J. R. ROGERS.

LINE CASTING MACHINE.

APPLICATION FILED APR. 2, 1910.

1,028,137.

Patented June 4, 1912

4 SHEETS—SHEET 1.

Fig. 1.

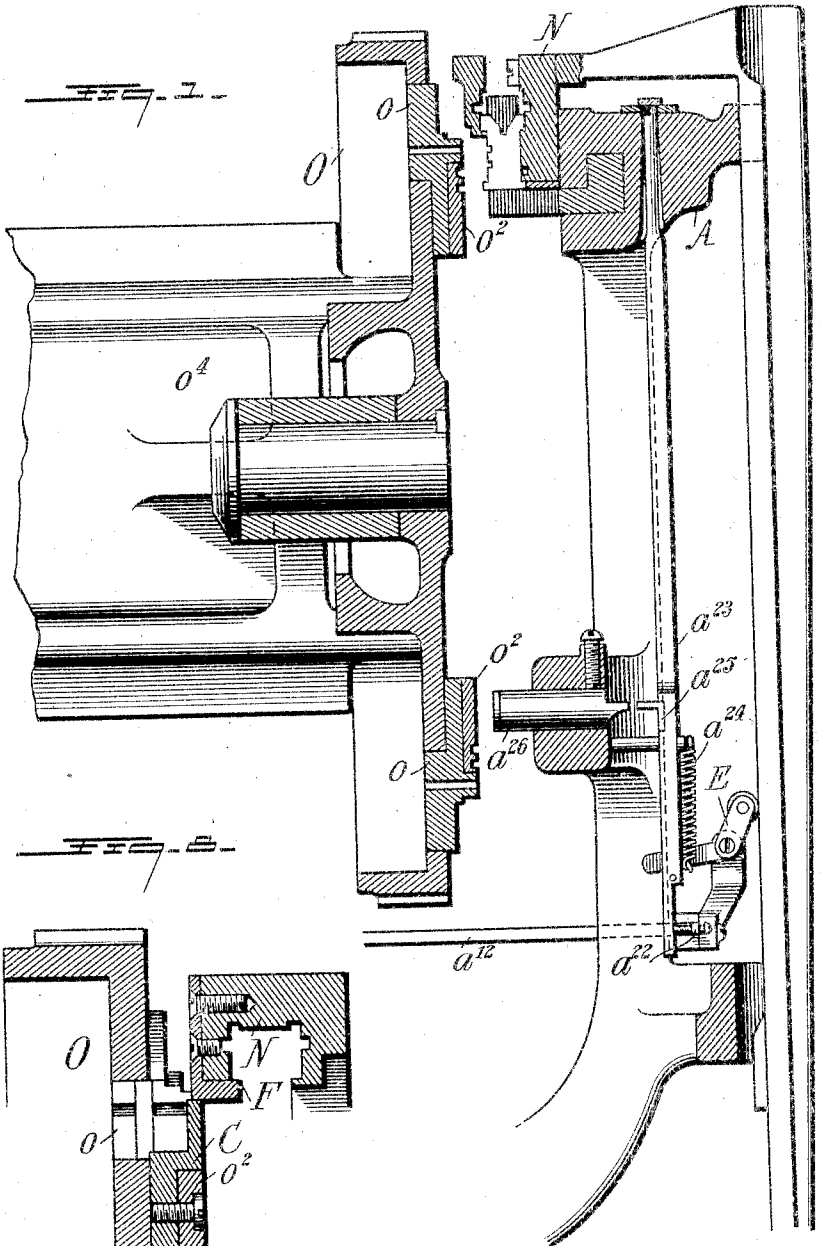

Fig. 2.

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4 SHEETS—SHEET 2.

Fig. 2.

