

F. B. CONVERSE.
 LINOTYPE MACHINE.

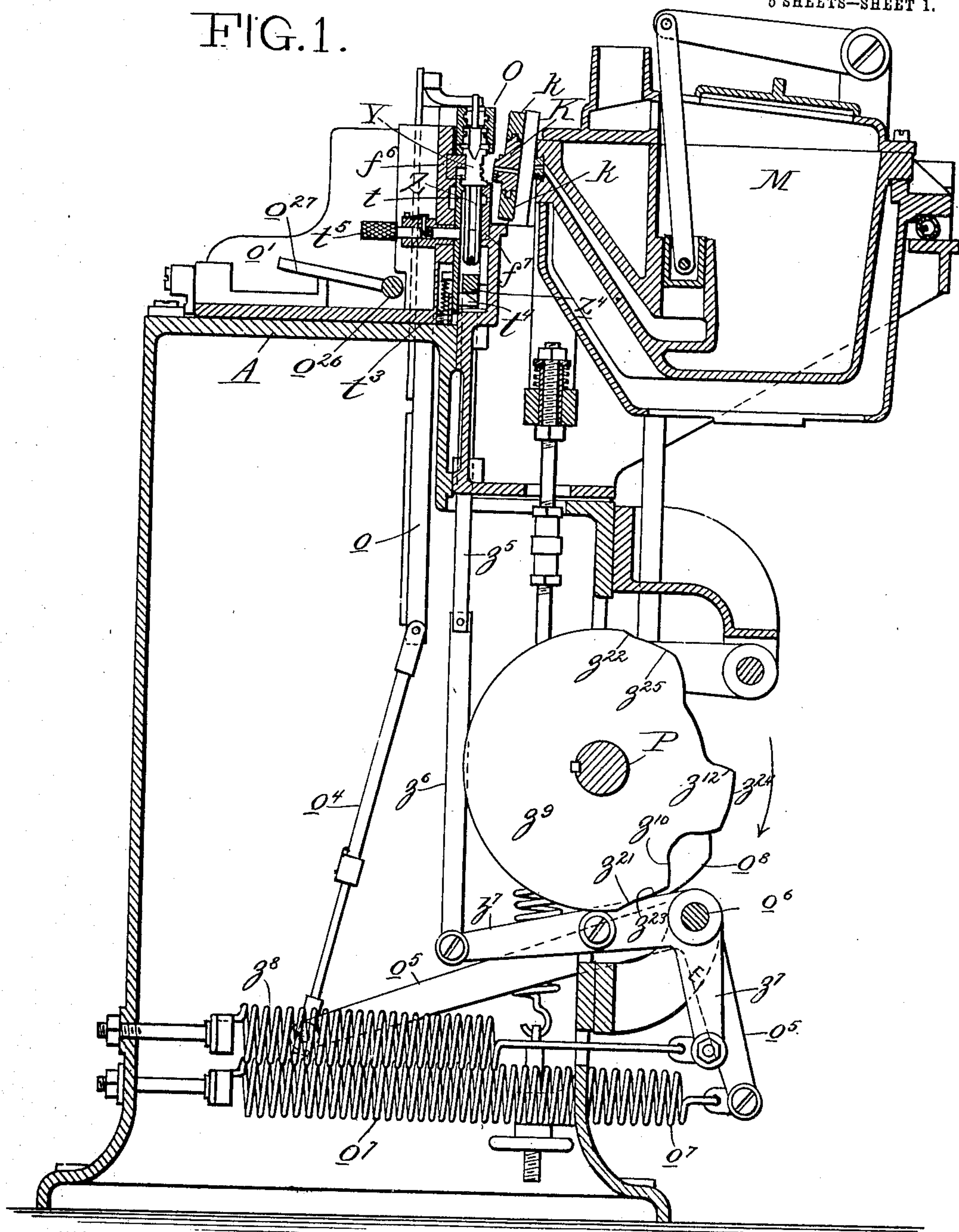
APPLICATION FILED FEB. 15, 1908. RENEWED APR. 5, 1909.

925,755.

Patented June 22, 1909.

5 SHEETS—SHEET 1.

FIG. 1.



