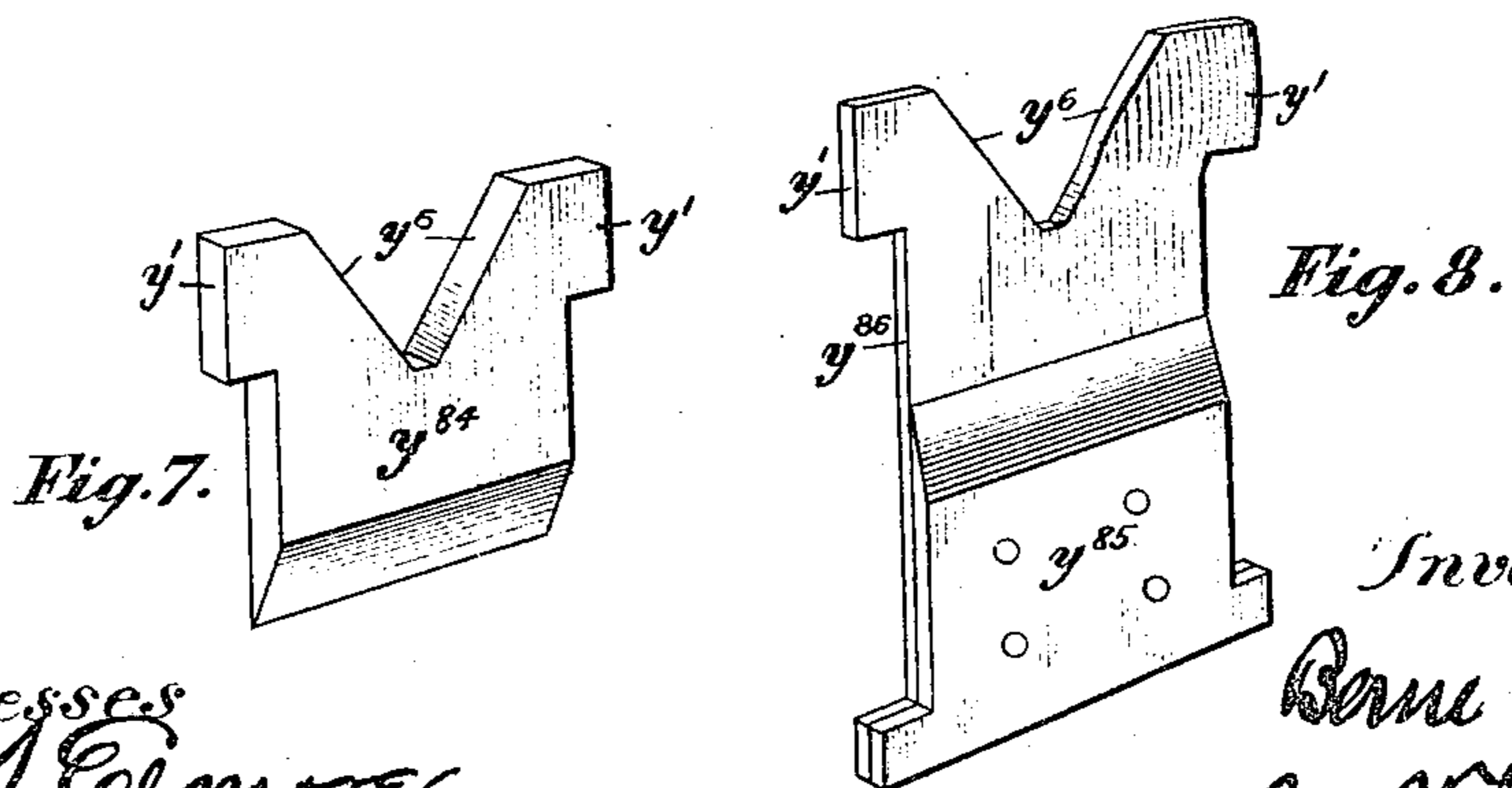
