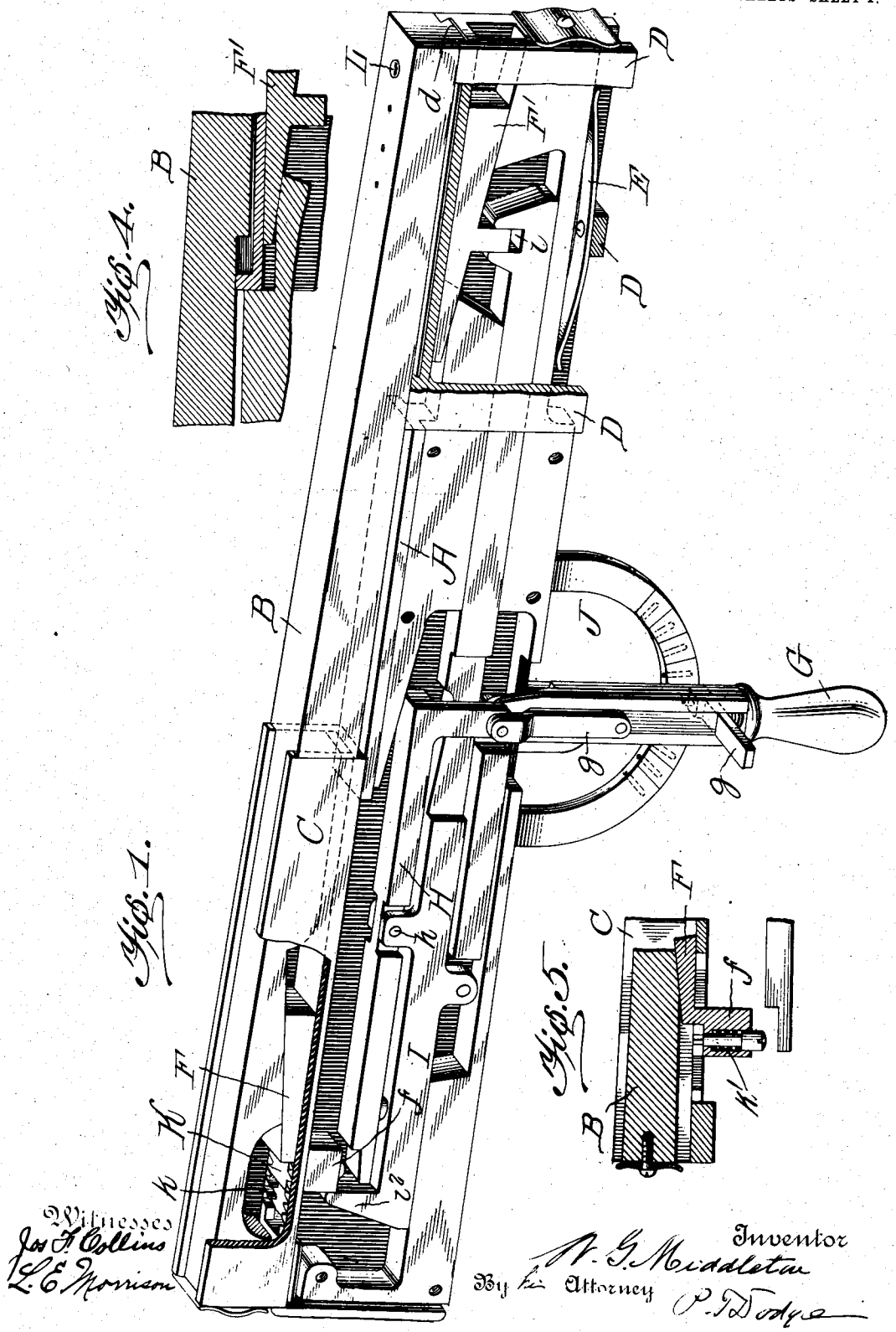
No. 834,835. PATENTED OCT. 30, 1906.

W. G. MIDDLETON.

LINOTYPE MACHINE.

APPLICATION FILED MAR. 24, 1906.

