

No. 751,607.

PATENTED FEB. 9, 1904.

J. BROADHOUSE.

LINOTYPE FOR PRINTING MUSIC TYPOGRAPHICALLY.

APPLICATION FILED OCT. 6, 1902.

NO MODEL.

4 SHEETS—SHEET 1.

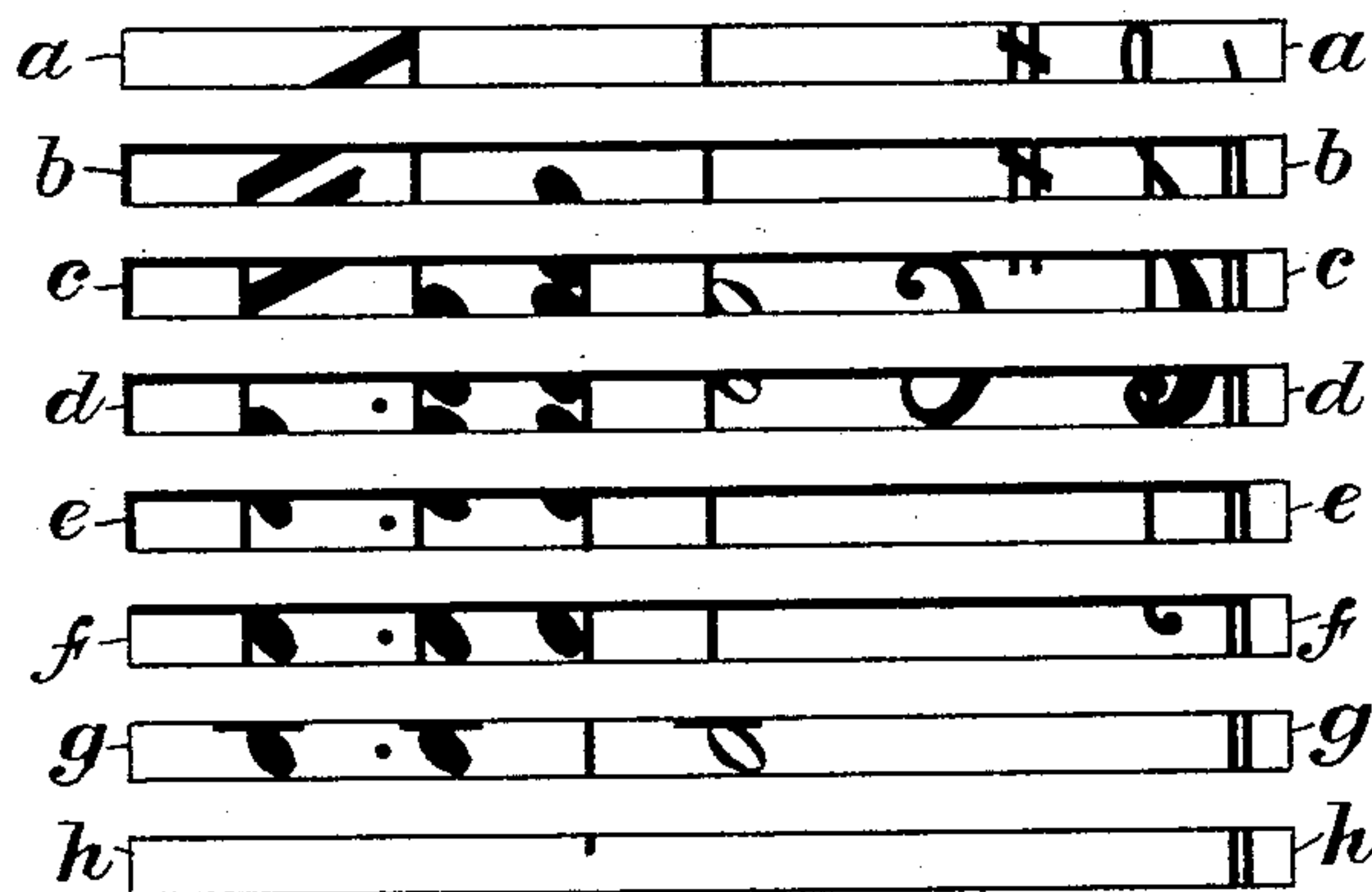


Fig. 10.

