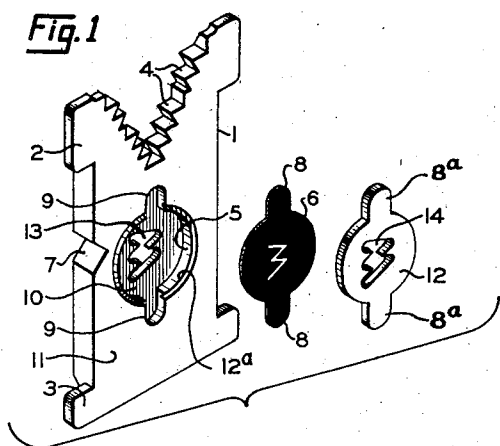
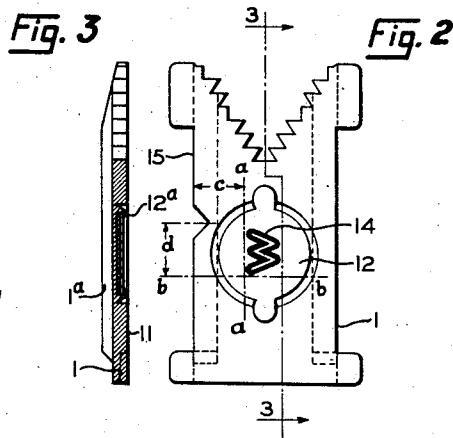
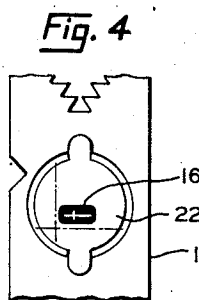
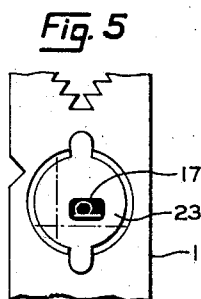
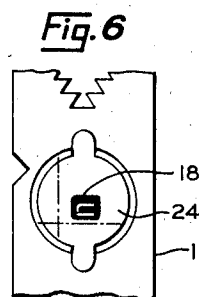
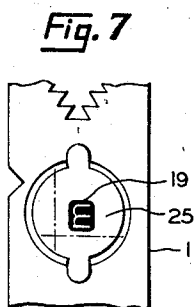
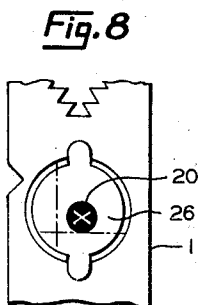
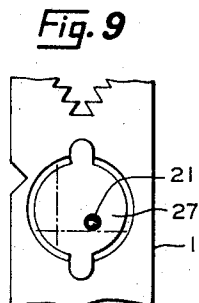


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H. R. FREUND
TYPOGRAPHICAL MATRIX

2,277,825

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TYPOGRAPHICAL MATRIX

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13 Claims. (Cl. 95—85)

This invention relates to improvements in character bearing elements or matrices of the class described in my pending application, Serial No. 274,758 filed May 20, 1939, said matrices being similar to the well known matrices used in type line composing and slug casting machines of the kind disclosed in Letters Patent 436,532 granted September 16, 1890 except for the fact that the disposition and the nature of the characters thereon makes them suitable for the production of type matter photographically rather than by the process of casting type bearing slugs.

The matrices alluded to above have the common characteristic that their body thicknesses vary according to the setwise width respectively of the type characters provided thereon. The matrices for slug casting purposes, however, have their characters punched in one edge thereof the width of which edge denotes the body thickness of the element whereas when constructed for photographic purposes, according to my pending application referred to, the characters are carried on a plaque such as a piece of film secured, as by a clamping ring or washer, in an opening extending through the thickness of the element as defined by its flat or broad side faces, the film being disposed preferably in a plane located between said faces but at the same distance from one of them no matter what the body thickness may be.

Further, as proposed in said pending application, and for convenience and economy in manufacture, the opening in the matrix body for the character carrying plaque is of the same size for any and all characters, is preferably circular and is located at the same place relative to the bottom and edges of the body. Stated in another way, the opening is of an arbitrary size, naturally somewhat larger than the largest character to be provided, and such size opening and its location is common for all matrices of a font thereof (a group usually comprising lower case and cap letter alphabets, numerals and punctuation marks).

