No. 848,318. PATENTED MAR. 26, 1907.

D. PETRI-PALMEDO.

LOGOTYPE MACHINE.

APPLICATION FILED JAN. 11, 1907.

4 SHEETS—SHEET 1.

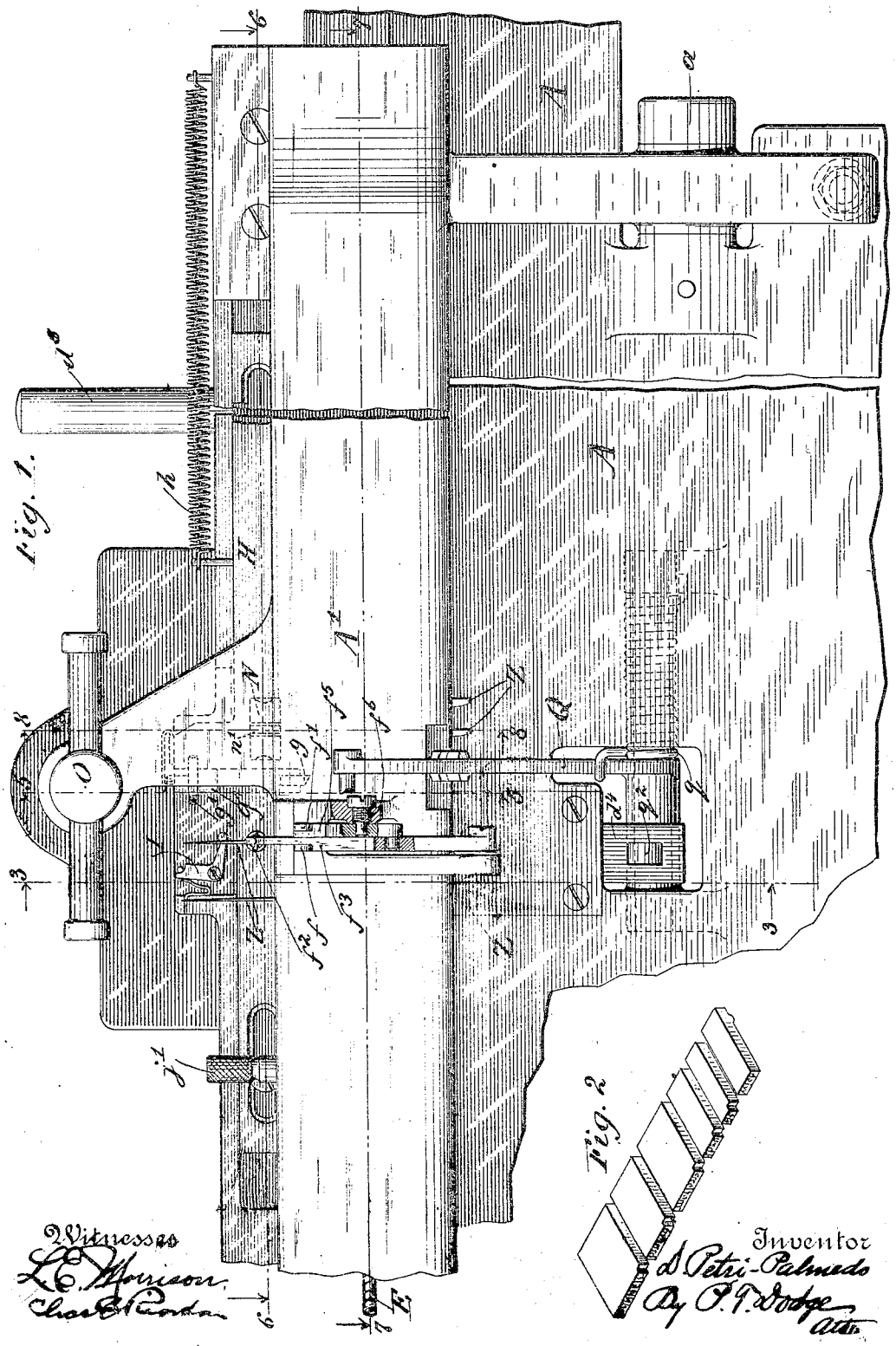


Fig. 1.

Fig. 2.

Witnesses
L. E. Morrison
Chas. B. Corbin

Inventor
D. Petri-Palmedo
By P. P. Dodge
Atty.