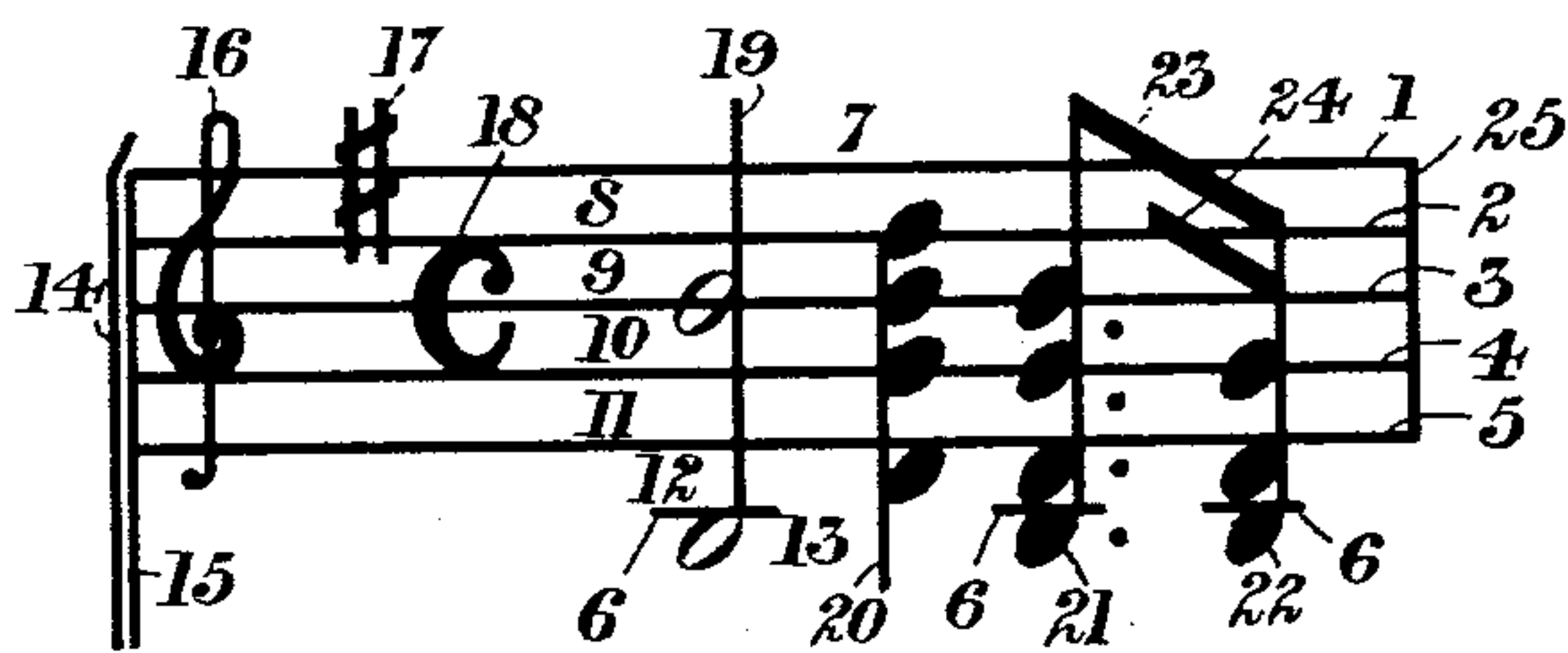


Fig. 1.

Witnesses
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4 SHEETS—SHEET 2.

Fig.2.

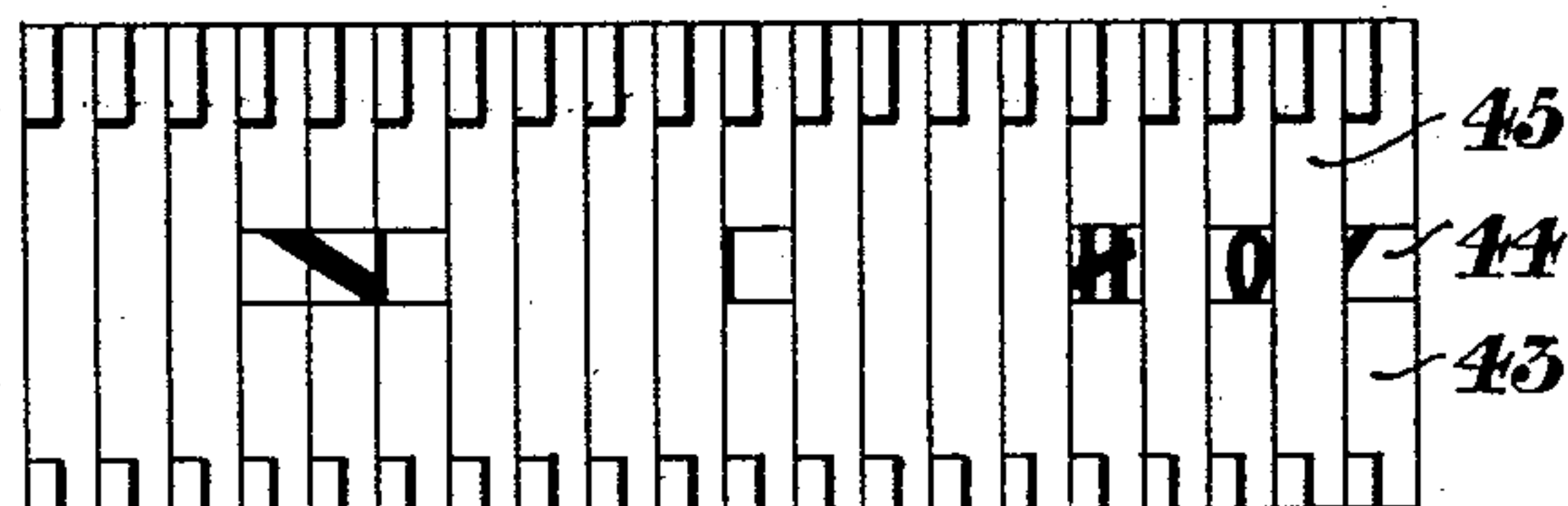


Fig.3.

