

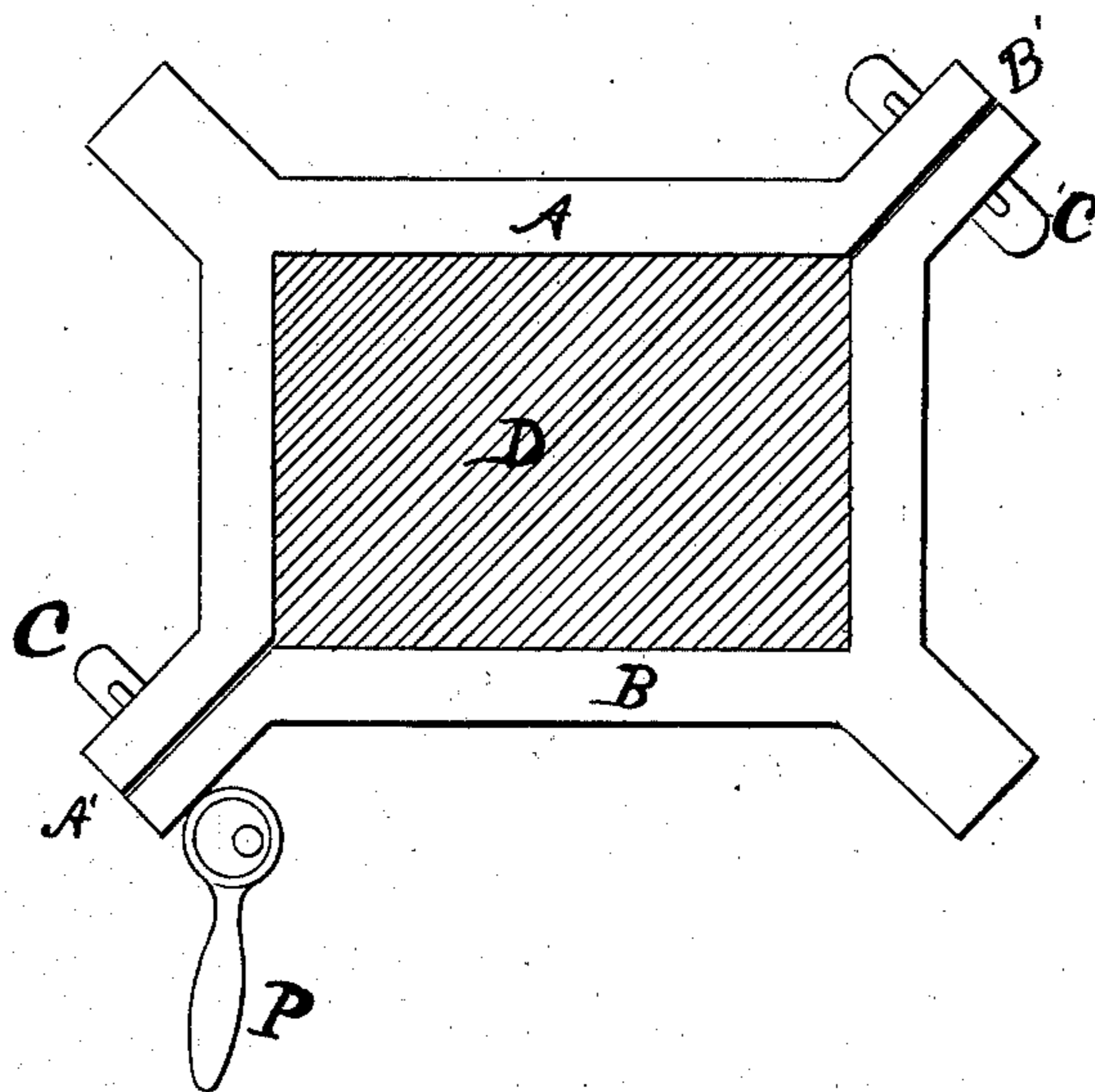
(No Model.)

A. MICHAUD.

PROCESS OF AND MEANS FOR PHOTO-ENGRAVING METALLIC PLATES.

No. 254,998

Patented Mar. 14, 1882.



Witnesses:

1. *Cliff M. Benson*
2. *Albert Moreau*

Inventor

A. J. Michaud

UNITED STATES PATENT OFFICE.

ALFRED MICHAUD, OF PARIS, FRANCE.

PROCESS OF AND MEANS FOR PHOTO-ENGRAVING METALLIC PLATES.

SPECIFICATION forming part of Letters Patent No. 254,998, dated March 14, 1882.

Application filed September 3, 1881. (No model.) Patented in France July 11, 1881.

To all whom it may concern:

Be it known that I, ALFRED MICHAUD, of Paris, France, have invented a Process of Engraving Metallic Plates to be used for Printing and Ornamental Purposes; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the annexed sheet of drawings, making a part of the same.

