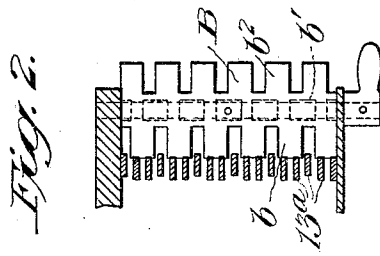
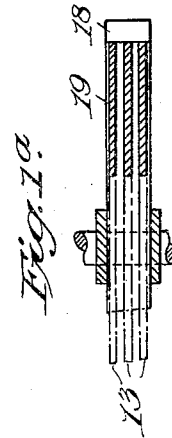
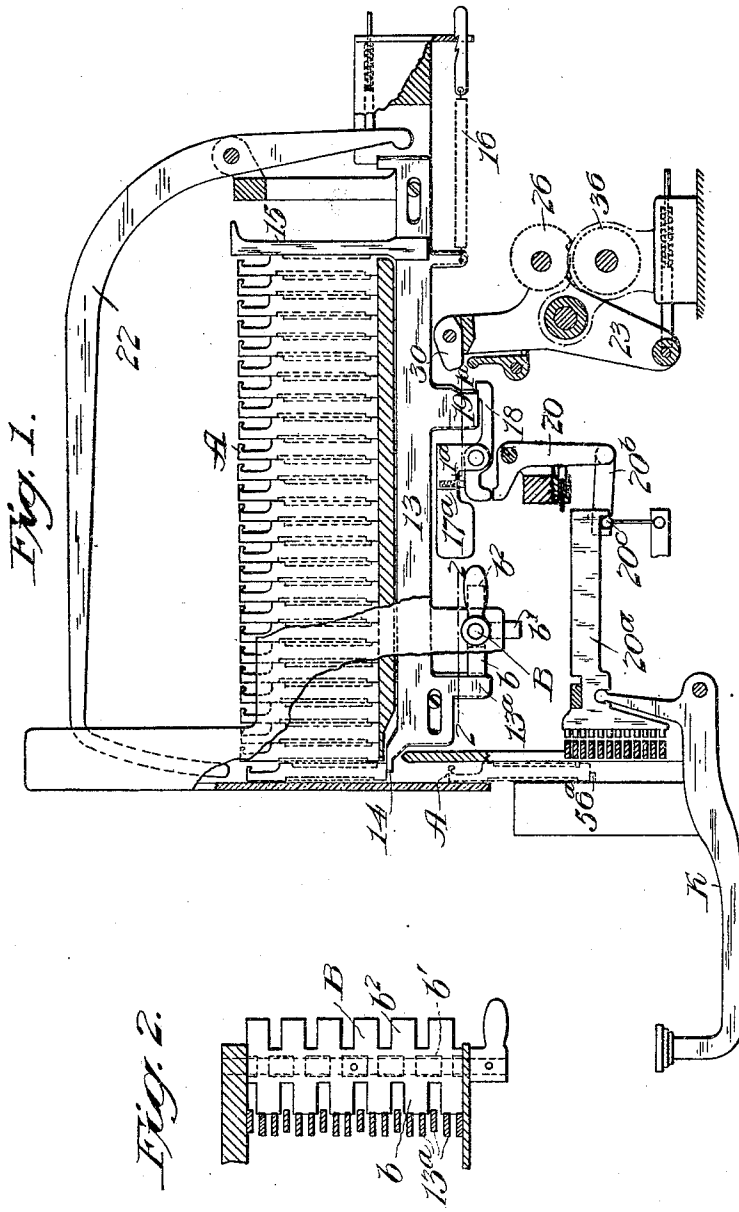


J. McNAMARA.
 LINE CASTING MACHINE.
 APPLICATION FILED APR. 30, 1909.

951,655.

Patented Mar. 8, 1910.

