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H. R. FREUND

1,718,921

MATRIX

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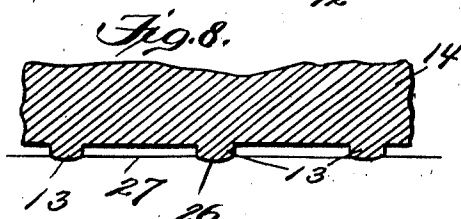
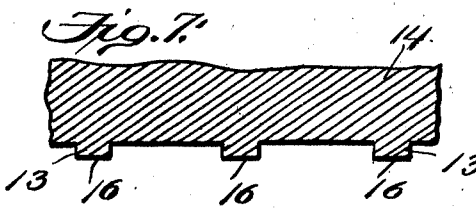
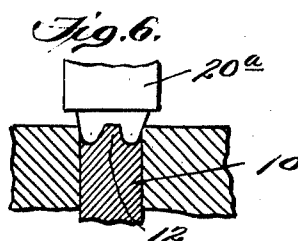
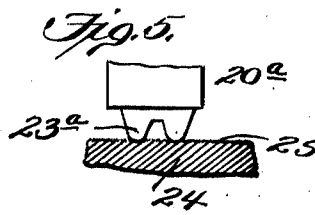
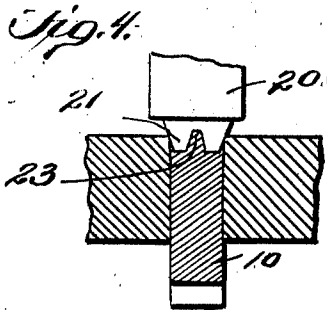
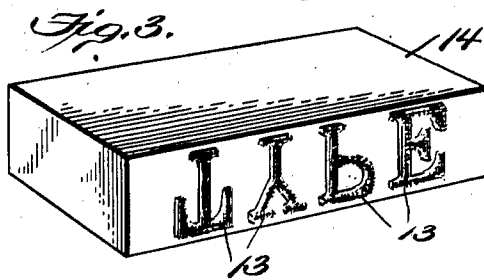
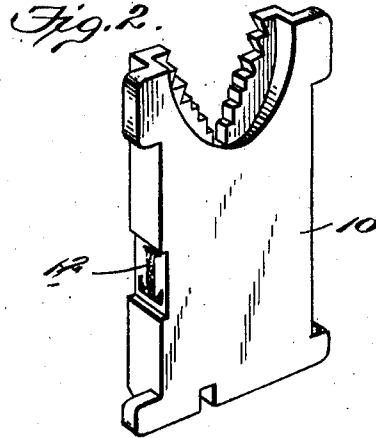
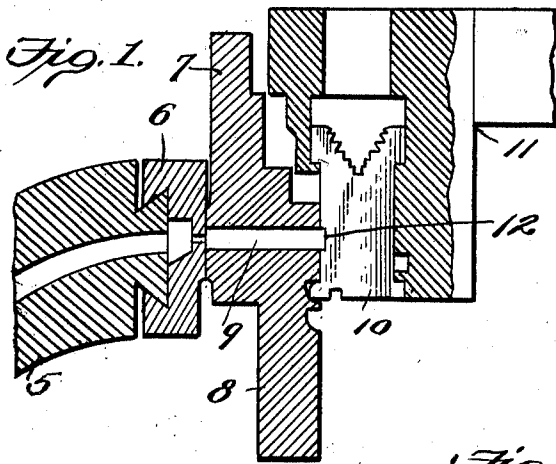


Fig. 9.

TYPE

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UNITED STATES PATENT OFFICE.

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MATRIX.

Application filed December 17, 1927. Serial No. 240,896.

The present invention relates to improvements in matrices of the kind used in typographical machines, and more especially matrices of the kind used in machines of the general class shown and described in Letters Patent No. 436,532 granted September 16, 1890, to O. Mergenthaler, wherein the matrices are delivered from a magazine under the control of a key-board and are assembled into a composed line from which a type bar or slug is cast, the latter bearing along its edge a type face which is a reproduction of the type characters borne by the matrices.

In modern printing, there is a demand for a type face which is capable of producing a printed impression which will simulate in appearance the ordinary type-written character. The ordinary typewritten character is printed by making the impression from the type through an interposed fabric inking ribbon, the typewritten character, in consequence, bearing an irregular or relatively indefinite demarkation between it and the surrounding surface on which it is printed, and this characteristic of typewritten characters readily distinguishes them from the more definitely and regularly outlined direct printed character as used in ordinary printing.

