(No Model.) 2 Sheets—Sheet 1.

I. McK. CHASE.

TYPE BAR.

No. 490,739. Patented Jan. 31, 1893.

Fig. 1.

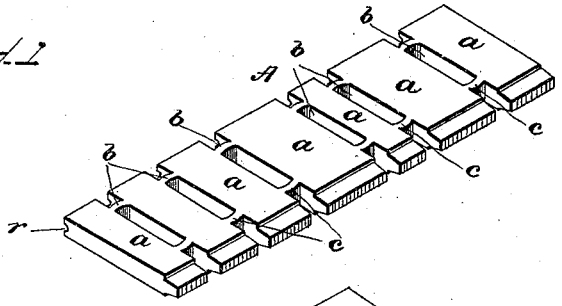


Fig. 5.

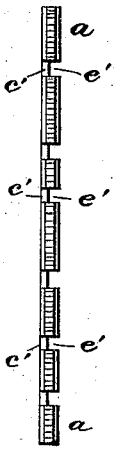


Fig. 2.

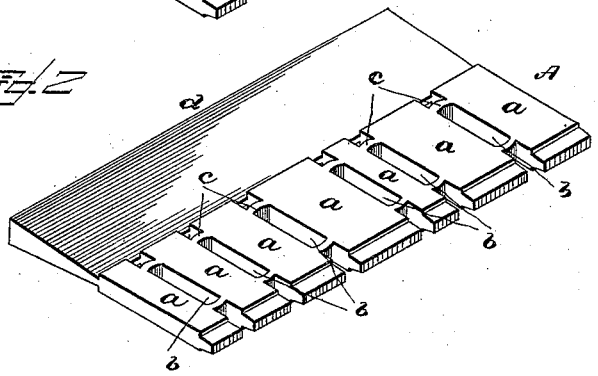


Fig. 6.

Fig. 3.

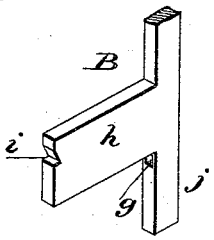
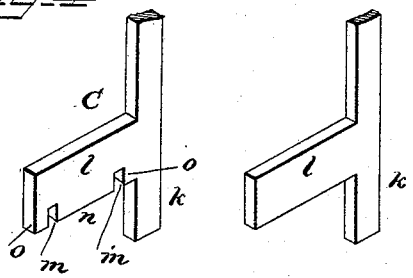


Fig. 4.



Witnesses

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A. M. Reinohl.

Inventor

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Attys.

(No Model.) 2 Sheets—Sheet 2.

I. McK. CHASE.

TYPE BAR.

No. 490,739. Patented Jan. 31, 1893.