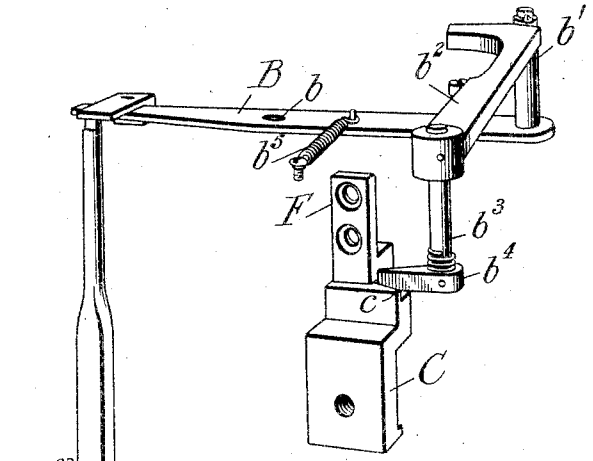
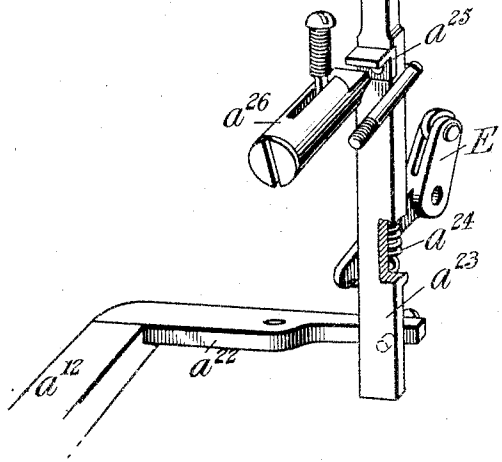


Fig. 3.



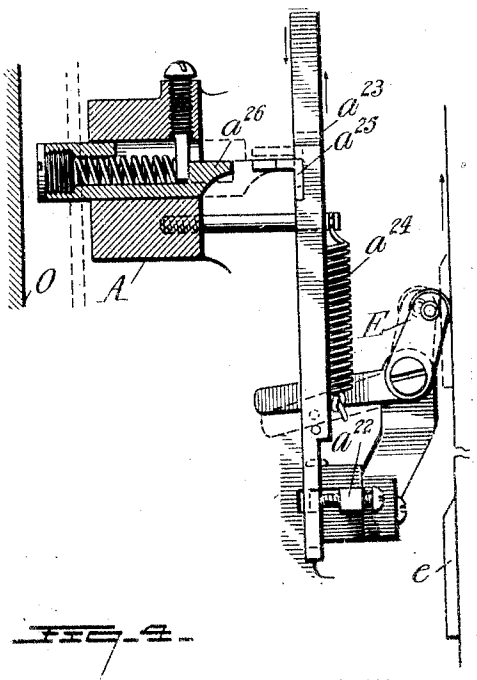
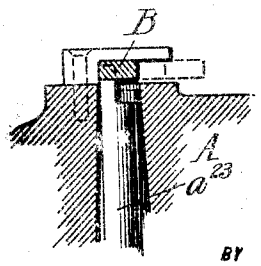


Fig. 4.



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4 SHEETS—SHEET 3

Fig. 5.

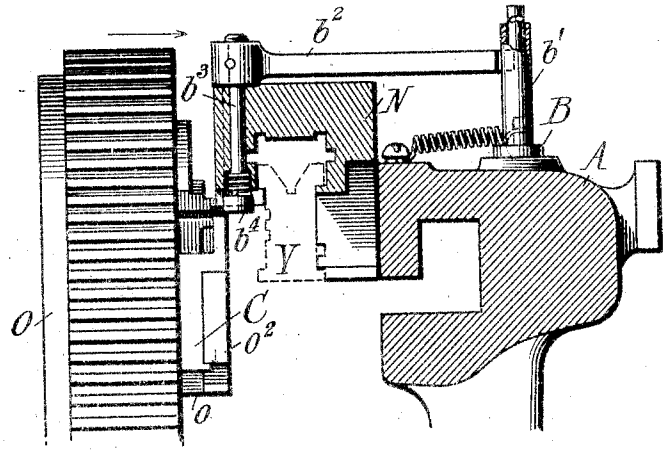
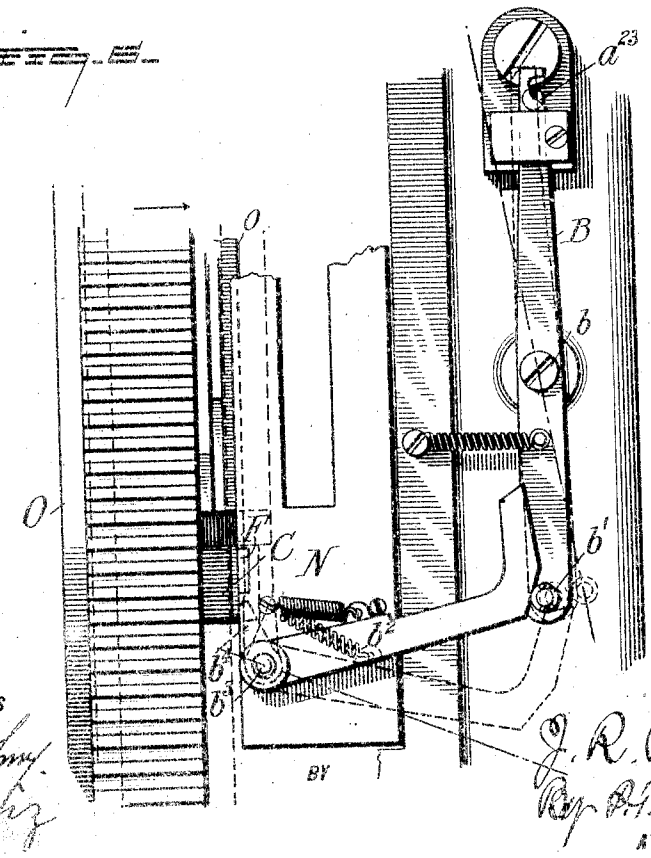