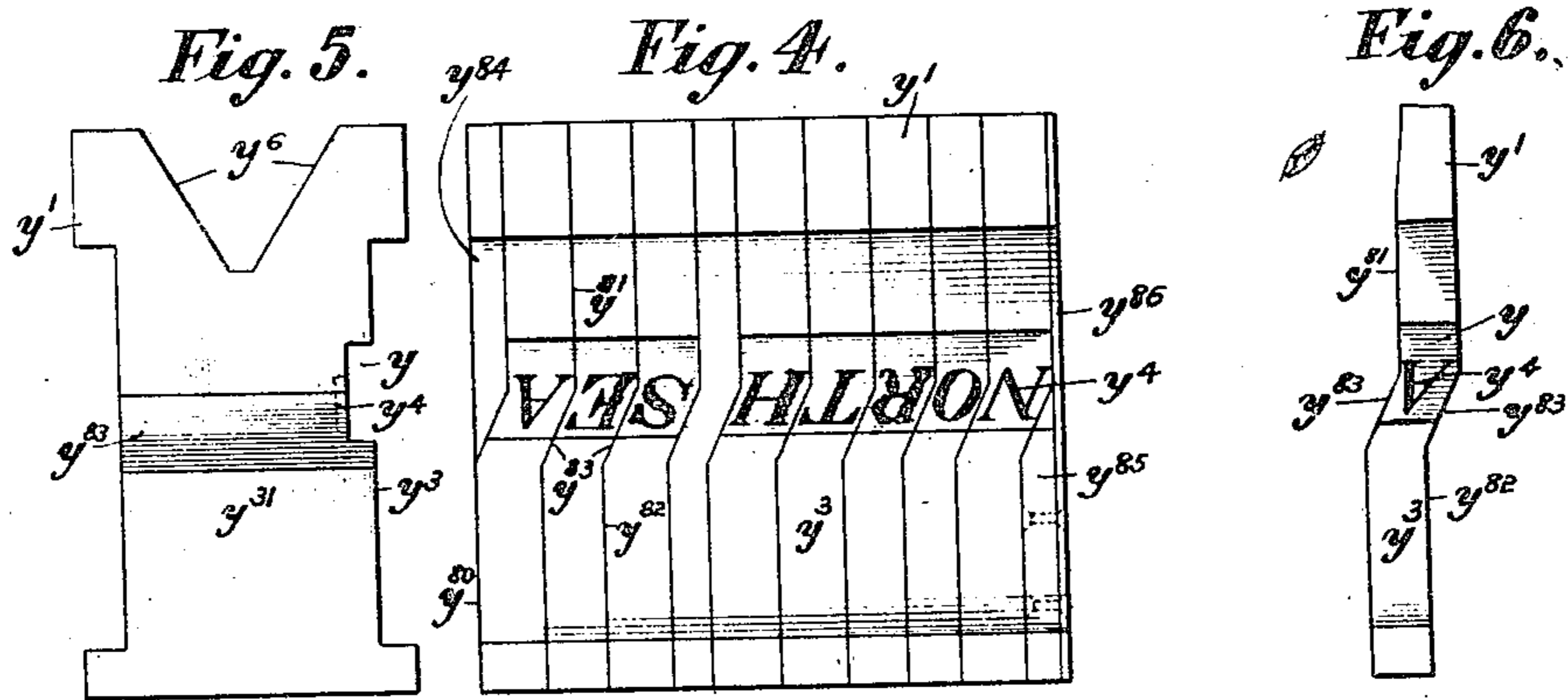