My invention relates to a new process of engraving, consisting in the use of special metallic plates, which I shall afterward describe. The application of these plates (for which I have filed an application at the same time as the present one) is effected by a process known as "photo-engraving," and which I call "galvano-engraving" or "physical engraving," and which I will now proceed to describe.

Supposing it be desired to make an engraving on no matter what scale, after nature or after a painting or a pen or pencil drawing, &c., I proceed as follows: I either, having previously prepared a suitable supply of my metallic plates, which have the smoothness and polish of glass, and having obtained a photographic negative of the subject to be engraved on a glass plate, cover one of the said polished plates with a bichromated gelatine film, place the photographic negative upon it, and expose them to the light. The action of light renders the gelatine insoluble, so that when the negative is removed and the gelatine plate washed all the gelatine on the surface of the plate will be removed, except the duplicate of the lines or tracings of the photograph, which will remain in relief on the said polished plate. Or on the photographic negative itself, covered with gummy varnish mixed with one per cent. of bichromate of potash, I pour a determined quantity of bichromated gelatine. This is then allowed to dry, its back is exposed to the light, and on being subsequently developed in warm water it gives the gelatine proof in relief. When dry this proof is placed for some hours in a damp place. For instance, it may be shut up in a box, at the bottom of which is placed wet paper. This wet paper is separated from the proof by a row of glass tubes. The proof is then coated with plumbago, laid on with a brush, after which it is applied to a

melted alloy placed in a special vessel. This alloy is then subjected to an ordinary pressure, and on cooling produces a hollow metallic plate or mold, ready to be printed. The fusible alloy which I preferably employ consists of bismuth, tin, lead, and mercury, in proportions varying according to the degree of hardness desired to be obtained in the mold.

The special vessel used to contain the melted metal is constructed as follows: It is made in the form of a frame, A B, (see the accompanying drawing, showing a plan view,) jointed at A' and B' by means of cross-pieces C, provided with wedges. The cross-piece shown at B is furnished with an eccentric handle, P, so that the two halves of the frame may be joined at will. Between these two halves is placed a smooth and strong metallic plate, which serves as a bottom, D. The liquid metal is poured into a vessel thus constructed, and the gelatine proof is immediately applied on the said metal, and the whole being covered by a second thick metallic plate, which closes the vessel, it is put under momentary pressure. When the metal has cooled the frame is removed, so as to separate the two iron plates containing the proof and the metallic mold produced by said proof, and which are easily separated one from the other.

The hollow mold of fusible metal thus obtained is quite ready for printing—that is to say, it can be used for producing, first, transfer on stone; second, transfer on metal for obtaining either typographic blocks by the ordinary means or hollow plates by the photo-chemical process; but if this metallic mold be placed in a galvanic bath of copper a relief is obtained capable of reproducing galvanically an indefinite number of hollow metallic plates, which may either be silvered or gilt and used as mock jewelry; or it may be used for copper-printing.

To return to the proofs obtained by the use of bichromated gelatine. These proofs are of two kinds. If the photographic negative used represents merely outlines, it may be employed at once without any preparation. If, on the contrary, it represents a photograph taken from nature or from a half-tone drawing or painting, it is first of all covered with a thin film, which produces the grain of the impres-

sion, and which is transferred by insolation to the gelatine proof, and consequently to the plate from which the print is produced. I produce the said grain as follows: I uniformly cover a
5 piece of glass, of variable dimensions, with a gummy liquid, and I introduce this piece of glass into a box or case containing the opaque powder which forms the grain, and which box or case has been previously well shaken in
10 every direction. By means of the type or types thus made I insolate a sheet of paper treated with colored and bichromated gelatine. I apply this sheet on the photographic negative, which is covered with bichromated gum var-
15 nish, and I develop the same in warm water, which draws off the non-insolated gelatine, leaving the insoluble parts which form the grain. It is evident that in place of this uniform grain it is easy to produce another grain for photo-
20 graphic negatives, either by artistic work or mechanically, by using metallic wires, &c.,

combined in various ways, so as to produce the kind of engraving which is indispensable in copper-printing.

I claim—

1. The combination, with the frame A B, pro-
25 vided with the slotted and jointed ends A' B', and the removable plates D, of the slotted cross-pieces C, provided with wedges, and the eccentric handle P, substantially as and for 30 the purpose set forth.

2. The process herein described of producing a metal mold in relief, consisting in applying a gelatine bichromatic proof, formed by the process above described, to the surface of a
35 melted alloy in a close vessel and subjecting it to pressure, as set forth.

ALFRED MICHAUD.

Witnesses:

ROBT. M. HOOPER,
ALBERT MOREAU.