

Feb. 23, 1937.

L. MELIND

2,071,646

MEANS FOR MAKING RUBBER PRINTING TYPE AND PLATES

Filed Dec. 16, 1932

3 Sheets-Sheet 1

Fig. 1.

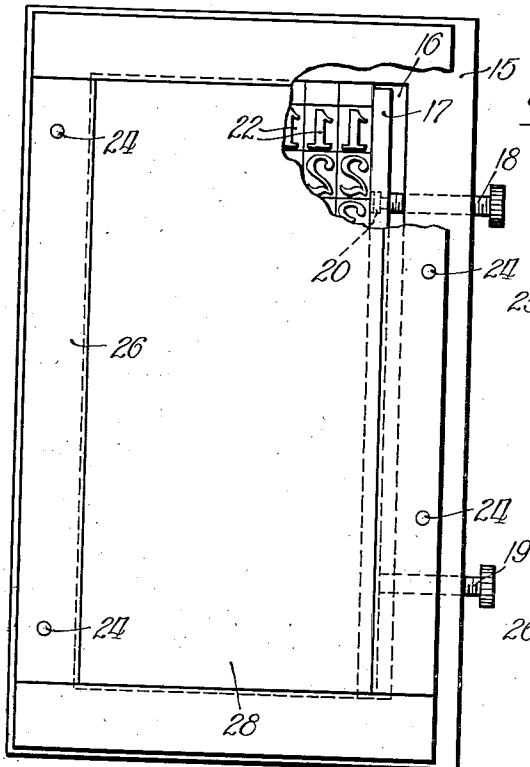


Fig. 3.

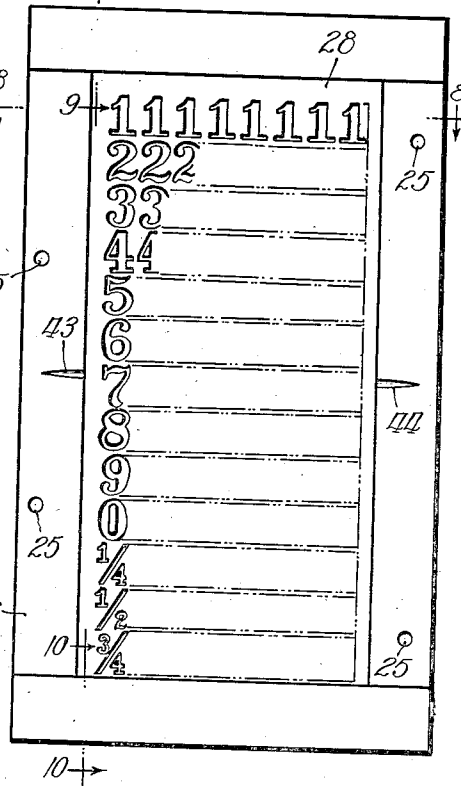


Fig. 2.

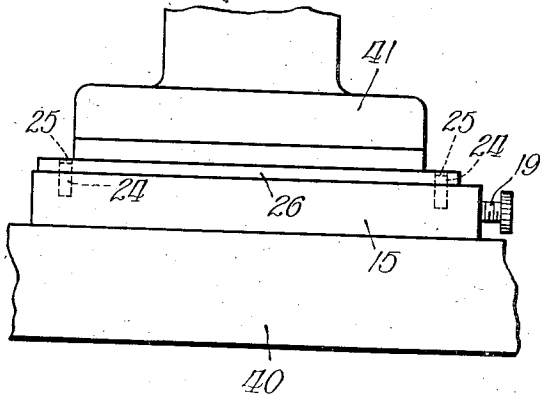


Fig. 5.

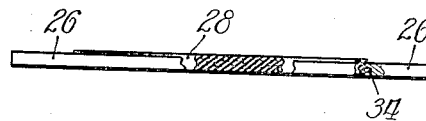
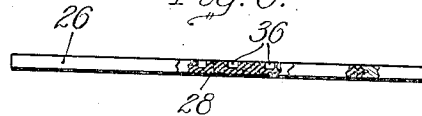


Fig. 6.



Inventor:
Louis Melind
By: Brown, Jackson, Boltcher & Klemmer,

Attys

Feb. 23, 1937.