Fig. 6.



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4 SHEETS—SHEET 4.

Fig. 7.

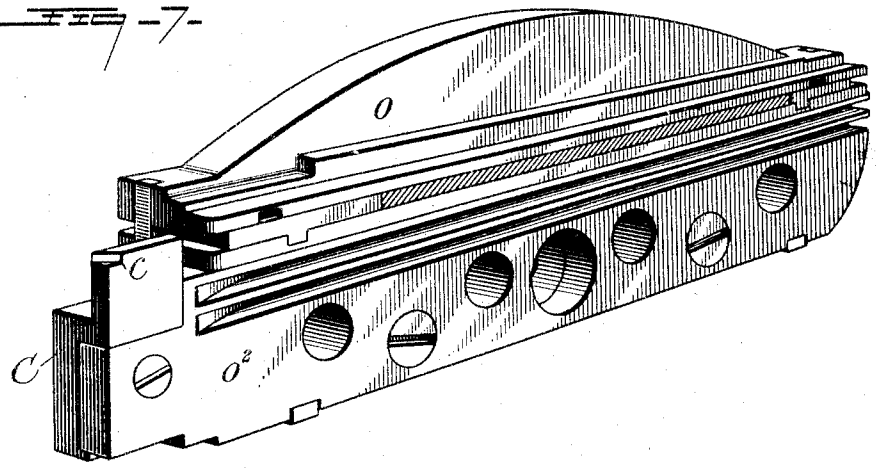


Fig. 9.

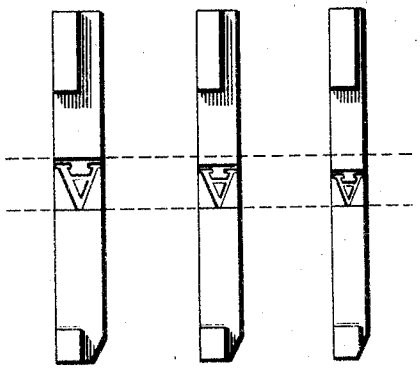
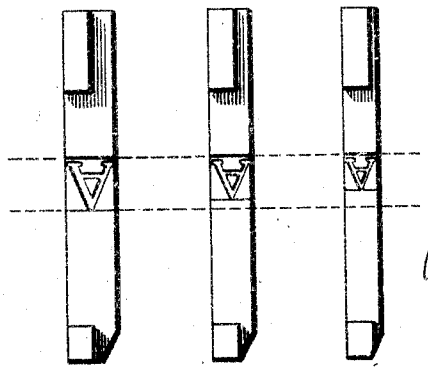


Fig. 10.



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UNITED STATES PATENT OFFICE.

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LINE-CASTING MACHINE.

1,028,137. Specification of Letters Patent. Patented June 4, 1912.

Application filed April 2, 1910. Serial No. 553,124.