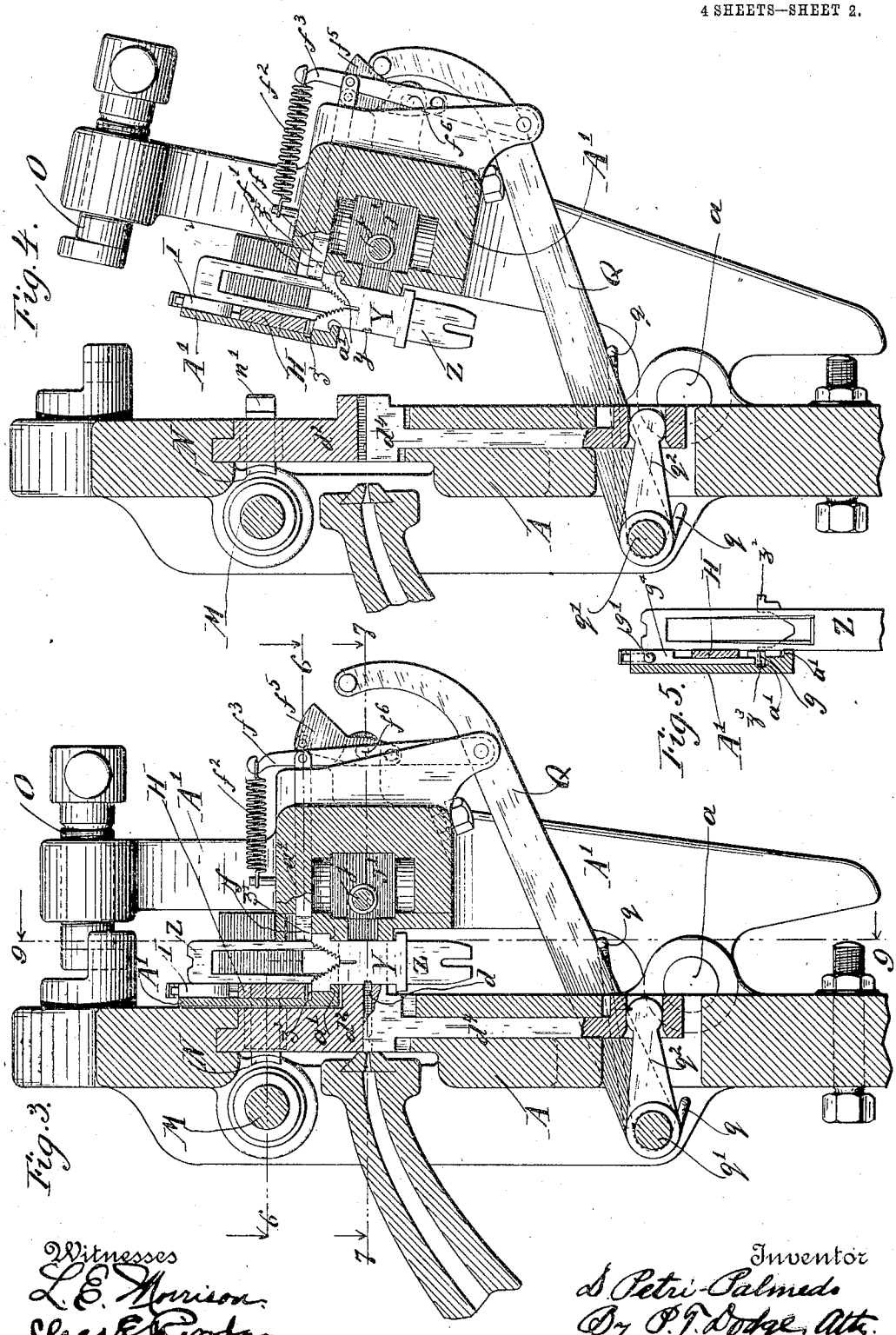
No. 848,318. PATENTED MAR. 26, 1907.

D. PETRI-PALMEDO.

LOGOTYPE MACHINE.

APPLICATION FILED JAN. 11, 1907.

4 SHEETS—SHEET 2.



Witnesses
L. E. Morrison
Chas. E. Gordon

Inventor
D. Petri-Palmedo
By P. T. Dodge, Atty.