L. MELIND

2,071,646

MEANS FOR MAKING RUBBER PRINTING TYPE AND PLATES

Filed Dec. 16, 1932

3 Sheets-Sheet 2

Fig. 4.

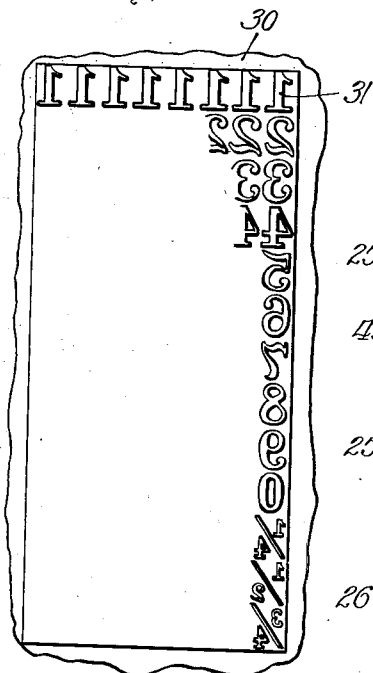


Fig. 7.

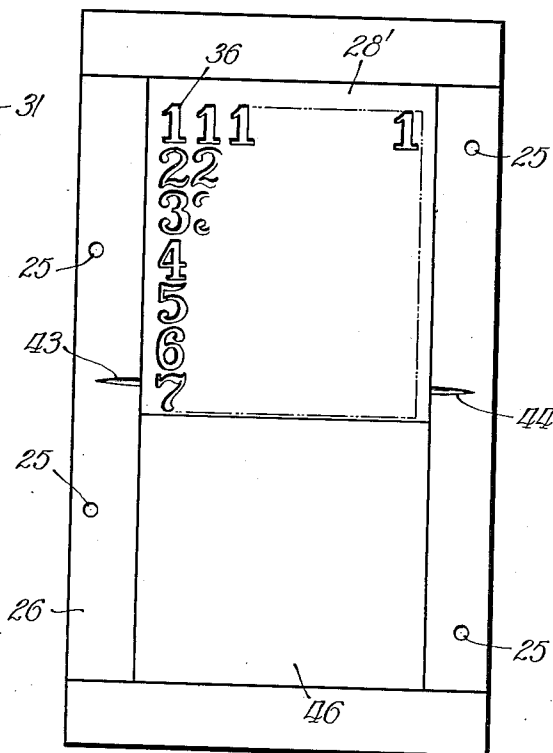


Fig. 8.

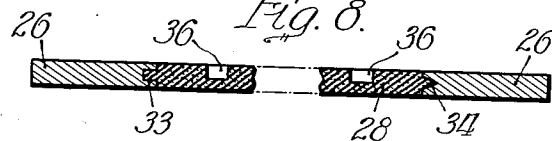


Fig. 9.

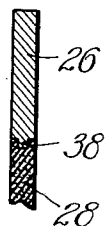
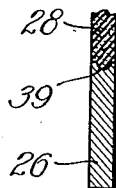


Fig. 10.



Inventor:
Louis Melind

By: Brown, Jackson, Boettcher & Linnner,

Attys

Feb. 23, 1937.

L. MELIND

2,071,646

MEANS FOR MAKING RUBBER PRINTING TYPE AND PLATES

Filed Dec. 16, 1932

3 Sheets-Sheet 3

Fig. 12.