WITNESSES:

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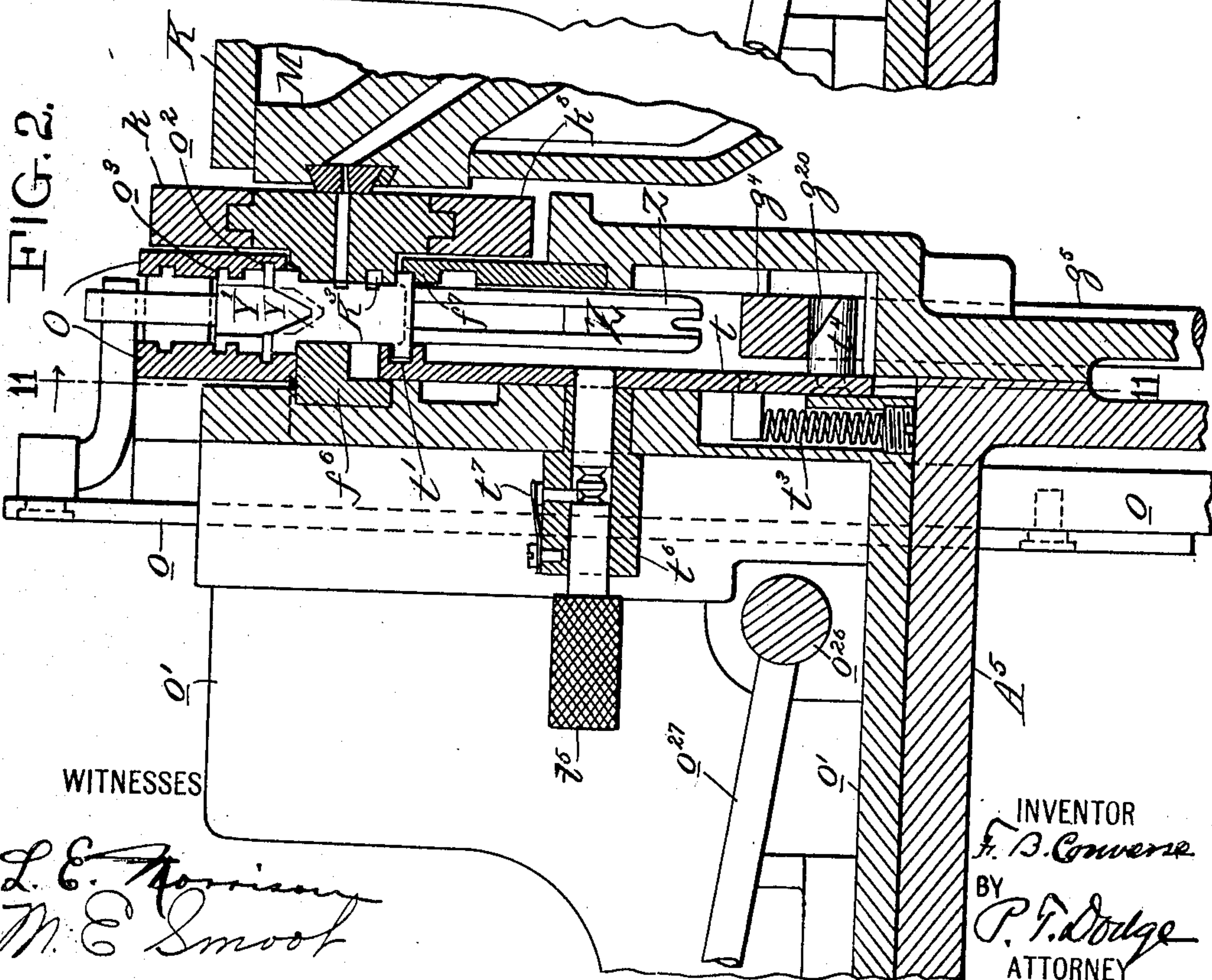
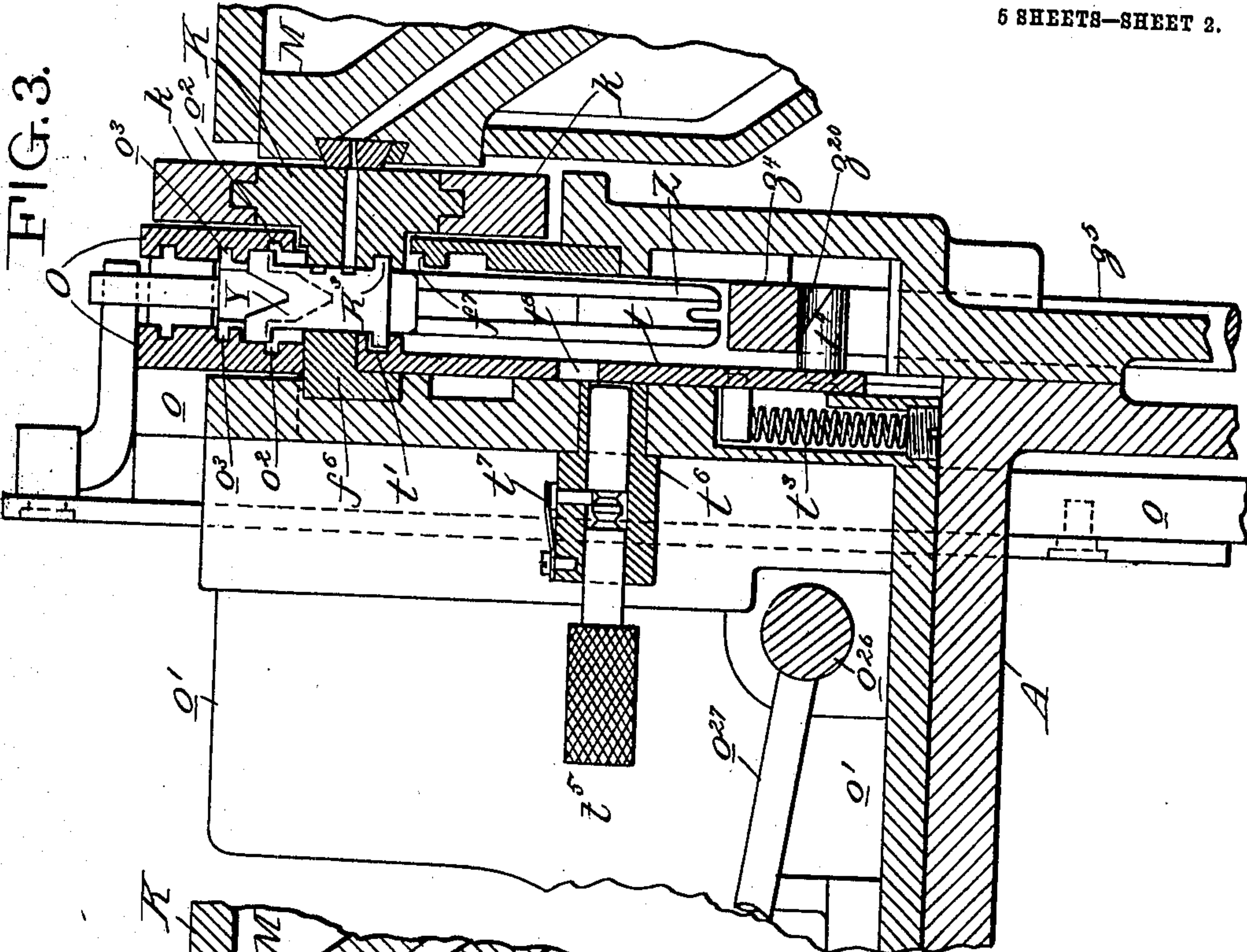
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5 SHEETS—SHEET 3.



