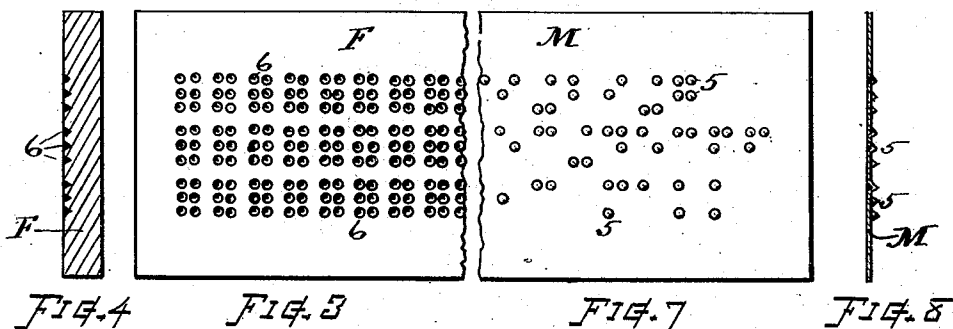
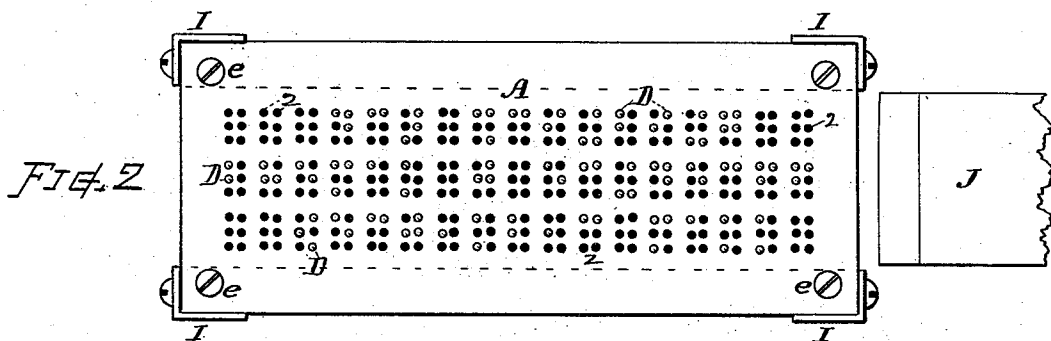
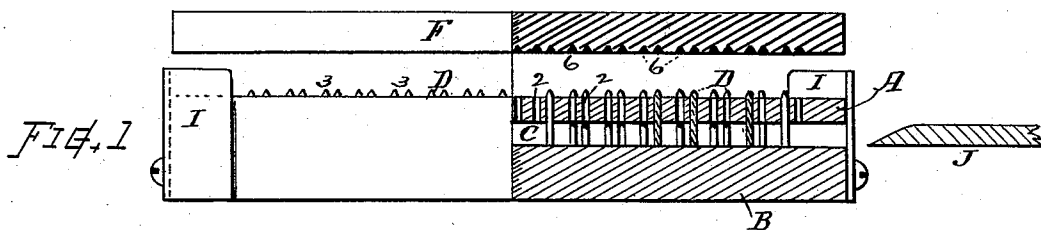


(No Model.)

T. C. ORNDORFF.  
PRODUCING PRINTED MATTER FOR THE BLIND.

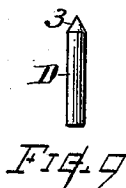
No. 506,718.

Patented Oct. 17, 1893.



Witnesses.

Ella P. Blinn  
Simon E. King



Inventor

Thomas C. Orndorff  
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Attorney

# UNITED STATES PATENT OFFICE.

THOMAS C. ORNDORFF, OF WORCESTER, MASSACHUSETTS.

## PRODUCING PRINTED MATTER FOR THE BLIND.

**SPECIFICATION** forming part of Letters Patent No. 506,718, dated October 17, 1893.

Application filed November 19, 1892. Serial No. 452,484. (No model.)