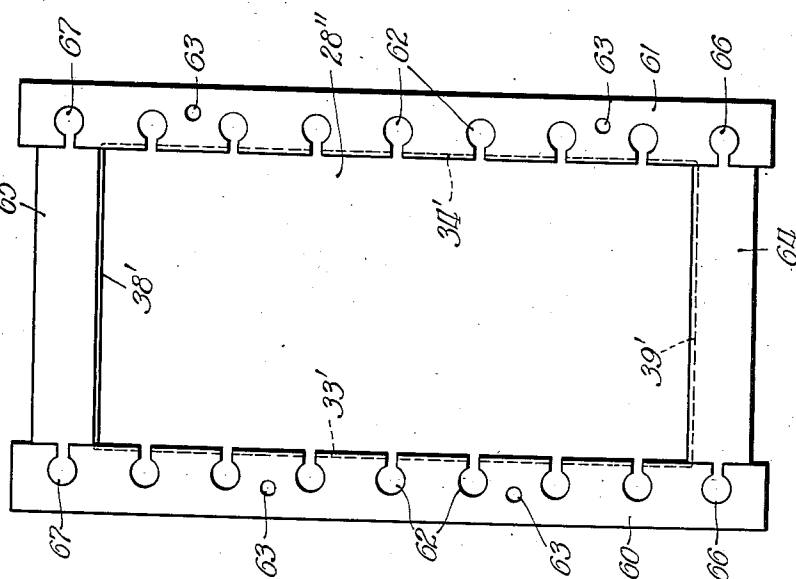
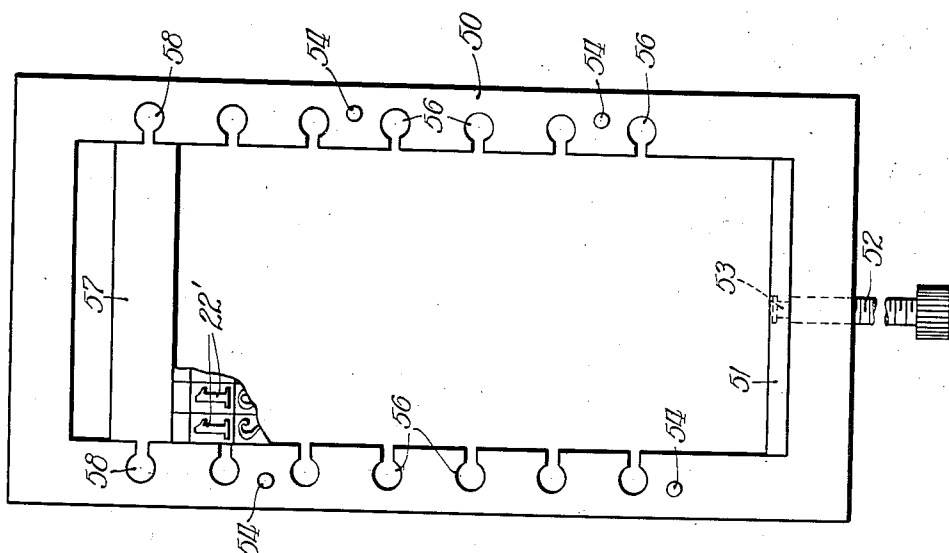


Fig. 11.

Inventor:
Louis Melind
By: Brown, Jackson, Baethke & Kimmner

Attys.

UNITED STATES PATENT OFFICE

2,071,646

MEANS FOR MAKING RUBBER PRINTING
TYPE AND PLATES

Louis Melind, Chicago, Ill.

Application December 16, 1932, Serial No. 647,562

8 Claims. (Cl. 18—44)

This invention relates to means for making rubber printing type and plates and is directed more particularly to means for forming matrices to receive impressions from printing plates and type, woodcuts, zinc etchings, electro-engravings and the like.

In the preferred embodiment of the invention, I provide a chase adapted to receive the type, cut or engraving from which it is desired to obtain an impression, this material being securely locked in the chase in any well known manner. A matrix frame of particular form is provided, which has openings spaced therein for receiving corresponding spaced dowel or aligning pins projecting from the face of the chase, and thus permitting placing of the frame upon the chase in only a single predetermined position. The matrix frame is provided with an interiorly cut-out portion having defining edges shaped to provide various types of tongue and groove engagement. Each of the edges has a different type of engaging surface for a purpose to be hereinafter described.

The matrix used in my invention is preferably formed from a composition of rubber, "bake-lite" or other similar condensation product. This matrix has substantially no resiliency or distortability, and is impervious to normal temperature or moisture variations.

The matrix blank is cut to a size slightly smaller than the size of the opening in the frame. The matrix and frame are then positioned in aligned relation upon the chase containing the material of which it is desired to obtain an impression. The matrix blank is slightly thicker than the frame, and upon application of pressure, such as by any suitable press operation, the material in the blank is forced outwardly to engage with the tongues and grooves of the defining edges of the frame, at the same time receiving the impression of the material in the chase.

