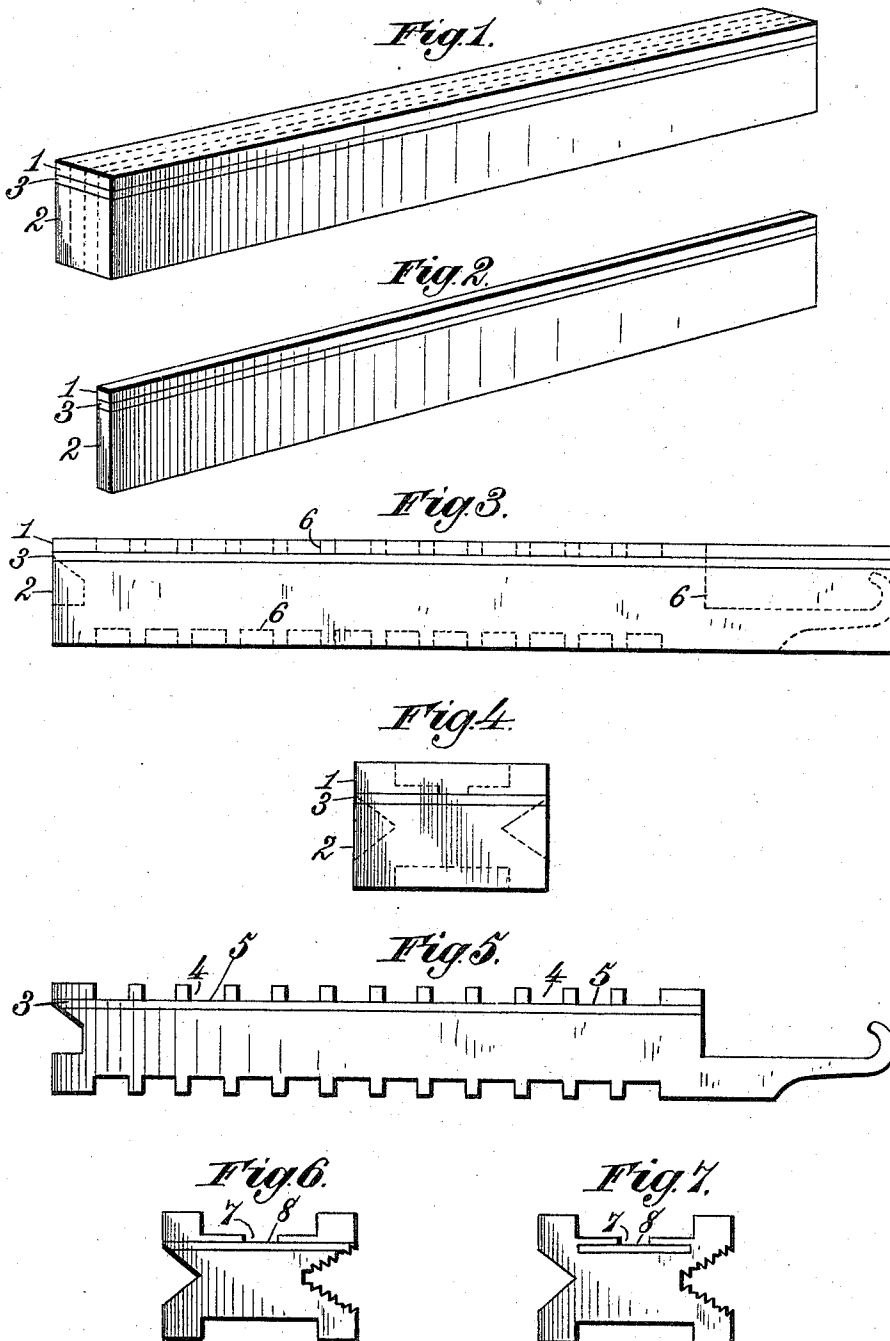


(No Model.)

A. S. CAPEHART.
MATRIX BAR OR PLATE.

No. 579,292.

Patented Mar. 23, 1897.



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UNITED STATES PATENT OFFICE.

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MATRIX BAR OR PLATE.

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To all whom it may concern:

Be it known that I, ALEXANDER S. CAPEHART, a citizen of the United States, and a resident of Bismarck, North Dakota, have invented certain new and useful Improvements in Matrix Bars or Plates, of which the following is a full, clear, and exact specification.

This invention relates to matrices or intaglio-type designed for type-setting and line-casting machines wherein the matrices or intaglio-type are stored in a magazine from which they are released by suitable means in the order required and composed or set up in a line to constitute a matrix for casting a printing-bar having at one edge a series of relief characters the counterparts of the composed matrices or intaglio-type. The intaglios are usually formed by dies or punches in a suitable metal, and it is preferable to produce them in copper, as this is the best-known metal for producing intaglio-type faces. The bodies of matrix bars or plates designed to circulate in a line-casting machine must be made of brass or some other metal harder and tougher than copper in order to avoid the rapid wear which would occur if the bodies of the bars or plates were made of copper or a comparatively soft metal suitable to be readily impressed for the best formation or production of the intaglio or type characters.