Fig. 7

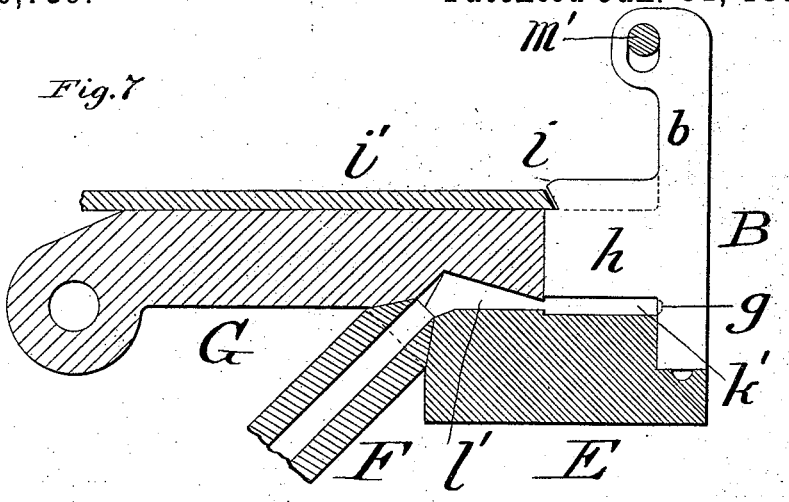


Fig. 8

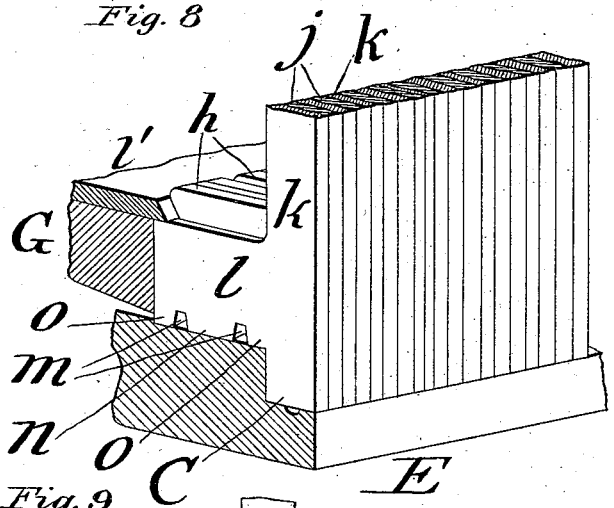
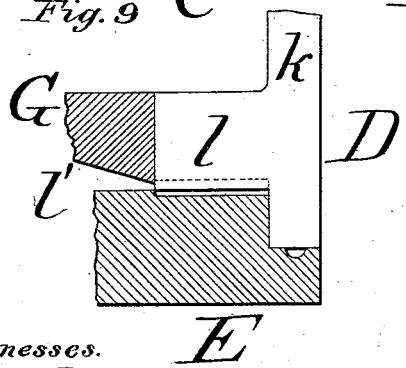


Fig. 9



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UNITED STATES PATENT OFFICE.

ISAAC McKIM CHASE, OF WASHINGTON, DISTRICT OF COLUMBIA.

TYPE-BAR.

SPECIFICATION forming part of Letters Patent No. 490,739, dated January 31, 1893.

Application filed February 1, 1892. Serial No. 419,918. (No model.)

To all whom it may concern:

Be it known that I, ISAAC MCKIM CHASE, a citizen of the United States, residing at Washington, in the District of Columbia, have invented certain new and useful Improvements in Type-Bars; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My present invention relates to the art of printing and has for its object certain improvements in the construction of type-bars or linotype and in the method of justifying the lines of composition.

The invention will be disclosed in the following specification and claims.

In the art of linotype printing the prevailing practice has been to assemble the character matrices and the space-bars in front of the mold in a length not exceeding the length of the line of composition. Should there be a vacant space between the last matrix assembled and the end of the intended line of composition, this space is taken up by spreading or separating the space-bars and moving the last matrix to the end of the intended line. This operation is called justifying the line and is always done before the type-bar is cast. It is my purpose to avoid the necessity for this operation and the use of the mechanism employed to effect the same.

In the accompanying drawings which form part of this specification I have shown the best form in which I have contemplated embodying my invention so far as it relates to the construction of the type-bar, and in said drawings.

Figure 1, is a perspective of a completed type-bar. Fig. 2, a similar view showing the type-bar before the sprue has been removed. Fig. 3, a perspective of a character-matrix. Fig. 4, a similar view of a space-matrix. Fig. 5, a top plan view of a modification of the type-bar. Fig. 6, a perspective of a modification of the space-matrix. Fig. 7, a vertical transverse section through the mold for forming the type-bar showing a character-matrix in position. Fig. 8, a perspective partly in section of the mold showing a number of matrices assembled with a space-matrix at one end of the mold, and Fig. 9, a vertical transverse section through the mold showing the space-matrix of Fig. 6 in position.

Reference being had to the drawings and the letters thereon, A indicates an unjustified type-bar or linotype which is composed of a series of character sections *a* for words, separated by spaces in or openings *b* through the bar and sections *c* of less cross sectional area than the character sections for connecting contiguous bars, and said sections may be curved as shown in Figs. 1 and 2 to yield or contract under compression or extend under tensile stress. The bar is cast with a sprue *d* preferably made the length of the bar to distribute the metal evenly throughout the bar and cause it to flow readily and fill the mold to secure the formation of the sections *c*.

In Fig. 5 the bar is shown provided with sections *c'* and spaces *e'* between the character sections *a*, the openings *b*, being omitted. In either construction the sections *c'* are compressible and extensible, the metal displaced by compression in the latter construction being accommodated by the spaces *e'*.

B indicates a character-matrix which is provided with a vertical bar *f* having a character or letter *g* formed thereon and a bar or arm *h* having a notch *i* in the outer end to be engaged by a suitable bar *i'* on a linotype machine to hold the matrix down to its place on the mold while the metal to form the type-bar is being supplied.