4 SHEETS—SHEET 1.



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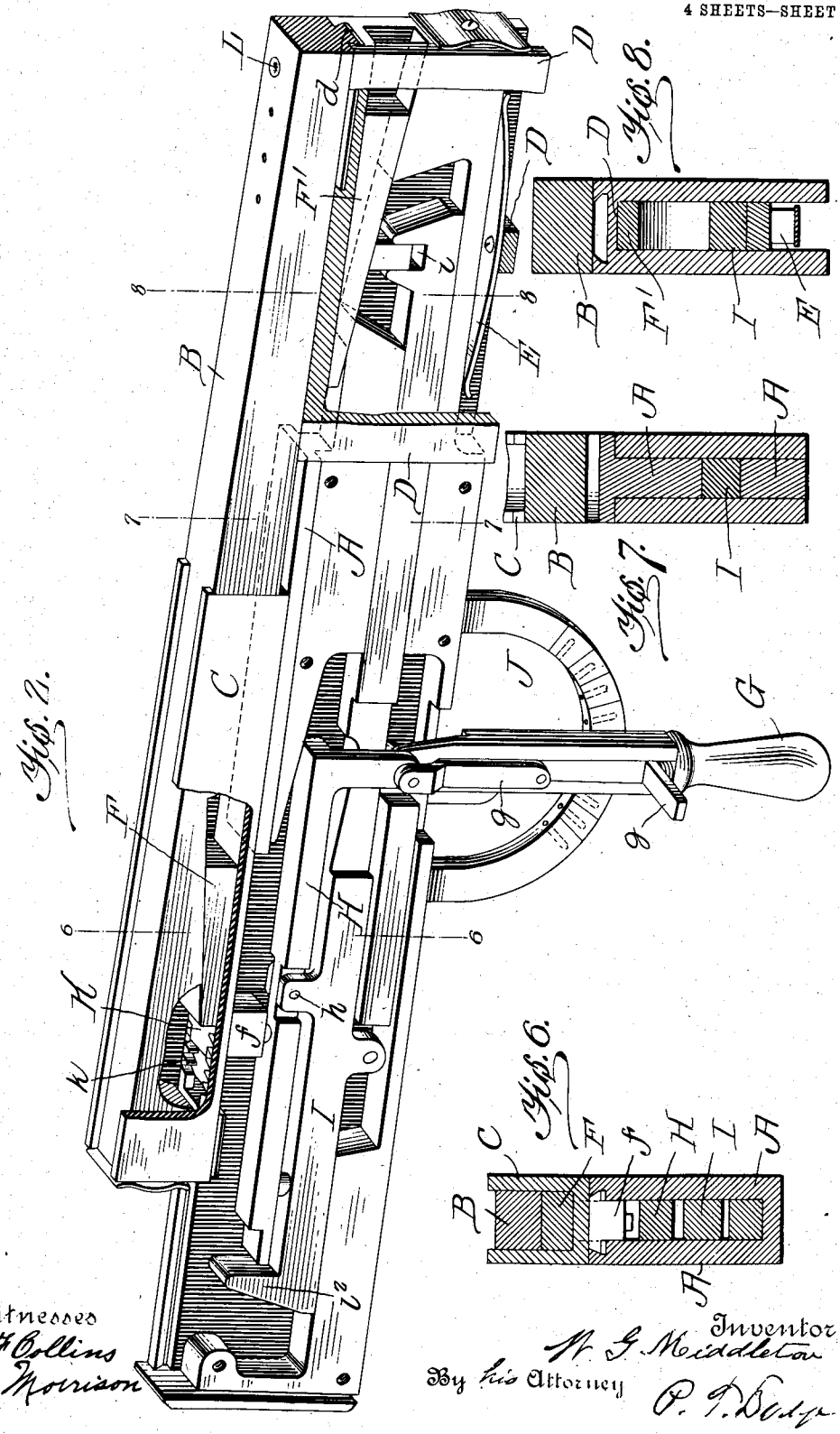