3 SHEETS—SHEET 1.



WITNESSES

G. D. Hartley
L. E. Morrison

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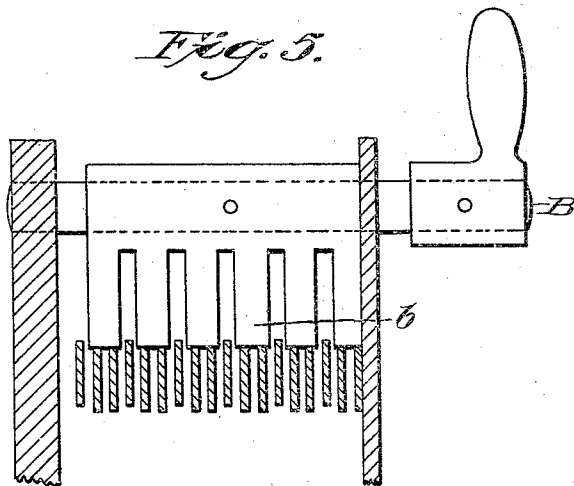
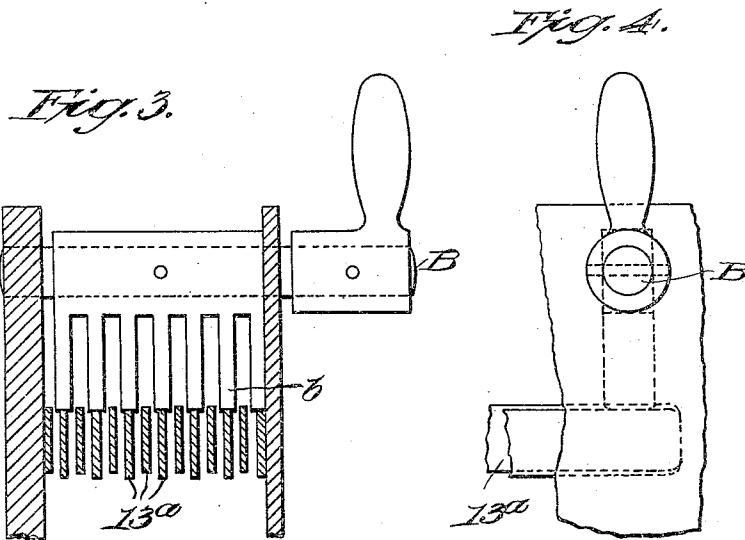
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3 SHEETS—SHEET 2.



WITNESSES

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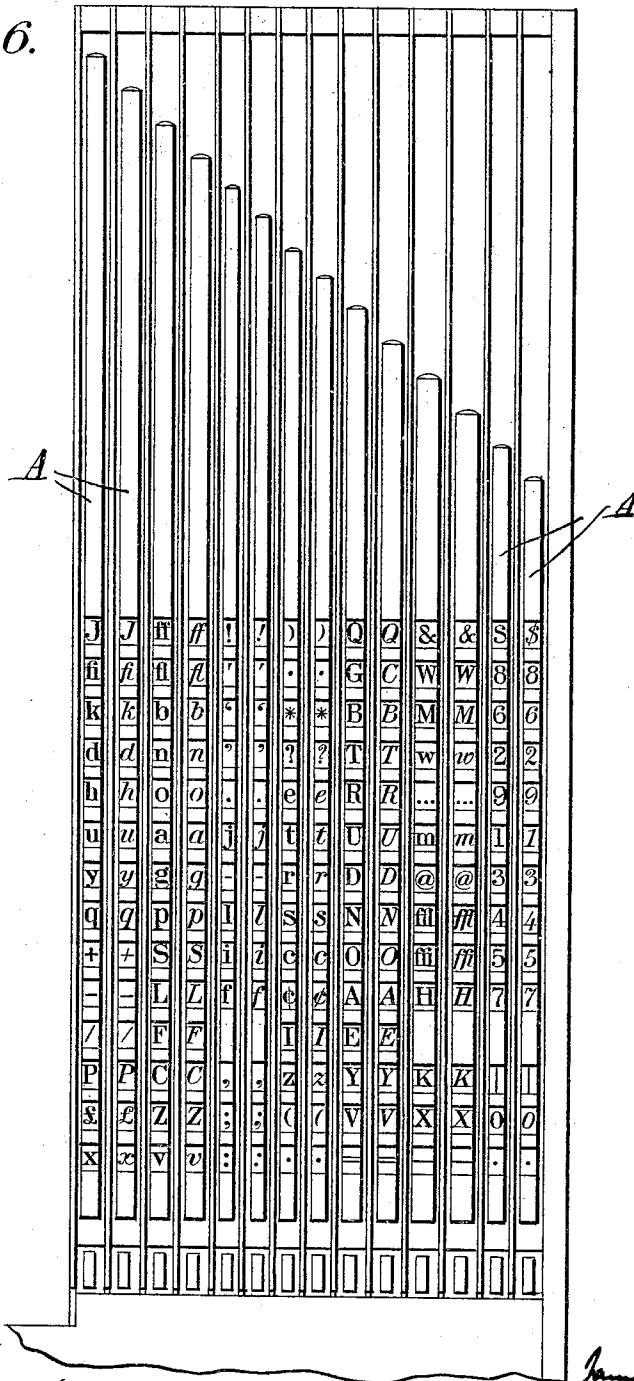
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3 SHEETS—SHEET 3.