The matrix, after receiving the impression, is allowed to cool and harden, and is then ready for use in preparing the rubber type. A piece of commercial sheet rubber is pressed over the matrix in any well known manner, and enters into the impressions formed therein. The sheet rubber is then removed, suitably backed, and then cut into strips for use in rubber stamps and the like. This procedure is well known, and needs no further description.

In forming the matrix, it may be desirable to submit it to pressure several times in order to obtain the proper depth and clearness of the im-

pressions. Between the pressing operations, the matrix is laid to one side to allow it to cool. It must then be reassembled in the matrix frame before the next pressing operation. For this reason it is desirable that the matrix be positioned in the matrix frame in the same manner during each operation, since there may be irregularities in the thickness and contour of the defining edges of the frame. To this end, I have provided the different types of tongue and groove engagement, whereby the matrix can be positioned in only one aligned position with respect to the matrix frame. Also, the matrix and frame must be aligned in the same manner upon the chase for each successive pressure operation. To this end I have provided the projecting aligning pins carried by the chase and received in suitable openings formed in the matrix frame for definitely aligning the frame with respect to the chase.

Also, it is desirable, in some instances, to provide a matrix which is not of the same size as the matrix frame, as for example, to obtain impressions of small woodcuts or etchings. I therefore have provided modified forms of the matrix frame and chase which are capable of adjustment to the size desired, while still retaining all of their distinctive features of alignment.

It is therefore an object of this invention to provide a chase for receiving material from which it is desired to obtain an impression, having means for aligning a matrix frame thereon in only one position.

Another object of the present invention is to provide a matrix frame having means cooperating with a chase to properly align the frame thereon, and having the matrix receiving portion provided with edges having distinctive engagement with corresponding edges of the matrix, so that the matrix is always positioned in the same manner within the frame.

A still further object of the present invention is to provide a matrix formed of commercial sheet rubber impregnated with a condensation product, preferably by the application of heat and pressure thereto, the matrix thus formed being substantially nonresilient and nondistortable, and not subject to change in size due to normal temperature and moisture variations.

Another object of the present invention is to provide a chase and a matrix frame which can be correspondingly adjusted to receive a smaller quantity of impressionable material and a smaller matrix, respectively, while still retaining all

of the distinctive features of alignment and engagement.

Other objects and advantages of the present invention will appear more fully from the following detailed description, which, taken in connection with the accompanying drawings, will disclose to those skilled in the art the particular construction and operation of a preferred form of my invention.

10 In the drawings:

Figure 1 is a plan view of the matrix and matrix frame, partly broken away and in position upon the chase;

15 Figure 2 is a fragmentary elevational view of a press and associated parts for the application of pressure upon the matrix for securing an impression therein;

Figure 3 is a plan view of the matrix and matrix frame, the matrix being shown as having received an impression;

20 Figure 4 is a front view of the rubber sheet produced by the matrix;

Figure 5 is an end elevation of the matrix and frame shown in Figure 3, with portions thereof in section, before the pressing operation;

Figure 6 is a view similar to Figure 5, after the completion of the pressing operation;

Figure 7 is a plan view of a modified form of platen disposed within the matrix frame;

30 Figure 8 is a sectional view taken substantially on line 8—8 of Figure 3 on an enlarged scale;

Figure 9 is a sectional view taken substantially on line 9—9 of Figure 3 on an enlarged scale;

35 Figure 10 is a sectional view taken substantially on line 10—10 of Figure 3 on an enlarged scale;

Figure 11 is a plan view of a modified form of chase; and

Figure 12 is a plan view of a modified form of matrix frame.

40 Referring now in detail to the drawings, in Figures 1 to 3 I have shown the chase 15, having the type-receiving portion 16 formed therein, there being a locking bar 17 disposed adjacent one side of the frame 15, which locking bar is adapted to be moved laterally in the frame by means of a pair of locking screws 18 and 19, having extending portions 20 engaged in the locking bar and providing for lateral movement of the bar when it is desired to lock type, etchings, or engravings within the chase. In Figure 50 1, I have shown a plurality of numerical type forms, indicated by the numeral 22, locked within the chase 15.