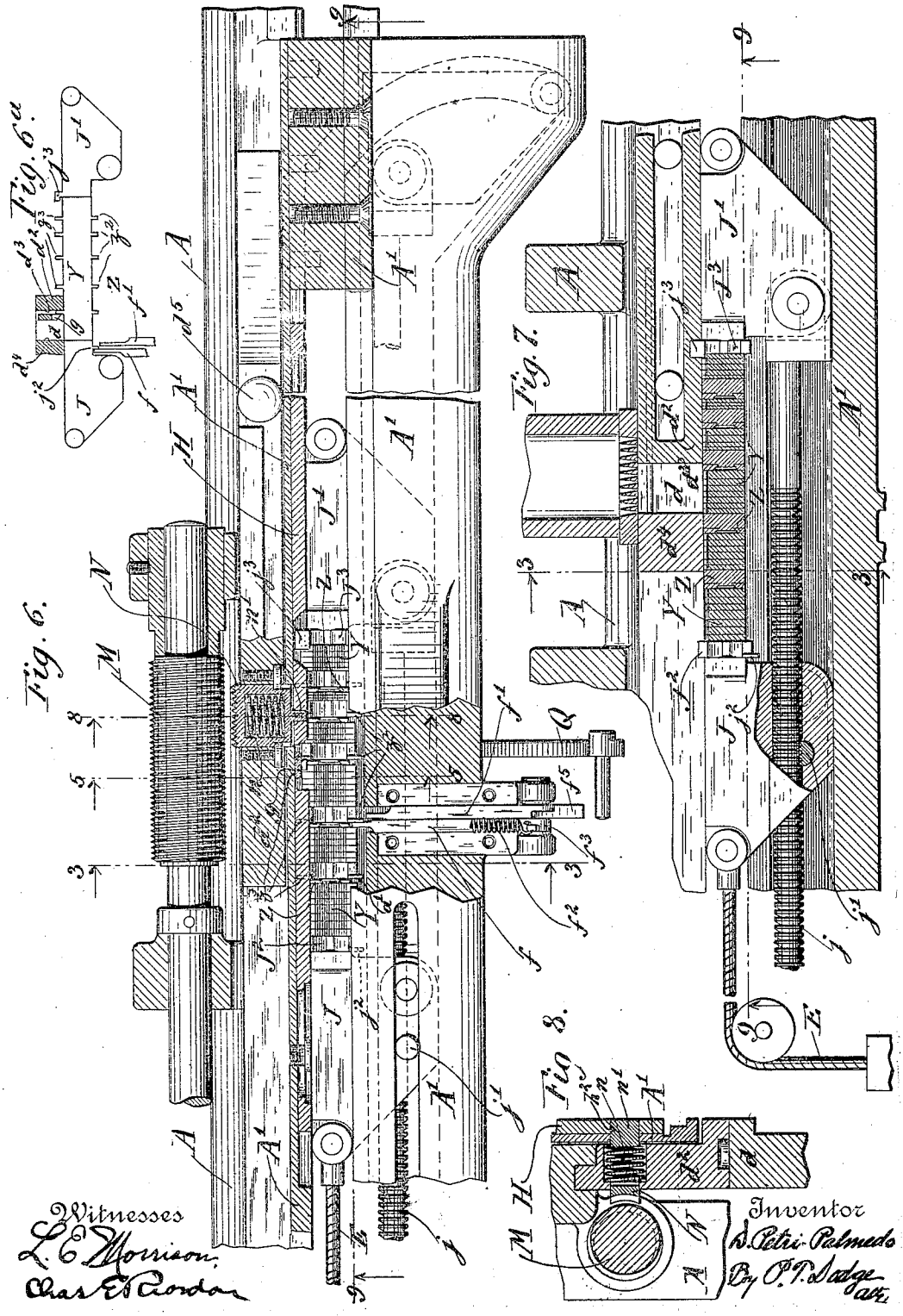
No. 848,318. PATENTED MAR. 26, 1907.

D. PETRI-PALMEDO.

LOGOTYPE MACHINE.

APPLICATION FILED JAN. 11, 1907.

4 SHEETS—SHEET 3.



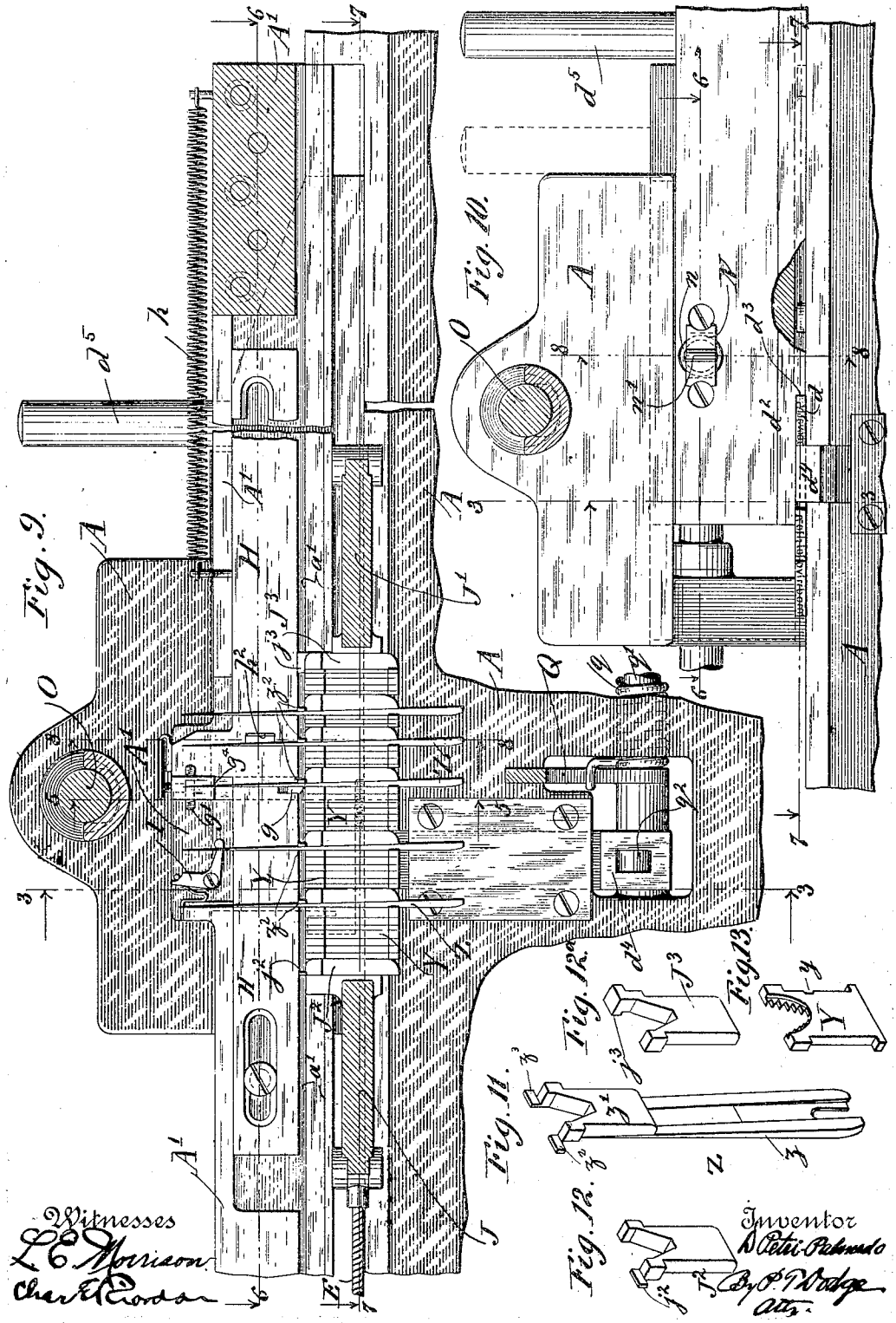
No. 848,318. PATENTED MAR. 26, 1907.