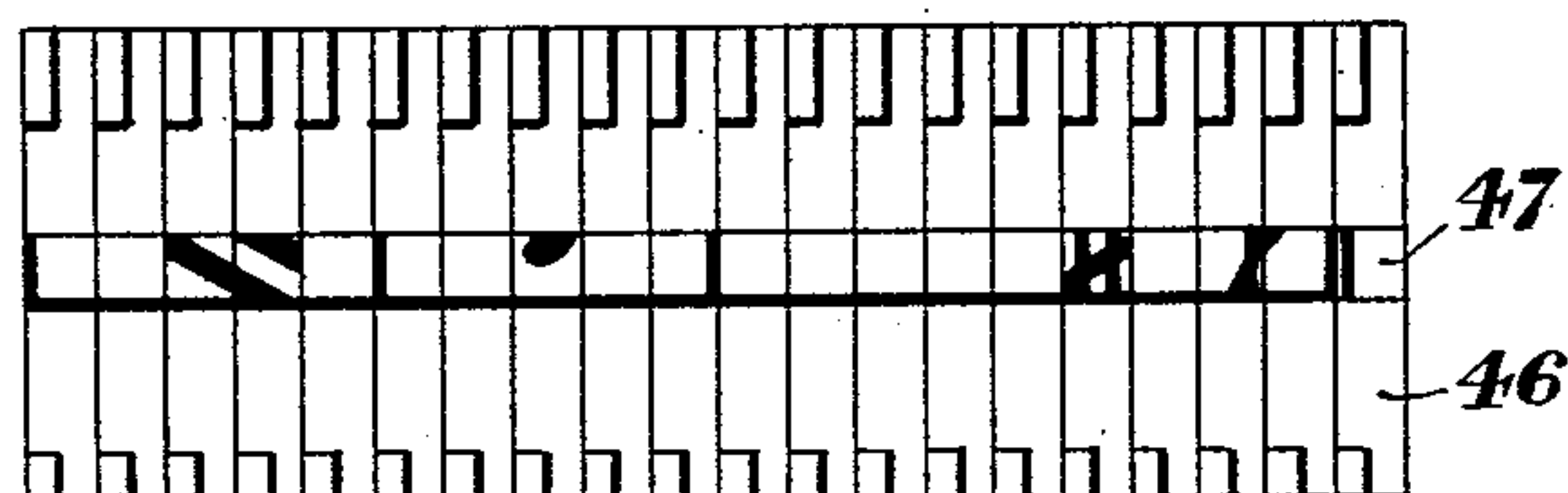


Fig.4.

