No. 620,288. Patented Feb. 28, 1899.

A. E. DOWELL.

LINOTYPE AND METHOD OF MAKING SAME.

(Application filed June 21, 1898.)

(No Model.)

Fig. 1.

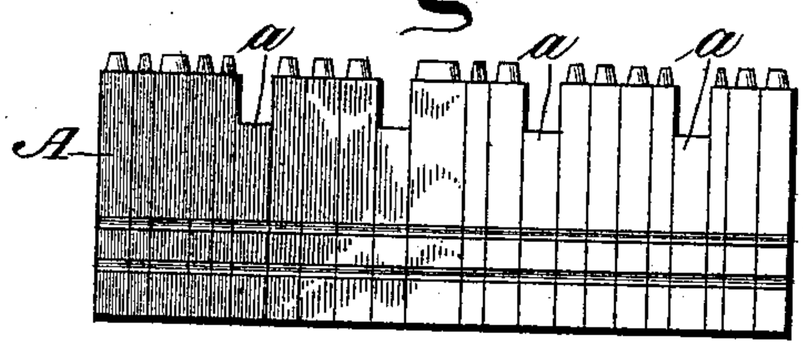


Fig. 2.

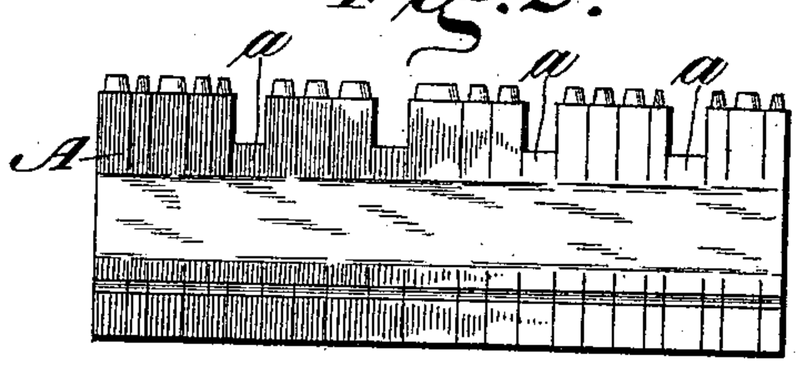


Fig. 3.

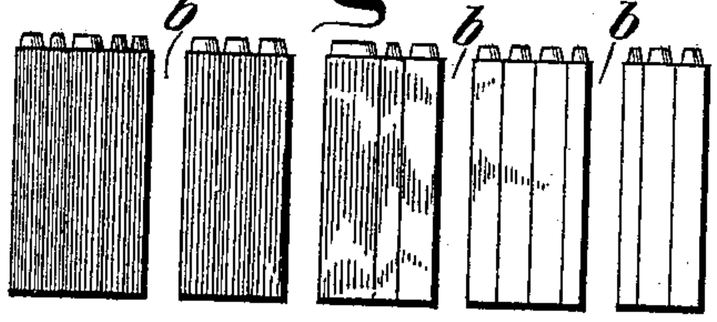


Fig. 4.

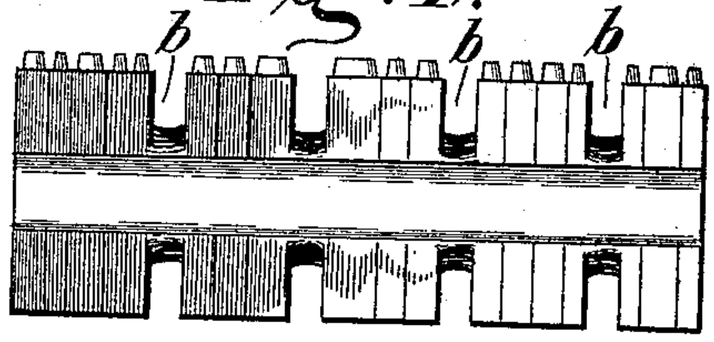


Fig. 5.

