

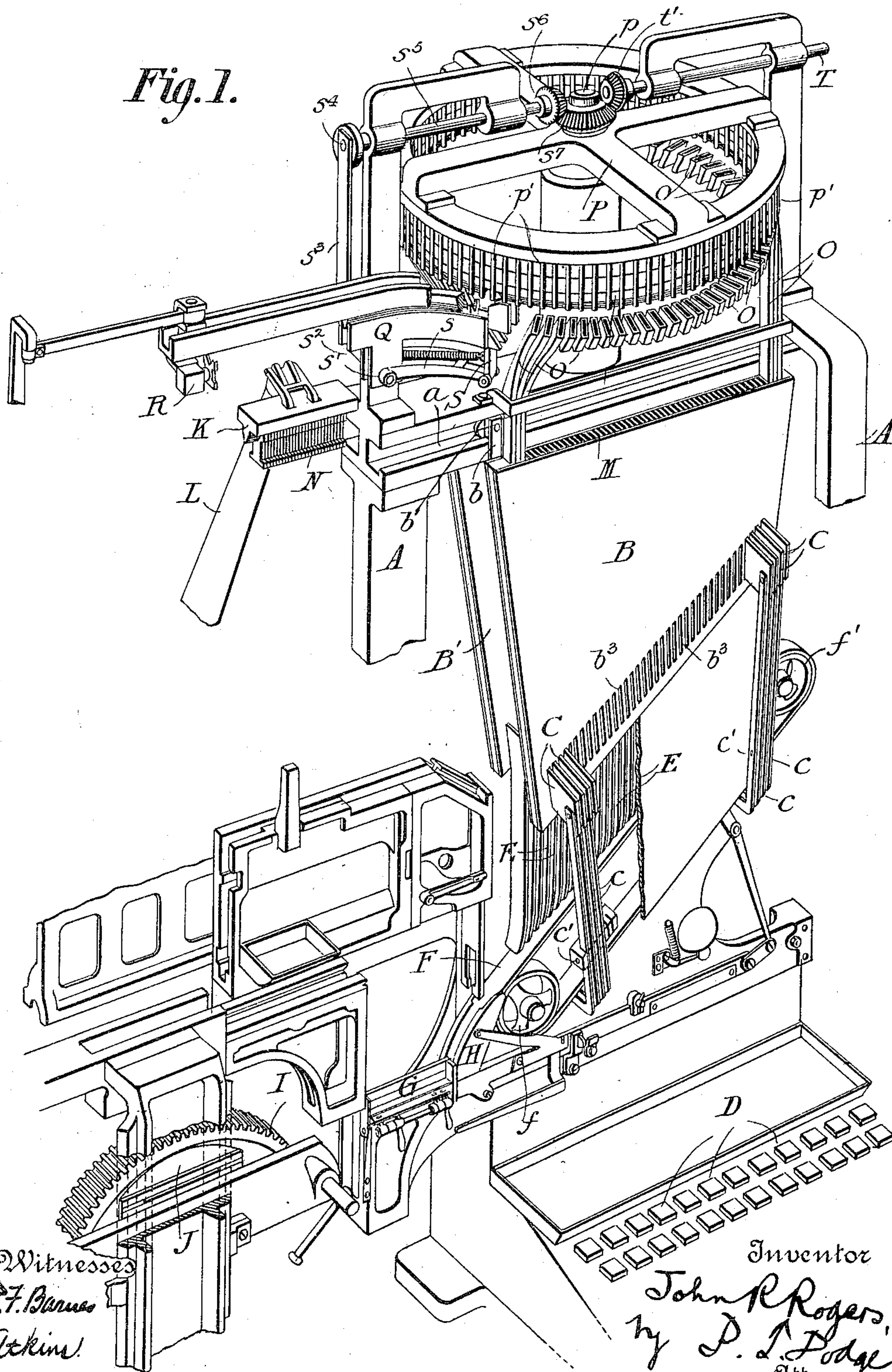
998,802.

J. R. ROGERS.
LINE CASTING MACHINE.
APPLICATION FILED MAR. 11, 1910.

Patented July 25, 1911.

2 SHEETS—SHEET 1.

Fig. 1.



