(No Model.)

T. T. HEATH.

MATRIX.

No. 589,470. Patented Sept. 7, 1897.

Fig. 1.

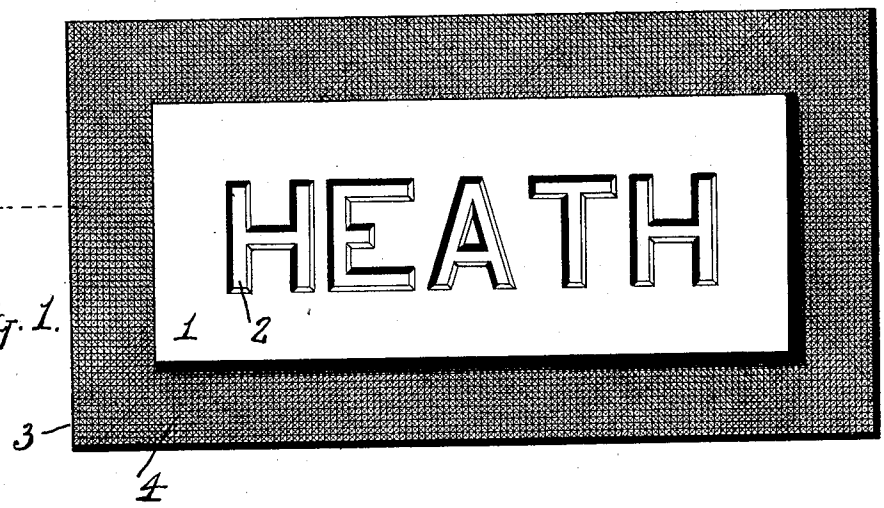
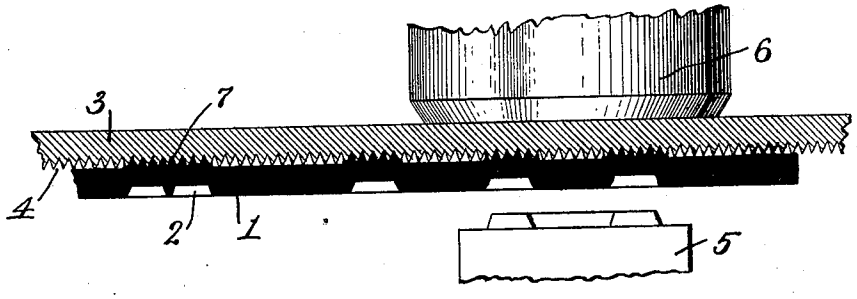


Fig. 2.



Witnesses:
E. R. Shipley.
M. S. Beldin.

Thomas J. Heath
Inventor
by James W. See
Attorney

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

THOMAS T. HEATH, OF LOVELAND, OHIO.

MATRIX.

SPECIFICATION forming part of Letters Patent No. 589,470, dated September 7, 1897.

Application filed March 17, 1897. Serial No. 627,942. (No model.)

To all whom it may concern:

Be it known that I, THOMAS T. HEATH, of Loveland, Clermont county, Ohio, have invented certain new and useful Improvements in Matrices, of which the following is a specification.

In the production of typographical matrices by impressing the types successively into the matrix material serious difficulties have been met with on account of the side flow of the displaced matrix material tending to disturb contiguous impressions. The first impression into the matrix material will yield a satisfactory result, the displacement of matrix material under the action of the punch having resulted in condensation of the material in advance of the punch, but having resulted also in a considerable side flow of the displaced material, and when the next succeeding impression contiguous to the first impression takes place there is again the condensation of material in front of the punch; but, unfortunately, there is a serious side flow of displaced material, which side flow has a disturbing and distorting effect upon the impression previously made. Such disturbing side flow has had the effect not only of distorting the face of contiguous previously-made impressions, but it has also had the effect of somewhat sliding the relief material standing between the impressions, and at the same time the face of the matrix material has been more or less disturbed, so as to interfere with the height of the face of the matrix, and it is well understood that the perfection of the face of the matrix has much to do with the character of the stereotypes or electrotypes gotten from the matrix, an imperfect face requiring the building up of the lands or a corresponding routing of the stereotype or electrotype, if clean typographic plates are required. Therefore in the matrix-making art a great desideratum has been to find a matrix material which by its inherent nature was not open to the objection of serious side flow and surface disturbance. Many more or less satisfactory matrix materials have been proposed and produced. It may be stated that sheet-lead fairly illustrates the worst material for matrix purposes as matrices are ordinarily produced, it being considered practically impossible to produce an anywise satisfactory matrix in this material. In my improved system I can deal with most any material, be it metal or paper, which is adapted to receive an impression from matrix-making punches, and even lead will, under my system, produce a perfect matrix. In my system I provide recesses at the rear of the matrix, into which recesses the impressing-punches may produce a direct rearward flow of the matrix material in conjunction with such degree of condensation of the material in front of the punch as is necessary to secure a perfect impression at the face of the character, and the system yields matrices in which the lands or matrix-faces are in the best possible condition.