While the foregoing construction of these matrices for photographic purposes is generally satisfactory it has been found that the area of a circular opening large enough for the largest letters, such as cap M or W, is such that when the matrices are handled, as they must be in manufacture and in use, the fingers are likely to contact with the exposed surfaces of the film. It is obvious that finger-prints on the film not only result in stains but also show up to a more or less degree as imperfections in the photographically reproduced matter.

The object of the present invention is to overcome the aforesaid objectionable condition and thus render the matrices more durable and more practical generally for commercial use. To this

end the invention provides in its broadest sense a construction whereby the character bearing plaque or film is shielded and thus protected against contact thereof with the fingers. More specifically, the invention provides an opening as before, transverse the thickness of the matrix body and of substantial size for accommodating the character bearing plaque as a whole, and then provides over the exposed surfaces of the plaque at each side a cover or shield having an aperture therein which may either conform in shape to the particular character on the plaque or may be rectangular or circular. However, the said apertures in the covers or shields are in any case only slightly larger than the actual character and thus so small in size that even pressure of the fingers against the side faces of the matrix will not permit of actual contact with the plaque or film. Such construction involves, as will later be seen, a variation in the location of the apertures in the covers or shields relative to the axial center of the opening for the plaque, or perhaps better, relative to certain fixed points on the matrix body with reference to which points all characters are located. Further, in the case of apertures which are not circular in shape, all corner walls are preferably rounded in order to minimize the tendency for collecting dirt or dust and to facilitate blowing out such accumulations as by the use of a jet of compressed air.

In the accompanying drawing, which shows several embodiments of my invention;

Figure 1 is an exploded isometric view of a matrix embodying the form of the invention in which the apertures in the shields over each face of the character bearing plaque conform to the shape of the character on the plaque.

Figure 2 is a front elevation of the matrix in Figure 1 with the plaque and front shield in place.

Figure 3 is a vertical section taken on the line 3—3 of Figure 2.

Figure 4 is a fragmentary front elevation of a matrix similar to that shown in Figure 2 but having rectangular apertures suitable for an ascending character.

Figure 5 is similar to Figure 4 but shows rectangular apertures suitable for a descending character.

Figure 6 is similar to Figure 4 but shows square apertures suitable for certain letters.

Figure 7 is similar to Figure 4 but shows rectangular apertures properly disposed for a broad character.

Figure 8 is similar to Figure 4 but shows a circular aperture.

Figure 9 is similar to Figure 8 but shows a smaller circular aperture differently located as for a punctuation mark.

Corresponding parts throughout the several

views of the drawing are designated by the same reference characters.

Referring to Figures 1, 2 and 3, the character bearing element or matrix comprises a main body portion 1 which preferably has the general shape, size and physical characteristics of a matrix such as is employed in type slug casting machines, namely, upper and lower ears or lugs 2 and 3 respectively which support and guide the matrices during line composition and circulation in the machine, and combination teeth 4 for their selective distribution to channeled magazines in which they are stored on the machine. The thickness of the matrix body is its over-all dimension edge-wise as viewed in Figure 3, and this dimension varies with and is proportional to the setwise width of the character which is disposed in a plane parallel to the flat side faces of the body as shown in Figure 2. The over-all body thickness is varied by altering the projected distance outwardly of the ribs 1^a from the rear face of the main body portion 1.

The body 1 is provided with a circular recess or opening 5 for receiving and supporting against its bottom surface and side walls the character-bearing plaque 6, the latter being held in accurate position of alignment in the recess relative to a predetermined point on the matrix body, such as a notch 7, by means of ears 8 on the plaque coacting with curved notches 9 formed in the side walls of the recess 5. The recess 5 is of the same depth on all of the matrices in a font thereof, that is, the bottom surface 10 of the recess is parallel to and spaced the same distance from the flat front face 11 on all of the matrices in a font so that, assuming the plaque thickness to be the same in all cases, the face 11 of the matrices when used as a reference surface in the machine will enable maintaining a constant spacing of all characters from the sensitized surface during the photographing operation. Actually, the depth of the recess 5 is equal approximately to the thickness of the plaque 6 plus that of the plaque retaining washer 12, this latter element corresponding in function to the washers shown in my aforesaid co-pending application and being secured in the recess 5 (after insertion of the plaque 6) by bending over the thin annular rib 12^a formed around the periphery of recess 5.