Witnesses
S. F. Barnes
J. Atkins

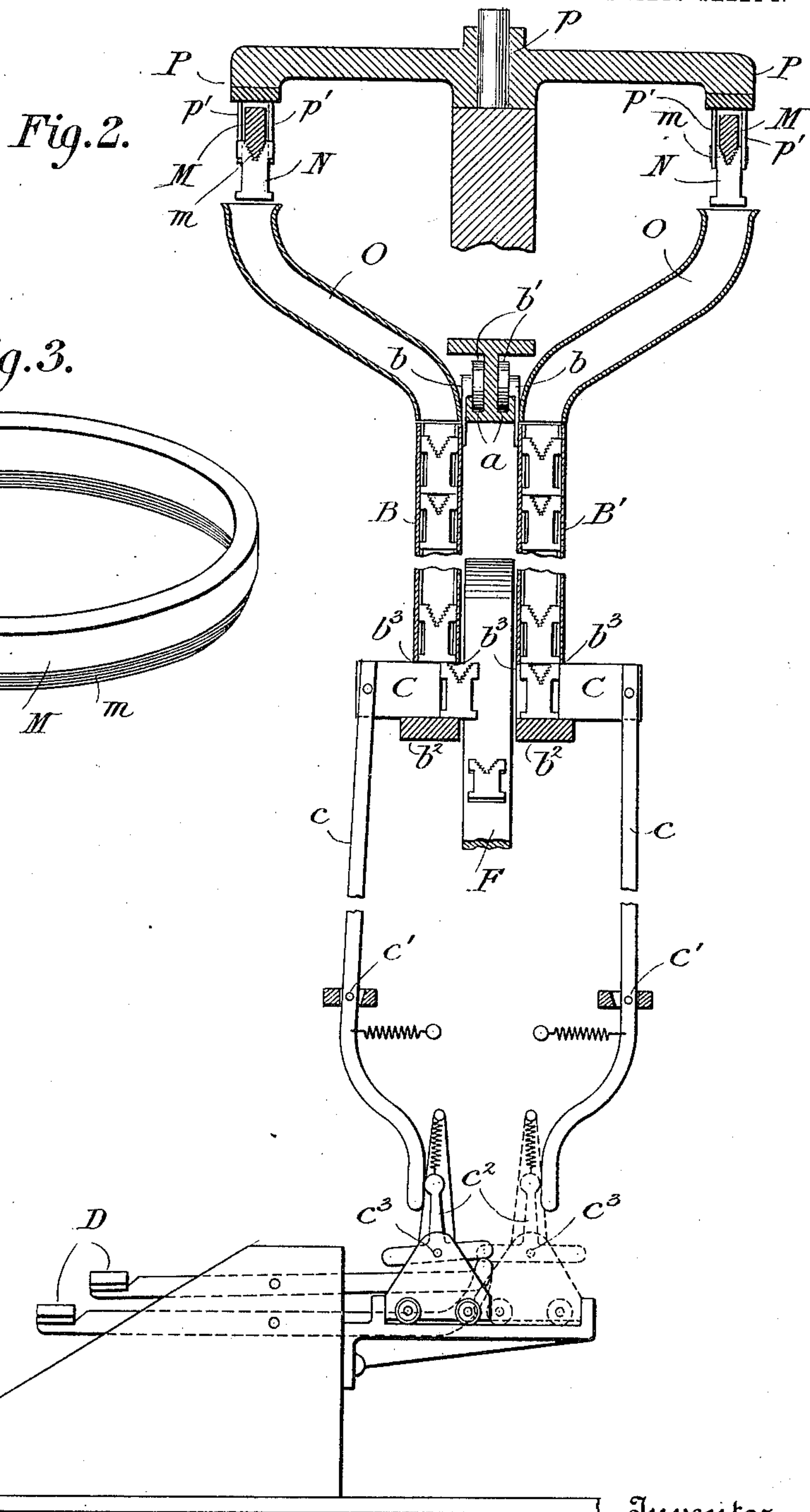
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2 SHEETS—SHEET 2.



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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.

998,802.

Specification of Letters Patent. Patented July 25, 1911.

Application filed March 11, 1910. Serial No. 548,625.

