UNITED STATES PATENT OFFICE.

GUSTAVE HUBMANN, OF NEW YORK, N. Y., ASSIGNOR TO FELIX MARX, OF SAME PLACE.

IMPROVEMENT IN THE PROCESSES OF ORNAMENTING MARBLE AND SIMILAR SURFACES.

Specification forming part of Letters Patent No. **199,366**, dated January 22, 1878; application filed August 16, 1875.

To all whom it may concern:

Be it known that I, GUSTAVE HUBMANN, of the Republic of France, but temporarily residing in the city of New York, United States of America, have invented and produced a new and original method for the adhesive incrustation of any kind of metal upon marble, hard stones, granite, porcelain, and glass, and also upon all species of stones, by the galvano-plastic process; and I do hereby declare that the following is a full, clear, and exact description of said invention.

To produce the engraving, I take a block of marble upon which I wish to make an incrustation, being an ornament, figure, or any other subject, and employ the following means:

First, by cleaning carefully the block of marble, so that no oil or grease may impede the process of operation.

Second, by placing the same out of the light, and pouring upon it a varnish composed of bichromate of potassium and gelatine.

Third, when the varnish is dry, I take the design which I intend to reproduce upon the marble and pour upon it another varnish of benzine, which renders the paper of the design transparent.

Fourth, I then apply the design to the marble, expose it to the light—about one-fourth hour to the sun and one hour to a diffused light.

Fifth, after the lapse of this time, I then withdraw the design, and pour upon the marble a little spirits of wine. This has the effect of hardening those parts which have not been struck by the light.

Sixth, I then immediately place the marble into hot water, and, after a few moments, all that which has not been struck by the light will detach itself, and will form the design similar to the model.

Seventh, in order to obtain the engraving, I either place the marble in an acidulated bath, or I pour upon it the same liquid, taking care to put around the edges of the block of marble a border of wax, to prevent the liquid from running over.

Eighth, more or less of depth will be obtained, according to the time that the liquid is allowed to do its work.

Ninth, when I judge that the engraving upon the marble is deep enough, I wash it in fresh water, and pour benzine immediately over it, which has the effect to take off the varnish which had been struck by the light, and thereupon the engraving will appear clear and pure.

The whole process of engraving thus far described is old, and I do not claim it.

First, to form the incrustation, I put, with a brush, a varnish or epargnes into all the engraved parts, and I brush the whole with a soft brush, using plumbago.

Second, in order to give it the required adhesion, so as to go through the operation of engraving—that is, hand-engraving, where the graver is employed after the metal has been deposited—I run a thin copper wire, or wire of the metal to be deposited, inside on the bottom of the acid-engraved parts, covering holes which have previously been drilled, and then force a rivet of the metal to be deposited into the holes, forcing my thin wire in with it, so that the galvano-plastic incrustation will form body with the marble, and obtain an equal and well-regulated current in all the parts at the same time, the wire acting as conductor, as well as metalizer and consolidator.

Third, I then place the block so prepared in a bath of a light current, and the metal will at once precipitate into the engraving, and, as soon as it touches the wire, it will form one body with the same.

Fourth, I leave the block in the bath until a convenient thickness has been attained, and I then subject it to a hand-polish, which makes the excess of metal to disappear up to the surface of the marble.

Fifth, as a last resort, I then polish the metal and the marble by known means, and then engrave the metal, if the design calls for it.

Sixth, it is well understood that after these different operations the metal can be gilded, silvered, plated, &c., by any known means.

I am also aware that securing adhesion between electro-deposited metals and the body-substance by means of rivets or strips and

screws of copper or other metal corresponding with that to be deposited is not new; but

What I claim as my improvement in producing damaskeen-work on marble and analogous substances is—

In the process of electroplating designs in stone and analogous substances, the method of securing perfect adhesion between the metal and stone by means of wires of copper, or of the same metal to be electro-deposited, applied along the bottoms of all the engraved portions of the stone, and secured therein by means of rivets of the same metal, substantially as and for the purposes set forth.

Dated New York, August 13, 1875.

GUSTAVE HUBMANN.

Witnesses:

MARCUS J. WALDHEIMER,

M. I. FRIEDLANDER.