

No. 645,658.

Patented Mar. 20, 1900.

E. V. BEALS.  
PRINTING BAR.

Application filed Feb. 21, 1898.)

(No Model.)

Fig. 1.

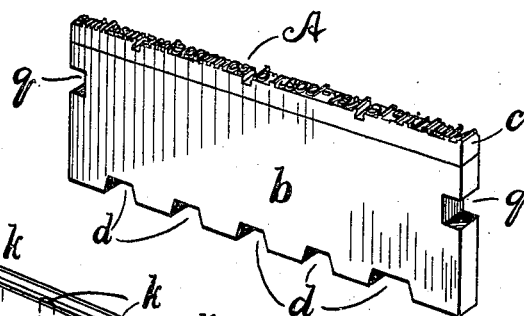


Fig. 2.

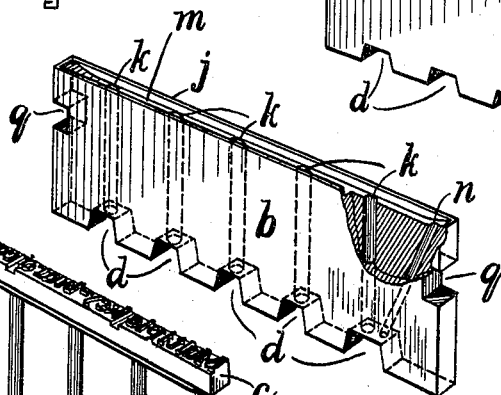
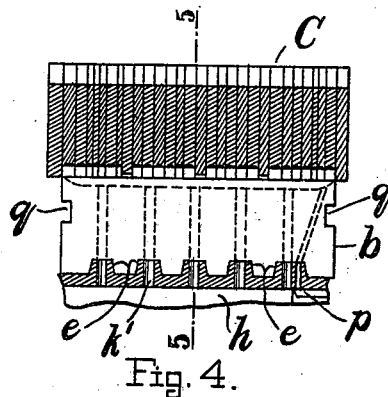
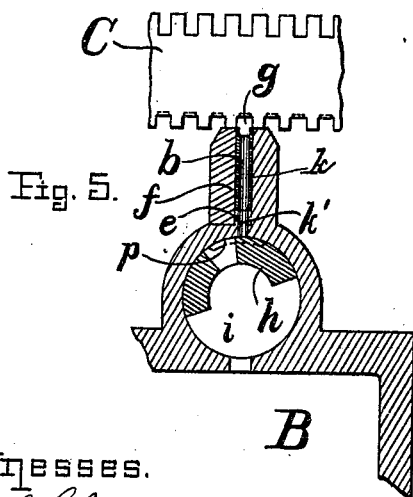
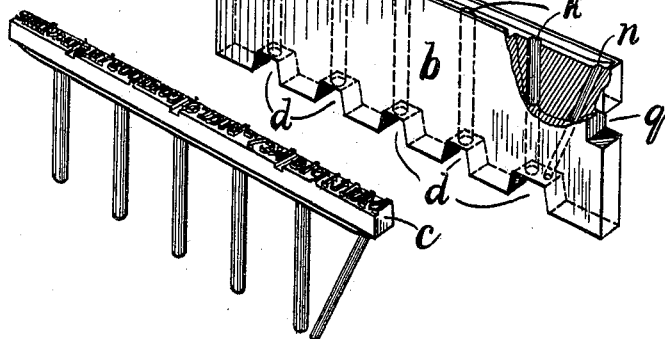


Fig. 3.



Witnesses.

*H. L. Chapin.*  
*Louise A. Grace*

Inventor.

*E. V. Beals*  
By *H. E. Schenck* Att'y

# UNITED STATES PATENT OFFICE.

ERL V. BEALS, OF BOSTON, MASSACHUSETTS.

## PRINTING-BAR.

SPECIFICATION forming part of Letters Patent No. 645,658, dated March 20, 1900.

Application filed February 21, 1898. Serial No. 671,169. (No model.)