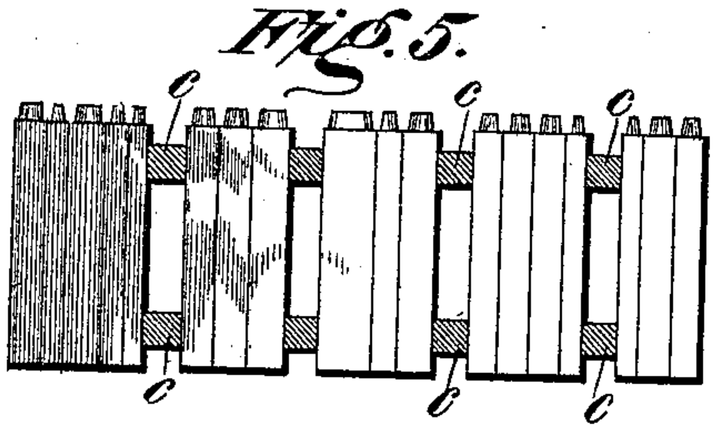


Fig. 6.

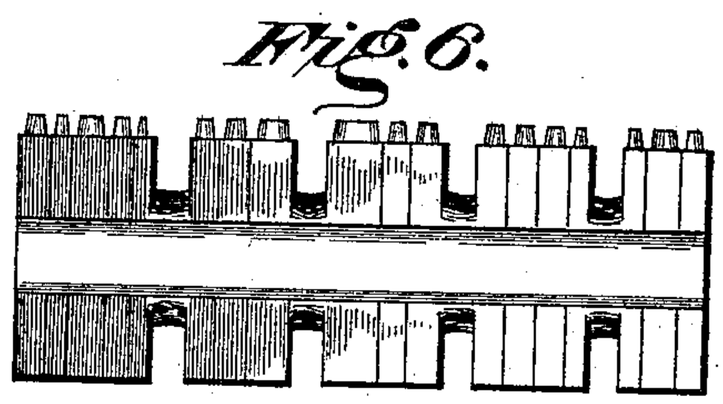


Fig. 7.

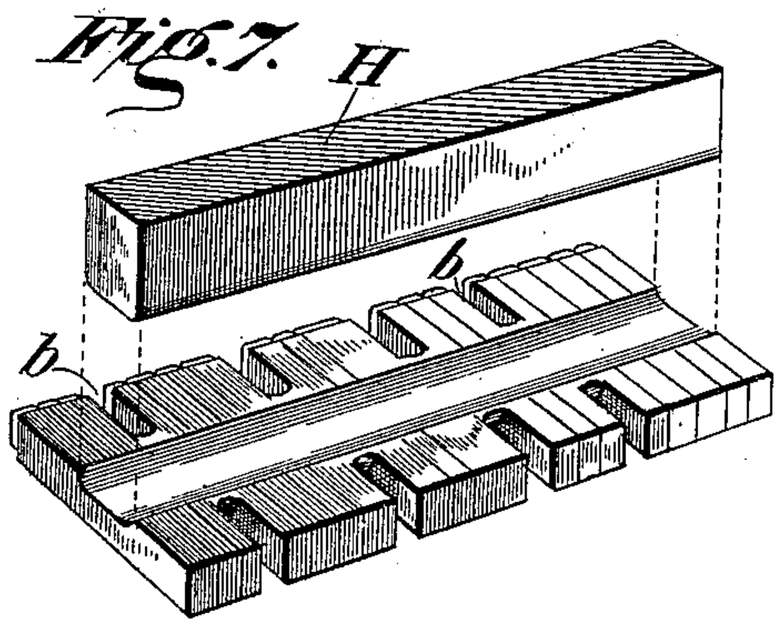
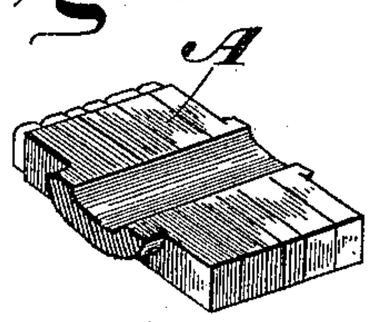


Fig. 8.