The chase 15 is also provided with upwardly extending dowel or aligning pins 24, which are received in suitably spaced openings 25 formed in the matrix frame 26. It will be noted that the dowel members 24 upon one side of the chase 15 are spaced differently than the dowel members upon the other side of the chase. This is for the purpose of preventing misalignment of the matrix frame 26 upon the chase, since by this spacing it is possible to position the platen frame upon the chase in only the one position shown in Figure 1.

55 The matrix frame 26 is of substantially rectangular shape, corresponding to the shape of the chase 15, and receives the correspondingly shaped matrix 28. The frame 26 may be made from a single piece of material, or may be made by interlocking the edges of a plurality of bar members. The latter construction is preferable, and has been disclosed in the drawings.

70 The matrix 28 is formed from a composition of rubber and a condensation product, such as

"bakelite". In forming this matrix, commercial sheet rubber is placed in a suitable mold, and a layer of "bakelite" or similar condensation product is placed upon one surface of the rubber. I have found that a proportion of approximately 90 percent rubber and 10 percent "bakelite" produces the best results but this proportion may be varied considerably within the scope of my invention.

The "bakelite" and rubber are then subjected to heat and pressure, the heat and pressure causing the rubber to liquify and allowing the "bakelite" to pass therinto and to be assimilated by the rubber. In thus combining the rubber and the condensation product, I preferably employ a pressure of approximately 500 pounds to the square inch and a temperature of from 280° F. to 350° F. However, the pressure and the temperature employed may be varied considerably, within limits. This provides a matrix having the nonresilient and nondistortable characteristics of bakelite, while retaining the characteristics of rubber in that a clear and definite impression can be made therein.

However, the matrix is capable of being bent so that it can be moved into and out of the matrix frame by pressure applied to the center of the matrix. This in nowise injures the edges of the matrix.

From this matrix, the rubber type is made by placing a sheet of commercial rubber over the surface of the matrix, this sheet being indicated by the reference numeral 30 in Figure 4, and subjecting this sheet to heat and pressure, causing the rubber to enter into the impressions of the matrix. This produces the characters 31 molded on the sheet 30. The sheet 30 is then backed by fabric or other similar material, and is cut into strips which may be formed into bands for use in numbering or dating stamps, or for other purposes. This procedure is well known in the art, and needs no detailed description.

Referring now to Figures 8 to 10, inclusive, it will be noted that the inner edge of the left side of the frame member 26 is provided with a substantially rectangular groove 33 formed therein. The opposite or right hand side of the matrix frame 26 is provided with a wedge or V-shaped groove 34. The upper end of the matrix frame 26 is provided with a tongue 38 (Figure 9), while the lower end of the matrix frame is provided with a semi-circular groove 39 (Figure 10).

The matrix, when originally blanked out from the impregnated rubber sheet, is cut to a size slightly smaller than the opening formed in the matrix frame 26. This is shown in Figure 5. During the first pressing operation, the matrix 28 is spread in all directions in the plane thereof and is forced into the grooves 33, 34, and 39, and about the tongue 38. It will be noted in Figure 5 that the matrix 28 is slightly thicker than the frame 26. During the pressing operation, the thickness of the matrix is reduced, and the excess material is forced into the grooves and about the tongue of the matrix frame for keying the matrix therein.

It will also be apparent that, because of the variation in the engagement provided at each edge of the matrix and frame, there will be no possibility of positioning the matrix in any but its original position within the frame member after it has once been removed therefrom. Also, the provision of the semi-circular groove and the wedge-shape groove facilitates the replacement of the matrix within the frame member, since

the left hand edge of the matrix can first be inserted in the groove 33, and the other edges can then be forced into their proper position because of the peculiar characteristics of the groove. This is desirable, since it facilitates the removal and insertion of the matrix within the frame, while not impairing its positive alignment therein. The pressing operation for forcing the matrix into engagement with the type 22 and into the grooves of the matrix frame 26 is shown clearly in Figure 2. In this figure, the chase 15 is shown resting upon a bed or base 40. Disposed above the chase 15 is the matrix frame 26, having its openings 25 aligned with the pins 24 of the chase. The matrix 28 is disposed within the frame 26, and a suitable platen 41 is brought down into engagement with the surface of the matrix 28 and forces the matrix to receive the impression of the type 22. At the same time, the thickness of the matrix is reduced and it is forced outwardly into engagement with the edges of the frame. Heat may be applied during this pressing operation.