*To all whom it may concern:*

Be it known that I, ERL V. BEALS, a citizen of the United States, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Printing-Bars, of which the following is a specification.

My invention relates to a printing bar or slug bearing on one edge the characters required to print an entire line. These bars have usually been cast in a single piece, necessitating the employment of a considerable quantity of metal, the frequent recasting of which occasions much waste. The casting of the entire slug in a single piece also requires a considerable portion of the whole time devoted to the operation of casting due to the cooling of the metal, which is prolonged both by the quantity of metal in the slug and on account of the heat of the contiguous surfaces. A slug cast in a single piece furthermore requires to be trimmed on its sides.

My invention has for its object to provide a printing bar or slug which can be produced more rapidly and economically and with greater facility than heretofore.

It consists in a blank or body portion of suitable material prepared for repeated usefulness and provided with one or more apertures extending therethrough from edge to edge and an edge portion molded thereon bearing the printing characters to form a line, the molten metal being delivered by a suitable casting mechanism through said aperture or apertures in said blank into a space between the faces of a line of assembled matrices and the edge of said blank which is presented thereto.

My invention furthermore consists in providing the blank or body portion of the printing-bar at any suitable point, but preferably at one end, with a small aperture communicating with the space into which the metal is cast, said aperture permitting the escape of air from said space during the operation of casting and being designed to be closed as soon as the space and the air-aperture itself is filled with metal; and my invention furthermore consists in certain novel features and details of construction, as hereinafter

fully described, and specifically pointed out in the claims.

In the accompanying drawings, Figure 1 is a perspective view of a printing-bar constructed in accordance with my invention. Fig. 2 is a perspective view of the blank or foundation-piece of the same, a portion being broken away to show the interior construction. Fig. 3 is a perspective view of the cast or molded edge portion of the blank which bears the characters required to print an entire line. Fig. 4 is a vertical section through an assembled line of matrices and the upper portion of the melting-pot of a machine for producing printing-bars, illustrating the method of delivering the soft or molten material through the holes or openings in the foundation-piece of my printing-bar into the line-matrices to form the edge portion bearing the printing-surfaces. Fig. 5 is a vertical section on the line 5 5 of Fig. 4.

Referring to the drawings, A represents my improved printing-bar, which is composed of a blank or foundation-piece *b*, composed of any suitable material—for example, hard metal—upon one edge of which is cast or molded in any suitable manner or in any machine adapted for the purpose an edge portion *c*, of soft metal or other suitable substance, designed to bear upon its face the printing letters or characters required for an entire line. One longitudinal edge of the portion *b* is provided with notches *d*, into which fit correspondingly-shaped apertured projections or nipples *e*, Figs. 4 and 5, in the bottom of a narrow slot *f*, formed at the top of a melting pot or receptacle B, which may form a portion of the casting device of a machine for producing printing-bars, C representing a line of assembled matrices used in connection with said casting device. The blank or foundation-piece *b* is placed within the slot *f*, which forms the mouth of the melting-pot, leaving a molding-chamber *g* between the upper edge of the portion *b* and the line of matrices C.

*h*, Fig. 5, represents a rotary valve or cut-off placed within a chamber *i* immediately beneath the mouthpiece of the melting-pot, said valve being operated at the proper times to permit the soft or molten material contained

in the pot to be forced through its mouthpiece and to cut it off therefrom.

Extending through the blank or portion *b* in the direction of its width from the bottom of the notches *d* to its opposite edge *j* is a series of holes or openings *k*, registering with the corresponding orifices *k'* in the nipples *e*, through which the molten material contained in a pot *B* is caused to pass or flow into the space or molding-chamber *g* between the edge *j* of the portion *b* and the matrices *C*, properly assembled to form a line of printed matter, the soft or molten material at the same time filling a groove *m*, formed in the edge *j* of the portion *b*, which groove, together with the material in the openings *k* and *n* when hardened by cooling, forms a means for securely holding the edge portion *c* aligned and in place upon the portion *b*.