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UNITED STATES PATENT OFFICE.

ARTHUR E. DOWELL, OF WASHINGTON, DISTRICT OF COLUMBIA, ASSIGNOR OF ONE-HALF TO JOHN HEWITT, OF CHICAGO, ILLINOIS.

LINOTYPE AND METHOD OF MAKING SAME.

SPECIFICATION forming part of Letters Patent No. 620,288, dated February 28, 1899.

Application filed June 21, 1898. Serial No. 684,038. (No model.)

To all whom it may concern:

Be it known that I, ARTHUR E. DOWELL, of Washington, in the District of Columbia, have invented certain new and useful Improvements in Type-Setting and Linotyping; and I hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, which form part of this specification.

This invention is an improvement in type-setting and linotyping; and its objects are, first, to produce a type-bar or line-unit out of a composed line of single type; second, to enable a line of ordinary type (which may be composed by hand or machinery) to be unified or bonded, so that it can be handled as a type-bar, and, third, to enable a line of type to be composed by hand or machinery, and after the words in said line have been properly spaced apart to practically unify or bond the type to form a type-bar out of the metal of the original type. These objects can be attained by my invention without the employment of secondary casting devices or use of auxiliary metal, as the unification or bonding of the line is accomplished by partially melting the type-bodies in line, so that they become partially homogeneous or unified by the coalescence of the metal, while the individual type characters are preserved and firmly retained in the positions to which they have been adjusted prior to the unification of the line.

The invention therefore involves a novel type-bar and also the novel process or method of making a type-line bar or unifying or bonding a line of type.

The invention is best summarized in the claims appended to this specification, and the following description, in connection with the accompanying drawings, forming part of this specification, will enable those skilled in the art to thoroughly comprehend and utilize the invention, and the adaptability of the invention to and its utility in connection with various well-known forms of type casting and composing machinery are so obvious that a detailed description of mechanism for composing the type or for justifying the same is unnecessary.

My invention is applicable to type composed and justified by hand wherever it is desired to make the composed lines unitary, and it is also applicable to machines in which the lines are composed and justified by machinery, the spaces being supplied during the composition, and such spaces can be made part of the line-bar, if desired, and, as above stated, the invention is also applicable to machines wherein the lines are composed and the words spaced and properly justified by automatic space-bars; but when applied to this class of machines mechanism for inserting the spaces may be omitted and instead the line may be unified while the words are properly separated, as sufficient metal from the type-bodies can be displaced to bridge the intervals between the words and take the place of the spaces proper.

Referring to the accompanying drawings, Figure 1 shows a line of ordinary type as set and justified by hand or machinery with ready-made spaces supplied between the words. Fig. 2 is a view of such line unified or bonded. Fig. 3 is a view similar to Fig. 1, the spaces being omitted. Fig. 4 is a view of the line shown in Fig. 3 unified. Fig. 5 is view similar to Fig. 1, showing a line of words with justifying spacing-bars between the words. Fig. 6 is view of such line unified. Fig. 7 is a detail perspective view of a line of type and of means for unifying the same. Fig. 8 is a detail sectional view of a unified type-line or type-bar.

To carry out my method for producing a bonded or unitary type-line, a line of ordinary type A is set and justified. Then while so held the line of type is partially melted at a point which will not injure the faces of the type nor destroy the height of the type-bodies, the melted portions of the type-bodies commingling and becoming virtually unitary, so that when cold the previously separate type are bonded together by that portion thereof which has been melted and run together, and the line can therefore be handled as a unit. This will be obvious from an inspection of Figs. 1 and 2.

