No. 896,881. PATENTED AUG. 25, 1908.

E. ALBERT.

PROCESS FOR MAKING METAL MATRICES.

APPLICATION FILED OCT. 4, 1906.

Fig. 1.

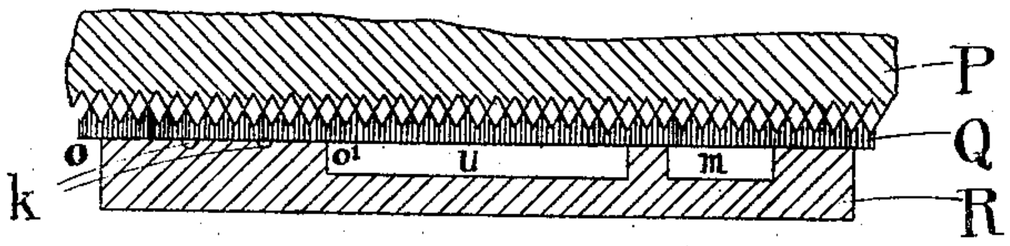


Fig. 2.

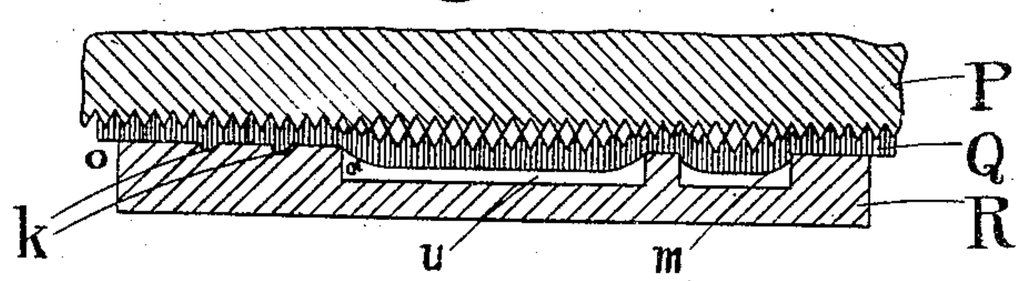
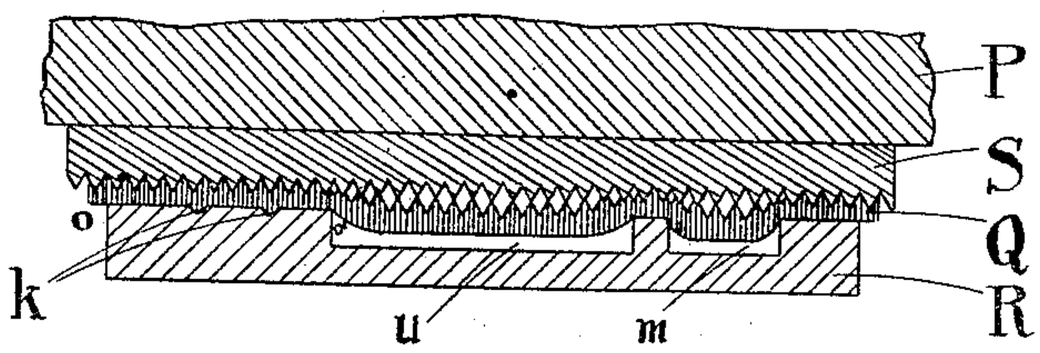


Fig. 3.



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UNITED STATES PATENT OFFICE.

EUGEN ALBERT, OF MUNICH, GERMANY.

PROCESS FOR MAKING METAL MATRICES.

No. 896,881. Specification of Letters Patent. Patented Aug. 25, 1908.

Application filed October 4, 1906. Serial No. 337,421.

To all whom it may concern:

Be it known that I, EUGEN ALBERT, a subject of the Emperor of Germany, residing at 55 Schwabingerlandstrasse, in Munich, in the Empire of Germany, have invented certain new and useful Improvements in Processes for Making Metal Matrices, of which the following is a specification.

This invention relates to a process for the production of matrices for the reproduction by electro deposition of printing blocks or forms, wood blocks, autotypes, and the like, and has for its object to render the process more effective and to avoid the heavy pressures which have been necessary hitherto.

In molding metal matrices of half tone blocks, wood cuts, types, and the like, it has been necessary to use an interlayer of such a consistency that it will allow of the metal matrix being pressed thoroughly into the deepest cavities of the original in order that such cavities shall be properly reproduced in the new block, this being necessary for printing therefrom. Such a method is set forth in my British Patent No. 8117 of 1904. By using such an interlaying substance, softer than the matrix metal the material of which is prevented from spreading sidewise, the use of great pressures is avoided and good results may be obtained. If the matrix be of lead sheet, a suitable interlayer could be formed of lead balls, or shot with means for preventing them moving sidewise; when pressure is applied the small balls would be compressed by the press platen to an even surface on those parts which are opposite the high parts of the original, but opposite the cavities of the original where there is no resistance the lead sheet of the matrix would be bent down without altering the form of the balls. This result may be obtained by various means such as grooves, corrugations, or the like and they are referred to generally in this specification as "projections" since they may be also in the form of squares or grains. A convenient projection for this purpose is made with alternate ridges and grooves on the adjoining faces of a platen and the back of the matrix respectively.