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 line casting machines of the general organization represented in Letters Patent of the United States No. 436,532, wherein type matrices, assembled temporarily in line, are suspended in a device known as the first elevator, and lowered thereby to a position in front of a horizontally slotted mold, which is thereafter advanced facewise against the matrices, which close the front of the mold, while it is filled from the rear with molten metal to produce a slug or linotype, on the front edge of which the type characters are formed by the matrices. The characters stand in an inverted position in the matrices, and heretofore it has been the practice to have characters of different sizes, as nonpareil, minion, etc., aline at the top of the characters; in other words, matrices of all fonts had a common alining level in the machine, at the heads or tops of the characters.

Under a new system recently inaugurated, matrices of various sizes are arranged to have a common alinement at the base of the characters; or in other words, matrices used in the machine for fonts of different sizes have their characters arranged to aline at the base at one and the same level. When the older matrices are used, with the top alinement, the elevator descends always to one and the same level in presenting the matrices before the mold, but if matrices using the base alinement are employed, the elevator is required to descend to a different distance in order to properly present the matrices in relation to the mold, and this distance must be varied to some extent, according to the size of the characters employed and the thickness of the slugs which the mold is adjusted to produce.

It is very important that the matrices shall be lowered to the exact level required, as otherwise the mold advancing toward them is liable to mutilate the ears which project from the lower ends of the matrices. Heretofore the machines have been provided, as shown in Patent No. 436,532, with mechanism by which the driving clutch of the machine was automatically thrown out of action if the matrices were not lowered to the proper level.

The present invention relates to an improved mechanism for this purpose, adapted to permit the use in the machine of matrices having a common alinement at the foot, or matrices having a common alinement at the top of the characters.

The drawings herein are limited to those parts of the machine with which my improvements are directly associated. It is understood that as to all other parts the machine may be of the construction represented in the above named patent, or of any similar or equivalent construction.

Figure 1 is a vertical section through the mold carrying disk, the first elevator, and the attendant devices for throwing the machine out of action if the elevator fails to lower the matrix line to the proper level. Fig. 2 is a perspective view showing in their operative relation the principal parts of my mechanism. Fig. 3 is a vertical section through the clutch controlling devices and the parts by which they are actuated. Fig. 4 is a vertical cross section through the top of the main frame and the clutch controlling rod, commonly known as the vise automatic, in its normal position. Fig. 5 is a vertical cross section through the top of the first elevator, by which the matrix line is carried to the mold, and the adjacent parts. Fig. 6 is a top plan view of parts shown in the preceding figure. Fig. 7 is a perspective view of the mold and the attached arm to limit the descent of the elevator and the contained matrix line. Fig. 8 is a vertical section through one end of the first elevator, and the adjacent parts, illustrating the manner in which its descent is arrested. Figs. 9 and 10 are views illustrating the alinement of matrix characters at the head and foot respectively.

Referring to the drawings, O represents the upright mold wheel, carrying one or

more slotted molds, o, and mounted on a horizontal slide, o^4, sustained in the main frame for the purpose of advancing the mold facewise against the line of matrices, as hereinafter described.

N represents the first elevator, so-called, mounted to rise and fall in the machine, its upper end slotted horizontally to receive and sustain the matrices, Y.

The composed line of matrices is moved endwise into the elevator N when the latter is in an elevated position, and thereafter the elevator is lowered, in order to present the matrices directly in front of the mold, with the matrix characters opposite the mold slot, as shown in Fig. 1. While the matrices are in this position, the mold is advanced facewise and crowded tightly against the matrices, and held in this position while the mold is filled from the back with molten metal, ejected from the mouth of the usual melting pot, not shown in the drawings.

For the purpose of throwing the main clutch, which drives the machine, out of action if the matrix line is not lowered to the proper point, a rod, a^{23}, is provided, its upper end being guided in the main-frame and its lower end sustained by a spring, a^{24}, so that it may swing forward and backward. The lower end of this rod a^{23} bears against one end of a centrally pivoted lever, a^{22}, which acts at the opposite end against a bar, a^{12}, acting to throw the main clutch out of operation. The rod a^{23} is provided with a lip, a^{25}, and receives its motion to operate the clutch from a horizontal slide, a^{26}, mounted in the main-frame in position to be acted upon and pushed forward by the mold disk O as the mold is advanced against the matrices.