*To all whom it may concern:*

Be it known that I, THOMAS C. ORNDORFF, a citizen of the United States, residing at Worcester, in the county of Worcester and State of Massachusetts, have invented a new and useful Improvement in Producing Printed Matter for the Blind, of which the following, together with the accompanying drawings, is a specification sufficiently full, clear, and exact to enable persons skilled in the art to which this invention appertains to make and use the same.

The object of my present invention is to afford a practical and efficient method and means whereby reading matter can be set up for printing in a ready, convenient and accurate manner in what is known as the "point" system of printing for the use of the blind; and also inexpensive plates can be made for the reproduction of such class of printed matter to be used for printing in presses such as employ an elastic plate or blanket.

Another object is to provide means for the purpose stated, having convenient facilities for effecting changes in the composition, or the resetting of the characters as occasion may require; also, to provide facilities for the elevation or projection of the point pins during the composing operations, for convenience of manipulation in taking up or resetting the points.

These objects I attain by the means illustrated, and as explained in the following detailed description; the particular subject-matter claimed being hereinafter definitely specified.

In the drawings, Figure 1 is a part side, part vertical sectional view of an appliance or mechanism embodying my invention. Fig. 2 is a top view of the composing tablet. Fig. 3 is a bottom view of a portion of the matrix plate. Fig. 4 is a transverse section of the same. Fig. 5 is a transverse section of the tablet, matrix plate and impressed sheet when the parts are closed together. Fig. 6 is a sectional view of the appliance inverted, showing the method of projecting the pins for convenience of resetting them. Fig. 7 is a front view of a portion of the impression or print sheet. Fig. 8 is a transverse section of

the same, and Fig. 9 is an enlarged view of one of the pins.

In my invention I employ a block or tablet, the top A of which is perforated with a series of holes 2, perpendicular to the plane of its face, and disposed in groups or rows to correspond with the order and disposition of the dots in the point system of printing for the blind; the holes of each group or row representing all of the dot-positions that are embraced in any character of the system. The plate A can be perforated to correspond with either the "Braille" or the "New York point" systems of notation, or as required. The drawings in the present instance show the arrangement as used in the Braille system.

The plate A is best mounted upon a back piece B having ribs *b* that sustain said plate with an open space C between it and the back; the top of the back and the top of the plate A being parallel.

A series of small pins D are provided of a size to easily fit within the holes and of a length slightly greater than the distance from the back piece B to the face of the perforated plate A. Said pins have one of their ends formed conical or of proper shape to make the desired indentation originally in the matrix plate, and thereafter in the paper or material acted upon; and the other end 4 is best formed square for seating upon the back B. These pins are set in the holes 2 in the plate A where their conical points 3 protrude above the surface thereof in the manner indicated, and are removable and interchangeable so that they can be readily disposed in different composition or arrangement for producing in any group of holes any character of the printing system as desired.

F indicates a plate of indentable material, preferably the material known as "vulcanized fiber," but other suitable material may be used if in any instance desired. Said plate has, in its under face, indentations 6 corresponding in form to the pin points 3, and disposed to match the perforations 2 in the plate A, so that the plate F will serve as a matrix for use in conjunction with the studded tablet in any and all composition. This matrix-plate F is made by placing a pin D in each hole in plate A. Then the plate F is placed

over the plate A resting on the conical ends 3 of the pins D; and while in this position is subjected to sufficient pressure to force the conical ends of all the pins D into the face of the plate A, indenting it as at 6, and forming thereby a complete matrix that will always meet the pins D when set in any of the holes and in all forms of composition. Upwardly projecting flanges or guards I are provided at the angles of the tablet for retaining the matrix-plate F in proper lateral relation to the plate A, so that the parts may be separated and again brought together with accuracy.

15 The plate A is made of such thickness that it will properly support the pins D in upright position, and also sustain the required amount of downward pressure without yielding in any appreciable degree. Said plate is secured to the back B, or its ribs, by the screw e, or by other fastenings so that the two parts together make a rigid tablet, as indicated. The block or tablet, or its perforated area, may be of greater or less dimensions and capacity according to the size of the page or sheet which it is intended for printing.