In the production of form letters and other advertising matter, it is usually desirable to print them from type bars or slugs of the kind which can be produced in typographical machines of the class hereinbefore referred to, the printed matter to have the appearance of ordinary typewritten matter. Heretofore, this has been done by producing in a typographical machine of the class hereinbefore referred to, type bars or slugs bearing characters which are similar in configuration to the ordinary typewritten characters, and by printing from the slugs, through a silk ink bearing ribbon on to the paper or other material, the resulting imprinted characters having the appearance of the usual typewritten characters. However, such a method of printing required a specially prepared machine to feed the ribbon between the slugs and the surface to be printed and such a method is very expensive, and hence it is desirable to avoid these objections by printing directly from the slugs on to the paper or other surface, and attempts have been made to accomplish this, although the results heretofore obtained have been unsatisfactory.

The object of the present invention is to

provide a matrix having a novel and improved type-forming character therein whereby type bars or slugs may be cast in the usual way in a typographical machine of the class hereinbefore referred to, the type characters on the type bars or slugs having such characteristics that the printing may be done directly from the type bars or slugs, without an interposed ink-bearing ribbon, and the resulting printed characters will be similar in appearance to typewritten characters.

The preferred matrix character and method of making it are illustrated in the accompanying drawing, wherein,

Fig. 1 is a sectional view taken vertically through the mouth piece, mold and a composed line of matrices, illustrating the manner in which the type bars or slugs may be cast in a typographical machine;

Fig. 2 is a detail perspective view showing on an enlarged scale the matrix bearing a character produced in accordance with the present invention;

Fig. 3 is a perspective view of a type bar or slug bearing type characters produced in accordance with the present invention;

Fig. 4 is a fragmentary sectional view illustrating the manner in which the character is formed in the ordinary matrix by the ordinary punching tool or die;

Fig. 5 is a detail view of a portion of the punching tool or die employed in producing the improved matrix character, showing a step in the method of preparing the punching tool or die for the production of the improved matrix character;

Fig. 6 is a view similar to Fig. 4 but it illustrates the method of forming the improved matrix character by a punching tool or die formed and prepared as illustrated in Fig. 5;

Fig. 7 is a fragmentary section taken perpendicularly through the printing face of an ordinary type bar, illustrating the nature of the printing face on the ordinary type bar or slug produced in the usual line casting machine;

Fig. 8 is a view similar to Fig. 7 but illustrating the nature of the printing face of a type bar or slug produced from matrices bearing the improved characters; and

Fig. 9 represents substantially the appearance of the characters when printed directly from the improved type bar or slug.

Similar parts are designated by the same reference characters in the several figures.

In the present instance, the accompanying drawing illustrates the invention as carried out in connection with a typographical or line casting machine of the general class shown and described in the patent hereinbefore referred to, 5 representing a portion of the throat of the metal pot or crucible of such machine, to which the usual mouth piece 6 is secured, 7 representing the usual mold cap and 8 the usual mold body, the mold cap and body cooperating in a manner well understood, to produce the mold cavity 9. A composed line of matrices 10 is contained between the jaws of the usual first elevator 11, the latter positioning the matrix line in front of the mold so that the type-forming characters 12 in the rear edges of the matrices will be aligned with the mold cavity 9 so that when molten metal is injected into the mold cavity through the metal pot mouth-piece, a type bar or slug will be cast in the mold cavity and the front edge of the type bar will bear type characters which are reproductions of the characters borne by the matrices, as is well understood in the art.

In matrices of the kinds heretofore used in ordinary printing, the bottoms or inner surfaces of the cavities which form the characters 12 are flat, smooth, and perpendicular to the flat sides of the matrices, so that the printing characters 13 of the ordinary type bar or slug 14, which are cast in such cavities, will have printing faces 16 which are flat, smooth and lie in a plane which is parallel to the length of the type bar or slug, as will be clear from Figure 7. A printed impression made directly from such a type bar or slug, after inking the printing face 16 in the usual way, will comprise printed characters the outlines of which are very definite and form a sharp marginal demarkation between the printed character and the surrounding surface on which it is printed. Consequently matter printed directly from type bars or slugs bearing the ordinary type characters is readily distinguishable from typewritten matter, and hence will not serve as a good substitute therefor.

In manufacturing matrices bearing characters of the ordinary kind, the character is formed in intaglio in the edge of the matrix by a punching tool or die 20 the character-forming part 21 of which has a nose or face 23 which is smooth, flat and perpendicular to the flat side of the matrix, as is shown in Fig. 4, so that the intaglio character formed in the matrix as a counterpart of the punching tool or die will have a bottom or inner surface which is smooth, flat, and perpendicular to the flat side of the matrix, and in consequence the characters reproduced from such matrices on the type bars or slugs will have smooth flat printing faces 16 which are parallel to the length of the slug, as is shown in Figure 7.