It is to be noted that in the present instance the retaining washer 12 is formed with lugs 8^a corresponding to the lugs 8 on the plaque 6, cooperation of the lugs 8^a with the notches 9 in the matrix body serving to assure accurate alignment of the opening 14 in the washer with the opening 13 in the bottom of the recess 5.

The primary distinction between the construction according to the present invention and that disclosed in my co-pending application referred to is that the character bearing plaque 6 is now covered or shielded at both sides to the greatest extent possible instead of being exposed to the extent permitted by an opening of the size of the plaque supporting recess. Thus, the recess 5 in the present instance has an opening 13 in its bottom 10 which, in the embodiment best shown in Figure 1, follows the outlines of the character—in this case a capital W—and the washer 12 has a similar opening 14. The openings 13 and 14 provide, in effect, a frame of reduced size disposed within the frame defined by the outlines of the recess 5 and such frame may reduce the area of the plaque exposed within the recess to only a portion having the configuration of the charac-

ter itself, or its shape and maximum dimensions may be determined by and limited substantially to the overall height and width of the character. In any event the size, shape and disposition of the aperture frame relative to the frame outlined by the recess is determined by and commensurate with these three characteristics of the character.

These openings 13 and 14 so materially reduce the exposed areas of the surface of the plaque 6 that even if the fingers be pressed firmly against the flat sides of the matrix actual contact cannot be made with the surfaces of the plaque, thus precluding any chance of fingerprints or stains on these surfaces.

It will be understood that the openings 13 and 14 are made slightly larger than the character on the plaque so as to avoid any interference with or obstruction to the passage of light when the matrix is presented in the machine for photographic exposure of the character thereon. Such openings may be made in any desired manner, an ordinary metal punching operation having been found both convenient and practical.

In order to obtain proper horizontal alignment of and proper setwise relation between the characters in a font when such characters are exposed by successive displacement of the matrices one-by-one from a composed line thereof, all characters are located on the matrices relative to horizontal and vertical reference or imaginary foundation lines *a—*a** and *b—*b**. The line *a—*a** lies at a given distance *c* from the edge 15 and the line *b—*b** at a given distance *d* from the apex of the notch 7. With this in mind it will be obvious that only the largest characters such as cap W and M will be concentrically positioned in relation to the full perimeter of the circular recess 5. Other characters such as the narrower caps, lower case letters and punctuation marks will have their uppermost extremities at various distances from the reference line *a—*a** while their leftmost extremities in every instance will lie the same distance from the reference line *b—*b**, the effect being an eccentric positioning of these characters relative to the circular recess 5. This condition is exemplified by the several different letters on the character plaques in Figures 4 to 9 inclusive.

Now since lower case letters and punctuation marks are quite small as compared to the capital letters, it is not necessary that the openings in the shields or covers over the plaques bearing such small characters actually follow the outlines of the characters. Thus, as shown in Figures 4 to 9 inclusive, appropriate openings such as rectangular or circular apertures are provided, such openings being only slightly larger than the particular characters and being variously located relative to the actual center of the recess 5. In Figures 4 to 9 inclusive only the openings 15 to 21 inclusive in the respective plaque retaining washers 22 to 27 inclusive are shown but it will be understood that openings corresponding thereto in shape, size and location are provided in the bottom of the recess 5 overlying the other or rear surface of the various character plaques.

The openings 16 to 21 inclusive are all so small as adequately to protect the surfaces of the plaques from contact of the fingers thereagainst. Further, it will be observed that the corners of the rectangular openings are somewhat rounded, the purpose being to minimize the chances of dust particles filling in the corners and at the

same time making it easier to clean out the corners as with a soft brush or a jet of dry air.

I claim:

1. A line composing matrix adapted for use in the photographic production of type matter, said matrix comprising, in combination, a body portion having a recess therein transverse of the thickness of the body, a character bearing plaque supported in said recess in a plane between and parallel to the broad sides of the body, and shields overlying each side of said plaque having apertures therein the outlines of which provide a frame of reduced size within the frame defined by the outlines of the recess and the shape and dimensions of the apertures being determined by and limited substantially to the overall height and width of the character on the plaque.

