J. R. ROGERS.

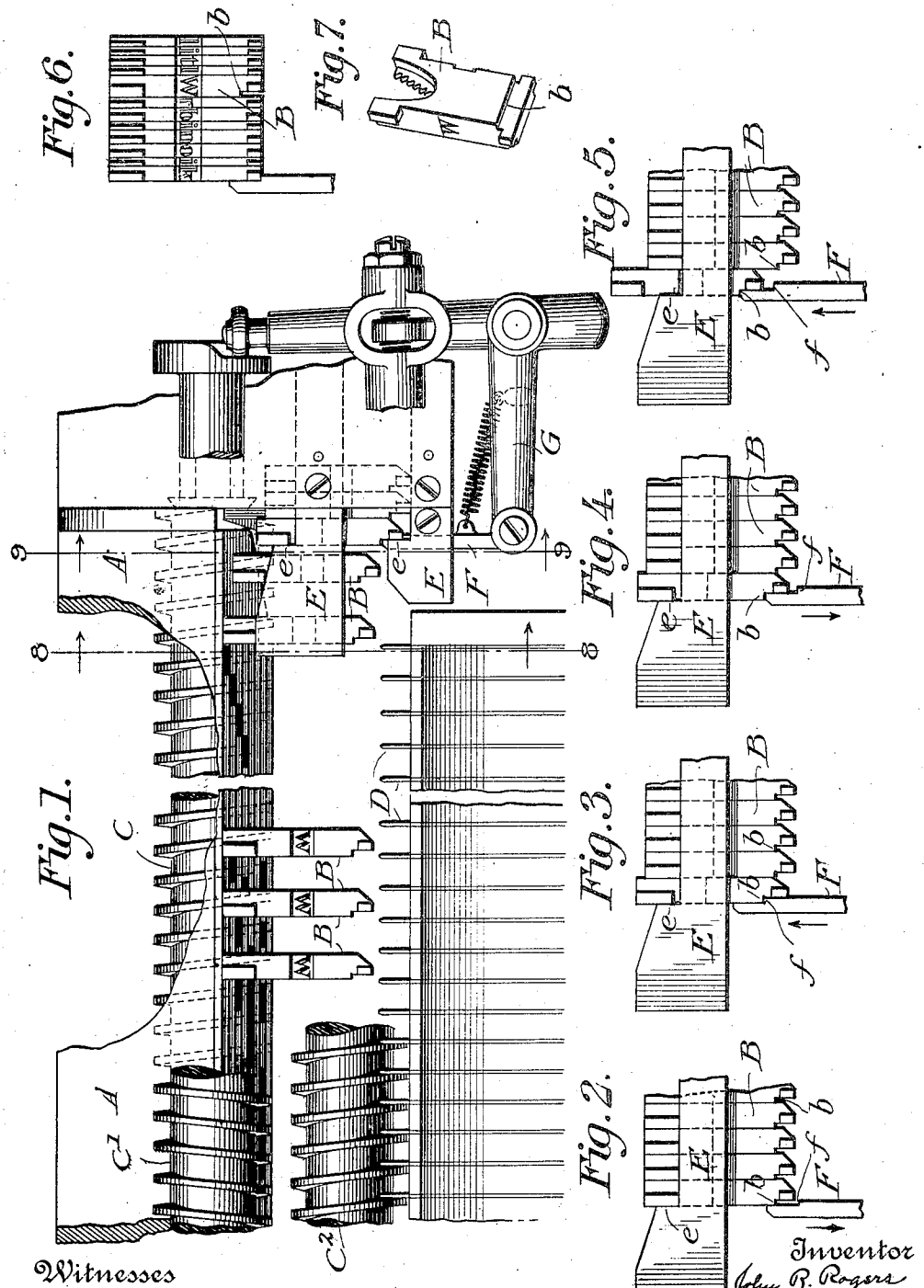
LINE CASTING MACHINE.

APPLICATION FILED JAN. 20, 1909.

942,845.

Patented Dec. 7, 1909.

2 SHEETS—SHEET 1.



Witnesses

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2 SHEETS—SHEET 2.

Fig. 8.

