

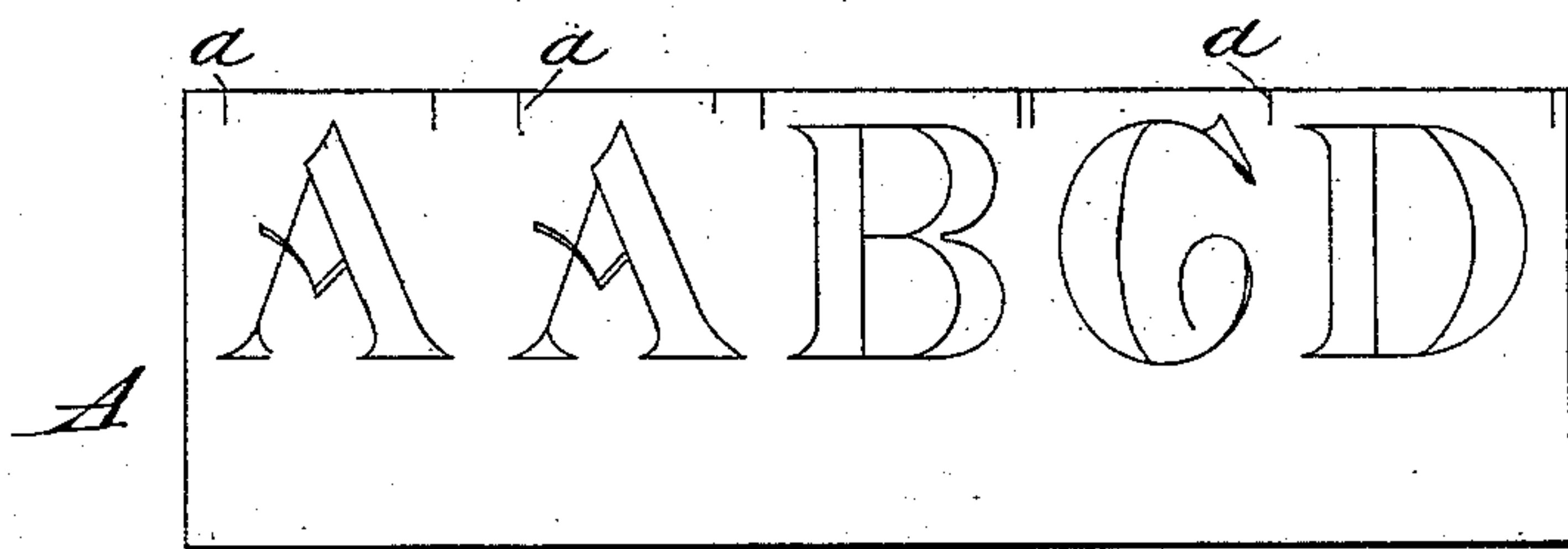
(No Model.)

J. EARLE.  
METHOD OF ENGRAVING.

No. 277,412.

Patented May 8, 1883.