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5 SHEETS--SHEET 4.

FIG. 2.



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5 SHEETS—SHEET 5.

FIG. 11.

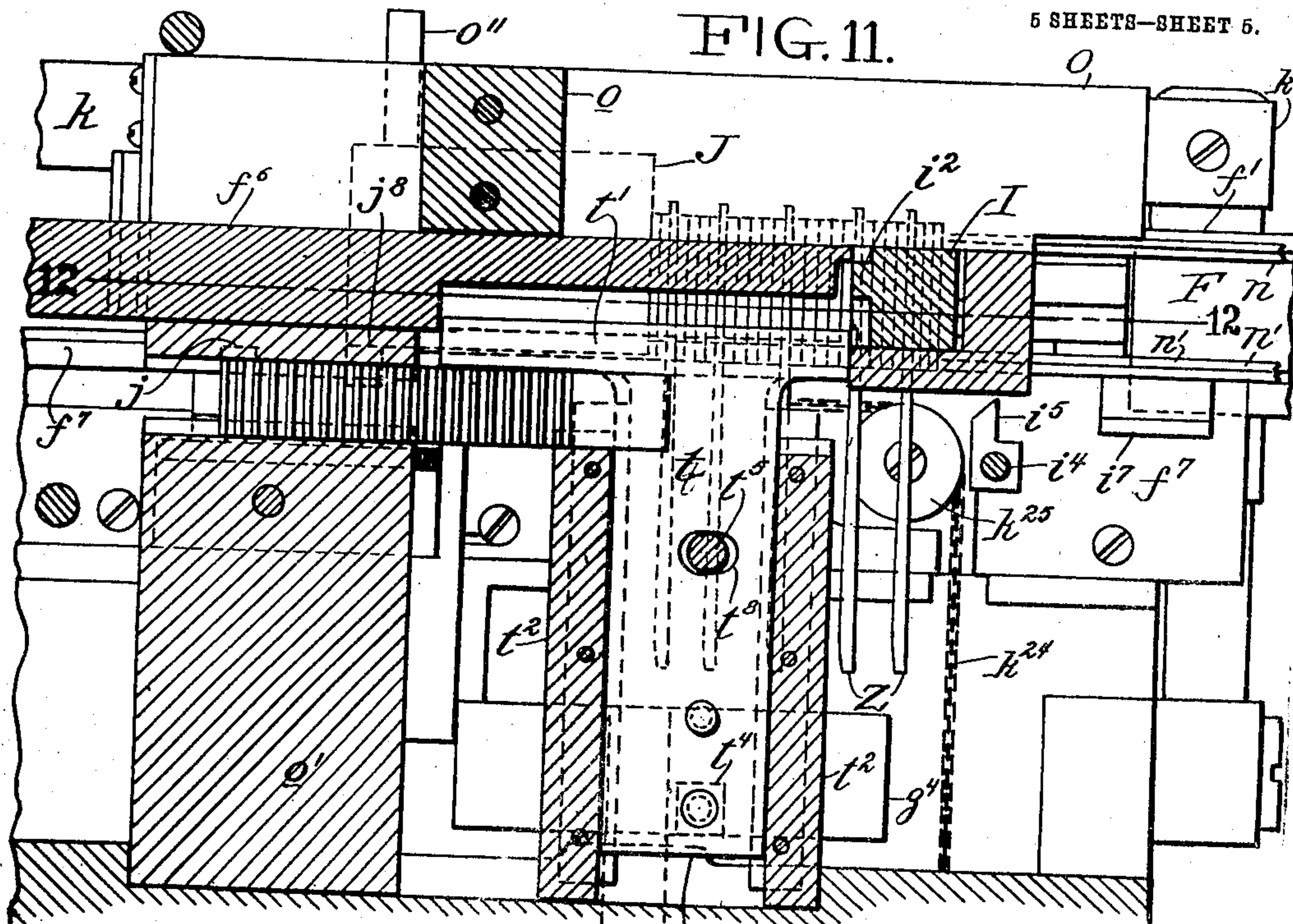
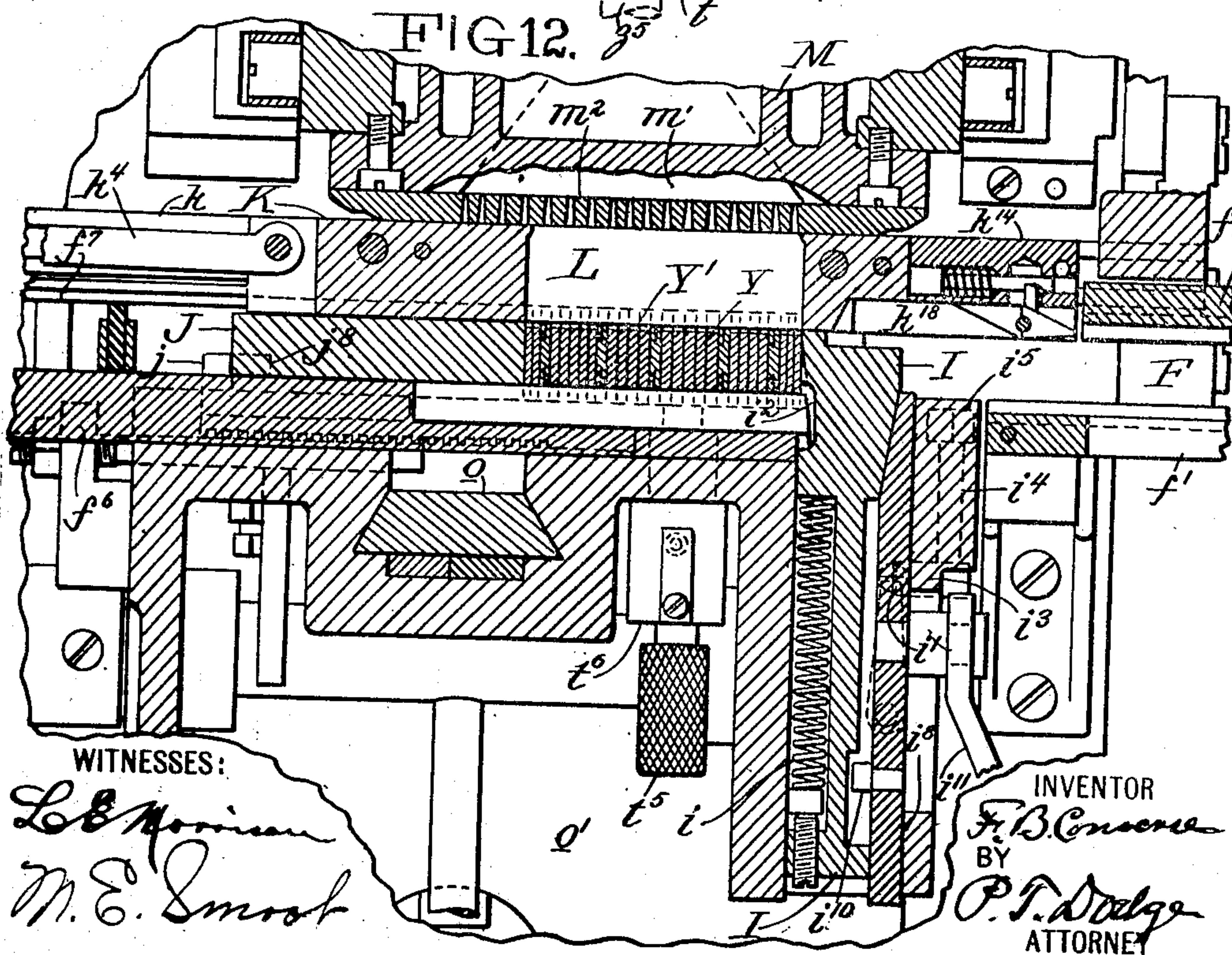