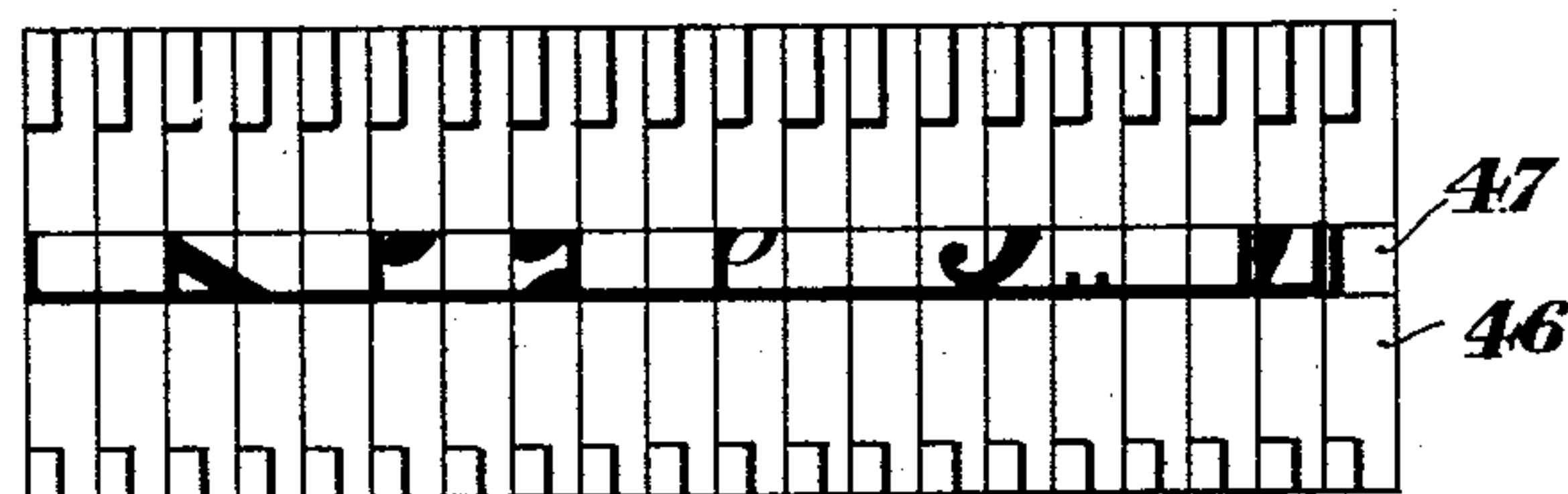
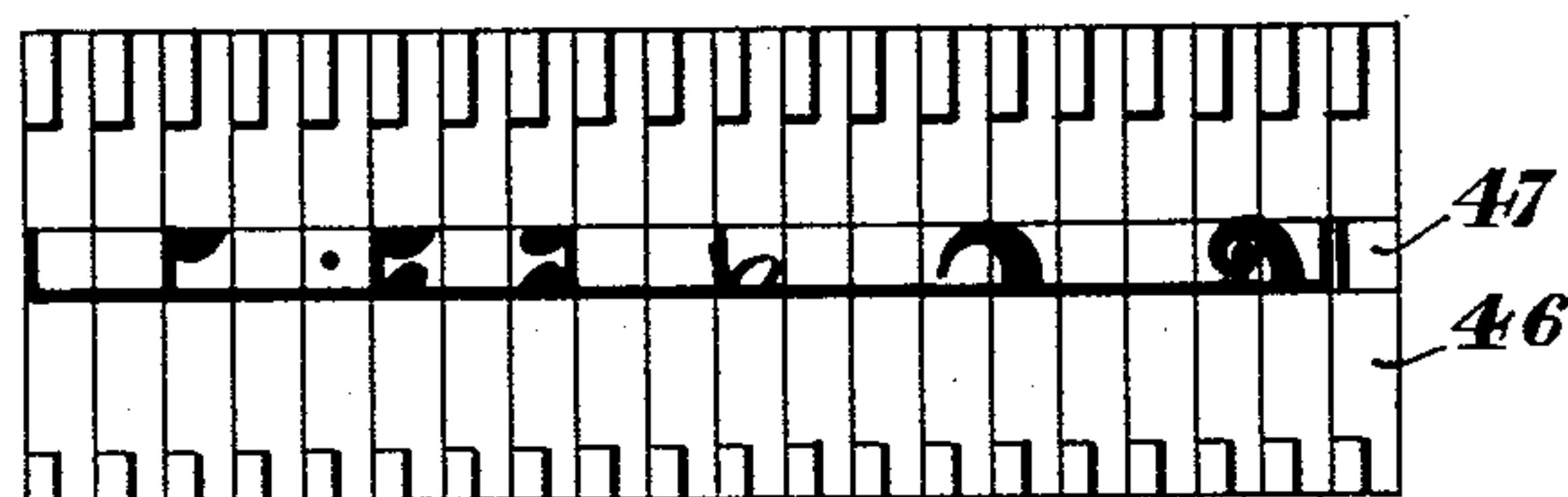


Fig.5.



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4 SHEETS—SHEET 3.

Fig.6.

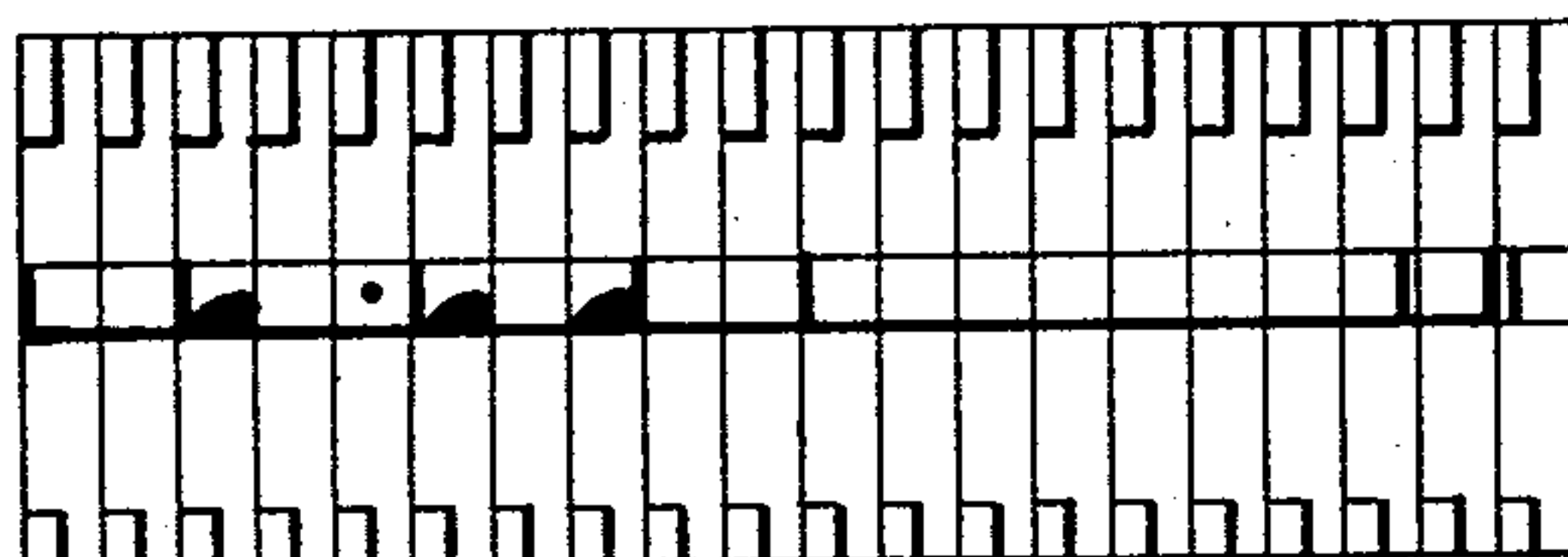


Fig.7.