D. PETRI-PALMEDO.

LOGOTYPE MACHINE.

APPLICATION FILED JAN. 11, 1907.

4 SHEETS—SHEET 4.



UNITED STATES PATENT OFFICE.

DAVID PETRI-PALMEDO, OF HOBOKEN, NEW JERSEY, ASSIGNOR TO MERGENTHALER LINOTYPE COMPANY, A CORPORATION OF NEW YORK.

LOGOTYPE-MACHINE.

No. 848,318. Specification of Letters Patent. Patented March 26, 1907.

Application filed January 11, 1907. Serial No. 351,780.

To all whom it may concern:

Be it known that I, DAVID PETRI-PALMEDO, of Hoboken, county of Hudson, and State of New Jersey, have invented a new and useful Improvement in Logotype-Machines, of which the following is a specification.

My invention relates to a mechanism for casting in succession logotypes with integral spaces of such width that when assembled they will form a justified line of predetermined length.

In carrying my invention into effect I employ for casting each line or series of logotypes a composed justified line of matrices. This line I advance step by step past the mold in order to present the successive word groups of matrices and intervening spacers thereto. The mold is automatically adjusted on the presentation of each word group in the line to correspond with the length of the word plus the justifying-space, the mold being thereafter supplied with molten metal, which solidifies in the form of a logotype having a justifying-space integral therewith. This operation is repeated for each word in the line, one logotype, however, at either end of the line being formed without a space thereon. The result of this operation is a series of logotypes which on being assembled will form a line of predetermined length.

The composed line of matrices may have the exact length required for the line of logotypes; but it is preferred to give the justifying-spacers an arbitrary and uniform increase in thickness, the added portions to serve as "lands" or bearings for the face of the mold in order to prevent leakage of the molten metal therefrom; but in the casting operation this extra thickness is not taken into consideration, and, as before indicated, it may be omitted.

In the accompanying drawings I have illustrated a mechanism adapted to be operated by hand and containing elements sufficient to perform the various operations above indicated. Although the parts shown constitute a complete and operative mechanism, I propose to combine with them for commercial purposes driving mechanism adapted to impart automatic and rapid movement to the parts shown. This actuating mechanism is, however, foreign to the present invention.

In the drawings, Figure 1 is a front elevation of my logotype-casting mechanism. Fig. 2 is a perspective view of a line of justifying-logotypes the product of my mechanism. Fig. 3 is a vertical cross-section on the line 3 3 of Fig. 1 with the parts in the casting position. Fig. 4 is a similar view with the parts in position to permit the advance of the matrix-line and the delivery of the logotype last produced. Fig. 5 is a vertical section through the escapement device controlling the setting of the mold according to the length of the logotype to be cast on the line 5 5, Figs. 1, 6, and 9. Fig. 6 is a horizontal section on the line 6 6, Figs. 1, 3, 9, and 10. Fig. 6^a is a plan view illustrating in outline the matrix-line, its confining-jaws, and the devices for controlling its step-by-step advance, portions being broken away to expose internal parts to view. Fig. 7 is a horizontal section through the mold, the matrix-line, the mouth of the melting-pot, and the adjacent parts on the line 7 7, Figs. 1, 3, 9, and 10. Fig. 8 is a transverse vertical section on the line 8 8, Figs. 1, 6, and 9, showing part of the mechanism for adjusting the mold to the length of the respective words. Fig. 9 is a longitudinal vertical section on the line 9 9, Figs. 3, 6, and 7. Fig. 10 is a similar view with the matrices and their supporting-frame removed to expose the mold and adjacent parts. Fig. 11 is a perspective view of one of the justifying-spacers. Figs. 12 and 12^a are dummy-pieces used at the ends of the matrix-line to coöperate with the escapement devices. Fig. 13 is a perspective view of one of the matrices.