Witnesses
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L. E. Morrison

Inventor
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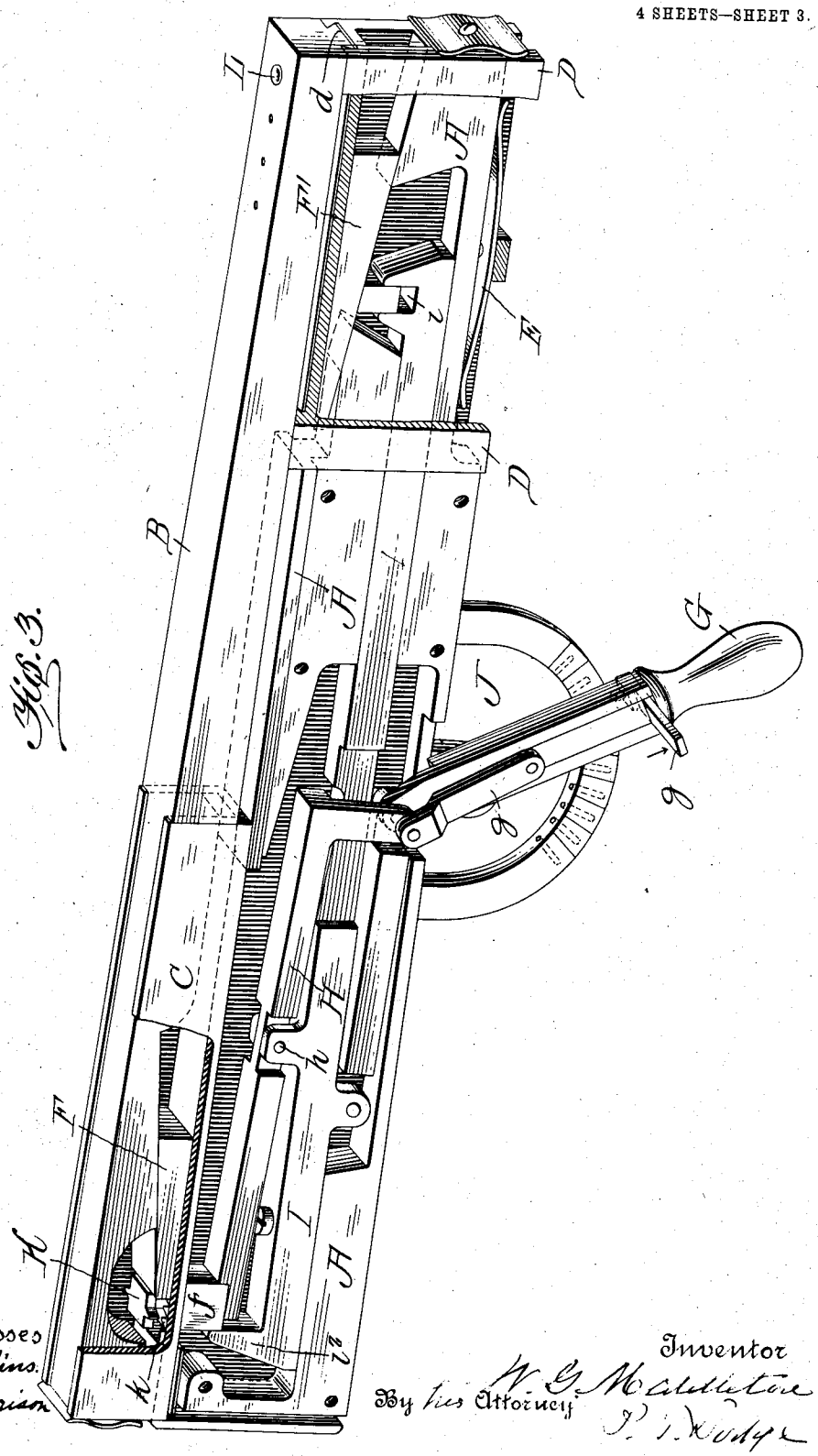
4 SHEETS—SHEET 3.

Fig. 3.