FIG. 12.



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UNITED STATES PATENT OFFICE.

FRANCIS B. CONVERSE, OF BROOKLYN, NEW YORK, ASSIGNOR TO MERGENTHALER
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LINOTYPE-MACHINE.

No. 925,755.

Specification of Letters Patent.

Patented June 22, 1909.

Application filed February 15, 1908, Serial No. 416,053. Renewed April 5, 1909. Serial No. 488,069.

To all whom it may concern:

Be it known that I, FRANCIS B. CONVERSE, of borough of Brooklyn, county of Kings, and State of New York, have invented a new and useful Improvement in Linotype-Machines, of which the following is a specification.

This invention has reference to that class of line-casting machines, generally known under the trade mark "Linotype", in which composed lines of matrices are presented successively to the face of a slotted mold, in order to produce lines of type characters on the edge of type metal slugs cast therein. At the present day, it is a common practice to adapt these machines for the production of two different alphabets by providing each matrix with the same character in two styles or sizes, and so arranging the mechanism that the matrices may be assembled and transferred to the mold at a high or a low level, in order that the upper or the lower characters may cooperate therewith, as desired.

Mechanisms heretofore in use have generally been constructed in such manner that each matrix added to the line in the course of composition may be adjusted to the upper or the lower level as demanded, a double system of horizontal guides being provided to maintain the matrices at their respective levels during their transference to the mold.

My improvement is intended more particularly for use in connection with the machine represented in my application for Letters Patent of the United States filed on the 9th day of November, 1907, Serial No. 401,412. In this machine it is not convenient to make use of the matrix-controlling mechanism such as above described, and I therefore provide for setting all the matrices in the first instance on a common level, and thereafter changing the level of the entire composed line in relation to the mold, so as to present the upper or the lower characters thereto, as demanded. The shifting mechanism is preferably arranged in front of or adjacent to the mold, and combined with automatic mechanism for restoring the line-support to the normal level.

In the drawings,—Figure 1 is a vertical cross-section from front to rear through the casting mechanism, with my improvement incorporated therein. Fig. 2 is a similar cross-section on an enlarged scale with the parts in casting position and the matrices

aligned to cast the upper characters. Fig. 3 is a similar view with the matrices adjusted to cast the lower characters. Fig. 4 is a perspective view from the front with the vise-knee and its line-confining jaws removed, showing the delivery end of the assemblage channel, the mold, galley, and adjacent parts. Fig. 5 is a vertical section through one end of the mold and the connected means for advancing the line of matrices beyond the casting position. Fig. 6 is a horizontal section through the means for advancing the line beyond the casting position, together with the right-hand jaw and adjacent parts. Fig. 7 is a right-hand side elevation of the parts shown in Fig. 4 with the line-supporting and advancing devices shown in vertical cross-section. Fig. 8 is a perspective view looking from the rear and showing principally the rear face of the vise-knee, the line-confining jaws, and adjacent parts,—the left-hand jaw being shown in its forward or inactive position to resist the line as the latter is advanced to the casting position. Fig. 9 is a perspective view of the right-hand vise-jaw looking from the rear. Fig. 10 is a perspective view of one of the two-letter matrices such as are used in the machine. Fig. 11 is a longitudinal vertical section on the line 11—11, Fig. 2, looking toward the rear. Fig. 12 is a horizontal section through the casting mechanism on the line 12—12, Fig. 11.

