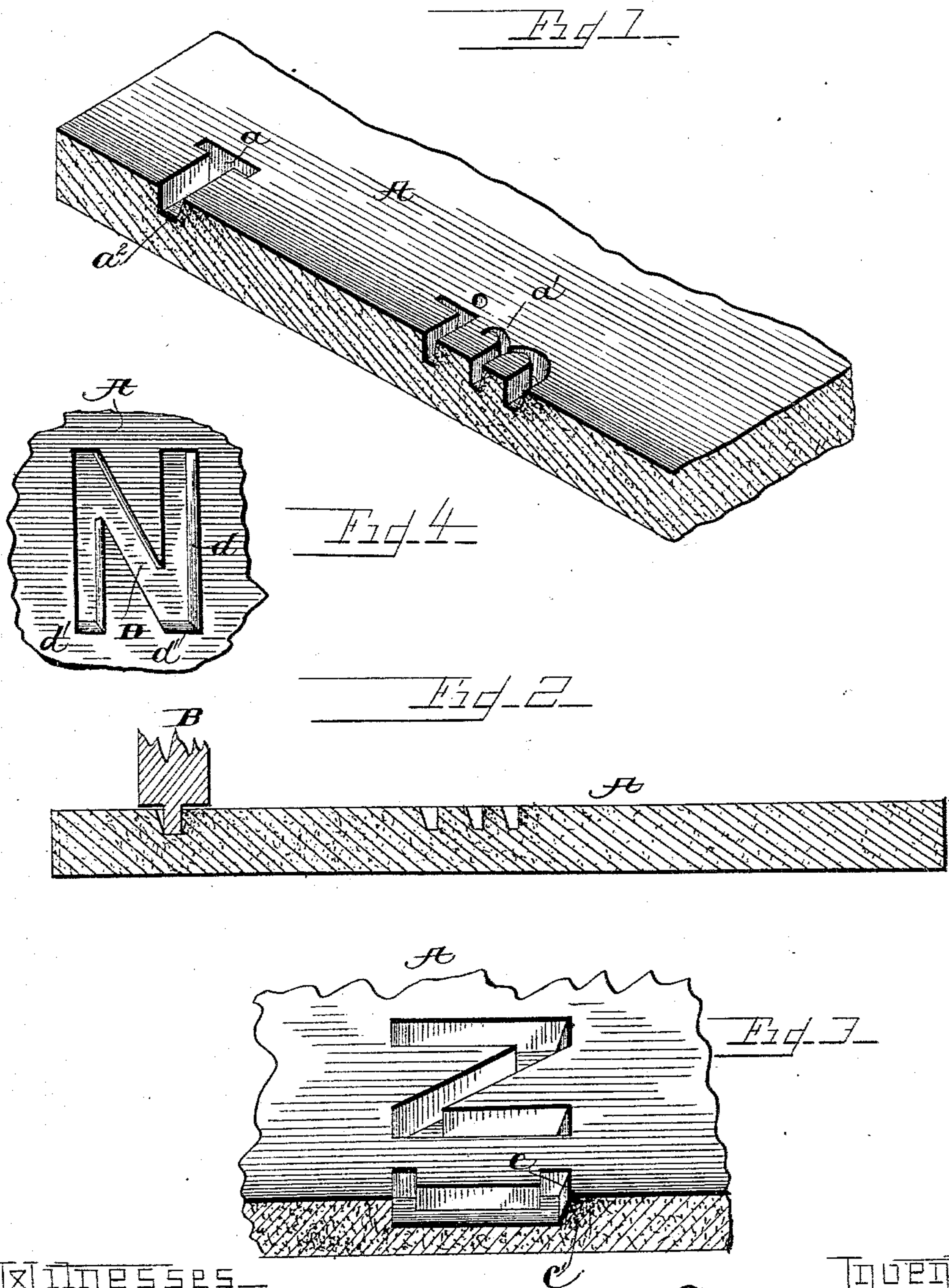


(No Model.)

G. A. GOODSON.
PROCESS OF FORMING MATRICES.

No. 414,521.

Patented Nov. 5, 1889.



WITNESSES—

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PROCESS OF FORMING MATRICES.

SPECIFICATION forming part of Letters Patent No. 414,521, dated November 5, 1889.

Application filed January 31, 1889. Serial No. 298,223. (No model.)

To all whom it may concern:

Be it known that I, GEORGE A. GOODSON, a citizen of the Dominion of Canada, residing at Minneapolis, in the county of Hennepin and State of Minnesota, have invented certain new and useful Improvements in the Process of Forming Matrices; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to the art of forming matrices for the production of character-plates for printing by impressing the characters successively in the matrix material. For a considerable period there have been many experiments in this direction; but, so far as I am aware, it is a generally recognized fact that no method or machine has been devised, or at least perfected and put in use, which has been capable of producing matrix-plates of so perfect a character as to supersede or successfully compete with the ordinary methods of stereotyping in general use. This failure to surpass or compete with the ordinary modes of procedure has in the main been attributed to the imperfection of the mechanism employed and the inherent defects of the mode of procedure, as it has been found impossible to form a later impression in close proximity to one previously made without crowding the material in which the impressions are formed back upon the earlier impression and injuriously distorting the same. This crowding occurs in respect to the successive impressions in a line and also in respect to the successive lines of a matrix, so that the only perfect impression secured is often the last one of the matrix. The crowding action and its distortion of the impression has had the effect to render it difficult to obtain stereotype-plates from the matrices made in this way, and also to render the plates when obtained defective and incapable of producing satisfactory results in the operation of printing.