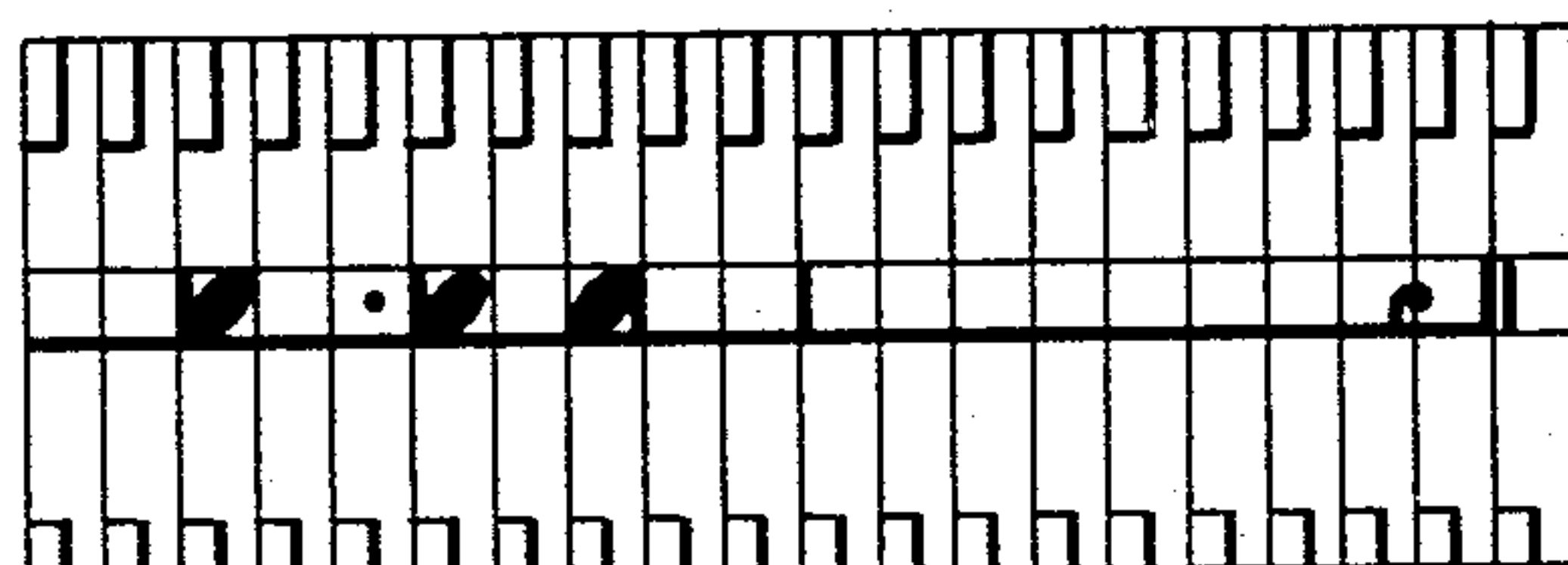


Fig.8.