In some matrix bars or plates composed of brass or similar comparatively hard metal the intaglio characters are impressed directly into the hard metal by dies or punches.

It is desirable to provide circulating matrices or intaglio-type characters for type-setting and line-casting machines wherein the intaglio-type faces may be formed by dies or punches directly in a soft metal, such as copper, while the longitudinal edges and the greater portions of the ends and sides of the matrix bars or plates will be composed of a comparatively hard metal which will not unduly wear by frictional contact with fixed surfaces during the circulating motions of the matrices through the machine or the motions incident to assembling and distributing the matrices.

In preparing metal bodies for the manufacture of matrices designed for type-setting

and line-casting machines due consideration should be given to the possibility of practically and rapidly manufacturing the blank bars or plates by machinery, as they require to be so constructed that they can be mechanically handled by the assembling and distributing mechanisms of the type-setting and line-casting machine, in addition to which the edges of the bars or plates ordinarily used must be cut away or recessed at the places where the intaglio characters are to be formed by dies or punches or otherwise, this being usually accomplished by presenting a plurality of the bars or plates, arranged side by side, to the action of cutting or milling mechanism, which forms the recesses simultaneously in a large number of bars or plates.

With the foregoing in view I have produced a compound-metal body so constructed and possessing such characteristics that the intaglio characters can be formed directly in copper or other soft-metal stratum, while the longitudinal edges and practically the entire ends and sides of the matrix bars or plates are of a harder metal, which will successfully resist tendency to rapidly wear when the bars or plates circulate through the machine or are repeatedly assembled and distributed.

The chief object of my invention is to provide a new and improved matrix bar or plate for a line-casting machine, having the brass or other hard-metal edge recessed to expose the copper or other soft metal in which the intaglio is conveniently and perfectly formed, whereby the wearing-surfaces of the edges of the bar or plate and the greater portions of the ends and sides thereof are wholly of hard metal, which will effectually and successfully resist wear during the circulating or other motions of the bars or plates in the machine.

The invention also has for its objects to generally improve matrix bars or plates designed to be assembled and distributed in a line-casting machine, to improve the manufacture of that class of matrix bars or plates which have the intaglio characters formed in the bottoms of edge recesses open at opposite sides, and to provide a matrix bar or plate of the character referred to which will be strong and durable and not subject to undue wear

and wherein the intaglio-type characters may have copper faces in contradistinction to faces of hard metal like brass.

The objects of my invention are accomplished in the manner and by the means hereinafter described and claimed, reference being made to the accompanying drawings, in which—

Figure 1 is a perspective view of a compound-metal body made according to my invention to provide blanks for making matrix bars or plates; Fig. 2, a similar view of a blank for a matrix bar or plate. Fig. 3 is a side elevation indicating by dotted lines the manner in which the compound-metal blank is cut to form a matrix-bar for the monoline type setting and casting machine. Fig. 4 is a similar view indicating by dotted lines the manner of cutting the blank to produce a matrix-plate suitable for a Mergenthaler line-casting machine. Fig. 5 is a side elevation of a completed matrix-bar made according to my invention and suitable for the monoline-machine. Fig. 6 is a similar view of a matrix-plate made according to my invention and designed for a Mergenthaler machine, and Fig. 7 is a similar view showing a modification in the construction of a matrix-plate for a Mergenthaler machine.

In order to enable those skilled in the art to make and use my invention, I will now describe the same in detail, referring first to Fig. 1 of the drawings, which represents a compound-metal body composed of layers or strata 1 and 2 of comparatively hard metal, such as brass, and a layer or stratum 3 of comparatively soft metal, such as copper.

The dimensions or width of the compound-metal block may be such that it can be cut or divided longitudinally into a plurality of strips, such as shown in Fig. 2, suitable for single matrix-bar blanks, or for a plurality of such blanks if the strip be of sufficient length for the purpose. In Fig. 2 I represent a strip of the compound metal which is intended to serve as a blank for making a matrix-bar having a plurality of intaglios at the bottoms of open-sided recesses formed in one edge like the bars used in the monoline type setting and casting machine.

In producing the compound-metal body the hard-metal layers or strata, such as brass, and the soft-metal layer or stratum, such as copper, are preferably laid up in sheets and drawn or rolled to the required thickness and width. Any known method of applying heat and metallic adhesives and pressure may be employed to bring the strata into one solid compound-metal body. The drawn or rolled strips of convenient or proper sizes are of such construction that the hard-metal or brass layers or strata are outermost, and the edges of each blank matrix bar or plate comprise continuous pieces of brass or other hard metal superimposed on a continuous layer or stratum of copper or other soft metal in such

manner that by cutting away or removing a portion of the hard-metal edge to form a recess a portion of the copper or soft metal is exposed and constitutes a bottom wall to the recess to receive the desired intaglio character, which may be formed by dies or punches or otherwise, as usual.

