members for use as a cathode, said members being spaced to encompass rectangular openings, such members having semi-circular portions on one side except at their grooves or points of juncture, the sides being parallel beyond the semi-circular portions, the faces opposite said semi-circular portions being plane surfaces.

2. A grid cathode comprising integral longitudinal and transverse members, a portion thereof being convex in cross section, said convex portions being groined at their junctions, the opposite portions of said members having flat surfaces which are on the same plane with each other.

3. A grid-shaped cathode for electrolytic baths, consisting of longitudinal and transverse connected bar-like members, the upper portion of which are convexedly curved or rounded and located on the same plane, the sides thereof joining opposite faces which are on the same plane, and provide a flat surface for engagement with a diaphragm.

In testimony whereof I affix my signature.

ADOLF ERGANG.