I employ as the basis of my mechanism a series of matrices Y, such as shown in Fig. 13, and expanding spacers or justifiers Z, such as shown in Fig. 11. In the form shown the matrices are similar to those used in the ordinary Mergenthaler linotype-machine, consisting each of a flat plate having the matrix proper, *y*, in one edge and having also shoulders on the vertical edges and a toothed notch in the upper end to coöperate with the distributing devices, forming no part of the present invention. When assembled side by side, they present their characters in a common horizontal line in order to coöperate with the mold and form the type characters in relief on one edge of the logotypes cast therein.

The spacers Z resemble those used in the

Mergenthaler machines, and consist each of a long vertically-movable wedge *z*, connected by a sliding joint to a shorter and oppositely-tapered wedge *z'*, which is to be inserted and locked fast in the composed line of matrices. The line, which may be composed by hand or by mechanism of any suitable character, will consist of matrices representing all the characters which are to appear in one line of print, arranged in the proper sequence and with the expanding-spacers introduced between the word groups of matrices, as shown in Fig. 9, &c. After the line is composed it may be elongated or justified to the predetermined length by raising the wedges *z* vertically through the line past the companion wedges in a manner well known in the art.

The spacers may be made of the thickness required to justify the line of matrices to a length equal to that of the line to be printed; but for purposes which will presently appear I prefer to arbitrarily increase the thickness of the spacers, giving to each of the shorter wedges *z'* a definite additional thickness equal, for example, to one em pica.

For the purpose of casting the series of justifying-logotypes from the composed line I employ mechanism which will now be described.

In a framework A', connected to the main frame A by a horizontal pivot *a*, I mount two horizontally-sliding jaws J and J', rigidly connected for the purpose of limiting the length of the justified line temporarily confined between them. The jaws are urged constantly to the left by a weighted cord E or equivalent means. The connection may consist, as in Fig. 7, of a toothed rod *j*, extended from one jaw through the other and adjustably connected by a toothed pin *j'*, or any other suitable construction may be employed. The jaws are first moved to the extreme right in their slot or guideway in the main frame and the composed line introduced vertically between them. At the same time there is introduced between the jaws at one end of the line a dummy plate or matrix J^2, having a projection j^2, and there is also introduced at the opposite end a dummy plate or matrix J^3, having a projection j^3. These projections are intended to coöperate with the escapement devices controlling the movement of the line past the mold, as hereinafter explained. The line is then justified or expanded tightly between the jaws.

The frame is provided with horizontal shoulders or ledges *a'* to sustain the matrices and spacers at the proper level. The jaws are next moved with the line between them step by step to the left in order to present the successive word groups of matrices to the mold, as hereinafter explained.

The stationary mold, which is variable in length, consists, as shown more particularly in Figs. 3, 7, and 10, of the fixed lower wall *d*, formed on or secured to the main frame, the horizontally-sliding top portion d^2, having a vertical shoulder d^3 to form the right end of the mold-slot, and a vertically-movable slide d^4, mounted in the main frame and forming the left end of the slot. When this slide is retracted, it permits the horizontal delivery of the logotype from the mold.

The length of the slot depends upon the distance between the shoulder d^3 and the slide d^4, and it is varied according to the length of the words and spaces by moving the upper portion d^2 horizontally. The mold-slot is normally open at the front and is closed temporarily by the presentation of the matrices thereto and is also open at the rear in order that it may receive the molten metal from the mouth of the melting-pot.

The advance of the line is effected mechanically and controlled by means of the spacers between the words in the manner which will now be described.

The matrix-confining jaws with the line between them standing normally at the extreme right are urged constantly to the left and tend to carry the word groups of matrices past the front of the mold. As the line is thus advanced it is repeatedly arrested by horizontally-moving escapement-pawls *f* and *f'*, engaging first the projection j^2 on the dummy plate and thereafter in succession the forward ears z^2 of the spacers Z, as shown in Figs. 3, 4, and 6. When the advance of the line to the left begins, the pawl *f*, engaging the projection j^2, arrests the line with the left-hand matrix in line with the left side of the mold, where it remains during the casting of the first word. After this word is cast the escapement is disengaged and the line advanced until the ear z^2 of the first spacer engages the pawl, whereby the line is arrested with the first matrix of the second word in line with the left side of the mold, and so on repeatedly as the words represented in the matrix-line are presented one after another opposite the mold and in register therewith at the left.

As the advance of the line is controlled by the action of the pawls *f f'*, they are advanced and retracted alternately, so that when the pawl *f* is withdrawn to release the line the pawl *f'* is advanced to momentarily engage the next spacer, and thus hold the line in check until the pawl *f* is in turn advanced to let the line move the fractional distance required to bring it in proper relation to the mold. Were it not for the use of the two alternating pawls the line once released would shoot forward its entire length. The manner in which these pawls are actuated is hereinafter described.