Fig. 6.



Witnesses

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UNITED STATES PATENT OFFICE.

JAMES McNAMARA, OF MONTREAL, QUEBEC, CANADA, ASSIGNOR TO MERGENTHALER
LINOTYPE COMPANY, A CORPORATION OF NEW YORK.

LINE-CASTING MACHINE.

951,655.

Specification of Letters Patent.

Patented Mar. 8, 1910.

Application filed April 30, 1909. Serial No. 493,122.

To all whom it may concern:

Be it known that I, JAMES McNAMARA, a citizen of the United States, residing in Montreal, in the Province of Quebec, Dominion of Canada, have invented a new and useful Improvement in Line-Casting Machines, of which the following is a specification.

This invention relates to that class of line casting machines commonly known under the trade name "Monoline", and represented as to their general organization in Letters Patent of the United States to Scudder No. 605,141. These machines contain a series of vertical matrices each bearing in one edge a number of characters, and commonly known in the art as "multiple letter matrices". The matrices are held in a series of parallel magazine channels. Finger keys, representing the various characters and spaces, are each connected with means for releasing matrices bearing the corresponding characters from one channel of the magazine, and also connected with devices which arrest the descending matrices at one height or another, to bring the designated characters to the alining level. Several keys actuate a common device to arrest matrices from all the channels, and different keys release matrices from the same channel, according to the character demanded. The connections are such that a particular key will release matrices from one channel only, and will actuate only the arresting device which corresponds to the designated character. Heretofore these machines have been provided with matrices carrying only the characters of one font—usually eight groups or styles of matrices with twelve characters in each matrix.

The object of my invention is to adapt the machine, without increasing the number of finger keys, to carry one or more additional fonts of matrices with characters differing in size or style from those of the first font. To this end I provide one or more additional sets or fonts of matrices similar to the first except as to the size or style of the characters. I construct the magazine with additional channels sufficient to carry the additional groups of matrices. When two fonts are used I arrange the matrices of one font in the alternate channels of the magazine and the matrices of the other font in the remaining or intermediate channels. If

three fonts are employed I devote three adjoining channels of the magazine to the first matrices of the respective fonts, the next three channels to the second three matrices of the respective fonts, and so on repeatedly.

I connect the matrix arresting devices, which determine their height in the line, permanently with the finger keys as heretofore. Instead, however, of arranging each finger key to control a single matrix releasing device, I now make the intermediate dogs of such width that each finger key will control one releasing device of each font, so that if there were nothing to prevent, the operation of one key would be followed by the release of similar matrices of all the fonts. These connections are maintained at all times and there are no shifting or changing connections of any kind between the finger keys and the matrix releasing devices.

In order to secure the release of a single matrix of a given font at each action of the key, I provide means by which the releasing devices of the other font or fonts may be locked out of action and prevented from responding to the action of the finger key. This locking mechanism is so constructed that the releasing devices of all but one font of matrices may be held out of action at will, while the others are permitted to operate. It will be seen that I am thus enabled without increasing the size of the keyboard, without changing the character of the magazine, and without changing the connections between the finger keys and the releasing or alining devices, to effect the delivery of matrices from any font at will to the exclusion of the others.

With the exceptions hereinafter specified the machine may be in all respects like that in the patent above referred to, or of any similar construction.

In the drawings: Figure 1 represents a vertical section from front to rear of a monoline machine with my improvements incorporated therein for controlling three fonts of matrices. Fig. 1^a is a sectional view showing the manner in which one detent controls three matrix releasing devices. Fig. 2 is a sectional plan on the line 2—2 looking in a downward direction, on an enlarged scale. Fig. 3 is a plan view showing an equivalent arrangement for controlling two fonts of matrices. Fig. 4 is a side elevation of the same. Fig. 5 is a plan view of an

alternative arrangement for controlling three fonts of matrices. Fig. 6 is a front elevation showing two fonts of matrices, the matrices of the respective fonts being interspaced or alternated in arrangement.