To all whom it may concern:

Be it known that I, JOHN R. ROGERS, of the 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 machines for casting printing bars or slugs with type characters thereon commonly known in commerce under the trademark "Linotype," and more especially to machines in which circulating matrices representing individual characters are stored in magazines, released individually by finger keys, assembled temporarily in line, and finally presented to the face of a slotted mold, where they form type characters on the edge of a type metal slug cast therein, the line being thereafter presented to a distributing mechanism, by which the individual matrices are delivered to their original magazine channels.

The object of the invention is to provide a machine of simple organization on the above lines; and to this end it consists in the combination of a circular distributing mechanism with one or more flat magazines and with intermediate tubes or conductors by which the individual matrices received from the distributor are delivered to the appropriate channels of the magazines.

It also consists in various details of construction relating to the above parts, and to cooperating parts in the machine.

With the exception of the parts hereinafter specifically described, the machine may be of the same general organization as that represented in Letters Patent of the United States 436,532, or of any other suitable construction.

In the mechanism herewith shown the transferring, justifying and casting mechanism, and the means for delivering the matrices from the casting mechanism to the distributor, may be, if desired, in all respects identical with those now employed in the commercial Mergenthaler linotype machine.

In the accompanying drawings: Figure 1 is an outline perspective view of the principal parts of a machine embodying my invention. Fig. 2 is a vertical central cross section through the distributor, the matrix conductors, the magazines, and the key-

board. Fig. 3 is a perspective view illustrating the general construction of the distributor.

Referring to the drawings, A represents the rigid main frame, which may be of any form and construction adapted to sustain the various operative parts hereinafter described.

B, B' represent two upright channeled magazines, adapted to receive and guide the matrices, which are received from the distributor at the upper end and delivered at the lower end to the assembling mechanism. These magazines may be of any suitable construction, but they consist preferably of two parallel plates secured to intermediate spacing pieces, and grooved in their proximate faces to receive and guide the edges of the matrices in the manner commonly practiced in commercial Mergenthaler machines of the present day, and described in Letters Patent of the United States 436,532. These magazines are provided at the upper end with sustaining arms *b*, carrying rollers *b'*, which bear on stationary guide rails *a*, attached to, or forming part of, the main frame, the arrangement, as shown, being such that every magazine may be withdrawn edgewise in a horizontal direction from the frame and replaced by another. At the lower end each magazine is provided with a fixed bottom plate, *b²*, upon which the lowermost matrices rest in order to sustain the column of matrices above. Transverse openings, *b³*, are made through both magazine plates in line with the channels therein, so that the matrices may be pushed laterally out of the inner side of the magazine by an ejector entering from the opposite side. C C represent suitable ejectors for this purpose. They consist of thin blades arranged in two rows opposite the outer sides of the respective magazines, in position to pass through the slots and through the lower ends of the magazines, and deliver the matrices on the opposite or inner side, the matrices from both magazines being delivered into a central or intermediate space, where they are received by the assembling devices hereinafter described.

The ejectors C may be made of any suitable form and operated by any appropriate mechanism. In the form shown they consist of light blades carried by the ends of

levers c , which are mounted in horizontal pivots c' . The lower ends of these levers are arranged in two parallel ranks, one outside each magazine, and are acted upon by angular levers c^2 pivoted at c^3 , and acted upon in turn by the inner end of finger key levers D, arranged in a bank or keyboard, and representing the various characters and fixed spaces. Whenever one of these keys is depressed the effect is to actuate the corresponding ejector and deliver the corresponding matrix horizontally from the lower end of the magazine.

For the purpose of assembling the matrices in line, I mount rigidly in the open space between the two magazines a series of upright blades or guides E, adapted to receive the ejected matrices and guide them downward in an erect position.

F is an inclined assembler belt extending beneath the guides E, and constantly driven in order to receive the successive matrices as they descend from the magazine and carry them downward one after another to the line in course of composition. The belt F is sustained by two pulleys f and f' , by one of which it may be driven.

G is a channeled assembler into which the matrices are delivered one after another, and assembled side by side in a common line, being guided thereto by an inclined block or support H, over which they pass from the belt end.

I is a vertical rotary wheel in which the slotted mold J is mounted.