As the successive word groups are presented to the mold, which is normally closed to its shortest length, it is necessary that it shall be open to a length corresponding to

that of the word plus the adjoining spacers if there be one. This is effected in the manner following: A constantly-rotating screw M is mounted horizontally in the main frame, and the sliding upper portion of the mold d^2 is provided with a horizontally-movable nut N, urged constantly forward by an internal spring n. This nut is toothed on its rear end, so that when forced backward it will engage the screw M and be carried horizontally to the right, thereby moving the mold member d^2 to the right from the extreme left-hand position in which it stands after the ejection of each logotype.

When the mold is opened to the length required, it is necessary that the nut shall be disengaged from the screw in order to prevent a further opening action. In order to secure this result automatically, I mount in the frame A', which is pivoted to swing forward and backward, as before mentioned, a horizontally-sliding plate H, containing a slot h^2 to receive a nose or projection n' on the front of the nut N. When the frame is swung forward to the position shown in Fig. 4, the plate is carried out of engagement with the nut and the nut permitted to move to the left, so that the mold may close.

When the frame is closed backward to the position shown in Fig. 3, the face of the plate H is carried against the face of the nut N, driving it backward into engagement with the screw. As the nut N is carried to the right by the action of the screw in opening the mold its nose finally arrives opposite the slot in plate H, whereupon the nut is permitted to move forward out of engagement with the screw, as shown in Fig. 6, and thus the opening action of the mold is arrested. The point at which the nut is permitted to disengage must of course depend upon the length of the logotype to be cast, and therefore the plate H and its slot must be set in a special position for each word. This adjustment is also effected by the spacers through means shown in Figs. 3, 4, 5, and 9.

The plate H is provided with and adjusted by a vertically-moving pawl g in position to be engaged by the rear ears z^3 of the successive spacers Z as the line is advanced. The plate H is urged constantly to the right by a spring h, Fig. 9, of such strength that it can be overcome by the movement of the matrix-line to the left. As the matrix-line is carried to the left the spacer-ears z^3, engaging the pawl g, as shown in Figs. 6 and 9, move the slide H to the left, thereby locating its slot h^2 in proper position to release the nut and arrest the opening movement of the mold when the latter has acquired a length equal to that of the word which is at the moment presented thereto.

After the casting action and when the hinged frame is again swung forward the plate H is disengaged from the nut, and thus freed to follow the action of spring h to the right. As the matrix-line advances it is necessary that the pawl g shall be disengaged from the successive spacers, and for this purpose I pivot on the frame an angular dog I in such position that when the slide H is moved to the left the stud g' thereon will encounter the upper end of the dog and move it in such manner that its lower end will rise beneath a shoulder g^4 on the upper end of the pawl g, and thus lift the latter out of engagement with the spacer, so that the slide H may move to the right until the pawl g engages the rear ear of the next spacer.

From the foregoing it will be perceived that the front ear of one spacer determines the advance of the matrix-line past the mold, while the rear ear of the next spacer determines the point at which the mold-opening devices shall cease their action.

When the last word in the line is to be cast, the opening of the mold is controlled by the ear or projection j^3 on the right-hand dummy plate. This is necessary because there is no spacer at the end of the line.

While the mold is closed at the front side by the word group of matrices presented thereto, it is filled from the rear with molten metal delivered from the mouth of a melting-pot P, which may be constructed in the same form as in the ordinary linotype-machines, with a plunger therein to effect the delivery of the metal and with a burner thereunder to maintain the metal in a molten condition.

The swinging frame A', in which the jaws and other leading parts are mounted, may be actuated by hand or mechanically. In the form shown it is intended for manual operation and is provided at the top with a locking-screw O, having a head to engage a socket in the main frame A. The forward-and-backward movement of this frame—that is to say, the movement from the casting position (shown in Fig. 3) to the position shown in Fig. 4—is utilized to actuate the escapements and the movable side of the mold in the manner following.

The two pawls slide on guideways in the frame, and the left-hand pawl f is jointed to the upper end of a lever f^3, which is pivoted at its lower end to the frame and urged forward at its upper end by a spring f^2, tending to advance the pawl into the path of the spacer-ears. The second pawl f' is jointed to a lever f^5, centrally pivoted to the frame at f^6, and jointed at its lower end to the lever f^3, before mentioned, these lever connections between the two pawls compelling them to move in reverse directions. When the frame is swung to the open position, the lever f^5 encounters the upper end of a lever Q, which offers sufficient resistance to momentarily reverse the position of the levers and pawls. When the frame is swung up to its closed position, the pawls are released and re-

turned to their original positions by the spring f^2. The lever Q is mounted on a horizontal rock-shaft q' in the main frame and is acted upon by a spring q, tending to swing it upward. The rock-shaft carries also a second lever or arm q^2, seated in an opening in the lower end of the vertical mold-slide d'. When the parts are in the casting position, the spring maintains the mold-slide d^4 in its elevated or closed position. When the frame is swung back, as shown in Fig. 4, it acts to depress the lever Q, which in turn depresses the mold-slide d^4, thereby opening the left side of the mold to permit horizontal ejection of the contained logotype. This ejection is effected by moving the upper member d^2 of the mold to the left by hand, a handle d^5 being provided thereon for the purpose. As the part d^2 is thus moved its shoulder d^3 carries the logotype forward away from the mold and over the top of the slide d^4 against the preceding logotypes, which are supported in a horizontal surface on the top of the frame. This action being repeated as one logotype after another is cast causes them to be assembled in line. After each line or series is completed it may be removed to a galley by hand or by any suitable mechanism.