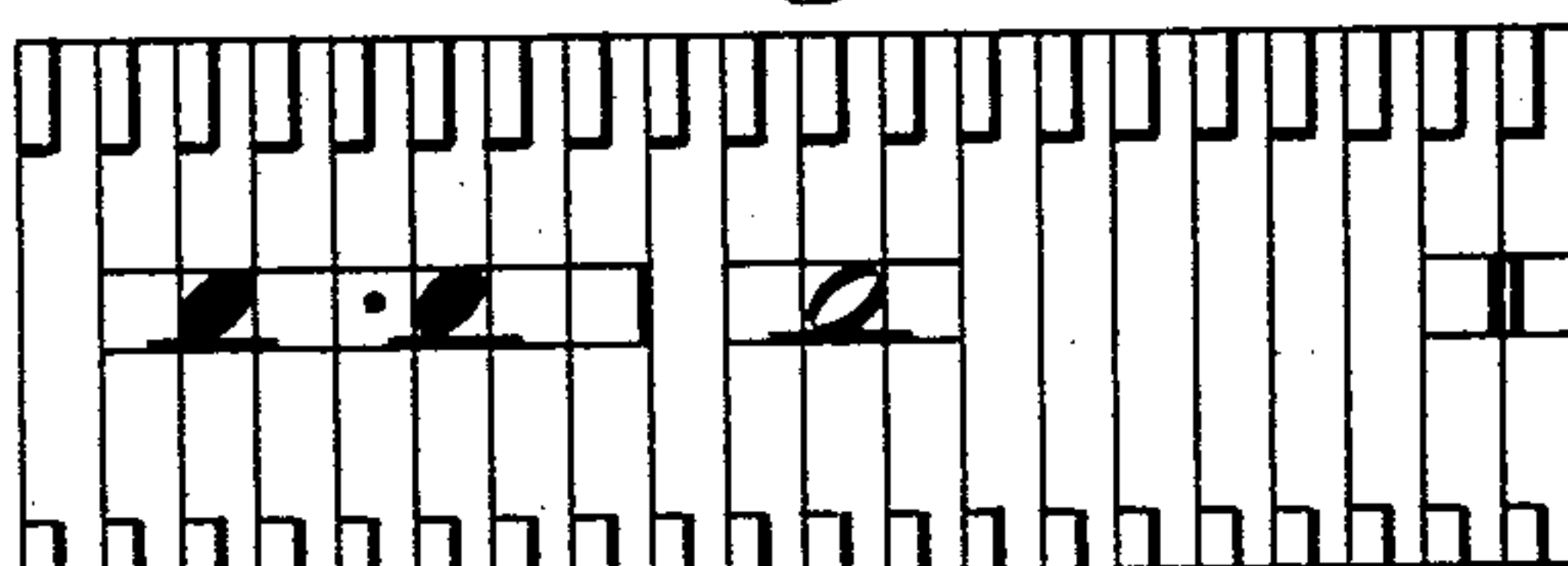
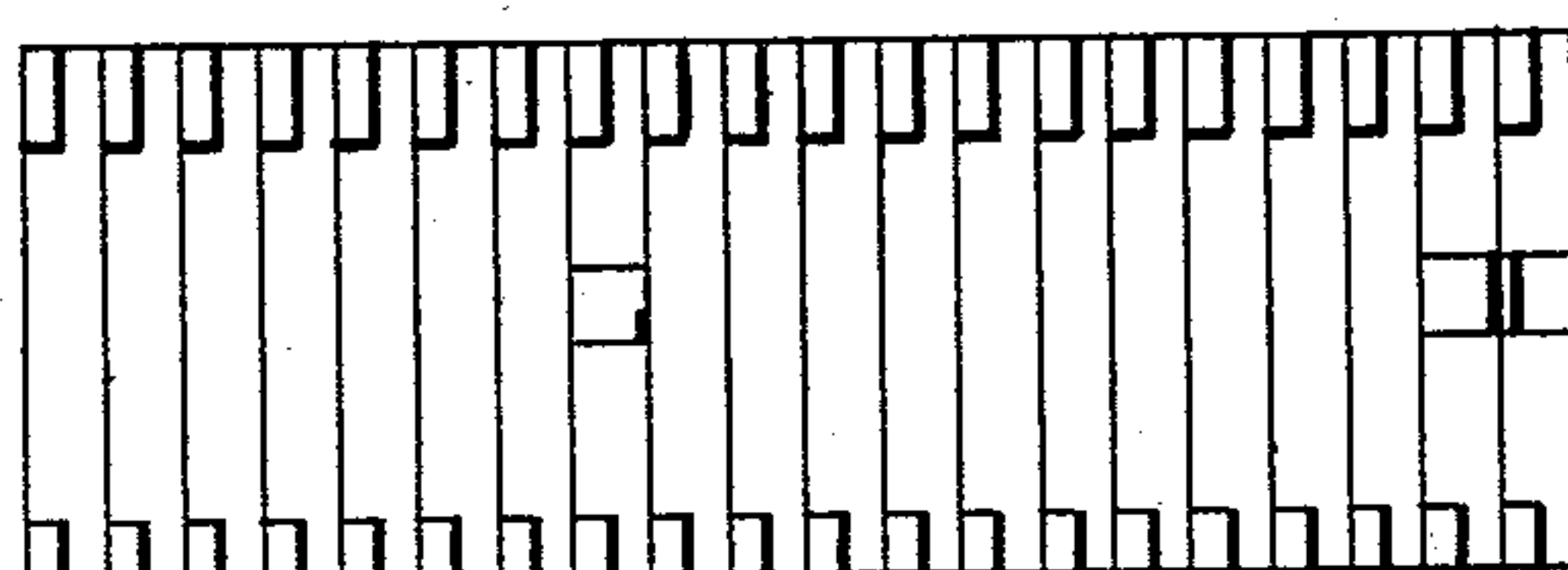


Fig.9.



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4 SHEETS—SHEET 4.



