C. A. ALBRECHT & L. LEIDENBERG.

TYPE SETTING MACHINE FOR VARIOUS SIZES OF TYPE.

APPLICATION FILED FEB. 6, 1909.

961,742. Patented June 14, 1910.

Fig. 1.

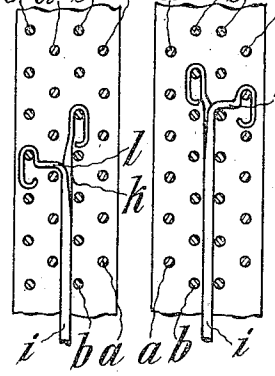

Fig. 2.

Fig. 3.

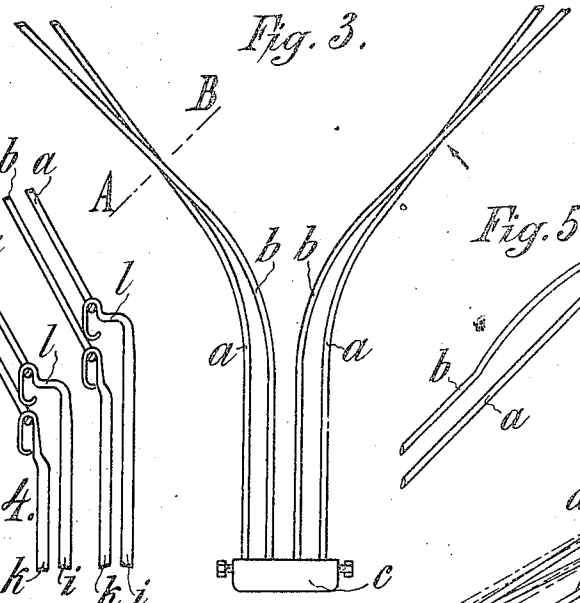

Fig. 4.

Fig. 5.

Fig. 6.

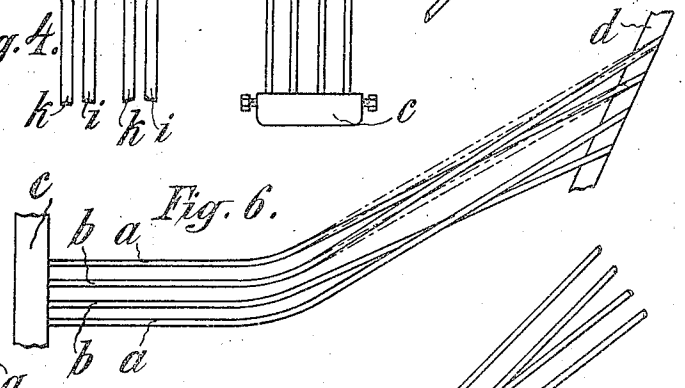

Fig. 7.

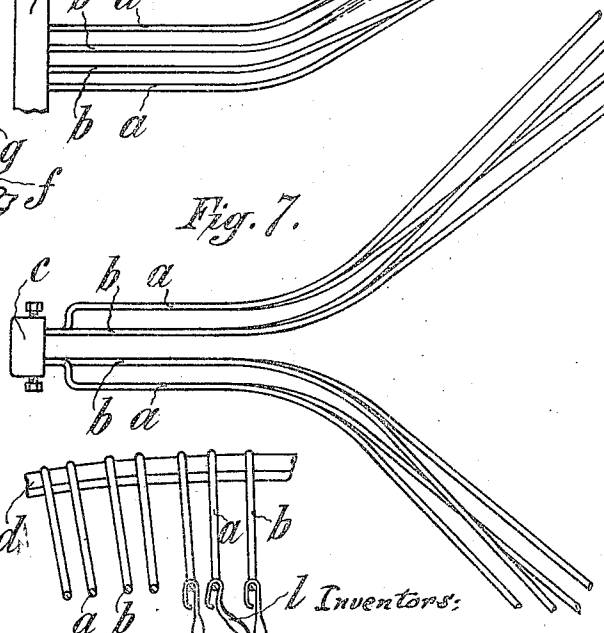

Fig. 8.