The matrices Y, used in the machine and shown in Fig. 10, are of the same general shape as those used in the well-known Mergenthaler linotype machines. They consist each of a body portion having its upper end notched and provided with distributing teeth y^1 , its corners provided with lugs y , y' , y^2 and y^3 , and one of the vertical edges provided with the intaglio characters or matrices proper y^5 and y^6 .

Matrices representing the characters for one line are assembled or composed into lines (see Fig. 4) with interposed justifiers or spacers Z of the usual type, each consisting of two oppositely tapered wedges. The line is composed (see Fig. 4) in an assemblage channel F between two plates f' , f' , on which the upper shoulders of the matrices and justifiers rest. The composed line is advanced from the assemblage position toward the left to the casting position by a horizontal pusher including two plates n and n' ,

guided in grooves in the side plates. This pusher is actuated by a hand-lever and connections, shown in my original application and foreign to the present invention. The assemblage channel F terminates at a point just to the right of the casting position, but it is continued in effect to the left by the horizontal plate f^7 , the fixed bar f^6 , and the vertically movable justifier-elevator O, which jointly guide and sustain the composed line at the casting position. The plate f^7 has its upper edge in line with the lower rear ears of the matrices, so that as the line is shifted to the left, they ride thereon and are supported thereby. The bar f^6 has its upper surface in position to receive and support the forward upper ears of the matrices as the line is advanced at the assembling level.

The justifier-elevator O, which stands in front of the mold in a position to receive and sustain the upper ends of the justifiers Z when they are in the casting position, consists of two horizontal arms fastened to distance pieces between them, and to the upper end of a vertical slide o . When the parts are in the casting position, this elevator sustains the justifiers independently of the matrices, and after the casting action, the rise of the justifier-elevator serves to lift the justifiers out of the matrix line and to such level that they may be transferred laterally to their magazine. The elevator O receives motion, as shown in Fig. 1, through a link o^4 , and an elbow-lever o^5 , which is raised by a spring o^7 and depressed by a cam o^8 . It will be understood that as the line of matrices and spacers is shifted horizontally to the casting position, the ears of the spacers enter the grooves o^2 in the elevator O, as shown in Figs. 2 and 3, while the matrices ride upon the upper edges of the plate f^7 and bar f^6 , by which they are sustained in position.

J is the jaw for confining and supporting the left end of the matrix line at the casting position. It is in the form of a horizontally sliding block seated in the justifier-elevator O, with ribs guided in grooves o^3 therein. It stands normally at the right side of the elevator when the latter is down and supports the forward end of the matrix line as the latter is advanced to the left toward the casting position. The movement of this jaw in advance of the line is limited by an adjustable stop j (Figs. 11 and 12) which is seated firmly in the elevator and engages a lug j^8 on the bottom of the jaw.

During the justifying and casting operations, the line is confined between the jaw J and the right-hand jaw I. The jaw I consists of a bar having a forward and backward sliding movement across the end of the matrix line. A spring i urges the jaw rearward to its operative position, as shown in Fig. 12. The jaw is drawn forward and held normally in an inactive position beyond the path of

the matrices, as shown in Fig. 8, by a stud i^{10} (Fig. 12) projecting from a sliding wedge-bar i^3 , and engaging the shoulder on the jaw. The wedge-bar is connected by a link i^{11} with a lever having cam connections, as in my prior application, whereby it is moved forward and backward in order not only to move the stud i^{10} , but also to crowd the jaw laterally against the matrix line. When the jaw I is drawn forward to its inoperative position, a latch-pin i' (Fig. 7) engages a notch in the lower face of the wedge-bar i^3 , and holds the parts in their inoperative positions. As the matrix line is advanced to the casting position, a block i^7 (Figs. 7 and 11) on the under side of the line-pushing plate n' engages an arm i^5 (Figs. 7, 8 and 11) on a horizontal rock-shaft i^4 , which carries on its forward end an arm i^3 (Figs. 7 and 8) which engages the latch-pin i' , before referred to, in order to effect its disengagement from the wedge-bar i^3 , thereby unlocking the bar and the jaw I, so that the latter may be projected rearward across the end of the line of matrices. In brief, the act of advancing the matrix line to the casting position causes the advance of the jaw I behind the line to confine it in such position.