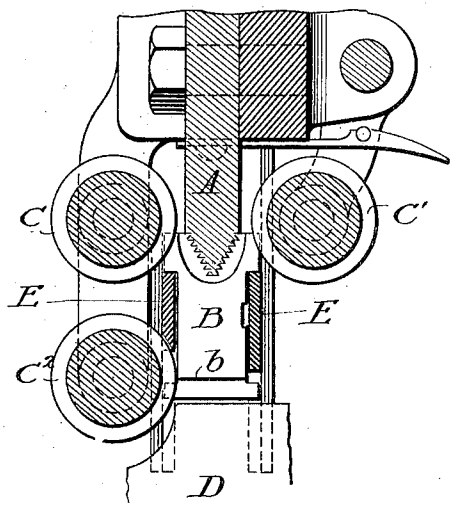


Fig. 9

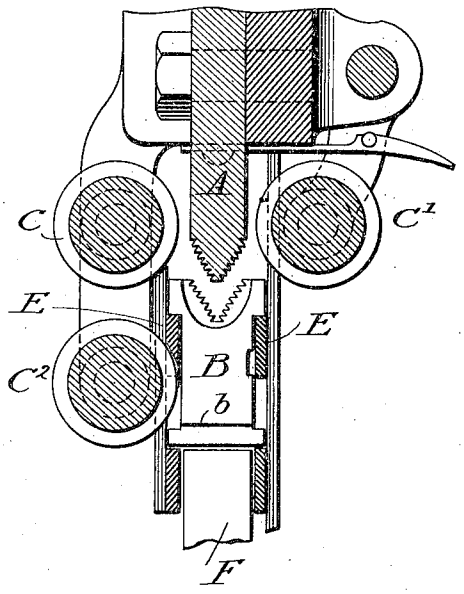


Fig. 10.

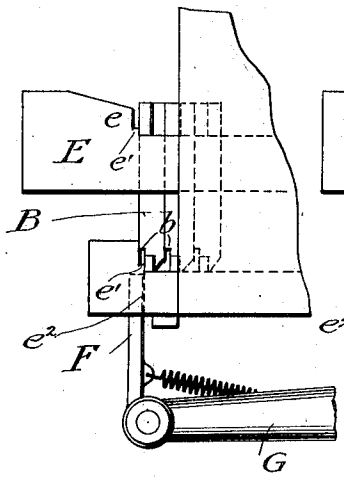


Fig. 11.

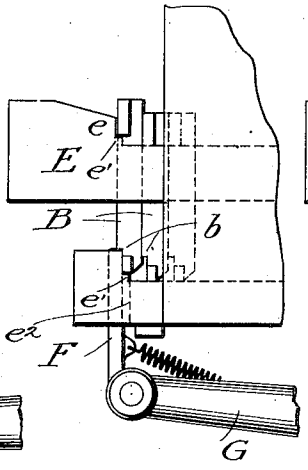
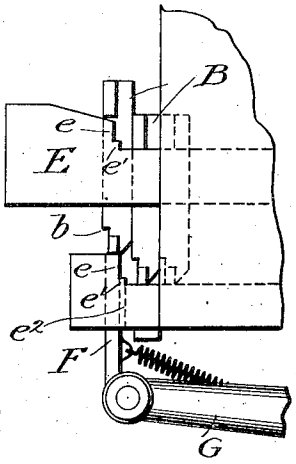


Fig. 12.



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UNITED STATES PATENT OFFICE.

JOHN R. ROGERS, OF BROOKLYN, NEW YORK, ASSIGNOR TO MERGENTHALER LINOTYPE COMPANY, A CORPORATION OF NEW YORK.

LINE-CASTING MACHINE.

942,845. Specification of Letters Patent. Patented Dec. 7, 1909.

Application filed January 20, 1909. Serial No. 473,271.

To all whom it may concern:

Be it known that I, JOHN R. ROGERS, of borough of Brooklyn, county of Kings, and State of New York, have invented a new and useful Improvement in Line-Casting Machines, of which the following is a specification.

This invention has reference to line-casting machines in which circulating matrices and spaces, both of various thicknesses, are temporarily composed in line and presented to a mold to form type characters on a slug cast therein, are thereafter delivered to a distributing mechanism by which the matrices and spaces are returned to the appropriate individual channels in the magazine.

As the matrices and spaces are alike, except that the latter contain no characters, and as they are assembled and distributed in the same manner, the term matrices is hereinafter used in a generic sense to include both matrices and spaces.

Although applicable to an extent to other machines, the improvements are intended more particularly for use in Mergenthaler machines of the general organization represented in Letters Patent of the United States Nos. 436,531 and 436,532, in which matrices having toothed notches in their upper end are suspended from a horizontal, toothed distributer bar, along which they are carried by horizontal screws until they arrive individually over their corresponding channels, into which they are permitted to fall by reason of their being released by the teeth of the distributer bar. In this class of machines—for various reasons unnecessary to detail—it is the practice to arrange the magazine channels as closely together as the width of the matrices will permit.

As heretofore constructed the feed devices have delivered a matrix to the feed screws at each revolution of the latter, so that a matrix was carried between each turn of the screw threads and the next. In consequence of this fact the distance between thick matrices traveling along the distributer bar was very small, and it occasionally happened that the lower end of an advancing matrix would overtake and bind against the side of the preceding matrix, which had fallen from the distributer bar but which had not had sufficient time to pass below the path of the second matrix.