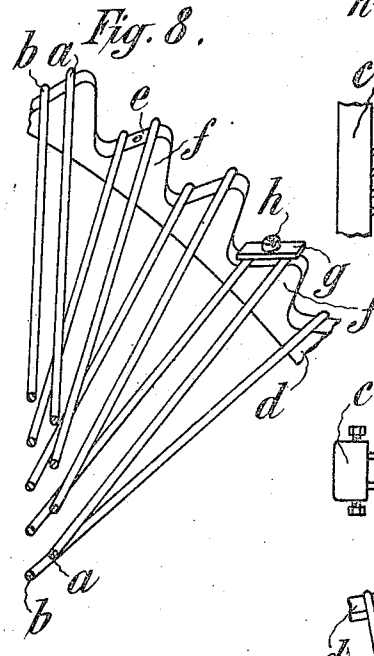

Fig. 9.

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UNITED STATES PATENT OFFICE.

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TYPE-SETTING MACHINE FOR VARIOUS SIZES OF TYPE.

961,742. Specification of Letters Patent. Patented June 14, 1910.

Application filed February 6, 1909. Serial No. 476,462.

To all whom it may concern:

Be it known that we, CHRISTIAN A. ALBRECHT, a citizen of the United States of America, and a resident of Baltimore, in the State of Maryland, temporarily residing at Berlin, Germany, and LEOPOLD LEIDENBERG, a subject of the Emperor of Germany, residing at Berlin, Germany, have jointly invented certain new and useful Improvements in Type-Setting Machines, of which the following is a specification.

Our invention is intended more particularly for composing and setting the female type or matrices, used in line casting machines.

It has reference more particularly to that class of machines represented, for example, in Letters Patent of the United States No. 437,139, wherein matrices containing the vairous characters are suspended on inclined wires which converge toward their lower ends, where they are arranged in vertical, parallel tiers, so that the descending matrices may be assembled in a common line between them. In modern machines of this class it is common to provide each matrix bar with the same letter or character in two different forms, one above the other, so that either one of the characters may be brought into action at the casting level by raising or lowering the matrix. In order to permit this vertical adjustment of the matrices in relation to the coöperating mold, different complicated constructions have been adopted. In some cases the entire series of guide wires have been raised and lowered with the matrices upon them. In another case the matrices have been jointed near their upper ends, so that the upper portion surrounding the guide wire could rotate thereon, in order to permit the lower portion to rise and fall.

The object of our invention is to avoid these complications, and at the same time leave the overlying guide wires close together, in order to avoid that excessive lengthening of the matrices which would result from separating the guides vertically. To this end we provide our matrices at the upper end with elongated eyes or slots, so that they may be raised and lowered bodily in relation to the guide wires from which they are suspended, and instead of arranging the guide wires at their lower ends in two vertical tiers or columns, we arrange them in four parallel tiers, the ends of the respective matrices being bent laterally in such manner that although their body portions are assembled in a common line, their upper ends will extend to and remain in engagement with the respective guides. This arrangement of the guide wires in four or more tiers permits us to keep the wires within narrow limits vertically, so that relatively short matrices may be employed, while at the same time there is sufficient room between the wires to admit of the matrices sliding upward and downward thereon in relation thereto, to bring the upper or the lower matrix characters into action.

In carrying our invention into effect, the upper or converging portions of the wires must, of course, be so disposed that a matrix descending on one wire will not be obstructed in its course to the line by the other wires. The wires may be variously arranged to this end. In the accompanying drawings we have shown several alternative arrangements.

With the exception of the guides and matrices, the machine may be of any ordinary construction. We have therefore limited the drawings to the parts to which our invention relates.

Figure 1 is a vertical section through the lower or assembling portion of the guide wires of a machine constructed on our plan, there being four vertical tiers or rows of guide wires with matrices thereon. Fig. 2 is a view showing a similar or equivalent arrangement of the guide wires. Fig. 3 is a top plan view of the arrangement shown in Fig. 2. Fig. 4 is a vertical section on the line A—B in Fig. 3. Fig. 5 is a side elevation looking in the direction of the arrow, Fig. 3. Fig. 6 is a side elevation showing another arrangement of the upper ends of the guide wires, to avoid conflict with the descending matrices. Fig. 7 is a top plan view of still another arrangement. Fig. 8 is a perspective view of the upper rear portion of the guide supporting frame, with the wires in still another arrangement. Fig. 9 is a cross section through the series of guides, showing matrices of different forms suspended therefrom.