Fig. 11

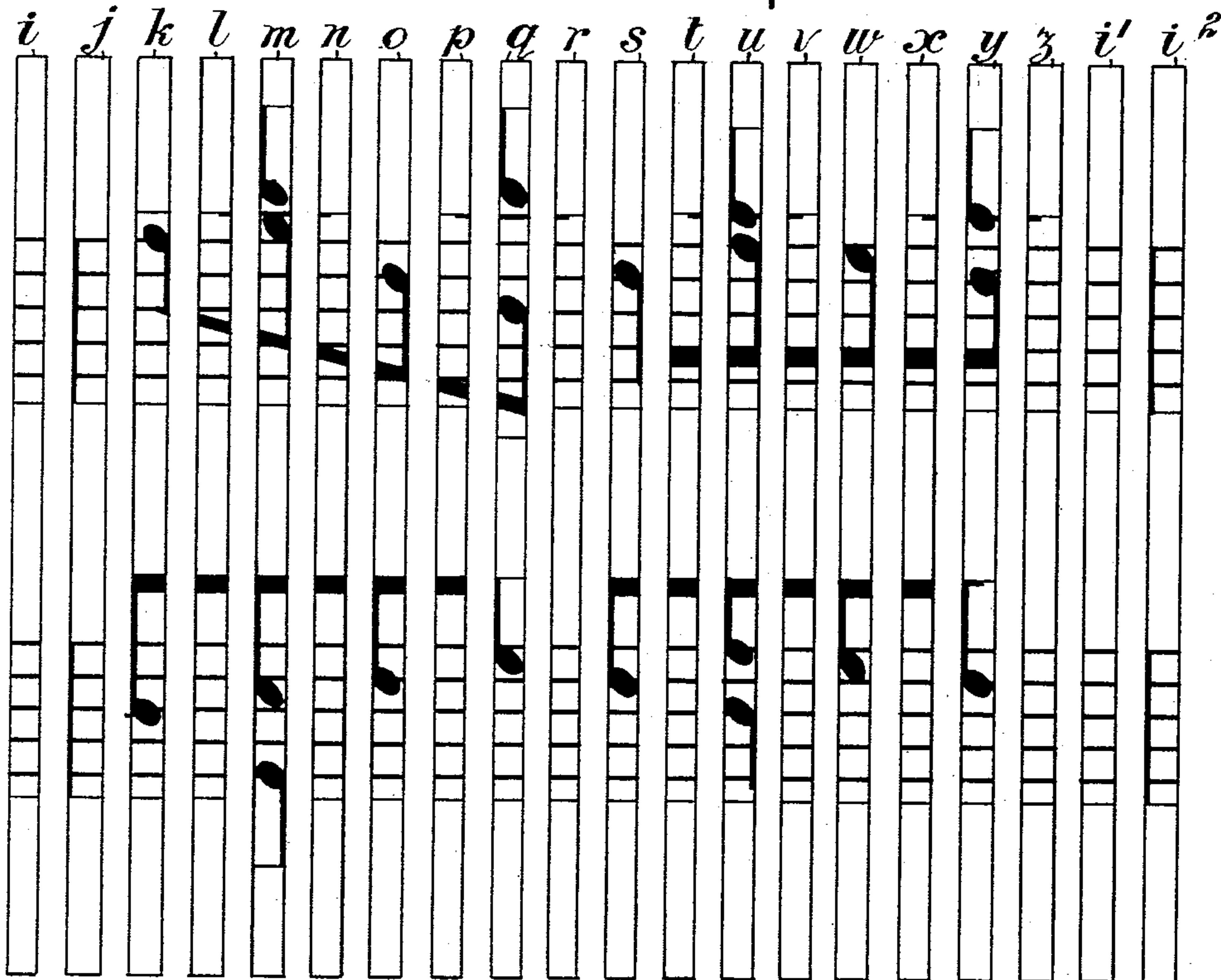


Fig. 12.

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UNITED STATES PATENT OFFICE.

JOHN BROADHOUSE, OF NORTH FINCHLEY, ENGLAND.

LINOTYPE FOR PRINTING MUSIC TYPOGRAPHICALLY.

SPECIFICATION forming part of Letters Patent No. 751,607, dated February 9, 1904.

Original application filed June 7, 1900, Serial No. 19,388. Divided and this application filed October 6, 1902. Serial No. 126,192.
(No model.)

To all whom it may concern:

Be it known that I, JOHN BROADHOUSE, of North Finchley, in the county of Middlesex, England, have invented certain new and useful Improvements in Linotypes for Printing Music Typographically; 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 linotypes for printing music typographically and is a division from pending application, Serial No. 19,388, filed June 7, 1900.

A linotype is a printing-bar as long as a column or page is wide and having the respective printing characters properly spaced out and justified into words standing up on one side edge thereof to form its printing edge. Linotypes are made in a linotype-machine. Of these machines there are two classes. One makes use of matrices, which the operator composes and spaces into a line a little shorter than the desired length and which line the machine proceeds to justify—*i. e.*, to extend to the exact length—and to cast a linotype from it. The other makes use of type-dies, which are composed, spaced, and justified, then caused to indent a strip of papier-mâché or the like, from which the linotype is cast.

Linotype-matrices or type-dies for letterpress printing vary in width according to the width of the respective characters; but according to the invention described in the said pending application all the matrices or type-dies of a font are of the same width. The formative cavity of the matrix or the printing-face of the type-die is situated in a square one side of which is equal to the width above mentioned, so that all the formative cavities or printing-faces, as the case may be, are situated in equal squares, the side of such a square being equal to the distance between two adjacent staff-lines plus the thickness of one staff-line.