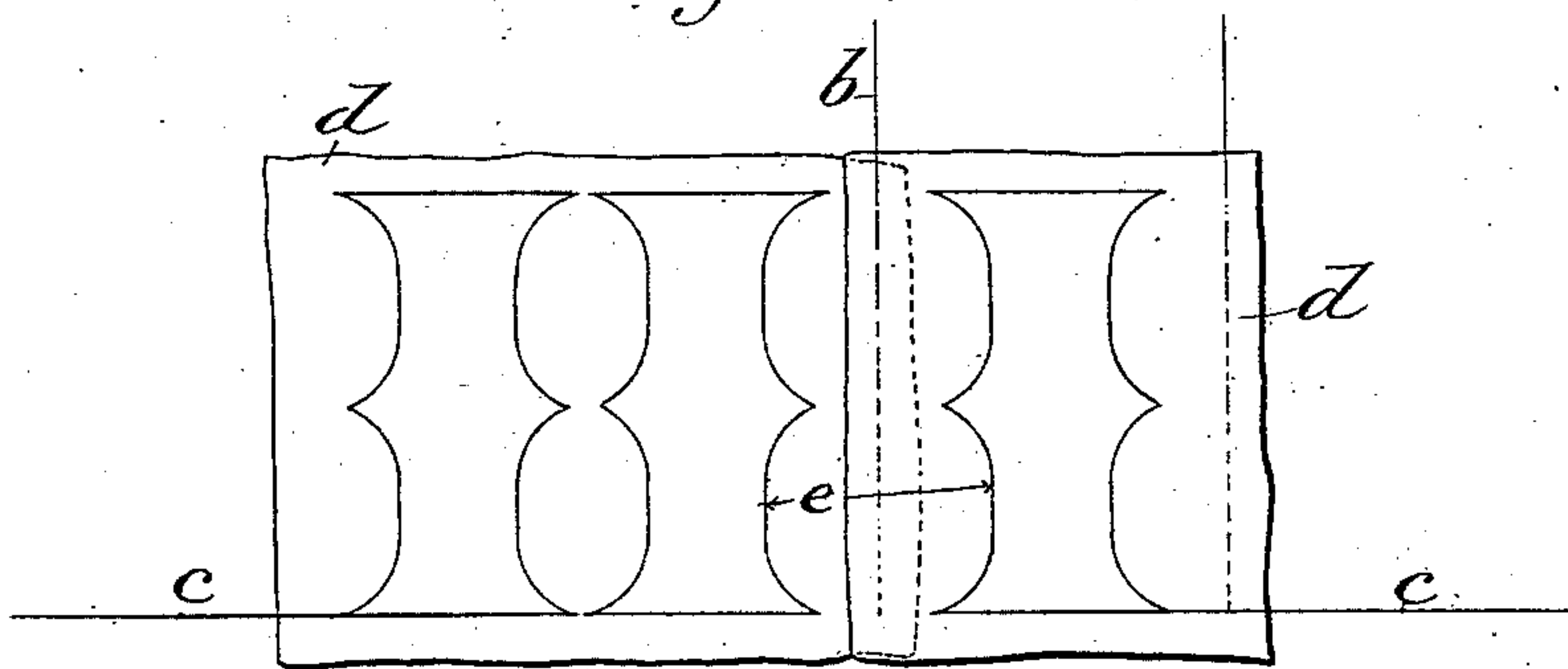
*Fig. 1.*



*Fig. 2.*

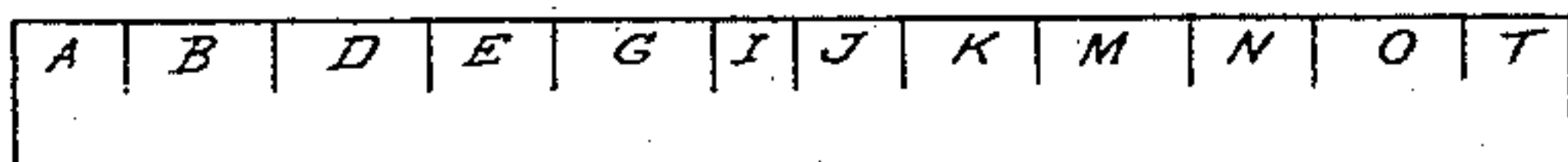
WASHINGTON.  
NOTGNIHSAW.  
BEANS.

*Fig. 3.*



*Fig. 4.*

*B*



WITNESSES

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# UNITED STATES PATENT OFFICE.

JOHN EARLE, OF DARBY, PENNSYLVANIA.

## METHOD OF ENGRAVING.

SPECIFICATION forming part of Letters Patent No. 277,412, dated May 8, 1883.

Application filed June 16, 1882. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN EARLE, a citizen of the United States, residing at Darby, in the county of Delaware and State of Pennsylvania, have invented certain new and useful Improvements in Methods of Engraving; and I do 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 ap-  
10 pertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

This invention relates to a universal or general spacing line, mark, or dot formed on an engraved pattern-plate, and adapted to be used in spacing letters for engraving with any suitable machine; and it consists in the method of determining the position of such spacing  
20 line or mark, whereby the letters of the alphabet can be combined into words or sentences with perfect spacing and evenness and great simplicity and readiness, as hereinafter more fully set forth.

In the annexed drawings, illustrating my invention, Figure 1 is a plan view of a pattern-plate provided with spacing-marks. Fig. 2 represents a series of words illustrating the spacing of the letters composing the same.  
30 Fig. 3 is a diagram illustrating the manner of determining the position of a spacing-line for letters, and Fig. 4 represents a spacing-scale.