The process is illustrated diagrammatically in the accompanying drawing, in which:—

Figure 1, is a sectional view showing a platen with hard grooves and a grooved matrix of soft material before pressure is applied; Fig. 2, is a sectional view showing the alteration in the disposition of the material of the matrix after pressure is applied; and Fig. 3, shows a modification in which the hard grooved surface is formed on a separate interlaying plate.

Similar letters refer to similar parts in the several views.

In the drawings P represents the platen of a press, Q represents the material of the matrix, and R represents the original block which is to be reproduced; the recesses *u*, and *m*, represent large cavities in the block much exaggerated to explain the working of the invention while *k*, *k*, indicate small cavities.

It will be evident that if the ridges are too wide apart corresponding ridges would show themselves in the front surface of the matrix when subjected to pressure and in practice they should not be more than about 1-16th of an inch deep therefore.

The invention consists in a process of pressing with a hard surface such as P having projections thereon an adjacent back surface of the matrix block Q having projections in the soft material thereof. It will be seen on reference to the drawings that the small cavities such as *k* on the high part *o*, *o'* of a printing block are filled before the large cavities such as *u* and *m* and that the further pressure required to press the matrix into *u* and *m* with ordinary flat surfaces between the platen face and the matrix back would cause shearing of the material in the cavities *k* to the detriment of the matrix face, owing to the fact that the matrix material on the high parts under such circumstances must move sidewise to allow of the further descent of the platen; by forming projections between the adjacent surfaces of P and Q the margin of pressure required to fill the deep cavities *u* and *m* is amply provided for without any lateral movement of the material opposite the high parts of the matrix taking place, since the hard surface P of the platen resists deformation and becoming embedded in the soft material of the matrix prevents its lateral movement, and also the hollows between the projections provide space for the reception of the surplus matrix material.

Figs. 1 and 2 show a grooved platen and a grooved lead matrix before and during pressure, Fig. 2 showing plainly the additional effect of the double grooving at the wide cavity *u* while opposite the high parts *o*, *o'* of the original block the grooves of the press platen have entirely destroyed the

original form of the lead grooves and being fully embedded in the matrix material successfully prevent it from sliding aside.

As the size of the projections is limited for the reasons mentioned it would not always be practicable to lay the grooves of the hard and the soft material parallel and opposite to each other and I preferably therefore form the grooves so that when brought together they may be at an angle to each other which produces substantially the same effect, an angle of 45° to each other usually being suitable.

It is desirable to place the surfaces at an angle with each other in any case where a regular projection is adopted but this of course is not necessary where the projection on the surface is a grain, or prismatic figure.

Fig. 3 shows a modification in which the hard material projections instead of being formed on the platen P itself are formed on a separate interlaying plate S; in this case the operation is as follows:—A slab of impressionable material Q having on its back surfaces a series of projections and recesses is subjected to pressure beneath a platen P with a smooth surface; this preliminary pressure would of course not be sufficient to produce any lateral displacement of the substance of the matrix. Following this preliminary pressure a plate of hard material S having a smooth surface on one side and projections and recesses on the other is interposed between the platen P and the partially formed matrix Q, the smooth surfaces being placed together and the surface of the interlayer with hard projections against the partially pressed back surface of the matrix with soft projections; a final pressure is now exerted by the platen on the interlayer and the soft slab, and the matrix completed, the hard projections of the interposed plate preventing the lateral movement of the particles of the matrix. Preferably the projections on the interposed plate S will be at an angle of about 45° to the projections on the slab Q, as before.

It must be understood that this process is applicable to other occasions upon which it is desired to make matrices of soft metal and is not limited to the reproduction of printing blocks only.

What I claim as my invention and desire to secure by Letters Patent is:—

1. The process of producing a matrix consisting in forming a slab of impressionable material in the back surface thereof with a series of projections and recesses, laying the said slab with its back surface against a hard surface having a series of rigid projections and recesses thereon and its front surface against the surface of the original block to be copied, and subjecting the impressionable slab to pressure between the block and the said hard surface, substantially as herein described.

2. The process of producing a matrix consisting in forming a slab of impressionable material on the back surface thereof with a series of alternate ridges and grooves, laying the said surface with its front surface against the surface of the original block to be copied and its back surface against a hard surface composed of a rigid series of alternate ridges and grooves so that the grooves of the rigid surface are parallel and directly opposite to the grooves on the impressionable slab, and subjecting the impressionable slab to pressure between the block and the said hard surface, substantially as herein described.

3. The process of producing a matrix consisting in forming a slab of impressionable material on the back surface thereof with a series of alternate ridges and grooves, laying the said slab with its front surface against the surface of the original block to be copied and its back surface against a hard surface composed of a rigid series of alternate ridges and grooves so that the grooves of the rigid surface are at an angle to the grooves of the impressionable slab, and subjecting the impressionable slab to pressure between the block and the said hard surface, substantially as herein described.

4. The process of producing a matrix consisting in forming a slab of impressionable material on the back surface thereof with a series of projections and recesses, subjecting the said slab to a preliminary pressure with its back surface against a flat surface on the pressing mechanism and its front surface against the surface of the block, and then subjecting the half formed matrix to a final pressure with its front surface against the surface of the block to be copied and its back surface against a hard surface having a series of rigid projections and recesses thereon, substantially as described.

In testimony whereof I have affixed my signature in presence of two witnesses.

EUGEN ALBERT.

Witnesses:
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