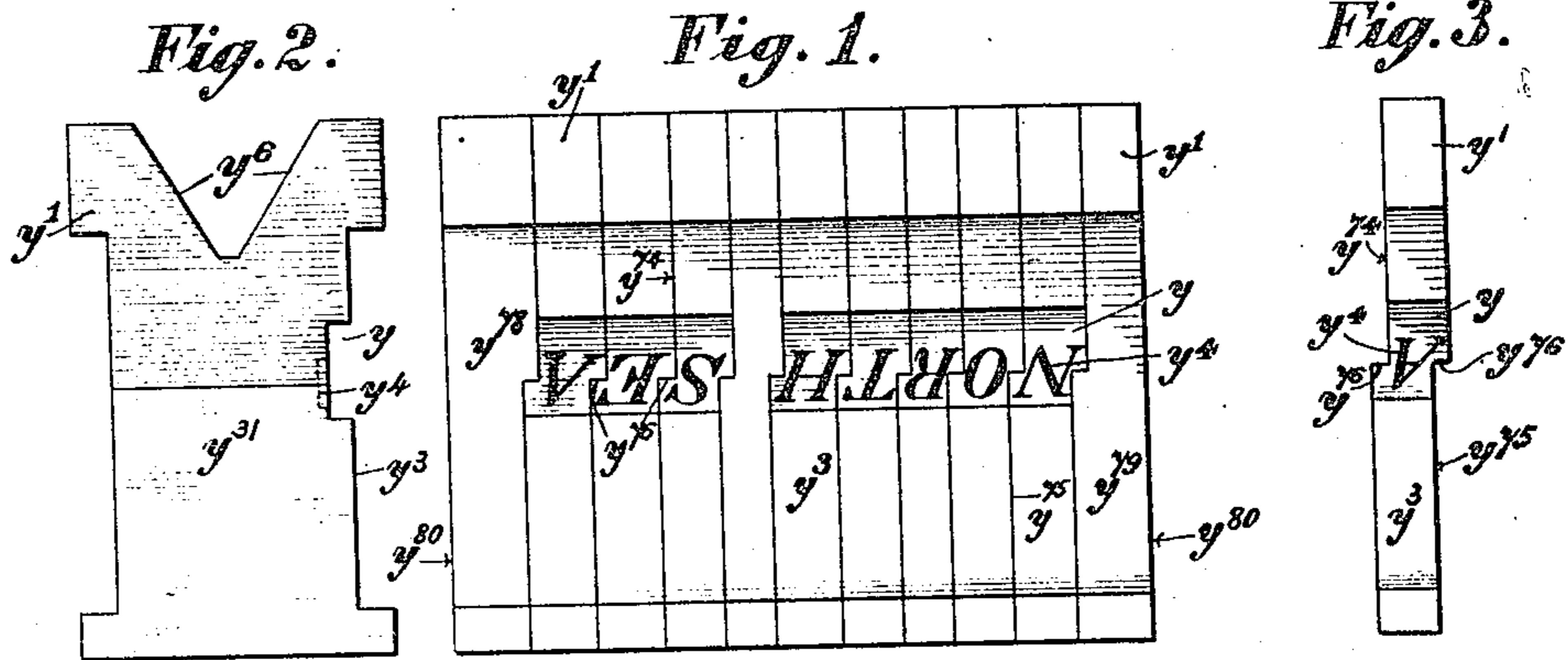