The assembling belt, assembler G, and the wheel I, and all of the intermediate and connected parts for assembling the matrices, transferring them to the mold, and casting the slug therefrom, are foreign to the present invention, and may be of the same construction as in a commercial Mergenthaler machine, the general arrangement of these parts, as indicated in the drawings, being that of said machines.

After the matrices have served their purpose at the mold it is necessary that the composed lines shall be elevated and disintegrated, and the matrices delivered to the individual channels of their magazines. For the purpose of elevating the lines I employ a so-called "second elevator" K, a horizontal toothed bar carried by a vertically swinging arm L. This bar is adapted to receive the composed line from the first elevator and lift it to the top of the machine for presentation to the distributor in the same manner that a like operation occurs in the Mergenthaler machine. My present distributor consists, as shown in Figs. 2 and 3, of a circular bar or ring, M, of V form in cross section, provided on its two sides with short longitudinal teeth, m , to engage corresponding teeth in the upper ends of the matrices N, and sustain the latter as they are carried around

the bar until they arrive individually over the corresponding tubes or channels, O, which conduct them to the magazine. The teeth of the bar are permuted in the same manner as that used in commercial Mergenthaler machines and described in Letters Patent of the United States 347,629, or in any similar manner, and the teeth of the matrices N will be permuted to correspond, so that the matrices, delivered successively at a common point to the bar and carried along the same in engagement therewith, will be sustained individually until they arrive at the proper point for release, where for the first time all of the teeth of the matrix will be released by the teeth of the bar.

The distributor bar is arranged in a horizontal position and sustained by one or more rigid supports, m' . For the purpose of moving the matrices along the distributor bar to the points of discharge I provide an overlying horizontal wheel, P, turning about a central axis, p , and provided with a series of dependent pins, p' , which extend downward, passing the inner and outer sides of the distributor bar, as clearly shown in Fig. 2, in such manner as to engage the matrices suspended from the bar.

The matrices are presented to the distributor bar and the carrying wheel in the manner following. Q is a stationary horizontal guide or channel having one end in position to receive the line of matrices horizontally from the elevator K when the latter is in its uppermost position, the delivery of the line to this guide being effected by a horizontal pusher slide R. The inner end of the guide Q lies beneath the distributor bar in such position that the individual matrices may be lifted from the inner end of the line between the carrier fingers p' and into engagement with the teeth of the distributor bar. This lifting action is effected by a vertically reciprocating finger, S, carried at one end of an arm, s , mounted on a horizontal rock shaft, s' , the arrangement being such that the finger lifts the successive matrices from the line as the latter is urged constantly forward. This lifting finger and its adjuncts may be identical with those used for a like purpose in commercial Mergenthaler machines, or may be of any other suitable construction.

In order that the matrices may be presented at the proper time between the advancing pins, I connect the pin-carrying wheel P with the lifting finger S by any suitable means. As shown in the drawing the rock shaft s' which actuates the lifting finger receives motion through a crank arm s^2 mounted thereon and connected by a link s^3 with a crank pin s^4 , carried on one end of a horizontal shaft s^5 , which has its inner end engaged by bevel gears s^6 and s^7 to the pin

wheel. Under this arrangement the delivery of the matrices at the proper time and place is insured. Motion may be communicated to the pin wheel by means of a shaft T and the bevel gears t' and s' , or by any other suitable means.

It is necessary that the matrices released by the distributor bar, and falling therefrom at different points in its length, shall be guided positively into their appropriate channels in the respective magazines. For this purpose I employ the previously mentioned tubes or conductors O, secured to the main frame in two straight parallel rows above the respective magazines. The tubes of each row have their lower ends arranged in position to deliver the matrices into the channels of the magazines, and their upper ends arranged in a curved row beneath the distributor bar, and in such relations to the latter as to receive at different points the matrices intended for different channels. It will be observed that the conducting tubes O which have their lower ends in a straight and their upper ends in a curved row, are variously curved to this end.