Due to the fact that certain gases may be formed during this pressing operation, the matrix frame is provided with suitable vents 43 and 44, shown in Figure 3, which comprise wedge-shaped grooves leading from the matrix outwardly through the matrix frame to the surface of the matrix frame exteriorly of the press head 41.

In Figure 7, the matrix does not extend throughout the entire opening in the matrix frame 26.

The matrix 28' of this embodiment is similar to the matrix 28 of the embodiment shown in Figures 1 to 6, but extends for a portion only of the length of the frame 26. In its other respects, the matrix is identical with the matrix 28. Below the matrix 28' a second matrix 46 is provided, which preferably is formed of the same material and is of the same thickness as the matrix 28'. This matrix 46 engages in the matrix frame 26 in the same manner as the matrix 28' and functions merely as a filler for the portion of the frame which would otherwise not be filled. Only that portion of the chase corresponding to matrix 28' has type characters set therein, the portion of the chase corresponding to matrix 46 being free of type characters or filled with slugs or a plate to provide a smooth surface flush with the bases of the type in the other portion of the chase.

In the embodiment shown in Figures 11 and 12, I have provided a chase and matrix holder or frame which are adjustable to provide for obtaining impressions of different areas of type set-ups and etchings or engravings. Considering Figure 11, in which I have disclosed the chase 50, the frame is of similar shape to that of the chase shown in Figure 1, but is provided with a locking bar 51 disposed at one end thereof instead of at a side as is the locking bar 17 of Figure 1.

A screw 52 is threaded through the chase frame 50 and has an extending portion 53 engaging in the locking bar for providing movement of the bar lengthwise of the frame. The frame is also provided with the extending dowel pins 54 corresponding to the pins 24 of the embodiment shown in Figure 1. Within the frame 50 are disposed the type 22' or other material from which it is desired to obtain an impression. If the amount of material is not sufficient to fill the entire chase frame, it is necessary to provide some means for shortening the effective area of the chase and which will assure positive alignment of the mate-

rial therein and is adjustable for different sizes or areas of material. To this end I have provided a plurality of keyways or openings 56 formed in the side members of the chase, these openings 56 being of any desired form, preferably of the form disclosed in order to provide positive locking of a movable bar 57 therein. The bar 57 is provided with integral extending tongues 58 which are fitted tightly into the openings 56. The openings extend through from one face of the chase to the other, and the bar is of the same thickness as the chase. Thus, the bar can be moved from one position to another, depending upon the area desired within the chase frame, and when the extending tongues 58 are engaged in the openings 56 the bar will be held in rigid position with respect to the chase. The locking bar 51 can then be moved forwardly to secure the type or other material within the chase.

Correspondingly, the matrix frame shown in Figure 12 comprises the two bars 60 and 61, having a plurality of keyways or grooves 62 formed therein and extending from one face to the other face of each of the bars 60 and 61. The side bars are also provided with openings 63 adapted to receive the dowel pins 54 of the chase 50, as described in connection with Figure 1. Two end bars 64 and 65 are provided having integral extending tongue portions 66 and 67 respectively, which fit tightly into the openings or keyways 62 of the side bars 60 and 61. The inner edges of the side bars 60 and 61 are grooved, having the grooves 33' and 34' formed therein and corresponding to the grooves 33 and 34 of the platen frame 26 of Figure 3. The upper bar member 65 is provided with the extending tongue 38' corresponding to the tongue 38 of Figure 9, and the lower bar 64 is provided with a semi-circular groove 39', corresponding to the groove 39 of Figure 10. It is thus apparent that the bars can be moved inwardly of the ends of the frame members 60 and 61 to provide the desired size of matrix, indicated by the opening 28'', corresponding to the material set up in the chase 50. The bars are then secured in the openings or keyways and the matrix is then cut to the size desired and laid within the matrix frame formed by the frame members 60 and 61 and the bars 64 and 65. Upon the first pressing operation, the matrix will have the outer edges thereof forced into the grooves and about the tongue of the defining edges of the matrix frame, as described in connection with the embodiments of Figures 1 to 6.