My invention is designed to avoid these objectionable features of present processes and

the defects arising therefrom; and it consists in so manipulating the matrix material in forming the impressions that the material is more or less forced away and compressed in a forward direction, so that the crowding or forcing back of the material when forming the later impressions will not injuriously affect the earlier impression or impressions.

In carrying out my process I protect each impression from injury by succeeding impressions in the same line by compressing the material on the forward side of the impression in a forward and downward direction or on the side opposite that of the previously-formed impression or impressions to a greater degree than in other directions, and in doing this I preferably effect the compression so as to leave such compressed wall of the impression inclining outwardly from the bottom to the top and the opposite wall straight or vertical. This result may be accomplished in any preferred way and by any preferred means. I have contemplated accomplishing it by giving the die a slight swinging motion forward as it leaves the matrix material, or by giving the matrix material a slight advance movement at such time, or by forming that portion of the die which engages the matrix material with an outward inclination on the forward side only from the face of the die toward the main body, the other sides being substantially straight or vertical. In either of these cases the material on the forward side of the impression will be more or less compressed, and the forward wall will have a forward and outward inclination. This compression of the material strengthens the forward side or wall of the impression, so that it is less likely to be disturbed or distorted by a succeeding impression in the same line. The compressed material has a greater capacity for resisting the crowding force attending the formation of a succeeding impression in the matrix material, and in consequence thereof the movement of the material resulting from a new impression is mainly in other directions where the material has not been compressed. Where the stroke or

line of movement of the die is vertical or at right angles to the matrix material the walls of the impression are more likely to be distorted near the surface of the material, and the inclination is given the forward wall, so that if this wall should be affected by the act of forming the succeeding impression the tendency will be to rectify the position of the wall and will not force it back into quite a vertical position. Much the same results might be accomplished by giving the material a slight advance movement while the die is passing downward in the matrix material. This will result in giving the forward wall of the impression a greater degree of compression than the other walls; but the rearward wall will in this instance be inclined instead of the forward wall. The movement of the matrix material effectually prevents any crowding back of the material upon the preceding impression.

My improved process may be employed so as to prevent the crowding action of the material displaced in the formation of a new line of impressions from injuriously affecting the impression of a previously-formed line by compressing the material at the ends of the impressions adjacent to the new line or the end opposite the previously-formed lines, and this result may be produced by means similar to those employed for producing the compressions at the sides; or the compression may be both on the forward side of the impressions in the line and on the forward end of the impressions or the end adjacent the next succeeding line of the matrix. The term "forward" will be used in this specification to designate both of these directions. This compression of the matrix material in these two directions is preferably effected by a die having its stem or matrix-material-engaging portion inclined outwardly from the face of the die toward the main body on the forward side and the forward end.

In the drawings which accompany and form part of this application, Figure 1 is an isometric perspective and sectional view of a portion of a matrix-plate, showing the impressions with the forward sides or walls compressed in the preferred manner. Fig. 2 is a section of a portion of a matrix-plate and a die, illustrating another mode of compressing the forward walls of the impressions. Fig. 3 is a perspective of a portion of a matrix-plate, showing the forward end walls of the impressions compressed by my preferred mode of procedure. Fig. 4 is a top view of a part of a matrix-plate with an impression therein having its forward side and end walls compressed and inclined.

In the said drawings, A is a portion of a matrix, showing at a an isolated impression of a single letter and at a' the impression of two letters in the usual relation of letters in a line of printing. It will be seen that the

forward wall of the solitary impression is strongly inclined outwardly from the bottom upward, and the greater compression of this wall is indicated at a^2 . In the impressions shown at a' the compression of the forward wall of each impression is also indicated in like manner, and that while the forward wall of the earlier impression has been somewhat rectified it has not been brought into a vertical position.

In Fig. 2, A is a portion of a matrix-plate similar to that shown in Fig. 1. The die B is shown as made with the sides of its stem or matrix-material-engaging portion parallel, and the compression of the forward side of the impression has been made by moving the matrix material while the die was moving from the surface of the material to its lowest point. The rear wall of each impression is inclined, and where there is an earlier with a later impression the former has not been distorted by the die in making the latter, as the die in making the impression tends to draw or move the displaced material away from the earlier impression.

In Fig. 3, A is a portion of a matrix-plate in which the wall of each impression at the forward end is compressed to a greater extent than the other walls to prevent injury from a succeeding line of impressions. c is the inclined end wall, and the compression of the material is indicated at c' .

In Fig. 4 I have shown in plan view a portion of a matrix A, in which is shown a single impression D, the forward sides d and forward ends d' of which are both compressed by the process already described for the purpose of protecting such impressions from later impressions in the same and in the next adjacent line.

I prefer to carry out this process by means of an apparatus such as is shown and described in my application filed March 20, 1888, Serial No. 267,795, the essential features of which are a means for bringing the desired die to a common center and a means for depressing and forcing the die into the matrix material. There are many other forms of machines designed for doing this, and any machine of this class may be employed in carrying out my process.

The matrix produced by my process is not herein claimed, as it forms the subject-matter of my applications, Serial Nos. 298,220 and 298,221, filed January 31, 1889.

What I claim, and desire to secure by Letters Patent, is—

1. The process of forming matrices for stereotype-plates, which consists in forming the impressions in the matrix successively by dies and forcing or crowding the material of the matrix adjacent to each impression forward or toward succeeding impressions to a greater degree than in other lateral directions, substantially as described.

2. The process of forming matrices for stereotype-plates, which consists in forming the impressions in the same successively by dies and inclining the walls of each impression in the direction of succeeding impressions by
5 applying thereto a greater degree of pressure or crowding force than to the other walls of the impressions, as set forth.

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

GEORGE A. GOODSON.

Witnesses:

ROBT. F. GAYLORD,
PARKER W. PAGE.