The present invention enables a type face to be produced which, when impressed directly on a printing surface will produce a character which simulates the appearance of a typewritten character, and the improved type face may be produced rapidly and economically in an ordinary line casting machine, by providing the matrices with novel and appropriate characters from which such type face is cast. According to the present invention, each matrix, which may otherwise be of the usual form, receives its type-forming cavity 12 from a punching tool or die 20^a the character-forming face 23^a of which is composed of ribs in relief which outline the character, the printing face of these ribs being rounded throughout the extent of the ribs in a direction transverse to the directions in which the ribs extend. The rounded faces of the ribs of the punch are roughened by pressing these faces against a stone, file or other medium 24 which has lines or irregularities thereon, indicated at 25, pressure of the punching tool or die against the roughened surface 24 of the stone, file or other medium producing minute depressions or roughened portions in the convex or rounded faces of the ribs which outline the character on the punching tool or die. The punching tool or die thus prepared is then forced into the edge of the matrix in the usual manner known to those skilled in the art, to produce the type casting character in intaglio therein, and the bottom or inner surface of this cavity in the matrix will be rounded or concave in a direction transverse to the directions in which the grooves outlining the character extend, and this concave surface will be roughened as it is a counterpart of the roughened convex surface of the ribs in relief on the punching tool from which the cavity in the matrix is formed. Preferably, the deepest portions of the inner concave surface of the character formed in the matrix are located at the depth occupied by the entire flat inner surface of the character in ordinary matrices, and the marginal portions of the inner concave surface will be at a relatively less depth.

Matrices provided with type-forming cavities as just described may be assembled in line casting machines of the class hereinbefore referred to and type bars or slugs may be cast from them in the usual way. However, instead of the print faces of the characters in relief on the type bar or slug being flat and smooth, like the surfaces 16 on the type bar shown in Figure 7, the printing faces which stand in relief from the type bar will be convex or rounded on an axis transverse to the directions in which the ribs extend, as is indicated at 26 in Figs. 3 and 8. For example, if the middle of the ribs outlining the printing face of the character is made of full height the marginal portions of

the ribs, will be of less or relatively reduced height.

The type bars or slugs cast from the improved matrices may be mounted in a suitable form, ink applied to their printing faces and an impression may be made on a sheet of paper or other surface 27, the impression being made direct from the type bars on to the surface to be printed. The printed impressions are made by the rounded or convex printing faces 26 of the type bar or slug, and due to the convexity of these faces, less pressure will be produced between the printing surface 27 and the marginal portions of the printing faces 26 than is produced between the printing surface and the middle or apex portions of the printing faces, and hence the marginal portions of the printed impressions made on the printing surface 27 will be somewhat indefinite or not sharply outlined, thus simulating the indefinite outlines of the ordinary typewritten characters. Furthermore, while the middle or apex portion of the rounded or convex printing face 26 will produce the full or maximum pressure against the printing surface 27 so that the body portions of the printed characters will be effectively outlined, the apex portion of the printing faces, which are roughened, will produce minute irregularities in the body portions of the printed characters, these irregularities in the printed character resembling the irregularities appearing in typewritten characters due to the interposition of the inking ribbon between the type and the printing surface. The indefinite outlining of the printed characters, due to the reduced pressure with which the marginal portions of the printing faces of the type bar are pressed against the printing surface, which avoids a sharp marginal demarkation between the printed characters and the surrounding printing surface, as obtained from the ordinary type bar or slug, and the minute irregularities in the distribution of the ink

which prints the body portions of the characters, as distinguished from the solid and uniform distribution of the ink in the characters printed from the usual type bar or slug, produce printed characters 28 which, as will be clear from Fig. 9, are similar in appearance to the ordinary typewritten characters.

The herein described type-forming character for matrices such as those used in ordinary line casting machines enables type bars or slugs having the improved printing faces thereon to be made in ordinary line casting machines with the same speed and facility as ordinary type bars or slugs, and the printed or other impressions may be made from the improved type bars or slugs, as is common in ordinary printing, although the printed matter will resemble or have the characteristics of typewritten matter.

I claim as my invention:—

1. A matrix for the casting of type therefrom in line casting machines comprising a body having in an edge thereof a type character-forming cavity the inner character outlining face of which is concave in a direction transverse to that in which the character-outlining portions of the cavity extend.

2. A matrix for the casting of type therefrom in line casting machines comprising a body having in an edge thereof a type character-forming cavity the inner character outlining face of which is roughened.

3. A matrix for line casting machines having a type character forming cavity therein the inner face of which is concave in a direction transverse to that in which the character-outlining portions of the cavity extend and is roughened, the deepest portion of said concave face being entirely roughened and the roughening diminishing as the depth of said concave face decreases.

In testimony whereof I have hereunto set my hand.

HERMAN R. FREUND.