It is thus apparent that I have provided a chase and matrix frame which are adjustable to accommodate any desired size of matrix, without alternating the distinctive features of alignment of the matrix frame upon the chase and alignment of the matrix within the matrix frame.

The particular manner in which the matrix is held within the matrix frame, and the means for aligning the frame with respect to the chase, in addition to the particular composition of the matrix, provide for simple and economical production of rubber type for stamping or other purposes, and assures that the cooperating elements used in forming the matrix for this type will all be held in aligned position during the forming operations.

I do not intend to be limited to the exact details shown and described in connection with the illustrated embodiments of my invention, but only in so far as defined by the scope and spirit of the appended claims.

I claim:

1. In a matrix frame, a plurality of bar members secured together to form a frame structure, differently shaped grooved means extending longitudinally along the inner edges of each of said members for securing a matrix in predetermined position within said frame and against displacement therefrom, and unequally spaced means formed in said bar members for aligning said frame upon a chase.

2. In a matrix frame, a plurality of members defining a frame structure, means on the inner edges of said frame structure for securing a matrix within said frame, said means comprising a rectangular groove in one edge, and a wedge-shaped groove in the opposite edge whereby said matrix may be snapped into positive locking engagement within said frame, said matrix having correspondingly shaped edges engaging in said grooves.

3. In a matrix frame, a plurality of members defining a frame structure, means on the inner edges of said frame structure for securing a matrix within said frame, said means comprising a rectangular tongue extending from one edge and a semi-circular groove in the opposite edge whereby said matrix may be snapped into locked engagement within said frame, said matrix having correspondingly shaped edges engaging said securing means.

4. In combination, a chase and type locked therein, a matrix frame adapted to be aligned in a predetermined position on said chase and defining a rectangular opening having edges of different sectional shapes, said opening being adapted to receive a matrix forming sheet adapted to be placed loosely within said frame over said type, and a platen for simultaneously forcing said matrix forming sheet into impression-receiving engagement with said type and into locking engagement with the defining edges of said opening to lock said sheet in aligned position against movement out of said frame when said frame is removed from said chase.

5. In combination, a matrix frame having a matrix-receiving opening extending therethrough, the defining edges of said opening being of varied sectional shape, said opening being adapted to receive a matrix-forming sheet there-

in of an area slightly less than the area of said opening, and means for forcing said sheet into engagement with said defining edges to lock said sheet in a single predetermined position within said matrix frame.

6. In combination, a matrix frame having its inner edges defining a matrix-receiving opening extending through said frame, said opening being adapted to receive a matrix-forming sheet of an initial thickness greater than the thickness of said frame and of an area smaller than the area of said opening, the edges of said opening having means formed therein providing for tongue and groove engagement of said sheet therewith, and platen means for forcing said sheet into engagement with said edges and for reducing the thickness of said sheet to the thickness of said frame, the engagement of said sheet with said edges preventing displacement of said sheet from said frame during movement of said frame.

7. In combination, a chase having type locked therein, a matrix frame having a central opening extending therethrough, inter-engaging means for aligning said frame on said chase with said opening over said type, said frame being adapted to receive a matrix forming sheet disposable in said opening and lying loosely on said type, and means for pressing said sheet into impression-receiving engagement with said type and simultaneously forcing the edges of said sheet into lateral keying engagement with the defining edges of the opening in said frame.

8. In combination, a chase having type locked therein, a matrix frame having a central rectangular opening extending therethrough, said frame being aligned upon said chase, the opposed defining edges of said opening being of longitudinally extending tongue and groove section, said frame being adapted to receive a matrix forming sheet loosely disposed in said opening over said type, and platen means for pressing said sheet into impression-receiving engagement with said type and simultaneously forcing the edges of said sheet into lateral keying engagement with the defining edges of the opening in said frame to maintain said sheet in said opening when said frame is removed from said chase.

LOUIS MELIND.