So far as described, the parts referred to correspond to the parts indicated by like letters in Letters Patent No. 436,532, and have a similar mode of action. In the former patent, the rod a^{23} stood normally in its uppermost position, with the lip a^{25} in position to be engaged by the actuating slide, a^{26}. The first elevator, N, in descending acted on the upper end of the rod to push it downward, and if the elevator and matrices descend to the proper level the lip a^{25} was carried below the slide, which advanced thereover without affecting the rod a^{23} or the clutch. If, however, the elevator failed to descend with the matrix line to the proper level, the lip a^{25} stood in the path of the slide a^{26}, which latter acted to push rod a^{23} horizontally, and thereby throw the clutch out of action, as before mentioned.

The present structure differs from that of the patent, among other things, in having the lip a^{25} stand normally above the actuating slide a^{26}. It is held down in its operative position by a horizontal lever, B, centrally pivoted to the top of the vise frame portion A of the main frame, with one end standing normally over the upper end of the rod a^{23}, to hold the same down in its active position, as shown by full lines in Fig. 3. The opposite end of the lever B carries a stud, b^1, which is acted upon by the eccentric end of an arm, b^2, carried on a vertical rock shaft, b^3, which is seated in the first elevator, and provided at its lower end with a second arm, b^4, acted upon by an arm, C, secured to the mold or mold disk.

The arm b^4 rises and falls with the first elevator. If the elevator descends with the matrix line to the proper level, the arm b^4 is presented opposite the lip c on the upper end of the plate C, so that when the mold advances toward the matrices, carrying with it the plate C, the lip c of the latter will act on the arm b^4, causing the end of the arm b^2 to actuate the lever B and swing its opposite end from over the rod a^{23}, which latter will be lifted by the spring a^{24} until the lip a^{25} stands above the path of the slide a^{26}, thus permitting the rod a^{23} to remain idle when the mold advances to the matrices, so that the main clutch may remain in action. In other words, the plate C, advancing with the mold, permits the rod a^{23} to assume such position that it will not disengage the main driving clutch. If, however, the elevator fails to descend to the proper level with the matrices, the arm b^4 will stop in its descent above the plate C, and when the mold advances, the plate C will pass under the arm b^4 without affecting the same; and consequently the lever B will continue to hold the rod a^{23} down in such position that its lip a^{25} will stand in the path of the slide a^{26}, and therefore the advancing mold-wheel, swinging rod a^{23} before it, will cause the rod to actuate the lever a^{22} and bar a^{12}, and thereby throw the clutch out of action, so that the machine will come to a rest.

After the rod a^{23} has been permitted to rise, it must be again depressed until its upper end is below the level of the locking lever B. This is effected by an angular lever, E, centrally pivoted to the main frame, with one end in position to act on a projection on the side of the rod a^{23}, and its other end, containing a roller, in position to be acted upon by a cam surface, e, on the vertical arm of the first elevator, N. When the elevator rises to lift the line from the casting position, it acts through the lever to pull the rod a^{23} downward. As well known, each mold is advanced when in the horizontal casting position, and again when in a vertical position opposite the ejector which delivers the slug therefrom.

It sometimes happens that the mold disk

is provided with two, three or more molds, and when the disk advances toward the matrices with a mold in the ejecting position, there would be danger of a bottom mold actuating the slide a^{26} and stopping the machine at an improper time. The lever E also prevents this action, since it carries the lip a^{25} below the slide a^{26} at such time.

When the first elevator N descends with the matrix line, its downward movement is arrested to determine the exact level of the line by a block, F, Figs. 1, 2 and 8, attached to the elevator N and arranged to bank on top of the plate C. In other words, the descent of the elevator and the matrices is limited by the contact of a member on the first elevator with a member attached to or forming part of the mold.

By adjusting the plate C vertically in relation to the mold, or by replacing it with a plate terminating at a different level, the descent of the elevator and the matrices may be varied at will, as the size of the characters in the matrices, their location therein, the size of the mold, or other conditions may demand, and thus the machine may be adapted to use matrices with either the head or the foot alinement.

I believe it to be wholly new in the art to limit the descent of the matrices through devices acting directly on the mold or a part in fixed relation thereto, and I believe it to be wholly new to utilize a part attached to and forming part of the mold for the purpose of throwing the main driving clutch out of action and arresting the movement of the machine.