The proper speed of the machine demands that the matrices shall be carried forward through the distributing mechanism in as rapid succession as possible, but at moderate speed so that they will not vibrate on the bar. I have therefore modified the distributing mechanism in such manner that while thin matrices, or matrices of ordinary thickness are delivered at each rotation of the screws and between adjoining turns of the screw thread and thus carried in close order, the very thick matrices are delivered only to alternate threads of the screws.

I believe it to be entirely new in the art to deliver matrices to a carrying mechanism of a distributer at irregular intervals, or at varying distances apart, according to their thickness; and it will be understood by those skilled in the art that this idea may be embodied in many different forms the equivalent of that herein shown.

In the drawings: Figure 1 is a side elevation of a distributing mechanism having my invention incorporated therein. Figs. 2, 3, 4 and 5 are side views illustrating the action of the matrix lifting device on thick matrices at various stages. Fig. 6 is a similar view illustrating its action on thin matrices. Fig. 7 is a perspective view of one of the matrices. Figs. 8 and 9 are cross-sections on the correspondingly numbered lines in Fig. 1. Figs. 10, 11 and 12 are views illustrating an alternative or equivalent construction.

Referring to the drawings, A represents the fixed horizontal distributer bar having its lower edge of V form, with longitudinal teeth, permuted or varied in arrangement at different points in its length.

B, B represent the matrices, having in their upper ends, as shown in Figs. 8 and 9, V shaped notches toothed to engage the teeth of the distributer bar for the purpose of suspending the matrices therefrom—matrices bearing different characters having different arrangements of teeth. The matrices have the usual ears or shoulders projecting edgewise therefrom at the upper and lower ends.

C, C′ C^2 are three horizontal screws adapted to engage the matrices suspended from the distributer bar for the purpose of carrying them along the same from the receiving end to the points at which they are released and delivered to the magazine. The

bar A and the screws constitute the distributing mechanism proper.

D represents the upper end of the magazine, having a series of vertical partitions or plates, *d*, which receive the falling matrices and direct them into the continuing channels of the magazine.

E, E are fixed parallel rails which support and guide the composed lines of matrices introduced between them preparatory to their delivery to the distributer bar and screws. These rails lie beneath the upper ears of the matrices and give support to the entire line which is forced endwise along the rails until the foremost matrix encounters the stop shoulders, *e*, formed on the rails. Beyond these shoulders the upper edges of the rails have an upward inclination toward the distributer bar.

F represents a vertically reciprocating finger or lifter carried by a lever, G, having a definite length of movement and serving to raise the matrices which stand successively at the front of the line clear of the stop shoulder, *e*, and between the threads of the carrier screws which act to advance the matrices along the rising surface of the rails E and thence upon and along the distributer bar.

The feed screws and the finger-actuating lever G are connected through the usual operating devices in such manner that the finger rises and falls once at each revolution of the screws.

So far as described the parts may all be of the ordinary construction and have the ordinary mode of operation.

When thin matrices are presented they will be lifted successively by the finger F and presented between successive turns or convolutions of the thread, so as to travel in close order along the distributer. In order, however, to cause the presentation of the very thick matrices between the alternate threads, only, of the screws, that is, to every second turn of the screws, I modify the parts as follows: The upper end or lip of the lifting finger F is extended for a greater distance than heretofore above its usual lifting shoulder *f*. The thick matrices are recessed at the lower end across one side, to form a shoulder *b*, this shoulder having a horizontal width slightly greater than that of the shoulder on the lifting finger F.

The action of the parts is as follows: If a thick, shouldered, matrix at the end of the line is presented against the lifting finger F, as shown in Fig. 2, the upper extremity of the finger bears on the outer vertical face of the matrix and the finger is held back, so that when it rises its shoulder, *f*, is prevented from engaging the lower end of the matrix. The finger consequently rises until the shoulder *f* encounters the shoulder *b*, on the matrix, whereupon the finger acts to lift the matrix a part only of the usual distance, to the position shown in Fig. 3, so that it is still retained by the shoulder *e* of the supporting rail. The finger, leaving the matrix in this position, descends, and again rises, and during its second ascent its upper extremity acting beneath the shoulder *b* of the matrix as shown in Fig. 4, lifts the matrix to the uppermost position, clear of the shoulder *e*, as shown in Fig. 5, and into engagement with the feed screws, so that it will be advanced to and along the distributer bar.

The stop shoulder *e* may have a straight, vertical face, the friction of which will be sufficient to hold the thick matrices when lifted by the first movement of the finger; or it may be made with a horizontal step or shoulder to underride the matrix at such time and prevent it from falling to the original position.

