

# UNITED STATES PATENT OFFICE.

WILLIAM C. NORMAN, OF SYDNEY, NEW SOUTH WALES.

## BLOCK FOR ENGRAVING OR ETCHING UPON.

SPECIFICATION forming part of Letters Patent No. 384,586, dated June 12, 1888.

Application filed December 11, 1885. Serial No. 185,344. (No model.) Patented in England September 15, 1884, No. 12,426; in New South Wales February 24, 1885, and in Victoria October 9, 1885, Nos. 4,267 and 4,268.

*To all whom it may concern:*

Be it known that I, WILLIAM CHOLMONDELY NORMAN, printer, a subject of the Queen of Great Britain, residing at Sydney, in the British Colony of New South Wales, have invented certain new and useful Improvements in Blocks or Surfaces for Engraving or Etching Upon, (for which Letters of Registration of the British Colony of New South Wales, dated the 24th day of February, 1885, were granted to me for fourteen years for such parts of the said invention which were then invented, for which a British patent, dated September 15, 1884, No. 12,426, was granted to H. H. Lake for similar parts of the invention, and for which applications for patents for the British Colony of Victoria were lodged the 9th day of October, 1885, Nos. 4,267 and 4,268, and which applications, when granted, will bear such date and numbers,) of which the following is a specification.

This invention relates more especially to the production of blocks or surfaces for typographical purposes; but it will be found useful in all those kinds of engraving or etching in which parts of the surface are covered with a substance that will resist the action of the etching material.

My invention has been specially devised to minimize the risk of the fine-line parts of the covered or drawn design being undermined and etched away, and also to lessen the time occupied by the etching process and to produce an etched block or surface having a background of a prearranged design.

My improved block or surface for engraving or etching upon has an etching-surface or veneer superposed either by cementing or combining on or adhering to a second prepared surface or block, which latter will more stubbornly resist the action of an etching material than the former. These blocks or surfaces I manufacture in either of the ways hereinafter set forth.

Any material or substance which is capable of being etched or eaten away by another material or by electricity of being formed into a veneer or very thin coating and of adhering to a "second" material not affected or only slightly affected by the same etching, or

"third" material, or by electricity, may form the superposed or "first" surface to be engraved upon or etched, while the second would be prepared in or with a design and form the second under or "back-tint" surface.

I manufacture my improved block or surface for engraving or etching upon by preparing the design for the second or under surface in reverse upon the reverse side or back of the sheet or veneer of first material, preferably zinc, to form the superposed part or surface of the block, and precipitate by electricity, in any well-known manner, the substance or second material, preferably copper, to form the back tint, and, either before or after engraving or etching, mount the combined surfaces "type-high" upon any convenient material. One way in which the design of the back tint is prepared is by indenting the back of the "surface" by means of a roulette or other instrument or machine, indenting, say, ten thousand dots to the square inch, and electroplating it with back-tint material. The resulting block or surface consists, then, of a thin surface of, say, zinc in which small pins or points of, say, copper are concealed. The design or picture is then drawn, transferred, or printed thereon and etched in the same manner as in that known as the "zinc process." It is in the etching process that this block appears to advantage, for the etching material or acid has only a slight depth of material to eat through before reaching the concealed tint-printing surface or back tint, and thus takes less time and minimizes the risk of under-mining.

Another method of manufacturing this improved block or surface which is equally effective may be described as follows: A sheet of material—say copper—is engraved, say, with minute V-shaped grooves at right angles to each other, thus forming pyramidal points all over it. This engraved sheet is then electroplated with the material—say zinc—to form the superposed layer, which layer is polished until the tops of the points of the under surface or copper just or almost appear through it, and it is then ready to receive the picture and to be etched, being mounted or backed before use in the printing-press. Under the

etching process this block or surface behaves in the same manner and gives the same results as that just before described.

A second modified method of manufacturing this block or surface is by electroplating or stereotyping any suitable material—say copper—upon an embossed, engraved, or suitably-prepared matrix to such a thickness as will enable it to be stripped off. It is stripped off and the material—say zinc—to form the superposed layer electroplated or precipitated upon it, and the block or surface finished as before described and used in the same manner.