The molds are commonly constructed, as shown in Figs. 1 and 7, with a so-called keeper-plate, o^2, secured firmly thereto and grooved to engage the lower ears of the matrices, for the purpose of securing the alinement of the matrix characters with the mold slot. The keeper-plates are sometimes adjustable vertically in relation to the mold slot, as in Patent No. 846,053, and in such case the adjustment of the keeper will effect the corresponding adjustment of the plate C. I prefer to attach the stop arm C to this keeper, as shown in Fig. 7, but it may be formed upon the keeper, or on the body of the mold, or attached to the mold disk, the only requirement being that it shall be held rigidly at a definite height; that is to say, in a definite relation to the mold slot, the banking of the matrix carrier N upon this member being equivalent to its banking directly upon the mold. This permits a great accuracy of adjustment, and insures the presentation of the matrices in proper relation to the mold slot with much greater certainty than by the mechanisms heretofore in use, in which the descent of the line was controlled by devices distinct from the mold and from the line carrier.

Having thus described my invention, I claim and desire to secure by Letters Patent,—

1. In a machine of the class described, the combination of a slotted mold and a movable carrier for bringing the matrix line to the mold level, said parts arranged to contact in order to limit the said movement of the carrier.

2. In a machine of the class described, the slotted mold, and the first elevator arranged to present the line of matrices thereto, in combination with a stop in fixed relation to the mold, to limit the descent of the elevator.

3. In a machine of the class described, the slotted mold, provided with a keeper, o^2, and a stop, C, secured to said keeper, in combination with the first elevator, N, having a member arranged to contact with the arm C, to limit the descent of the elevator.

4. In a machine of the class described, the mold, the first elevator for presenting matrices thereto, and a clutch controlling member, a^{23}, in combination with means carried by the first elevator to control the action of the member a^{23}, and a part in fixed relation to the mold, to actuate said controlling means.

5. In a machine of the class described, the combination of a mold, a first elevator for presenting matrices thereto, a clutch controlling member, a^{23}, mounted in the main frame, a member, C, in fixed relation to the mold, and devices carried by the first elevator, and actuated by the member C, to control the member a^{23}.

6. In a machine of the class described, in combination with a clutch controlling member, a^{23}, and its lifting spring, the lever B, the lever b^2, an arm b^4, to control lever B, and a member, C, in fixed relation to the mold, to actuate arm b^4.

7. In a machine of the class described, and in combination with the mold, the first elevator for presenting matrices thereto, clutch controlling mechanism, and means carried by the first elevator and controlled by the mold, to actuate the clutch controlling mechanism.

8. The mold carrying disk, movable forward and backward, and the first elevator for presenting matrices to the mold, in combination with a clutch controlling member, a^{23}, its lifting spring, the actuating slide a^{26}, a movable member on the first elevator, to control the part a^{23}, and a part in fixed relation to the mold, to actuate said movable member.

9. In a machine of the class described and in combination, a mold and first elevator, a vertically and horizontally movable clutch controlling member, a^{23}, its lifting spring,

means for effecting its depression, and means for locking it normally in its depressed condition, said locking means controlled by a part in fixed relation to the mold.

10. In a machine of the class described, a mold, a first elevator for presenting matrices thereto, and clutch controlling means in the main frame, in combination with a member, C, in fixed relation to the mold, and intermediate means carried by the first elevator, to govern the clutch controlling means and in turn governed by the member C.

11. In a machine of the class described, the mold, movable forward and backward, and the member C in fixed relation thereto, in combination with a clutch controlling member, a^{23}, its lifting spring, a slide, a^{26}, to actuate said member, and means carried by the first elevator and actuated by the member C, to control the member a^{23}.

12. In a machine of the class described, the combination of a mold and a movable carrier for bringing the matrix line to the mold level, said mold acting to limit the said movement of the carrier.

13. In a machine of the class described, the combination of a mold and a matrix carrier movable parallel with the face thereof, said mold acting to limit the said parallel movement of the carrier.

In testimony whereof I hereunto set my hand this thirty first day of March, 1910, in the presence of two attesting witnesses.

JOHN R. ROGERS.

Witnesses:
DAVID S. KENNEDY,
LUCY E. SMITH.