In each of the arrangements shown the wires converge with a downward inclination toward the front of the machine, and terminate at the lower end in four parallel tiers or rows, the space between the two

inner rows forming the assembling space or channel in which the bodies of the matrices are collected side by side.

In Fig. 1 the arrangement of the wires at the lower end is such that one outside and one inside wire are at practically the same level, while in Fig. 2 the inside wires are arranged at a common level and the outside wires at a different, but common level.

The matrices, *k*, have practically straight shanks with vertically elongated eyes at the upper end, so that each matrix suspended from a wire may be lifted bodily in relation thereto. Other matrices, *i*, have their upper ends deflected laterally, and provided with vertical eyes or slots at the extremity. The matrices of the different forms are suspended on the different wires—the arrangement being such in every case, however, that a matrix may descend freely from the upper to the lower end of the particular wire on which it is suspended, without being arrested by conflict with the other wires. The form and arrangement of the matrices is also such, that whether supported from the inner or the outer wires, the body portions of all the matrices will pass between the innermost wires, *b*, *b*, at their lower ends, so that all the matrices will be assembled side by side in a common line.

Each of the matrices is provided in the lower end with two or more matrices or type characters, *m*, one above the other. Usually each matrix carries the one character in different forms, so that any one may be brought into action in a manner well understood in the art.

The guide wires in each tier are separated vertically to such an extent that the matrices suspended thereon may be raised and lowered in relation thereto a sufficient distance to bring any one of the characters on the matrix to the alining or casting level. It will be seen that if the guide wires were arranged in two tiers only instead of four, and at the necessary distance apart to permit the vertical adjustment of the matrices, the tiers would have to be of far greater height than under the arrangement shown, and the matrices would have to be increased in length accordingly. It is to be understood that, as in other machines of this class, the matrices of different lengths, suspended from wires at different heights, will have their lower ends at a common level, so that when assembled in line they may all coöperate with the mold or casting mechanism as usual.

Fig. 5 illustrates the manner in which, where the guides cross one over another, one may be bent to prevent the eyes of the traveling matrices thereon from conflicting with the other; the rear upper ends of the guide wires may be deflected in the manner shown in Fig. 6, or Fig. 7, or they may be attached, as in Fig. 8, to a supporting frame having a sinuous surface. The only requirement is that the lower ends of the wires shall be arranged in more than two vertical tiers; that their upper ends shall diverge; and that they shall bear such relations as to permit the free passage of the matrices from end to end, and the passage of the bodies of all the matrices to a single line between the innermost wires.

Having described our invention, we claim and desire to secure by Letters Patent:

1. A matrix composing mechanism, comprising inclined converging guides having their lower ends arranged in four vertical tiers; in combination with the matrices suspended from the various guides, all of said matrices arranged to pass as to their body portions between two of said tiers.

2. In a matrix assembling mechanism, a series of inclined converging guides arranged at their lower ends in three or more vertical parallel tiers; in combination with matrices having their upper ends mounted to travel on the respective guides and offset in such manner that the bodies of all matrices may pass between two of the parallel tiers.

3. In a machine of the class described, inclined, converging guides, having their lower ends arranged in plural vertical tiers, in combination with matrices having their lower ends adapted for assemblage in a common line and their upper ends offset different distances to embrace guides of the respective tiers, substantially as described and shown.

4. In combination with a series of guides arranged in parallel, vertical tiers, a series of matrices adapted to be assembled in a common line between two of said tiers, their upper ends being offset laterally different distances to embrace guides of the different series.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

CHRISTIAN A. ALBRECHT.
LEOPOLD LEIDENBERG.

Witnesses:
WOLDEMAR HAUPT,
HENRY HASPER.