The two matrix-confining jaws and the justifier-elevator O are mounted in a casting o' , known as the casting-vise knee, and forming a part of the main-frame. This casting, which is locked rigidly in position by an eccentric shaft o^{20} provided with a handle o^{27} (Fig. 1), may be unlocked at will and moved forward to give access to the other parts. When the line is in the casting position, it stands directly in front of and in contact with a horizontally slotted mold K, which is momentarily closed at the rear and supplied with molten metal by the mouth of the melting-pot M. The mold is movable to and from the matrix line, and the pot is movable to and from the mold, as heretofore.

The foregoing parts may all be constructed and arranged to operate as in my prior application.

Passing now to the parts which form the subject-matter of the present invention, for the purpose of supporting and vertically adjusting the matrix line, I seat in the vise-knee o' a vertically guided slide t , having in its upper end a horizontal groove t' adapted to receive and confine the lower forward ears of the matrices. By moving this plate upward and downward, the entire line of matrices may be raised or lowered so as to present their lower or their upper characters opposite the mold and in position to form characters on the slugs cast therein. The plate is urged constantly upward by a spring t^3 bearing against the stud thereon. For the purpose of locking the plate down when required, a sliding pin t^5 is seated in the frame in position to enter a hole t^8 formed in the

slide. The pin is provided with circumferential grooves to receive a spring-actuated pin t' , by which the pin may be held in either of its two positions.

5 In the normal operation of the machine, the slide is locked down by the pin so that the matrices are received and used in the lower position, or in other words, at the assembling level, so that their upper characters are produced on the slugs. When it is required to produce the lower characters, the pin is withdrawn by hand and the slide permitted to raise the entire line of matrices from the lower position shown in Fig. 2, to the upper position shown in Fig. 3. It will be remembered that after the casting operation, the spacers Z are lifted out of the line by the elevator O . It is desirable that the matrices which remain behind, shall be lowered to their original level, in order that they may be shifted to the left preparatory to their elevation and distribution, as heretofore. To this end, I provide the slide t with a stud t' , which projects beneath the vertically movable justifier-bar z^4 , already referred to. After the casting action, this bar descends from the position shown in Fig. 3, to that shown in Fig. 2. In so doing, it depresses the stud t' and plate t , lowering the entire matrix line at one operation to the original level. The plate remains in this position not only during the transfer of the first matrix line to the left, but also until it receives the next matrix line from the right. It will be observed, therefore, that if the lower matrix characters are to be used continuously, the pin is withdrawn and permitted to remain in the position shown in Fig. 3, and that the matrix line will be received in front of the mold at the lower level, and automatically lifted by the plate t as the latter is released by the rise of the justifier-bar z^4 , and the line finally lowered automatically to its original level after the casting action. In other words, the line-supporting plate t is automatically raised and lowered whenever the lower matrix characters are being employed. If, on the other hand, the upper matrix characters are to be continuously employed, the plate may be locked down and permitted to remain in position. The upward movement of the plate t is limited by its contact with the under surface of the bar f^6 , as shown in Fig. 3.

55 It is, I believe, wholly new in the art to provide means for presenting a composed line of matrices in one casting position before the mold, and means for moving the line automatically to a second casting position prior to the casting action. It is also wholly new in the art, I believe, to provide means for guiding the composed line of matrices in a continuous path from the assembling to the casting position, and thence in a continuing course to the elevating position, in combina-

tion with means for shifting the line momentarily at the casting point from its original path, and thereafter restoring it to said path.

The employment of automatic means for shifting the line from the casting position in which it is first presented, to the second casting position, is advantageous in that the operator is relieved from the care and labor of watching and shifting the line, and permitted to direct his attention to the composition of a second line; and also advantageous in that the shifting of the line is effected positively and at the proper time, so that no oversight or carelessness on the part of the operator can prevent the proper sequences of operations.

The mold is provided, as shown, with horizontal shoulders to engage the lower rear ears of the matrices when they are in the upper, as well as when they are in the lower, positions, exact alinement of the characters vertically being thus secured.

The justifier-bar z^4 , and the other parts, are so shaped and controlled that the slide t is permitted to complete its upward movement before the bar z^4 , encounters the lower end of the justifiers Z . The justifier-bar is actuated, as shown in Fig. 1, by a link z^6 and the elbow-lever z^7 urged upward by a spring z^8 , and forced downward by a cam z^9 . This cam is provided with a surface z^{21} which permits the justifier-bar to rise and lift the slide t the required distance before the justifying actions take place. The concentric face z^{24} of this cam, which holds down the justifier between the justifying actions, is of the same radius as the portions z^{23} and z^{25} , and consequently the justifier-bar is not drawn down far enough to engage the lug t' after the plate has been permitted to rise, until the increasing face z^{22} comes into action subsequent to the completion of the casting operation and the unlocking of the line of matrices.

