

UNITED STATES PATENT OFFICE.

FREDERICK WINTERHOFF, OF LONDON, COUNTY OF MIDDLESEX, ENGLAND.

PROCESS OF ETCHING OR ENGRAVING ON GLASS, &c.

SPECIFICATION forming part of Letters Patent No. 411,560, dated September 24, 1889.

Application filed January 12, 1888. Renewed May 2, 1889. Serial No. 309,412. (No specimens.) Patented in England May 3, 1886, No. 5,978.

To all whom it may concern:

Be it known that I, FREDERICK WINTERHOFF, a subject of the Emperor of Germany, and a resident of London, in the county of Middlesex, England, have invented certain new and useful Improvements in the Processes of Etching or Engraving on Glass and Like Substances, (for which I have obtained a patent in Great Britain, No. 5,978, dated May 3, 1886,) of which the following is a full, clear, and exact specification.

My invention relates to a process of etching, &c.

Heretofore glass and other surfaces have in some cases been etched by first covering the surface with a protecting coating, then removing parts from the protecting coating where the glass or other surface is to be etched or eaten away, and then etching out the exposed surface with fluoric or other acid. Glass and other surfaces have also been coated with a solution of a substance—such as asphalt—which is rendered insoluble when acted on by light. A photographic negative has been placed over the coated surface and exposed to light. Part of the coating has so been rendered insoluble. The remainder has been dissolved away, and the parts of the glass or other surface so left exposed have been etched or eaten away with fluoric or other acid. These processes are slow and costly.

By my invention I am able to greatly increase the rate at which etched work can be produced.

For engraving or etching upon glass or upon brass, copper, zinc, or other metal plates, or upon marble, granite, or other substance which can be eaten away by acid, I first clean the substance or article to be etched and coat the same with a solution of asphalt, bichromate-black, or any other substance affected or hardened by exposure to sunlight and which is impervious to acids, and allow the same to dry in the dark. Preferably I use a solution made by dissolving about four pounds of finely-powdered asphalt in three pints of spirits of turpentine, boiling it gently for about three hours, and then adding and well

stirring in half a pint of spirits of turpentine. Afterward the solution should be filtered through muslin while hot, and should be kept in stoppered bottles away from the light. I also draw or engrave the matter to be etched on a lithographic stone or on a zinc or steel plate, or otherwise form a printing plate, block, or stamp, with which copies of the design or pattern to be etched can be printed. I then print with printing-ink from the stone or plate or block onto lithographic transfer-paper as many impressions as are required of the matter to be etched. I then transfer the printed matter from the transfer-paper onto the coating on the article. I then dust or cover the transferred matter over with bronze-powder, gold or other metal leaf, or any finely-ground powder which will obstruct the passage of light, and then carefully wash it, when it will be found that the bronze-powder or whatever else is used has adhered only to the printed matter and forms above it a surface impervious to light. I then place the article with the coated side toward the sunlight, the result being that the exposed surface of the asphaltum coating is hardened; but the portion covered by the bronze-powder, being protected from the action of the light, remains soft. I then with a stiff brush and paraffine-oil brush out the soft portion, which is the printed matter required to be etched, and it is then ready for acidifying in the usual way, the remaining hard portion of the coating being removed afterward by a soda bath or by turpentine, or in other ordinary ways.

If the design or pattern to be engraved is of a broad distinct nature, a fairly good result can be obtained even when the transferred printer design is not afterward coated with the bronze or other powder; but in all cases I prefer to use the bronze or other powder, as far better results are obtained by its use.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is—

The process of etching, consisting of coating the article with an acid-resisting sub-

stance, then transferring off a printed design
or picture onto the coated surface from trans-
fer-paper, and then dusting over or covering
this transferred design with metal leaf or
5 with bronze - powder or other finely - ground
powder which will obstruct the passage of
light, and subsequently exposing the surface
to light and dissolving out such parts of the
coating as are not thereby rendered insoluble,
10 then etching out the exposed portions of the

surface by means of acids, substantially as
described.

In testimony that I claim the foregoing I
have hereunto set my hand this 12th day of
August, 1887.

FREDERICK WINTERHOFF.

Witnesses:

SILO HERMANN KELLER,
HENRY BEAL.