It will be observed that two upward movements of the finger F are required to lift the thick matrix to the carrying devices. During these two movements the screws make two revolutions, and consequently the thick matrices are delivered only to every second turn of the threads, as clearly shown in Fig. 1. There is, consequently, sufficient separation between the matrices advancing horizontally along the distributer bar to admit of one matrix falling clear of the bar and so far downward between the partitions, *d*, of the magazine that the succeeding matrix may pass over its upper end without danger of conflict therewith.

If a thin matrix, without the shoulder *b*, be presented to the lifting finger the shoulder *f* of the latter will engage beneath the lower end of the matrix, as shown in Fig. 6, and the matrix will be lifted at once to its uppermost or delivery position by the first movement of the finger. Thus it will be seen that thin matrices will be delivered at each revolution of the screws, or to immediately succeeding turns of the threads, while the thick matrices will be delivered at longer intervals, each matrix controlling the delivery devices and determining the period which elapses between its delivery and the delivery of the preceding matrix.

The essence of my invention resides in the employment of means which will deliver to a carrier mechanism of a distributer thin matrices at short intervals and thick matrices at longer intervals.

It is evident that the parts may be widely modified without departing from the general mode of action or passing beyond the scope of the invention.

In Figs. 10, 11 and 12 I have represented an alternative method of construction. In this embodiment of the invention the thick matrices are recessed or shouldered as described above, but the stop shoulder of the

rails E is modified by the formation of a small shoulder e' thereon, of a horizontal width equal to that of the matrix shoulder b. The lifting finger F′ is in this case made without the lip or shoulder at the upper end. It works against a guide surface, e^2, by which it is prevented during its upward movement from passing beneath the lower end of the matrix. During this first upward movement the finger acts against the matrix shoulder b and lifts the matrix from the original position shown in Fig. 10 to the position shown in Fig. 11, clear of the shoulder e'. When thus lifted the matrix is carried forward horizontally to the position shown in Fig. 11, so that when the finger rises the second time it will act beneath the lower end of the matrix as shown in Fig. 12, and lift the same to its final position between the feed screws.

I do not claim herein the special arrangement of distributing screws in relation to a magazine as shown in the drawings, this arrangement forming the subject-matter of a separate invention.

I do not claim the matrices represented in the drawings, the same being the subject-matter of an application for Letters Patent of the United States filed on the 4th day of May, 1909, Serial Number 493,803.

Having thus described my invention, what I claim and desire to secure by Letters Patent is:

1. In a line casting machine, a horizontal distributer, matrices of different thicknesses, and means controlled by the matrices and acting to deliver thin matrices to the distributer at short intervals and thick matrices at longer intervals, substantially as described.

2. In a line-casting machine, the combination of the toothed distributer bar, feed screws adjacent thereto, a vertically reciprocating feed finger, and matrices shouldered substantially as described; whereby two upward movements of the finger are required to deliver a matrix to the screws.

3. In a line casting machine, the combination of the horizontal distributer bar, the feed screws, the rails E having shoulders to limit the horizontal advance of the matrices, thick matrices with lifting shoulders, thinner matrices without such shoulders, and a lifting finger shouldered substantially as described, whereby it is enabled to lift the thin matrices to the distributer bar by a single stroke and the thicker matrices by two strokes.

4. In a line-casting machine, the combination of a distributer bar, adjacent feed screws, a lifting finger, means for presenting matrices successively thereto, and a series of thick and thin matrices, the former being shouldered and the latter without shoulders, substantially as described; whereby the thin matrices are presented to the distributing devices at shorter intervals than the thick matrices.

5. The combination of a distributing mechanism and means for delivering individual matrices thereto at longer or shorter intervals according to their thickness.

6. In a line casting machine, a series of matrices differing in thickness and in form, in combination with means for feeding said matrices to the distributing mechanism, said means adapted substantially as described to feed matrices of one form at shorter intervals than those of the other form.

7. In a distributing mechanism a magazine having channels to receive the matrices, an overlying distributer bar adapted to carry the matrices and release them over the respective channels, means for feeding the matrices along the bar and means adapted to deliver matrices to the bar at longer or shorter intervals according to thickness.

8. The combination of a distributing mechanism, means for presenting a line of matrices below the level of the distributer, and means for delivering the individual matrices to the distributer by two successive steps.

9. In a distributing mechanism the combination of a lifting device, means for presenting successive matrices thereto, and matrices of variant forms at the lower end, the relative forms of the matrices and the lifting device being such that certain matrices are lifted the full height by a single movement of the lifting device, while other matrices are lifted by said device first to one level and then to a higher level.

In testimony whereof I hereunto set my hand this 7th day of January, 1909, in the presence of two attesting witnesses.

JOHN R. ROGERS.

Witnesses:

DAVID S. KENNEDY,

LUCY E. SMITH.