While I have described my improvement in a form more especially adapted for application to the machine shown in my prior application, it is to be understood that it may be widely modified as to form and arrangement of the parts, and that it may be applied to all analogous machines.

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

1. In a line-casting machine, a mold and means for guiding the composed line of matrices endwise to and beyond the mold, in combination with means for raising the line at the casting point momentarily above the level at which it is advanced, and again returning it to said level; whereby the line, advancing at a constant level, may be presented to the mold in an upper or lower position as required.

2. In a line-casting machine, the combination of the mold at a fixed height, two-letter

- matrices having ears, a vertically movable member adapted to engage the ears of the composed matrices, means for transferring the line endwise to said member, and means for continuing the movement of the line endwise therefrom at the same level; whereby the line may be carried to and from the mold at a fixed level and presented momentarily thereto at a higher level when required.
3. The combination in a line-casting machine, of two-letter matrices, means for assembling them in line, a mold at a fixed level, a line-elevator beyond the mold, means for advancing the composed line endwise in a continuous path from the assembling position to the mold, and thence to the elevator, and means for lifting the line momentarily at the casting position above the level of the adjacent guides, and again lowering it to the original level for transference to the elevator.
4. In a line-casting machine, the combination of a mold, two-letter matrices, fixed guides to direct the matrix line endwise to a casting level before the mold, and means adapted to shift the line transversely to the guides, and present the matrices to the mold at a second casting level; whereby either series of matrix characters may be brought into action.
5. In a line-casting machine, and in combination, a mold at a fixed level, two-letter matrices, a support for the composed matrix line movable vertically in relation to the mold to present the upper or lower matrix characters thereto, a spring tending to move the support to one position, means for locking the same in the other position, and means for delivering the matrix line endwise to said support in one of its positions; whereby the composed line of matrices, after presentation before the mold, may be shifted vertically in relation thereto, and thereafter returned to the original level.
6. In a line-casting machine, a mold, two-letter matrices, means for holding a composed line of matrices in one casting position before the mold, means for presenting the composed line to the holding means in said position, and automatic means for moving the line-holder from its normal position to a second casting position prior to the casting action.
7. In a line-casting machine and in combination with a line of two-letter matrices, a mold, means for shifting the line of matrices in relation to the mold to present their different characters thereto, a spring tending to move the line-shifting device in one direction, means for locking the shifting device against the action of the spring, and automatic means for moving the device against the resistance of the spring.
8. In a line-casting machine, the combination of two-letter matrices, and a device for shifting the matrix line to present different characters in the casting position, with a justifier-bar arranged to control said shifting device.
9. In a line-casting machine, a mold and two-letter matrices, in combination with guides extending horizontally to and beyond the mold and adapted to sustain the matrices at one casting level, said guides including a movable member in front of the mold, whereby the matrix line may be shifted in relation to the mold to another casting level.
10. In a line-casting machine, the mold and the adjacent matrix-shifting plate *t*, in combination with a spring *t*³, and a mechanically actuated bar *z*⁴ acting to move the plate in opposition to the spring.
11. The matrix-supports *f*⁶ and *f*⁷ and mold *K*, in combination with the justifier-elevator *O*, mechanically reciprocated bar *z*⁴, plate *t*, matrices *Y*, justifiers *Z*, spring *t*³, and a locking device *t*⁵.
12. In a line-casting machine, a mold, two-letter matrices, means for supporting a composed line of matrices in a casting position before the mold, automatic means for shifting said support to present the matrix line in a different casting position; whereby the matrices normally presented with one set of characters opposite the mold are shifted automatically and at the proper time to present the other characters thereto.
13. In combination with a mold, two-letter matrices and a movable support for the composed matrices before the mold, automatic means for shifting the support effecting a change in the matrix characters presented to the mold, and controllable means for preventing the action of the automatic mechanism; whereby the characters originally presented to the mold are retained in operative relation thereto.
14. In a line-casting machine, two-letter matrices, and continuous horizontal guides for the composed matrix line extended to the mold from one side, and continued therefrom on the opposite side, that portion of the guides in front of the mold being vertically movable that the matrices presented at one level may be raised in front of the mold and then lowered to the original level to continue their course.
- In testimony whereof I hereunto set my hand this 6th day of February, 1908, in the presence of two attesting witnesses.
- FRANCIS B. CONVERSE.
- Witnesses:
JOHN R. ROGERS,
DAVID S. KENNEDY.