J indicates a plate adapted for insertion within the space C between the back B and the ends of the pins D for partially elevating or causing said pins to project above the face of the tablet to facilitate composition, their removal or re-adjustment when changing the characters or composed matter.

K indicates a flat slab adapted to be placed over the tablet resting on the guards I, which latter are formed of a height somewhat less than the length of the pins D, and that will gage the amount of projection desired for said pins; and when so placed permits the inversion of the tablet while preventing the escape of the pins, (see Fig. 6) but allows them to fall to the desired degree of projection so that plate J can be introduced between their inner ends and the back piece, after which the tablet may be returned to normal position.

M indicates the impression or print sheet. When used merely as a print to read from it may be of paper, and it can be printed dry simply by compressing a plain paper sheet between the studded tablet A and the matrix-plate F, thereby embossing the point forms into the fabric, as at 5. When desired the sheet M can be prepared and used as an impression sheet for reproduction of similar printing; in which case the sheet is best made of thin copper or similar material, and after the points have been thrown up the sheet is coated on the back with molten type metal or otherwise reinforced to prevent the points crushing down, and reproductions can then be made therefrom by pressing a sheet of paper upon its surface in a press having an elastic platen or rubber blanket.

65 The operation of my invention is as follows:—The composition of matter to be printed is first produced by arranging the

pins D in proper order to form the required letters or characters. The sheet M is then laid on the face-plate A, the matrix-plate placed on it, within the guards, and the parts pressed together with sufficient force to emboss the sheet; any suitable kind of pressing mechanism being used therefor, and any number of sheets M desired can thus be made. This printing being accomplished the operator lays the slab K over the face of the tablet, inverts it, and introduces the plate J for retaining the pins projecting, returns the tablet to normal position, takes off the slab and then proceeds to reset the pins D for any different composition; after which the plate J is withdrawn and the pins drop to position when the tablet is ready for further printing operation; thus affording a very efficient, ready and practical method of producing printing for the blind.

I claim as my invention herein, to be secured by Letters Patent—

1. The method of producing, for the use of the blind, point print, or printing plates, which consists in first composing the required characters or copy by arrangement of a series of removable conical-pointed pins set up in a tablet or plate perforated to correspond with any point system, second, forming therefrom a matrix for the same by compressing the conical points into a plate of hard indentable material; third, embossing between said pin-set plate and matrix-plate a thin sheet of material, and fourth, applying said sheet as a point printing or embossing form in an elastic platen press for reproduction of its surface in paper or similar fabric, substantially as set forth.

2. The point-printing mechanism hereinbefore described, consisting of the tablet having its face provided with series of small holes disposed in the order described, and the series of removable interchangeable pins, the bodies of which fit into said holes leaving only their short conical ends protruding above the tablet surface, in combination with the embossing matrix-plate having in its face a series of indents or depressions disposed at positions corresponding with the positions of the holes of the tablet, the cavity-contour of said depressions counter-matching the conical points of said pins, all substantially as set forth.

3. In combination with the tablet consisting of the face-plate perforated with holes arranged as described, and the back-plate provided with upwardly projecting ribs whereon said face-plate is supported with an intervening space beneath its perforations, and the series of removable non-headed pins or point-studs adapted for interchangeably setting into said holes from the face of the tablet and having bodies the length of which corresponds with the depth of said face-plate and interspace; the removable plate J adapted for temporary insertion into said intervening space for partially elevating said pins above the

surface of the tablet to facilitate the removal and re-setting of the pins, when composing the form, substantially as set forth.

5 4. A tablet for the purpose specified, composed of the back B and attached face A, and having in its face the series of holes containing the removable point-printing pins, said tablet provided at its angles with flanges or  
10 guards that project above its face a distance somewhat less than the length of said pins and serve as gaging-rests, in combination with the covering plate K adapted to be sustained

on said gaging rests to attain a uniform projection of all the pins by reversal of the tablet, and the removable plate J adapted for insertion between the back and the inner ends  
15 of said pins, substantially as hereinbefore described.

Witness my hand this 15th day of November, A. D. 1892.

THOMAS C. ORNDORFF.

Witnesses:

E. F. BISCO,

ELLA P. BLENUS.