Referring to Figs. 1, 1^a and 2, A, A, represent a series of matrices standing edge to edge in one of the magazine channels and supported by an underlying plate forming the bottom of the channel. The matrices are fed forward and delivered in the order required by the horizontally reciprocating delivery gate 13 which at its front end 14 forms a support for the foremost matrix. The gate is provided at the rear end with an upright finger 15 which pushes the matrices forward toward the delivery point; an additional matrix being admitted to the channel each time that the gate 13 is retracted. When the gate is retracted its forward end 14 passes from under the foremost matrix and permits it to descend into the matrix receiving chamber, preparatory to its being carried laterally to the end of the line in the course of composition.

The gate 13 is one of the matrix releasing devices heretofore referred to. It will be understood that there are a series of these gates, one in each of the parallel magazine channels. Each of the delivery gates 13 is connected to a spring 16 by which it is moved quickly backward when released. The gate is held forward, in the position shown in Fig. 1, by a latch 18 engaging a lug 19 on the under side of the gate. The latch is pivoted midway of its length and acted upon by a spring 17^a by which it is caused to engage the gate.

The latch 18 is acted upon by one end of an angular lever 20 connected by a link 20^b to a crossbar 20^c which is in turn acted upon by a finger key lever K, so that whenever a finger key is depressed the latch 18 is disengaged. Heretofore each latch has been adapted to engage and hold a single delivery gate 13. In carrying my invention into effect I use the same number of latches as heretofore, and maintain the ordinary connection between the latch and the finger key, but I widen the rear end of the latch horizontally so that it may engage and hold more than one of the delivery gates 13. If there are three fonts in the machine the latch will, as shown in Fig. 1^a, be wide enough to engage three of the delivery gates, one of each font. These adjacent gates will control the delivery of similar matrices from the different fonts; that is to say matrices bearing like characters but in different sizes or forms. As two or more gates are controlled by one latch they are all released by the action of the finger key, and unless provision were made to the contrary the result would be the delivery of matrices of different fonts at one time. I therefore provide means for lock-

ing out of action all but one of the delivery gates controlled by each key and latch, so that although the latch may be operated to release three gates the locking device will prevent all but one from moving, and consequently prevent the release of more than one matrix. This locking mechanism may be made in various forms. In the form shown in Figs. 1 and 2 it consists of a transverse rockshaft B provided with three series of arms *b*, *b'* and *b''* extending therefrom in different directions, so that by rotating the shaft any set of arms may be caused to bear against lugs 13^a, extended downward from the delivery gates 13. The arms of one series are differently spaced along the shaft from those of the other series, each arm being adapted to bear against the shoulders of two delivery gates 13 and hold them from moving rearward when the latch 18 is disengaged. The location of the arms along the shaft is such that when the arms *b* are in action the gates for two fonts are held out of action and the third gates permitted to operate. When the arms *b'* are in action gates controlling another font are permitted to operate and the other two series held out of action. When the arms *b''* are in action the third series of gates is permitted to operate, and the others locked out of action. It will be seen that in this manner the rotation of the shaft serves to lock positively out of action the delivery gates of any two fonts desired, while permitting those of the remaining font to move freely. The one set of finger keys and latches serve to actuate the delivery gate or releasing devices for three fonts of matrices, the gates of two fonts being, however, locked in an idle position while those of the third font are free to operate.

Whenever a finger key is depressed one only of the delivery gates 13 will move rearward from under a matrix and permit it to escape from the magazine, the action in this respect being precisely the same as in the ordinary machine.

After a delivery gate is moved rearward to release a matrix it is immediately carried forward, in order that it may be again locked by the latch 18, by a rocker-frame 23 carrying at its upper end pivoted pawls 30 to act on the rear ends of the respective gates. This rocker-frame, which stands normally in the position shown, carries an eccentric overlying a constantly rotating roll mounted in fixed bearings. The cam is held normally out of contact with the roll by a spring 25^b. When the delivery gate moves rearward it throws the rocker-frame backward sufficiently to cause the engagement of the eccentric with the roll. The eccentric is at once rotated by frictional engagement with the roll 36, the effect being to rock the frame 23 forward until it restores the de-

livery gate to its normal position. These members form no part of the present invention, and operate as heretofore.

When the matrix is released its downward movement is accelerated by a pivoted arm 22 actuated by or controlled by the delivery gate 13 as heretofore. When a matrix is released and descends from the magazine it is arrested at one height or another, according to the character which is designated for use in the line by horizontally movable detent slides 56^a. These slides are acted upon by projections on the forward ends of the slides 20^a, each slide having a projection to push forward one detent only. When a finger key is actuated it advances the corresponding slide to arrest the coming matrix, and at the same time disengages the latch that the delivery gate may release the matrix.