No. 630,396.

Patented Aug. 8, 1899.

B. NADALL.  
LINO TYPE MACHINE.  
(Application filed Nov. 11, 1898.)

(No Model.)



Witnesses:  
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# UNITED STATES PATENT OFFICE.

BERNE NADALL, OF CHICAGO, ILLINOIS.

## LINOTYPE-MACHINE.

SPECIFICATION forming part of Letters Patent No. 630,396, dated August 8, 1899.

Application filed November 11, 1898. Serial No. 696,165. (No model.)

*To all whom it may concern:*

Be it known that I, BERNE NADALL, of Chicago, (Englewood,) in the State of Illinois, at present residing at 19 Stockport road, Altrincham, in the county of Chester, England, have invented certain new and useful Improvements in and Connected with Linotype-Machines; 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.

The present invention relates to improvements in and connected with the matrices of linotype-machines, and especially with the matrices of the celebrated Mergenthaler linotype-machine. The object of it is to diminish the thickness of the matrix-bodies of an Italic font.

It must be understood that the body of a Mergenthaler matrix is a rectangular plate having a formative character-cavity in one edge of it adapted to serve as the mold for the face of the respective character on the linotype. The thickness of that plate is the width of the character plus a margin on each side equal to half the white that there is to be in the printed line between that character and each adjoining one, the two margins taking the form of side walls to the cavity. As an Italic character is wider over all, or between "perpendiculars," so to speak, than the corresponding Roman one, it follows that a matrix-body for the former has been thicker hitherto than one for the latter. Thus take the case of the two capitals "A B." On matrix-bodies each of whose sides is one plane the position of the left side of the B-matrix body is settled by that of the adjacent serif and the position of the right side of the A-matrix body by that of the top of the "A." The present invention consists in there being a rabbet in each side of the matrix-body, one above and one below the middle of the formative cavity, so that the top half of the A-matrix body above mentioned shall fit into the rabbet in the B-matrix body, while the bottom half of the B-matrix body shall fit into the rabbet in the bottom half of the A-matrix body. The effect of the two rabbets, one on each side of the matrix-body, is to

bend the latter twice through a right angle through the formative cavity. The same effect is gained if each "bend" is at an obtuse instead of a right angle, both angles being equal. In the latter case the central portion of the matrix-body behind the formative cavity is inclined to the same angle as the character. However, for the reason that it is practically easier to rabbet the matrix-bodies by removing matrix material than by bending them the invention is described from that point of view.

Referring to the accompanying drawings, which are to be taken as part of this specification and read therewith, Figure 1 is an elevation of a line of matrices for the words "North Sea" as they hang in the machine above mentioned. Fig. 2 is a side elevation of one of the same matrices looking at it from the left hand of Fig. 1. Fig. 3 is an elevation of a single matrix separated from its fellows. Fig. 4 is an elevation of a line of modified matrices likewise for "North Sea" as they hang in the same machine. Fig. 5 is a side elevation of one of the same matrices looking at it from the left hand of Fig. 4. Fig. 6 is an elevation of a single matrix of the same line separated from its fellows. Fig. 7 is a perspective view of a short quad, and Fig. 8 is a perspective view of a long one.

Referring to Figs. 1 to 3,  $y^{31}$  is the rectangular metal plate or matrix-body above mentioned,  $y'$   $y'$  the shoulders or lugs by which each matrix is suspended in the machine and alined,  $y$  the notch in the rear edge  $y^3$ ,  $y^1$  the formative cavity at the bottom of the said notch and in which the type-face is cast, and  $y^6$  the V-shaped notch in the top end, all as heretofore. This notch may be toothed or not, according as to whether the improved matrices are to be sent through the distributor or into the sorts-box after the casting operation.

A comparison of the figures illustrating the present specification with those of the specification of Letters Patent No. 9,732 of 1895 will mark the absence of the side wall from each side of the formative cavity  $y^1$ . According to the present invention the body  $y^{31}$  has two rectangular rabbets  $y^{74}$   $y^{75}$ , one on each side of it and both of the same depth. Each

rabbit extends from the respective end of the body  $y^{31}$  and stops at a horizontal plane bisecting the formative cavity  $y^4$ , the shoulders  $y^{76}$  produced by the two rabbits being in that plane, because the obliquity of one half of an Italic character from the perpendicular to, say, the left hand, is equal to the obliquity of the other half to the right hand. The rabbits preferably extend across the matrix-body  $y^{31}$  from the edge  $y^3$  to the opposite one, as shown in Fig. 2, the shoulders  $y^{76}$  being also preferably rectilinear and at right angles with those edges, as illustrated; but the invention admits of variations in those respects.

15 All the matrices being rabbeted on both sides, it follows that both ends of a line of such matrices will be uneven. To enable those ends to receive the pressure of the vise-jaws of the justifying and casting mechanism, as well as to enable the uneven ends of a portion of a line in the improved Italic matrices to fit up to the other portion or portions of that line in Roman matrices, quads  $y^{78}$   $y^{79}$  are provided for the respective ends.

