T. W. SMITH.
Type-Matrix.

No. 220,039. Patented Sept. 30, 1879.

Fig. 3.

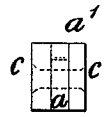
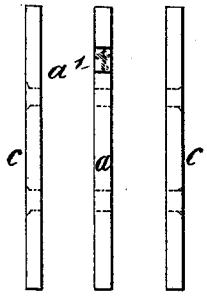


Fig. 4.



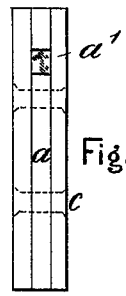
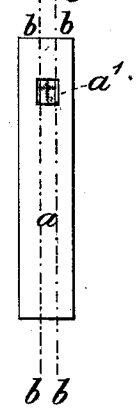


Fig. 1.

Fig 5



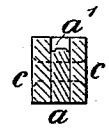


Fig 2

Witnesses:
Saml R. Turner
Geo. W. Smith

Inventor:
Thomas White Smith.
by John J. Halsted.
his Att'y.

N. PETERS, PHOTO-LITHOGRAPHER, WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

THOMAS W. SMITH, OF CHISWELL STREET, COUNTY OF MIDDLESEX, ENGLAND.

IMPROVEMENT IN TYPE-MATRICES.

Specification forming part of Letters Patent No. **220,039**, dated September 30, 1879; application filed June 5, 1879.

To all whom it may concern:

Be it known that I, THOMAS WHITE SMITH, of the Caslon Type Foundry, Chiswell Street, in the county of Middlesex, England, typefounder, have invented new and useful Improvements in Apparatus Employed in the Casting of Metal Type, which improvements are fully set forth in the following specification, reference being had to the accompanying drawings.

In the casting of metal type the letter or representation is formed by punching in a copper matrix, and the effect of the operation of the punch is to produce inclined or beveled sides to the letter or other representation therein and to the molded type. The consequence is, that the type as formed has a burr on its sides at the junction of the matrix with the mold, which defect increases with use of the matrix. This burr has to be removed by "rubbing"—a process requiring the exercise of considerable delicacy and skill in manipulation, and involving consequent additional cost of manufacture to the type.

The object of the invention is to render unnecessary this operation of rubbing, while the matrix is rendered more durable, and the appearance of the type is improved. For this purpose, after punching the letter or representation in the copper, I reduce such copper in breadth to the width of the face of the letter or representation punched thereon, so as to remove the beveling from the sides thereof, and I apply to such sides other hard metal, by preference hardened steel, which is formed to fit close to the copper part of the matrix, which is thus made of three pieces of metal instead of one. By these means a clean casting is obtained of greatly-increased durability, without burr or inclined sides to the type, the necessity for the rubbing process is avoided, and great economy in manufacture, with superiority of metal type produced, is secured.

But that the invention may be more fully understood, I will, by the aid of the accompanying drawings, proceed to describe the means pursued by me in carrying the same into effect.

Referring to the drawings, Figure 1 shows an upper-surface view, Fig. 2 a transverse section, and Fig. 3 an end view, of a matrix produced according to my invention. Fig. 4 shows, by an upper-surface view, the piece of copper reduced to the width of the face of the letter and the hard-metal side pieces. Fig. 5 shows a piece of copper of the form and character generally employed in the production of such matrix. In this and the other surface-figures the indentation *a'* represents the position of the letter or representation in the matrix *a*.

In proceeding according to my invention, this indentation is effected, in the usual way, by the forcible application thereto of a steel punch; but when the desired impression has been effected in the copper piece *a* the sides of such copper piece are then removed to the extent of about that on each side indicated by Fig. 4 and by the dotted lines *b b* in Fig. 5, or so as to remove the whole of the bevel from the sides of the letter as obtained by the action of the punch, and I then apply corresponding side pieces of hard metal, by preference hardened steel, as represented by *c c*. I then secure the three pieces together by a couple of rivets, one near each end, or otherwise.

Having thus described my invention and means which I adopt in carrying the same into effect, I would have it understood that what I claim is—

A matrix for casting metal types having the soft-metal central piece of about the same width as the face of the letter, and secured between two hard-metal pieces by rivets, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

THOS. W. SMITH.

Witnesses:

ALFRED GEORGE BROOKES,

JAMES EMSLIE.