If a matrix bar or plate having a plurality of intaglio characters in one edge is to be produced, the hard-metal layer or stratum 1 of the blank represented in Fig. 2 is cut away at several points by suitable cutting or milling devices for removing portions of the hard-metal edge to form open-sided recesses 4, Fig. 5, which expose certain portions 5 of the soft-metal or copper layer or stratum 3 at the places or points where the required intaglio characters are to be formed. The dotted lines 6, Fig. 3, indicate the lines on which the hard-metal edge of the blank is cut or milled to produce the matrix bar or plate, Fig. 5.

The intaglio characters may be formed in any ordinary manner by dies or punches or otherwise directly in the exposed portions 5 of copper or soft metal which constitute the bottom walls of the open-sided recesses for producing a matrix bar or plate, Fig. 5, suitable for a monoline type setting and casting machine.

If a matrix-plate having a single intaglio character in one edge is to be produced of the form represented in Fig. 6, which is suitable for a Mergenthaler machine, the blank is suitably cut or milled, as indicated by the dotted lines, Fig. 4, whereby the required form or shape is imparted to the plate and a portion of the brass or hard-metal edge is removed, as at 7, to expose a portion of the copper or soft metal, as at 8, in which the intaglio character is impressed or indented, thus obtaining a matrix-plate, such as shown in Fig. 6, suitable for a Mergenthaler machine.

The compound-metal body may be drawn or rolled in the form of a comparatively narrow strip, which may be divided at certain intervals to produce matrix-bar blanks, such as shown in Fig. 2 or as shown in Fig. 4. If desired, the compound-metal body may be produced in the form of a block, such as shown in Fig. 1, adapted to be divided, as indicated by dotted lines, to obtain blanks similar to those represented in Figs. 2 and 4.

The completed matrix bars or plates manufactured according to my invention are machine-made, in contradistinction to hand-fitted matrices, and each matrix bar or plate has the intaglio character impressed or produced directly in soft metal, preferably copper, while the large proportion of the body of the bar or plate is of hard metal, preferably brass, whereby they will not unduly wear by sliding contact with fixed and other parts of a line-casting machine while pursuing a circulating path, or while being assembled and distributed.

A special hard brass has heretofore been

considered best for matrix bars or plates for line-casting machines, in that such hard metal is suitable for the machine-work in shaping the bars or plates and secures the strength requisite to successfully withstand the mechanical manipulations necessary in operating the line-casting machine.

Matrix-plates of the construction represented in Fig. 7 may be produced from a block made by drawing or rolling superimposed layers or strata of brass or other hard metal and copper or other soft metal, the latter being of less width than the brass or hard-metal layers or strata, whereby the copper or soft metal is wholly inclosed longitudinally by the brass or hard metal. A block formed in this manner or otherwise produced can be cut or severed transversely to produce flat matrix-blanks, and then by cutting or milling the edges of these blanks to expose portions of the copper or soft metal, as before explained, matrix-plates such as shown in Fig. 7 are obtained.

My invention is more particularly intended for manufacturing matrix bars or plates designed for type-setting and line-casting machines of the monoline and Mergenthaler type, but I wish it understood that matrix bars or plates can be made according to my invention for any line-casting machine using matrix bars or plates to cast solid lines of relief type.

The matrix bars or plates are provided with suitable means, such as shown, whereby they may be mechanically manipulated by the mechanisms of the line-casting machine.

Having thus described my invention, what I claim is—

1. A matrix for a line-casting machine, consisting of a flat hard-metal plate containing a soft-metal stratum and cut away at the edge to form an open-sided recess and expose a

part of the soft-metal stratum in which the intaglio character is formed, substantially as and for the purposes described.

2. A matrix bar or plate having means by which it may be mechanically handled in a line-casting machine, and composed of hard and soft metal strata laid and held together by heat and pressure, with the hard metal outermost at the edges of the bar or plate, and the hard-metal edge of the latter cut away to form an open-sided recess which exposes a part of the soft metal in which the intaglio character is formed, substantially as and for the purposes described.

3. A matrix bar or plate for a line-casting machine, consisting of strata of hard and soft metals united by heat and pressure, with the hard metal outermost, and cut away to form a recess, one or more, with open sides, exposing a part of the soft metal in which an intaglio character is formed, substantially as and for the purposes described.

4. A compound-metal body for the manufacture of matrix bars or plates for line-casting machines, consisting of hard-metal strata and an intervening soft-metal stratum, the strata being relatively disposed to present a continuous edge of hard metal constructed and adapted to be cut away or removed to provide an open-sided recess and expose a part of the soft-metal stratum in which an intaglio may be formed at the bottom of said recess, substantially as and for the purposes described.

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

ALEXANDER S. CAPEHART.

Witnesses:

GREGORY PHELAN,
GEO. W. ROOSEVELT.