The operation of the mechanism is as follows: The operator manipulates the finger keys D in the order in which the corresponding characters and spaces are required to appear in the composed line. The keys cause the ejector C to push the corresponding matrices laterally out of the magazine into the intermediate space, where they descend between the guides E to the assembling belt F, by which they are delivered successively, over the block H, into the assembler G, where they are assembled or composed side by side in an upright position in a common line. When the composition of the line is completed it is transferred by the ordinary mechanism, foreign to the present invention, to the mold J, and thereafter to the elevator K, by which the line is raised and presented opposite the guide Q, into which it is delivered endwise by the advance of the slide R, which applies a continued pressure to the line. The matrices are lifted successively from the inner end of the line by the finger S to the distributor bar M, between the pins p' , p' . As the matrices are carried forward their teeth engage those of the distributor bar, from which they are suspended until they arrive over the mouths of the respective tubes O, into which they fall, and through which they descend by gravity into the upper ends of the appropriate channels of the magazine.

It will be observed that either magazine may be removed independently of the other and replaced by another containing a different font or set of matrices.

It is to be noted that my invention is not limited to the specific devices shown for delivering the matrices from the magazine.

Any suitable devices operated in connection with the keyboard may be used for this purpose, the only requirement being that the matrices shall be released from the lower ends of the magazine so that they may be directed to a common assembling mechanism.

It will be perceived that the distributor ring may be made of any desired diameter, and that the upper ends of the tubes O may be widened or flared in order to permit the free entrance of the matrices, this feature being of decided advantage when matrices of great thickness are employed.

While I have shown two magazines in connection with the one distributor mechanism, it is to be understood that either magazine may be omitted, or that the number of magazines may be increased, the only requirement being that the tubes O should be so shaped and arranged as to deliver the matrices from the circular distributor to the magazine or magazines, the tubes being given such curvature that they will deliver to the magazines whatever the number or form of the letters may be.

The general organization herein shown and claimed is advantageous, in that it comprises within a reasonable space: 1, a distributor of a length sufficient to directly distribute matrices of two fonts to two magazines; 2, magazines which are cheap and simple, and adapted for instantaneous removal; 3, the straight and direct delivery of the matrices released from the magazine to the line in course of composition, so that the time of travel of the matrices may be equalized and transpositions avoided when the machine is operated at high speed.

Having thus described my invention, what I claim is:

1. In a line casting machine including circulating matrices, the combination of a flat magazine comprising a series of matrix channels arranged in a common plane, a circular distributor above the magazine, and intermediate tubes adapted to receive the matrices from the distributor at different points and deliver them to the respective channels of the magazine.

2. In a line casting machine the combination of two flat, upright magazines, each comprising a series of matrix channels arranged in a common plane, an overlying circular distributor for the matrices, and intermediate matrix guides or channels, having their upper ends arranged beneath the distributor and their lower ends arranged over the individual channels of the magazines.

3. In a line casting machine the combination of a main frame, an upright flat channeled magazine mounted therein and comprising a series of matrix channels mounted in a common plane and arranged to be withdrawn edgewise therefrom, an overlying cir-

cular distributor, and intermediate guides for directing the matrices from the distributor to the channels of the magazine, said guides being supported independently of the magazine.

4. In a line casting machine, in combination, a circular distributor bar, a rotary wheel provided with means for advancing the matrices along the distributor bar, a guide for supporting the composed line of matrices beneath the distributor, a lifting finger to carry the individual matrices from the line to the distributor, and connections between said finger and the matrix carrying means, whereby the action of the finger is properly timed with reference to the carrying means.

5. In a line casting machine, the combination of two upright, parallel magazines, means for delivering the matrices laterally from the magazines directly into the space between them, upright matrix guides, E, located in said space to receive the matrices and maintain them in an upright position during their descent, an assembler to receive

the matrices, and a carrier belt, F, arranged to receive the matrices from the guides E and deliver them to the assembler.

6. In a line casting machine, the combination of two upright magazines, means for delivering the matrices from the magazines directly into the space between them, upright matrix guides located in said space between the magazines, and transferring devices located beneath the guides to receive the matrices therefrom.

7. In a line casting machine, the combination of a flat magazine comprising a series of matrix channels arranged in a common plane, a circular distributor above the magazine, and means to convey the matrices from the distributor to the respective channels of the magazine.

In testimony whereof I hereunto set my hand this 22nd day of December, 1909, in the presence of two attesting witnesses.

JOHN R. ROGERS.

Witnesses:

DAVID S. KENNEDY,
LUCY E. SMITH.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."