It is to be understood with reference to the metals zinc and copper, which I have mentioned as forming the two "materials" of my block, that any two metals or alloys or substances having the same respective relative qualities to a third etching substance, and which will adhere or may be made to adhere together, may be substituted for said zinc and copper, and it is also to be understood that any design having dots, lines, or other figures or forms may be prepared as the back tint upon the second material, and that any kind or combination of the designs or forms mentioned may be used, and that they may be made of any height or depth; but I do not consider that making them of any height or depth less than one three-hundredths part of an inch would be found practicable, and I prefer for ordinary commercial purposes to make this height or depth, say, one one-hundredth part of an inch.

The improved block or surface, being prepared in either of the ways hereinbefore described, consists of a compound sheet, which for typographical purposes it is necessary to mount or "back," and this I do in a novel manner, thus: I take the compound sheet, make its under surface chemically clean, and then "tin" or coat it with a layer or film of tin or other solder, in any well-known manner. I prepare a sheet of type-metal or of other alloy of the required thickness by "tinning" or coating one surface in a similar manner. The tinned or soldered surfaces of these two sheets are placed together and heated, and then subjected to pressure in, say, a screw or other press. The degree of temperature to which these plates are raised must be sufficient to melt the tin or solder and yet not injure the compound sheet or back sheet. Should the solder used be liable to amalgamate with and to the detriment of either of these plates, I coat such plate with a surface or film of copper before I tin it.

A modification of my improved block or surface for engraving or etching upon consists of a sheet or mass of material in which are embedded separately-arranged particles or quantities of material offering more stubborn resistance to the etching material than does the material of said sheet or mass.

Any material or substance which is capable of being etched or eaten away by another material or by electricity may form the sheet or

mass or surface, or first material, and in it may be embedded (in prearranged design or figure) any other material not affected or only slightly affected by the same etching material or by electricity to form the back tint or second material. I prefer to embed strips of copper or dots of copper in a bed of zinc; but any two metals or alloys or substances having the same relative qualities as these to a third etching material might be used. To manufacture this modification I take a block or a comparatively thick sheet of zinc and indent its upper or printing surface with dots by a roulette roller or other means, or engrave it with lines, say about one hundred lines or lines of dots to the linear inch, and upon or in such indentations, after making them chemically clean, I precipitate copper by any well-known electroplating process, and remove the surplus copper from the face by polishing until the plate is perfectly clean and the deposited material or copper only visible in the hollows or indentations of the bed. The after-polishing or most of it could be obviated by coating the bed or zinc with copper-plate-engraver's ordinary etching-ground, or such like substance, which is removed from those parts where copper is required by the indenting or engraving previously mentioned, by which means the copper is prevented from adhering to those parts where it is not required.

The resulting block or surface, consisting of a surface of zinc in which are embedded minute dots or cylinders or very thin strips or tongues of copper, is mounted or backed type-high upon or with any suitable material, such as type-metal, wood, &c., or in the manner hereinbefore described, and is then ready for use, and is used in the same way as previously set forth with regard to my first block, and the etching material used easily and quickly etches the zinc away, while it has very little or no effect on the copper, and thus the "whites" of the zinc are quickly eaten away, while the dots or lines of copper to form a back tint remain intact, so that the etching takes less time and it is not required of such a depth as will bring about a risk of undermining.

Having thus particularly described and ascertained the nature of the said invention and the manner in which the same is to be used and performed, I would have it understood that I do not confine myself to the precise details herein set forth, so long as the nature of the said invention be retained; but

What I believe to be new, and therefore claim, is—

1. An improved block or surface for engraving or etching upon, consisting of an etching-surface and an acid-resisting stippled film submerged below the upper etching film or surface, substantially as set forth.

2. An improved block or surface for engraving or etching upon, consisting of a surface sheet or mass of material in which are embedded separately-arranged quantities (such as dots, strips, &c.) of another material offering

more stubborn resistance to the action of a third material that will etch said surface or first material, substantially as herein described and explained.

5 3. An engraving block or surface comprising a plate or film constituting the etching-surface, having a design indented, engraved, or otherwise sunk in its under face and coated with a stippled acid-resisting film, substantially as and for the purpose set forth.

10 4. The herein-described method of mounting engraving blocks or surfaces of the character

described upon a smooth sheet of metal or alloy, consisting in first coating the two surfaces which are to adhere with a film of tin or solder, 15 and then pressing them together at a temperature which will melt and affect only the solder, substantially as herein described and explained.

Dated this 30th day of October, 1885.

W. C. NORMAN.

Witnesses:

FRED WALSH,

HENRY R. CHATER.