In carrying out my invention I place a line, mark, or dot on the pattern-plates on each side  
35 of every letter of the alphabet. I prefer a line, *a*, drawn from the top line of the letters to the upper edge of the pattern-plate *A*, as shown in Fig. 1, said lines being in such a position in relation to each letter as when the line in the  
40 front of any letter is made to agree or merge with the line at the back of any other letter of the same alphabet, in engraving the same, perfect regularity of spacing will be produced on the plate on which the engraving is being done  
45 in the machine.

The following is a description of my method of finding the true position of the above-mentioned spacing-line: The principle on which the proper position of this line is based is the  
50 placing of a tracing of a letter (said tracing being made from a carefully drawn or engraved letter on transparent paper or other

suitable tracing material) on one side of a perpendicular line, (drawn accurately upon a piece of card-board or other suitable material,) and  
55 then placing the tracing of another letter on the other side of said line in such a position that to a skilled eye the perpendicular line appears to equally divide the space between the two letters, and then marking on the margin of the paper on  
60 which each letter is traced the position of the perpendicular line seen through the overlapping paper. This mark will indicate the position of the true spacing-line for the two letters used, and will be so marked on the pattern-plate, the one being on the right and the  
65 other on the left of each respective letter. I now remove one of the letters (either the one on the right or left of the perpendicular line, leaving the remaining one in its proper position) and place another tracing in such a position that the perpendicular line will equally  
70 divide the space between it and the first letter laid down, and then mark the line (seen through the paper as before) on this letter, and so on through the whole alphabet. After all  
75 the letters are provided with marks or lines on one side the process is reversed—that is, the letter which has remained stationary during the before-mentioned process is removed and  
80 another placed in position to be marked, one of the previously-marked letters remaining on the opposite side of the line as a gage, and so on until every letter of the alphabet has a gage or spacing-line on both sides of it. The lines,  
85 marks, or dots the true position of which is thus determined are then placed on the engraved pattern-plate.

The perpendicular line above referred to is indicated in Fig. 3 by the letter *b*, and is  
90 preferably drawn from a base-line, *c*. These lines *b* and *c* may be drawn upon a piece of card-board or other suitable material. The trial-letters are traced from any accurate pattern upon detached pieces *d* of transparent  
95 paper or other suitable tracing material. These detached tracings are laid upon the card-board so as to overlap the line *b*, the lower edges of the letters corresponding with the base-line *c*, and in such a position that to a skilled eye  
100 the line *b* will appear to equally divide the space between the letters. The accuracy of this position may be verified, if desired, by the use of compasses or other means. The posi-



tion of the perpendicular line *b* as seen through the tracing-papers is then marked upon each paper, the mark made upon one paper being on the front of the letter, while on the other paper it will be at the back of the letter. Either letter is now removed, leaving the other in its proper position, and another letter being placed in such position that the perpendicular line *b* will equally divide the space between it and the first or gage letter. This newly-selected letter is itself marked and removed, another being substituted therefor, and so on until all the letters of the alphabet have been provided with spacing-lines on each side, the process being reversed at the proper time, as before described.

All styles of letters and numerals can by this method be made to space with one another, each letter having but two lines, marks, or dots, one on each side of it. It is obvious that this method may be applied by type-founders to determine the position of the sides of the type in relation to the letters. It will be seen by reference to the word "Washington," Fig. 2, that by this method letters will space as well backward as forward.

In practicing this invention with an engraving-machine such as that for which I have obtained Letters Patent No. 260,463, dated July 4, 1882, I stretch a blank ribbon of paper upon a "straight-edge" secured to the table at the end of the machine. Let it be supposed that I am now about to engrave the word "Washington" on a plate lying on the circular bed of the machine. For this purpose I first take a pattern-plate having upon it the pattern-letter "W," and secure said plate firmly in contact with the straight-edge above referred to, at any point along the same. Now, with a pantographic tracing-point I proceed to follow through the lines of the pattern-letter "W," the diamond engraving-point on the other arm of the pantograph being thus caused to make a fac-simile of the letter on a plate resting on the bed of the machine. This letter being thus engraved, I register the spacing-line for the next letter of the word by simply continuing upon the ribbon or paper strip the spacing-line at the front of the first letter, the pattern-plate of which is then removed and one substituted therefor having on it the next letter required to form the desired word. This newly-selected plate is secured in contact with the straight-edge in such position that the spacing-line at the back of the second letter will agree with the line just drawn on the paper ribbon or strip, so that should the spacing-line at the back of the second letter be also carried upon the paper it would merge with the line or mark drawn from the spacing-line at the front of the first letter employed, this second letter being traced in the same manner as the preceding one, thus causing the second letter of the word to be engraved upon the plate carried by the machine-bed. As before described, the spacing-line at the front of the letter is carried up on the paper strip, as before, thus giving