C indicates a space-matrix which forms the spaces or openings *b* and the sections *c* and is provided with a vertical bar *k* and an arm *l* having notches or recesses *m m* for forming the sections *c*, an intervening bar *n* for forming the spaces or openings *b* between the sections *c* and ends *o*, *o* for forming the spaces or openings outside of the sections *c*.

D indicates a modified form of the space-matrix for forming the sections *c'* and the spaces *e'* of the bar shown in Fig. 5. In this matrix the arm *l* extends down into the mold to form the spaces *e'* between two contiguous characters on the face of the bar, and allow the metal to form the sections *e'*.

In each of the matrices B, C, and D it will be observed that the length of the horizontal arms *h* and *l* is equal to the width of the type-bar, and when assembled in a mold they form

the top or upper side of the mold, and E the base or bottom thereof. Molten metal is supplied to the mold through pipe F and the type-bar A is formed in the space k' and the sprue d in the space l', as indicated in Fig. 7.

To cast a type-bar the character-matrices and the space-matrices are assembled until a length is obtained about equal to the intended line of composition and the type-bar cast. The metal having been poured and the type-bar cooled sufficiently, the bar i' is first moved forward by a cam or other suitable device on a linotype machine, (not shown) to disengage the character-matrices from the characters, and then drawn back out of engagement with the notches i, and the hinged mold section G, raised out of contact with the sprue d and the front ends of the arms h and l of the matrices. The character-matrices having been disengaged from the characters on the type-bar, all the matrices are then raised vertically on their respective supporting rods m'. The type-bar is then easily removed from the mold by hand, the entire top or upper side of the mold having been formed by the arms h and l of the matrices which are now out of the way.

The matrices may be assembled in any approved manner, such as shown in patent to J. R. Rogers, dated September 23, 1890, No. 437,139, and when assembled secured in position on the base or bottom F by a suitable clamp (not shown).

After removing the type-bar from the mold, the sprue d is broken off and the bar routed or grooved at r in the usual manner of finishing type. The type-bar may now be a fraction longer or shorter than the line of composition and require justifying. If it is too long, which will most frequently occur, the bar is subjected to longitudinal compression and the sections c or c' shortened by stress applied to the ends of the bar, and the bar reduced to proper length, when it is ready to be assembled in a column of composition.

Should the type-bar be a fraction too short, tensile stress is applied to the bar and the sections c or c' extended until the bar has been brought to proper length. This may be effected by engaging the bar at each end with a draw-clamp.

By this method of justifying type-bars or linotypes, the justifying is done after the bar has been cast and is subject to no subsequent changes.

Having thus fully described my invention, what I claim is

1. An unjustified type-bar approximating the length of a line of composition and provided with character sections and sections between the character sections of less resistance than said character sections to stress applied longitudinally of the bar.

2. An unjustified type-bar approximating the length of a line of composition and provided with integral, compressible sections between the character sections.

3. An unjustified type-bar approximating the length of a line of composition and provided with character sections and spaces and compressible and extensible integral sections of less cross sectional area than the character sections and located in the spaces between the character sections.

4. An unjustified type-bar approximating the length of a line of composition and provided with one or more character sections and transverse openings through the bar between said sections and connecting integral sections of less cross sectional area than the character sections.

5. An unjustified type-bar approximating the length of a line of composition and having character sections and transverse openings between the sections and curved sections in the openings connecting the character sections.

6. A matrix having a vertical bar and an arm projecting from one side thereof and of a length equal to the width of the body of a type-bar and forming the top of the mold, in combination with a base for the mold.

7. A character-matrix having a vertical bar provided with a character and an arm on one side and above said character and of a length equal to the width of the body of a type-bar and forming the top of the mold, in combination with a base for the mold.

8. A space-matrix having a vertical bar and an arm on one side provided with recesses in the lower edge and of a length equal to the width of the body of a type-bar and forming the top of the mold, in combination with a base for a mold.

9. The method of justifying linotype, which consists in casting type-bars in lengths approximating the length of lines of composition and justifying the line by applying stress to the bar longitudinally to shorten or lengthen said bar.

In testimony whereof I affix my signature in presence of two witnesses.

ISAAC McKIM CHASE.

Witnesses:
D. C. REINOHL,
D. W. REINOHL.