In Fig. 1 it will be observed that the line before unification has been composed and justified with the ordinary spaces *a*, and in Fig. 4

the line has been composed and justified by properly separating the words, and while so separated the line has been unified by melting the bodies of the type, as before described, the molten metal partially filling the spaces *b* between the words and taking the place of the ordinary spaces, so that the line becomes unitary and properly justified as if it had been originally so cast, or as in Fig. 1.

In Fig. 5 the line is shown as composed and justified by means of the removable space-bars *c*, such as are used in various forms of linotype or monoline machines, and while so held the line is unified as before, with the same result as in Figs. 3 and 4. This unification of a line can be accomplished in various ways within the scope of my invention, care being taken that the type-faces are not injured—*e. g.*, the line can be held in a matrix or channel, and while so held a heated iron or bar H may be applied to the side of the line, so as to melt a portion of the side of each type and cause the molten metal to commingle. If the hot iron be pressed sufficiently inward, it will displace some of the molten type-metal and force the same to flow into the spaces *b* between the words.

When the lines are simply to be unified, it would be sufficient if the heater only contacts the surface of the type-bodies sufficiently to partially melt them, as in Figs. 1 and 2; but where they are to be unified and intervals between the words to be filled with metal, as in Figs. 3 and 4, the heater-iron should be projected slightly into the type-bodies, so as to slightly displace metal and cause the same to fill the spaces, as in Fig. 5. Again, a line might be unified by heat applied to the side of the matrix in which the line is held or to the side of the channel through which the line is passed, or the line might be unified while being moved past a heated point.

Obviously when the principle is disclosed many various modes of carrying the method into effect and utilizing the invention will suggest themselves or be devised within the scope of my invention.

If desired, two or more heating devices might be used, contacting with opposite sides or the same side of the type-bodies.

From the foregoing description and the drawings the invention will be comprehended by those skilled in the art, and its utility and applicability to various forms of machines will be at once recognized.

It will be observed that by utilizing the metal of the type-bodies to form the bond the operation is greatly simplified and no special formation of type is necessary to enable the unification to take place, and the complicated mechanism by which auxiliary bodies can be supplied for partial type-bodies or for peculiarly-shaped type-bodies to bond the same are avoided. I do not in this application claim any special form of apparatus for producing these type-bars or for utilizing the novel method of constructing the type-bars hereinbefore stated, reserving the apparatus as subject-matter for a divisional application.

Having thus described my invention, what I therefore claim as new, and desire to secure by Letters Patent thereon, is—

1. The herein-described method of forming type-line bars from single type, consisting in first assembling the type and then partially melting the bodies thereof to form the bar out of the metal of the original type, for the purpose and substantially as described.

2. The herein-described method of forming justified type-bars, consisting in assembling the type, separating the words or characters, and then partially melting the type-bodies so as to bond the type together and cause the molten metal to partially fill the spaces between the words, and to form the bar out of the metal of the original type, substantially as described.

3. The herein-described method of forming type-line bars, consisting in assembling a line of type, confining the same in a holder or channel, and partially melting the bodies of the type while so confined to form the bar out of the metal of the original type, for the purpose and substantially as described.

4. As a new article of manufacture, a line of type, or type-bar, formed of a series of individual types rigidly united by partially melting their bodies to form the bar out of the metal of the original type, for the purpose and substantially as described.

5. As a new article of manufacture, a line of type or type-bar, consisting of a series of individual types rigidly united by unifying a portion of their bodies to form the bar out of the metal of the original type, substantially as described.

6. The herein-described method of forming type-line bars from individual type, consisting in first assembling the type and then uniting the same by partially unifying their own bodies to form the bar out of the metal thereof, substantially as described.

7. A type-line bar consisting of a series of individual types having their bodies partially unified to form the bar out of the metal thereof, whereby the types are firmly united, substantially as and for the purpose described.

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

ARTHUR E. DOWELL.

In presence of—

JAMES R. MANSFIELD,

WILLIAM C. SULLIVAN.