Near one end of the edge *j* of the portion *b* is formed an additional passage or aperture *n*, communicating with the groove *m* and extending down into one of the notches *d* on one side of the adjacent opening *k* and having no communication therewith nor with the orifices *k'* of the melting-pot, but only with an exit-aperture *p*, formed in the valve *h* and its casing, said opening *n* forming an outlet for discharge of the air from the molding-chamber *g* during the inflow of the soft or molten material, which is designed to be injected into said molding-chamber first through the aperture at the end of the blank opposite to the end which bears the air-aperture *n* and thence successively through the other apertures in the order of their distance from said first aperture until finally the metal fills up said air-aperture *n* also, at which time the further revolving of valve *h* closes the end of the air-aperture.

At the opposite ends of the portion *b* are formed notches *q q* for the reception of rails or ways, upon which it is adapted to slide, whereby it is guided to the point in the machine where it enters the mouthpiece of the melting-pot opposite to the line of matrices *C*, after which the soft or molten material is admitted to the molding-chamber, as before described, to form the edge portion *c*, containing the printing characters to form an entire line. These notches *q q* also serve as a means for further controlling the movements of the blanks and finished printing-bar during the formation of its edge in the machine and its delivery therefrom.

While I have shown and make claim herein to a printing-bar having a blank portion to be repeatedly used and composed of harder material or materials than the section which bears the line of printing-faces, it should be understood that I claim as embodying a part of the invention the right to make these blank portions of the same material of which the printing-faces are composed, so that the printing-bar so formed may be entirely recast after fulfilling the purpose for which it was formed.

While this method necessitates the continual remelting of a greater quantity of metal than that herein more particularly specified and claimed, it still affords the great advantage of permitting the casting and trimming of said blank portions to be done outside of and distinct from main composing and line-forming machines. I desire it also to be understood that I do not limit myself to the particular form of the printing-bar herein specified, but claim such modifications as would be suggested to any skilled mechanic in the construction of the same.

I believe myself to be the first to provide a printing-bar in two parts, one of which becomes the mouthpiece of a casting device during the formation of such bar and having through its body a passage way or ways for the molding material to enter the chamber in which is formed the section of the bar bearing the printing-faces. I also further believe myself to be the first to provide a printing-bar blank which has through its body a passage-way for the escape of air from the molding-chamber while that section of a printing-bar bearing the printing-faces is being formed upon said blank.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. A blank for composite printing-bars having notches at its opposite ends for the reception of means for controlling its movements in a machine for producing printing-bars.

2. A blank or foundation-piece for printing bars or slugs consisting of a body having a groove along one edge and apertures extending therethrough from said groove.

3. A blank or foundation-piece for printing bars or slugs consisting of a body having notches at one edge in which terminate apertures extending through said body.

4. A printing bar or slug consisting of a foundation or main portion having a single groove along one edge and apertures extending therethrough from said groove, and an edge portion bearing the printing-faces to form a line, said edge portion extending into the grooved edge and apertures in said main portion.

5. A composite printing bar or slug having its base or main portion provided with apertures extending therethrough for the passage of soft or molten material to form thereon a character-bearing edge, said main portion being provided at one edge with notches in line with its openings for the reception of corresponding apertured projections at the mouth of a receptacle containing soft or molten material which passes directly from said projections through the apertures in the main portion of the printing-bar to the molding-chamber.

6. The herein-described printing-bar, comprising a blank or foundation-piece having notches at its opposite ends and provided with a groove along one edge, a series of

notches in its opposite edge, apertures extending from the bottom of said notches to said groove, and an edge portion bearing printing characters to form an entire line molded upon  
5 said foundation-piece by forcing soft or molten material through the apertures therein into the molding-chamber, said blank or foundation-piece having an additional aperture for

the passage of air while the edge piece is being molded thereon.

Witness my hand this 19th day of February,  
A. D. 1898.

ERL V. BEALS.

In presence of—

P. E. TESCHEMACHER,  
LOUISE A. CHACE.