25 They are of the same shape in all respects as the matrices with which they cooperate, excepting that they are rabbeted on only their inner side faces. Their outer side faces  $y^{80}$  are plane surfaces, and they have neither notches

30  $y'$  nor formative cavities  $y^4$ . The width of the quads from their outer faces  $y^{80}$  to the inner and opposite ones may be as narrow as is practicable—that is to say, a quad  $y^{78}$  whose only duty is to fill up an upper rabbit  $y^{74}$

35 need not be thicker than the projection of the shoulder  $y^{76}$  is wide, while a quad  $y^{79}$  that must fill up a lower rabbit  $y^{75}$  and carry a pair of top shoulders  $y'$  and a notch  $y^6$  must be as thick as the width of a shoulder  $y^{76}$

40 plus the minimum thickness of a shoulder  $y'$ . This point will be clear after a description of the modification illustrated in Figs. 4 to 8. According to it the upper and lower rabbits  $y^{81}$   $y^{82}$  do not extend up to the plane that intersects the formative cavities  $y^4$ , but only

45 about up to the tops and bottoms thereof, preferably past the bottoms and not as far as the tops, as clearly shown in Figs. 4 to 6. The shoulders  $y^{76}$  in the said plane become

50 impossible and are replaced by inclines  $y^{83}$ , which are at the same angle throughout the font in order that each matrix may be capable of fitting metal-tight up to any other. The short quad  $y^{84}$  to fill up the upper rabbit

55  $y^{81}$  extends as far as the junction of an incline  $y^{83}$ , with the respective matrix side beneath it, but not farther than that, and is of the same thickness as the depth of the upper rabbit  $y^{81}$ , which it fills. The long quad  $y^{85}$

60 must fill a lower rabbit  $y^{82}$  up to the junction of the incline  $y^{83}$ , with the matrix side above it, and must also carry top shoulders  $y'$  and notch  $y^6$ . To enable it to do that, a supplementary plate  $y^{86}$ , carrying the said

65 shoulders and notch and of the same area as

a quad  $y^{78}$  or  $y^{79}$  above described, is made fast to or incorporated with it.

The term "Italic" is to be understood as including all fonts whose general contour is a sloping one, as compared with the upright one of a Roman font.

The distinguishing feature or characteristic of my matrix is the arrangement of the two ends so that they are offset, or, in other words, so that they stand out of line with each other, thus permitting the application of an inclined or irregular character at the junction of the offset operations.

In order that the matrices may be practically handled by the composing, casting, and distributing mechanism of a linotype-machine and that they may properly serve their purpose therein, it is necessary that the offset or inclined portion shall occupy only the middle portion of the matrix, or, in other words, that it shall be restricted as nearly as possible to the space occupied by the character or matrix proper and that the matrix-body shall present at each end a long vertical portion of parallel outer faces.

I am aware that type have been formed with their body portions inclined from the vertical and with laterally-protruding lips at the upper and lower ends to enter corresponding notches in the adjacent type. This construction is not applicable to a matrix for a linotype-machine.

Having described my invention, what I claim is—

1. A linotype-matrix, laterally inclined or offset solely at the middle to receive the character or matrix proper, and having its side faces extended upward and downward in vertical lines from the offset portion.

2. A linotype-matrix having its middle portion only inclined or offset laterally, to contain the matrix proper, and having the long ends of equal and uniform thickness extended upward and downward respectively from the offset portion.

3. A matrix consisting of two rectangular sections joined directly together to form an offset on each side, the character or matrix proper being located at the point of juncture between the two sections.

4. In combination with a linotype-matrix having an offset portion at the middle and vertical upper and lower ends, a complementary quad of equal length with the matrix, having on one side a continuous vertical face and on the opposite side faces offset to correspond with the matrix.

In testimony that I claim the foregoing as my invention I have signed my name in presence of two subscribing witnesses.

BERNE NADAIL.

Witnesses:

CHAS. S. WOODROFFE  
HARRY L. COX.