The operation of the mechanism as a whole is as follows: While the frame A' stands in the position shown in Fig. 4, with the jaw J and J' at the extreme right, the composed line of matrices and spacers, with the dummy plates at the ends, is inserted vertically between the jaws. At this time the mold is closed to its shortest length. The nut N is out of engagement with the screw, and the plate H is in its extreme right-hand position. The line is now permitted to advance to the left, under the action of the weighted cord E, and is arrested in its advance by the pawl f, engaging the ear f^2 on the left dummy plate. During the first advance of the line the rear ear of the first spacer engages the pawl g, causing the slide H to move along with the line. The frame A' is now swung toward the main frame and locked in position. This action presents the first word group of matrices in front of the mold, and at the same time the plate H, acting against the nose of the nut N, forces the latter backward into engagement with the screw M, whereby the nut is carried to the right and the mold steadily opened or elongated until the nose of the nut arrives at the slot in the plate H, whereupon the nut moves forward out of engagement with the screw and the opening action of the mold ceases. The point at which this stoppage occurs depends upon the adjustment of the plate H, which is determined by the engagement of the rear ear of the spacer with the vertical pawl g. The length of the word, or, in other words, the distance between the succeeding spacers, of course determines the distance to which the plate H is advanced, and consequently the time at which the opening action of the mold shall cease. The mold is next filled with molten metal from the pot, producing a logotype bearing the characters in one group of matrices and having a space or extension equal to the width of the justifying-space. In this casting action the extra thickness of the spacer member Z' is of no effect. The thick edge of this member overlaps the face of the mold beyond the slot and simply insures a solid bearing and a tight joint, so that the metal may not overflow laterally upon the matrices of the next group. After one logotype has been cast as above the frame A' is swung forward to the position shown in Fig. 4, thereby drawing the matrices away from the logotype and withdrawing the end d' of the mold, leaving the logotype free to escape horizontally to the left. Its delivery is effected by moving the upper portion d^2 of the mold manually to the left, as before described, the movable member being left in this position. As the frame is swung forward the escapements f and f' are reversed, as before described, and the matrix-line permitted to advance until the second word group of matrices is presented in position to close against the mold. The swinging frame is next restored to the position shown in Fig. 3, the second word cast, and so on, repeatedly.

It will of course be understood that the commercial machine containing my mechanism will also include mechanisms for assembling and for distributing the matrices and spacers, which, together with the dummy plates, will form permanent members of the machine.

While I prefer to employ the expanding spacers as the most simple means of justifying the line, it will of course be understood that fixed spaces of suitable thickness may be employed, provided they are formed to engage with the escapement devices, and it is to be understood that, broadly considered, spaces and spacers are equivalents in the present mechanism.

While I have described the movement of the line past a stationary mold, it will be obvious to the skilled mechanic that the arrangement may be reversed and the mold moved step by step past the stationary line in order to make the successive cast against the different groups of matrices in the line.

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

1. In a machine for casting logotypes, a mold variable in length, in combination with a composed line of matrices and intervening spaces representing a plurality of words, and means for repeatedly joining the mold and the undivided line in different relations; whereby logotypes may be cast successively

in the one mold against different portions of the matrix-line.

2. In a machine for casting logotypes, a composed line of matrices representing a number of words and intervening spaces, in combination with a mold variable in length, means for advancing the line step by step past the mold, and means for adjusting the mold according to the length of each word group of matrices presented thereto.

3. In a mechanism for producing justified lines of logotypes, the combination of a composed line including matrices for a number of words and intervening justifying-spaces, a mold variable in length, means for advancing the undivided line to present the word groups of matrices successively to the mold, and automatic means for adjusting the mold to correspond with the length of the word groups and the adjacent spaces; whereby a series of logotypes may be produced with integral spaces adapted to give the line composed of such logotypes a predetermined length.

4. In a machine for producing lines of logotypes, the combination of a mold variable in length, a composed line including word groups of matrices and intervening spaces, means for presenting the line in different relations to the mold, and means controlled by said line for adjusting the mold according to the length of the words.

5. In a mechanism for casting lines of logotypes, a mold variable in length, a composed line including matrices for a number of words and intervening spaces, means for advancing the line past the mold to present the successive word groups of matrices thereto, and means controlled by the line for controlling its advance step by step.

6. In a machine for producing logotypes, the combination of a mold variable in length, a composed line including matrices for a number of words and intervening justifying-spaces, means for advancing the line step by step past the mold, means controlled by the line for limiting its advance to present the successive words to the mold, and means controlled by the line for adjusting the mold to correspond with the word and space presented thereto.

7. In a machine for casting logotypes, the combination of a mold variable in length, a composed line including word groups of matrices and intervening spaces, means for advancing the line intermittingly past the mold, and means controlled by the spacers for limiting the advance of the line.