The direction in which a printed line is to read controls the position of the respective character on the linotype-matrix or type-die. If the lines are to read horizontally, as in

English, the characters stand on the matrices or type-dies to read across them, and the resultant linotypes are hereinafter referred to as "horizontal" linotypes. If, however, the line is to read vertically, the characters must be turned through an angle of ninety degrees on the matrices or type-dies, (as more fully described in the specification of Letters Patent of the United States No. 604,404, May 24, 1898,) and the resultant linotypes are hereinafter referred to as "vertical" linotypes.

Referring to the accompanying drawings, which are to be taken as part of this specification and read therewith, Figure 1 is a representation of the first bar of the right-hand part of the organ or piano accompaniment to the chorus "Be not afraid," from Mendelssohn's "Elijah." It is the printed copy for the matrices and linotypes represented in Figs. 2 to 10. Figs. 2 to 9 are rear elevations of the eight composed lines of Mergenthaler linotype-matrices made according to the above-mentioned pending application and against which are cast the horizontal linotypes shown in Fig. 10. Fig. 10 is a plan of the eight horizontal linotypes cast from the eight composed lines of matrices shown in Figs. 2 to 9 for printing the bar of music represented in Fig. 1. Fig. 11 is a representation of one bar from one of Bach's variations. It is the printed copy for the linotypes represented in Fig. 12. Fig. 12 is a plan of the twenty vertical linotypes for printing the bar shown in Fig. 11.

Figs. 1 to 10 illustrate the production of horizontal linotypes as well as the horizontal linotypes themselves, while Figs. 11 and 12 illustrate vertical linotypes.

In Fig. 1, 1 2 3 4 5 are the five staff-lines; 6 6 6, leger-lines; 7, the space above the staff-line 1; 8 9 10 11, the spaces between the respective staff-lines 1, 2, 3, 4, and 5; 12, the space below the bottom staff-line 5; 13, the space below the leger-lines 6 6 6; 14, a part of a bracket; 15, a part of a bracket-line; 16, a clef character; 17, a sharp character; 18, a common time character; 19, a chord of two minims; 20, a chord of four crotchets; 21, a chord of four dotted quavers; 22, a chord of

three semiquavers; 23 24, two binders, and 25 a bar line.

In composing the matrices for the top row of squares in the copy shown in Fig. 1 and against which the horizontal linotype *a* of Fig. 10 will be cast the operator selects the matrix 43, which has a matrix-cavity 44 for the oblique top end of the bracket 14. He next selects one, 45, that has no cavity at all, to make the white space between the said top end of the bracket and the top of the clef character 16, and so on to the end of the linotype. Thus, referring to Fig. 10, *a* is a plan of the printing edge of the linotype that the composed line of matrices of Fig. 2 will produce; *b*, that of the linotype that Fig. 3 will produce; *c*, that of the one that Fig. 4 will produce, and so on for *d e f g h* and Figs. 5, 6, 7, 8, and 9, respectively. The plans *a, b, c, d, e, f, g, and h* are drawn apart to indicate that the eight linotypes are separate pieces. If the reader will imagine them closed up to each other in a vertical direction, he will perceive that they bear upon them a proper typographical surface for producing replicas of the copy shown in Fig. 1; but a musician reads his sheet-music by a chord at a time, and as chords stand vertically on his sheet it is thought that vertical linotypes will be preferable to horizontal ones. The process of composition of the above-mentioned part of the bracket 14 of Fig. 1 for a vertical linotype is as follows, it being understood that the matrices have their formative cavities set lengthwise: The operator selects the matrix 43, which has a formative cavity, as 44, for the oblique top end of the bracket 14 and the white space above it. He next selects a series of matrices, such as 46, each having a formative cavity, as 47, for the vertical portion of the bracket 14, and so on to the end of the linotype. Vertical composition and vertical linotypes are further illustrated in Figs.

11 and 12. The plans *i j k l m n o p q r s t u v w x y z i' i''* are drawn apart to indicate that the twenty linotypes are separate pieces. If the reader will imagine them closed up to each other in a horizontal direction, he will perceive that they bear upon them a proper typographical surface to produce replicas of the copy shown in Fig. 11.

As all the matrices or type-dies in the font are of the same thickness, there will be a perfect self-maintaining register, whether the composition is horizontal or vertical, thus obviating the necessity of devices for spacing or justifying the lines.

For the reason that the formative cavities of the matrices or the printing-faces of the type-dies, as the case may be, are situated in equal squares, the side of such a square being equal to the distance between two adjacent staff-lines plus the thickness of one staff-line, it follows that the printing edge of the linotype consists of quadrated parts of the respective musical characters, quadrated being here used in the sense of situated in a square area from which is excluded every other part of the same character.

I claim—

A linotype to be used with others of the same kind for printing music typographically, the printing edge of which consists of quadrated parts of the respective music characters and the corresponding portion of the staff-line cast on the body of the respective linotype from a matrix for only the respective part of the character and corresponding portion of the staff-line.

In witness whereof I have hereunto set my hand in the presence of two witnesses.

JOHN BROADHOUSE.

Witnesses:

CHAS. S. WOODROFFE,

WALTER J. SKERTEN.