2. A line composing matrix adapted for use in the photographic production of type matter, said matrix comprising, in combination, a body portion having a recess therein transverse of the edgewise thickness of the body, a character bearing plaque supported in said recess in a plane between and parallel to the broad sides of the body, and cover means overlying both sides of said plaque and having corresponding apertures therein adapted to reduce the area of the plaque normally exposed by the outlines of the recess to a limited portion commensurate with the actual size of the type character and its disposition within the recess.

3. A line composing matrix adapted for use in the photographic production of type matter, said matrix comprising, in combination, a body portion having a recess therein transverse of the edgewise thickness of the body, a plaque bearing a transparent character and supported in said recess in a plane between and parallel to the broad sides of the matrix body, and protecting cover means over the side surfaces of the plaque and provided with openings adapted to restrict the area of the plaque exposed by the outlines of the recess to a fractional part thereof sufficient only for passage of light through said transparent character.

4. A line composing matrix adapted for use in the photographic production of type matter, said matrix comprising, in combination, a body portion having a recess extending partially therethrough in a direction transverse of the edgewise thickness of the body, a character bearing plaque adapted for support on the bottom wall of said recess with the character thereon located eccentrically with respect to the true center of the recess, and a member for retaining the plaque in supported position within the recess, said bottom wall and said plaque retaining member having apertures therein the outlines of which register with and thus define the outlines of the character on the plaque.

5. A line composing matrix adapted for use in the photographic production of type matter, said matrix comprising a body portion having a recess extending partially therethrough in a direction transverse of the edgewise thickness of the body, the bottom wall of said recess having formed therein an aperture penetrating the remaining thickness of the matrix body and representing a type character.

6. A line composing matrix according to claim 5, including as additional elements a character bearing film adapted for support on the bottom wall of the recess in the matrix body, and a film retaining member adapted to fit into the open side of said recess, said retaining member

having an aperture registering in outline and position with the character on the film and the aperture in the bottom wall of the recess.

7. A line composing matrix adapted for use in the photographic production of type matter, said matrix comprising, in combination, a body portion, a character bearing plaque disposed on the body in a plane parallel to the broad sides thereof, and a protecting shield overlying said plaque and having an aperture therethrough adapted to restrict the exposed surface of the plaque substantially to such area thereof as is occupied by the character thereon.

8. A line composing matrix adapted for use in the photographic production of type matter, said matrix comprising a body portion bearing a type character disposed in a plane parallel to the broad sides of the body and a member for protecting the character proper from contact with the fingers, said member overlying the matrix body but being apertured to afford direct exposure of and access to such limited portion of the matrix body as is occupied by the type character.

9. A line composing matrix according to claim 1, wherein the apertures in the shields over the sides of the plaque are located in relation to the true center of the recess in the matrix body in accordance with the location of the character on the plaque, the location of said apertures and said character bearing a constant relation laterally and longitudinally to predetermined fixed points on the matrix body.

10. A line composing matrix according to claim 4, wherein the recess in the body portion of the matrix is provided with notches for holding the plaque in accurate position of alignment in said recess, and wherein the plaque and the member for retaining it in the recess are provided with lugs adapted to cooperate with said notches.

11. A line composing matrix adapted for use in the photographic production of type matter, said matrix comprising, in combination, a body portion having a recess therein and provided with means for aligning a type character relative to predetermined points on said body portion, a character bearing element adapted to fit into and cooperate with said recess and character aligning means, and a member for retaining the character bearing element in the recess, said member also being adapted to fit into and cooperate with the recess and character aligning means on the body portion of the matrix.

12. A line composing matrix according to claim 11, wherein the member for retaining the character bearing element in the recess in the matrix body is provided with an aperture in conformity with the size and location of the character on the character bearing element, and wherein alignment of said aperture with said character is effected through means on the retaining member engageable with the character aligning means on the matrix body.

13. A line composing matrix according to claim 4, wherein the body portion of the matrix is provided with means for aligning the character on the plaque relative to the aperture in the bottom of the recess and to predetermine points on the body portion of the matrix, and wherein the retaining member is provided with means cooperative with said aligning means to thereby align the aperture in said member with the character and with the aperture in the bottom of the recess.

HERMAN R. FREUND.