8. In a logotype-machine, and in combination with a composed line including word groups of matrices and intervening spaces, means for advancing the integral line to different casting positions, means coöperating with the spaces in the line to determine its advance; whereby the line is caused to advance equal distances to the length of the successive words and spaces.

9. In a machine for casting logotypes, the combination of a mold variable in length, a composed line including word groups of matrices and intervening spaces, each having a definite thickness in excess of that required for justification, means for advancing the line to present the successive word groups and the justifying portion of the spaces to the mold, and means for adjusting the mold to correspond therewith; whereby the integral line is utilized to produce a series of logotypes each with a justifying-space thereon, the excessive space at the same time overlapping the face of the mold to prevent the leakage of metal.

10. In a logotype-machine, a mold variable in length, a composed line of matrices and intervening spaces, means for advancing the line endwise past the mold, and escapement devices engaging the spaces to determine the successive advances of the line.

11. In a machine for casting logotypes, a composed line including word groups of matrices and intervening justifying-spaces, a mold variable in length, means for advancing the line to present the successive word groups to the mold, power-driven devices to adjust the length of the mold, and means controlled by the spacers and in turn controlling the adjustment of the mold to correspond with the length of the respective words plus the width of the adjacent justifying-spaces.

12. The combination of a mold variable in length, power-driven devices for adjusting the same, a composed line of matrices and spacers movable in relation to the mold and acting to control said power-driven devices.

13. In combination, a slotted mold including a movable member for changing its length, the continuously-driven screw, and intermediate means for connecting the screw with and disconnecting it from the mold member.

14. In combination, the mold variable in length, a composed line of matrices and spaces, movable jaws confining said line and limiting its length, means for advancing the jaws and the confined line past the mold, escapement devices operating with the line to control its advance step by step past the mold, and means controlled by the line to determine the adjustment of the mold.

15. In combination, the connected sliding jaws, the intermediate line of matrices and spacers, means urging the jaws in one direction, and escapement devices coöperating with the spaces to limit the advance of the line.

16. In combination with the traveling jaws and the intermediate line of matrices and spacers, alternating escapements *f* and *f'*, substantially as described.

17. The combination with the composed line of matrices and spacers and means for advancing the same endwise, a pawl *g* to engage the successive spaces, a traveling support H therefor, a mold variable in length, and means controlled by the support H for determining the adjustment of the mold.

18. In combination with the composed line of matrices and spacers and means for advancing the line endwise, a pawl *g* to engage the successive spacers, a movable pawl-support H, a mold variable in length, means controlled by the pawl-support to determine the length of the mold, and means also operated by the pawl support disengaging the pawl from the spacers; whereby the pawl is adapted to coöperate with the successive spacers in order to cause the adjustment of the mold to the length of the successive words.

19. In a logotype-machine, an adjustable mold, its supporting-frame, the constantly-rotated screw and the movable nut for imparting motion from the screw to the mold, in combination with the movable frame A′, means mounted therein for advancing the composed line of matrices and spacers past the mold, means actuated by the line to cause the engagement of the nut and determine its time of disengagement; whereby the mold may be set automatically to correspond with the length of the successive words presented.

20. In a logotype-machine, the combination with a mold variable in length, the composed line including word groups of matrices and expansible justifying-spacers, each arbitrarily increased in thickness beyond the justifying requirements, and means for presenting the line repeatedly to the mold with the word group of matrices and the justifying portion of the space opposite the mold-opening and the excess portion of the space overlapping the face of the mold; whereby the logotypes are produced with integral spaces and the leakage of molten metal prevented by the excess portion of the space overlapping the face of the mold.

21. In a logotype-machine, a mold variable in length, a composed line of matrices and spaces longer than the maximum length of the mold, means for presenting different portions of the integral line successively to the mold, and means for adjusting the mold to correspond with the presented portions; whereby logotypes of different length may be produced in succession from the one line of matrices.

22. In a logotype-machine, a mold variable in length, and means for supplying the same with molten metal, in combination with a justified line of matrices and spaces representing a number of words, means for presenting the word groups of matrices and spaces successively to the mold, and means controlled by the line to adjust the mold to correspond with the respective groups and spaces; whereby a line of logotypes of predetermined length may be produced.

23. A composed line of matrices including the characters for several words and intervening spaces, in combination with a mold variable in length, means for advancing the line to present the word groups of matrices successively to the mold, and means controlled by the line to determine the adjustments of the mold for successive words.

24. In a mechanism for producing justified lines of logotypes, a composed line of matrices including word groups of matrices and intervening justifying-spaces, in combination with a mold variable in length, means for presenting the word groups and adjacent spaces successively to the mold, and means for filling the mold with molten metal; whereby a series of logotypes with justifying-spaces thereon may be produced.

In testimony whereof I hereunto set my hand, this 10th day of January, 1907, in the presence of two attesting witnesses.

DAVID PETRI-PALMEDO.

Witnesses:
F. M. EGGLESTON,
WALTER MOBLARD.