It is to be observed that the arrangement and action of the finger key mechanism upon the matrix arresting devices and the matrix releasing devices is the same as in the patented machine, my improvement residing in the adaptation of the latches to hold more than one of the delivery gates, and in the provision of means for locking gates so that only one is permitted to move at a time. The locking arms *b*, *b'*, etc. are made of such length that they move the inactive gates slightly forward in order to prevent friction between them and the latches 18.

Figs. 3 and 4 represent a modified or equivalent mechanism for locking the inactive delivery gates. In the form shown it is adapted for a machine having only two fonts or sets of matrices, the channels and gates of the respective fonts being alternated. In this case the rockshaft has only one set of arms so spaced as to engage the alternate gates in a series. The shaft is movable endwise however so that the arms may be set against the alternate gates controlling either font. In this case, of course, each of the latches 18 will lock two gates only.

Fig. 5 shows a similar device for a machine having three fonts of matrices with the delivery gates arranged in groups of three. In this case each of the fingers is of suitable width to engage and hold out of action two delivery gates, the third one in each group being free to act.

Ordinarily all fonts of matrices will contain a like number of characters, and the matrices will contain like groups of characters. In other words, the matrices of the different fonts will correspond except as to the size or style of the characters therein. It will be seen, therefore, that when the matrices of different fonts are arranged in a two font machine two adjacent matrices will bear the same characters as illustrated in Fig. 6; and in a three font machine that

three adjacent matrices will bear the same characters, in a substantially similar manner.

It will of course be understood that the number of magazine channels and gates will correspond with the number of matrices employed, and that this number is variable at the will of the constructor.

The casting and distributing mechanisms may also be of the usual construction, the matrices of the various groups being of different lengths, and the distributor being enlarged or extended without change of principle to handle the increased number of groups.

The alternated or interspaced arrangement of the matrices belonging to the different fonts is advantageous, in that it permits a simple construction of the devices for controlling matrices of two or more fonts by a single finger-key; also in that it gives matrices of the different fonts substantially the same length of travel in their course to the composed line, thus avoiding the danger of transposition which exists in all machines where certain characters require a greater time than others in their passage to the line.

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

1. In a line casting machine of the class described, the combination of two matrix-releasing gates, springs for moving them to an inactive position, a single detent for locking both gates in an active position, a finger-key to operate said detent, and means adjustable at will for locking either gate against movement when released by the detent; whereby a single finger-key is enabled to deliver matrices of one kind or another, as demanded.

2. In a line casting machine of the class described, two matrix-releasing gates, springs for moving the gates to an inactive position, a single detent for locking both gates in an active position, a device for arresting the descent of the released matrices, a finger-key connected with both the detent and the arresting device, and means adjustable at will for retaining either gate in the active position when the detent is disengaged therefrom; whereby a single finger-key is enabled to release matrices of one kind or another as demanded, and also to arrest the descent of the released matrices.

3. In a line casting machine, plural fonts of multiple letter matrices, magazine channels having matrices of the respective fonts alternated or interspaced therein, means for delivering matrices from the respective channels, means for arresting the descent of the released matrices, finger-keys corresponding to the characters in one font of matrices, connections from each key to one of the arresting devices, connections from each key to plural matrix-releasing devices,

and means adjustable at will to lock out of action all the releasing devices except those of a pre-determined font; whereby one set of keys is enabled to deliver matrices of one font or another as required.

4. In a line casting machine containing multiple letter matrices, the combination of two or more matrix-releasing devices, means for arresting the descent of the released matrices, a finger-key having permanent connection with said arresting devices and with two or more of said releasing devices, and means adjustable at will to lock all but one releasing device out of action; whereby one key may be caused to release or arrest matrices of one style or another as required.

5. In a line casting machine of the class described, a channeled magazine, a plurality of gates 13 to deliver matrices from adjacent channels of the magazine, a single latch 18 controlling the several gates, and a finger key connected thereto and operable

so that the latch releases the gates simultaneously, together with an adjustable device for locking any desired gate out of action at will.

6. In a machine of the class described, two fonts of multiple letter matrices, means for releasing the individual matrices of the respective fonts and arresting them at different levels, finger-keys representing the characters of one font, non-shiftable means connecting said keys with the releasing and alining devices of both fonts, and means adjustable at will for locking the releasing means of either font out of action.

In testimony whereof I hereunto set my hand this 27th day of April, 1909, in the presence of two attesting witnesses.

JAMES McNAMARA.

Witnesses:

WESLEY BARRETT,
REUBEN NORTON.