My invention will be readily understood from the following description, taken in connection with the accompanying drawings, in which—

Figure 1 is a front elevation of an impressed matrix illustrating my invention; Fig. 2, a horizontal section of a portion of the same, on an enlarged scale, in conjunction with the faces of an impressing-punch and resisting-anvil.

In the drawings, 1 indicates a sheet of any suitable matrix material, be it paper, wood, or metal; 2, the letters impressed therein by the usual successive action of the matrix-punches; 3, a plate forming a backing for the matrix material; 4, closely-grouped recesses disposed at the back of the matrix and formed, preferaby, by a series of parallel grooves in two directions and crossing each other; 5, an exemplifying character-punch as usually employed in matrix-making machines; 6, an exemplifying-anvil at the rear of the plate to resist the impressive action of the punch, and 7 matrix material to the rear of impression-recesses 2 and condensed under the action of the impressing-punch and forced rearwardly into such of the recesses 4 as are to the rear of the impressed recesses.

Giving attention to Fig. 2 let it be assumed that backing-plate 3 is a simple plate of hard metal having its face provided with the recesses 4 by means of finely-laid grooves, as previously mentioned. The plain matrix material 1 is laid against the face of this plate and the plate and matrix material is to be fed along in front of the anvil, as usual. The

punch 5 attacks the face of the matrix material and makes the impression as usual; but the material directly in advance of the punch is at liberty to take a direct rearward flow into the recesses 4, there being, however, sufficient condensation of the material to secure a sharp face-impression. Displacement of of matrix material is thus possible without the usual damaging side flow of the material, each impression being left undisturbed by a succeeding impression and the face of the matrix being left undisturbed, except as to more or less direct forward swell, which will be recognized as distinctly advantageous. When the punch has thus pushed the matrix material rearwardly and condensed it and forced it into the recesses in the plate, the walls of those recesses take a grip upon the material, and when the punch retreats such gripped material is firmly held, which holding of itself serves not only in preventing side flow, but serves also largely in preventing a retreat of the condensed material as the punch moves back. Aside from improved results due to the lack of side flow this latter feature secures an evenness and uniformity of letter-faces not heretofore attainable in matrix material, owing to the fact that the variable elasticity of the condensed matrix material has tended to produce a variable return of the material as the punch retreated.

It will be observed that in my system the desired depth of impression can be gotten with comparatively little condensation and that the matrix material, after being pushed back, is well gripped by the walls of the recesses.

The plate and the matrix must move together as the feeding action takes place for the reception of the successive impressions, it being obvious that the matrix material cannot slide upon the plate. The first impression produced in the matrix material forces matrix material into the recesses in the plate, thereby locking the matrix to the plate at that point, and as the impression proceeds the matrix becomes impressed into and gripped by the plate at additional points, the gripping of the plate upon the matrix preventing the side flow of the matrix material and causing the side edges of the punch to produce a shearing effect upon the matrix material rather than a side compression and displacement. The finished matrix may be stripped from the plate and treated as usual in stereotyping and electrotyping, or the stereotyping and electrotyping operations may be carried out while the matrix is still attached to the plate, the plate thus forming a stiff backing for the matrix and obviously permitting of the use of thinner matrix material than would otherwise be permissible, a stiff and truly flat composite matrix being thus available.

I claim as my invention—

1. The improved typographic matrix which consists of a plate having a finely-recessed face, in conjunction with a sheet of matrix material having face-impressions and having rearwardly-extending condensations engaging the recesses of said plate and uniting the sheet of matrix material to the plate.

2. The improved matrix consisting of a sheet of impressible material having facial recesses impressed therein and having a rearwardly-extending group of condensed portions projecting from its rear face opposite each of said facial impressions.

3. The combination, substantially as set forth, of a metallic plate having its face formed with closely-grouped recesses, a sheet of impressible matrix material disposed against the recessed face of said plate, an anvil adapted to engage the rear face of said plate and have the plate move along the same, and a punch adapted to produce impressions in the face of said matrix material against the resistance offered by said plate and anvil.

THOMAS T. HEATH.

Witnesses:
M. B. FERRIS,
PHILIP RENNER.