ing the position for the next letter, and so on. In practice I prefer to lay out upon the paper ribbon all the spacing-lines for the matter I wish to engrave before stretching the ribbon or strip on the straight-edge. This may be done from a scale, or, in other words, a plate containing a duplicate of all the spacing-lines of all the letters of the alphabet in a compact form, one of these scales or plates being used with great advantage for each style of alphabet employed in engraving. This scale, Fig. 4, contains simply the limit-lines, indicating the width or space occupied by each letter; and as it frequently happens that several letters of the alphabet will occupy equal spaces, it will be seen that the same limit-lines can be used for such letters, and may, if desired, be so marked on the scale. The scale B, having such limit-lines, which are the spacing-lines previously ascertained by means of the tracings, as before described, is used in laying out work upon the paper strip or ribbon that is attached to the straight-edge.

Instead of engraving several letters on a pattern-plate, together with spacing-lines, as shown in Fig. 1, I may have a separate plate for each letter, and may cut off the plate at the points indicated by the spacing-lines, and so use the two perpendicular sides or edges of the plate in lieu of the spacing lines, marks, or dots, as before described. It will be seen that by placing two of such plates in contact, the plates having their respective letters engraved thereon with proper relation to their sides or edges, as before ascertained, the letters will be caused to space accurately in the same manner as that already described, the several plates, each containing a single letter, being placed in contact with the straight-edge and with each other in a manner similar to that in which type are set.

While the principle of my invention is clearly illustrated by the employment of the perpendicular line *b* in the manner before described, I have found in practice that two letters of suitable or convenient form—such as the letters H I—may be arranged as shown in Fig. 3, and the space separating said letters be used as a gage, from which the other letters of the alphabet may be accurately spaced, or provided with spacing marks or demarkations, as already mentioned. Any letters of the alphabet may be used for this purpose in place of the letters H I; but I prefer letters having one or more perpendicular lines or sides, or letters resembling each other in their strokes. In spacing letters by means of the gage-space *e* between such letters it is only necessary to place a tracing of each letter in succession in such position with relation to either of the letters bounding the gage-space *e* that the space between the letter last laid down and the adjacent gage-letter will appear to a skilled eye to be uniform or equal with the gage-space *e*. The tracing is then marked to correspond or agree with a fixed point or line having a predetermined relation to the letters bounding



the gage-space. This fixed point or line may correspond with the position of the line *b*, or may be located at any convenient distance to the right or left thereof. The space *e*, instead of being bounded by letters, as shown in Fig. 3, may be bounded by any arbitrary lines suitably arranged to assist in accomplishing the desired object.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The herein-described method of determining the spacing-lines of letters for engraving the same with a machine, consisting in successively placing tracings of all the letters of the alphabet in such relation to a selected gage-space bounded by letters or lines that the space between the trial-letter and said lines or letters bounding the gage-space will appear to a skilled eye to be equal to the gage-space, then marking the tracings at the front

or back of the letter with a line, mark, or dot corresponding with a fixed point or line having a predetermined relation to the letters or lines bounding the gage-space, and finally transferring the spacing-lines from the tracings to the engraved pattern-plate, substantially as described.

2. An engraved pattern-plate in which each pattern-letter is provided with spacing lines, marks, or dots so arranged in relation to each letter that by merging the spacing-line of any pattern-letter with the spacing-line of the letter last engraved the said letters will be accurately spaced to form words and sentences, substantially as described.

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

JOHN EARLE.

Witnesses:

PHILIP MAURO,  
A. R. BROWN.