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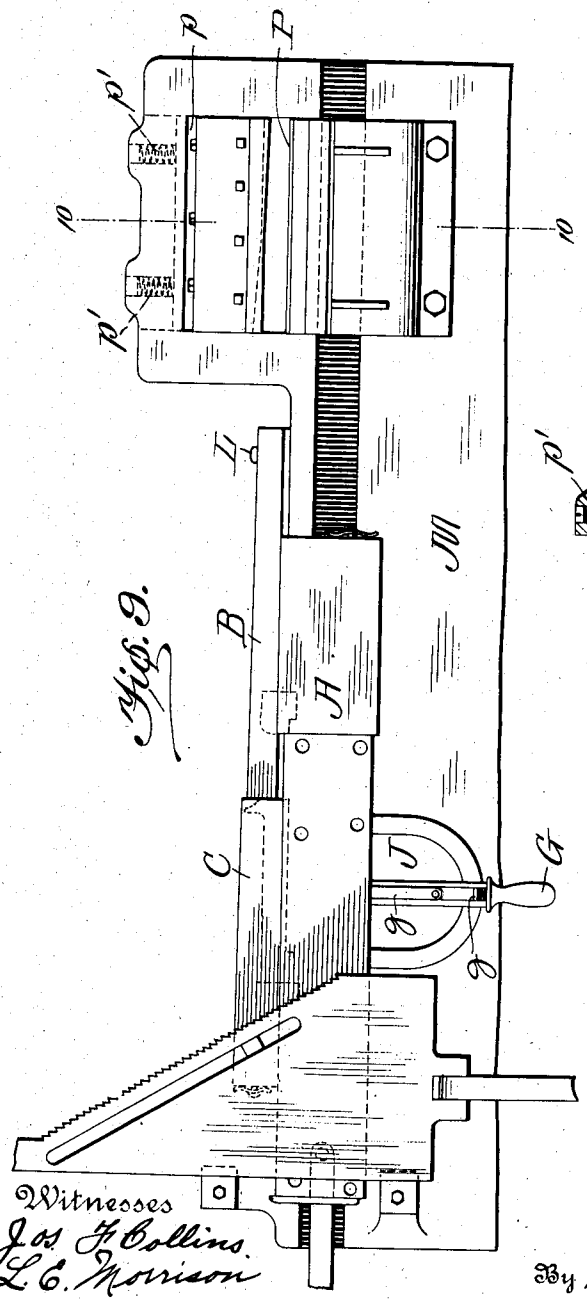

Fig. 9.

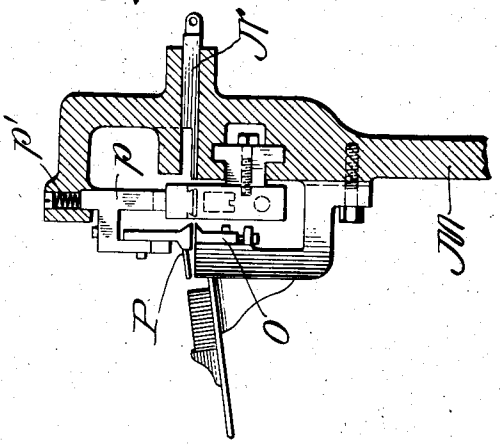

Fig. 10.

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UNITED STATES PATENT OFFICE.

WINTON G. MIDDLETON, OF TUCSON, ARIZONA TERRITORY, ASSIGNOR TO MERGENTHALER LINOTYPE COMPANY, A CORPORATION OF NEW YORK.

LINOTYPE-MACHINE.

No. 834,835. Specification of Letters Patent. Patented Oct. 30, 1906.

Application filed March 24, 1906. Serial No. 307,805.

To all whom it may concern:

Be it known that I, WINTON GORDON MIDDLETON, of Tucson, county of Pima, and Territory of Arizona, have invented a new and useful Improvement in Linotype-Machines, of which the following is a specification.

My invention relates to molds for linotype-machines wherein a slug or linotype of type-metal is cast in a slotted mold against a composed line of matrices which forms the type characters on the edge of the slug, as shown, for example, in Letters Patent of the United States No. 436,532. In this class of machines it is frequently necessary to change the length of the slug produced according to the width of the page or column desired and also necessary to change the thickness of the slug in order that it may carry type characters of different sizes and that they may appear solid or leaded.

The principal aim of my invention is to provide a mold which may be instantly adjusted both as to length and as to width without the necessity of detaching or applying parts. In this class of machines the slugs or linotypes are ejected from the mold between knives, which insure their uniformity in thickness, and it is of course necessary that the distance between these knives shall be varied according to the variations in the adjustment of the mold and the consequent thickness of the slug produced. I therefore propose to combine with my adjustable mold an adjustable trimming-knife coöperating with the mold in such manner that the mold effects the movement of the knife.

Referring to the drawings, Figures 1, 2, and 3 are perspective views of my mold with the parts in different positions to give the mold-slot different dimensions, the side plates being broken to expose the internal parts to view. Fig. 4 is a longitudinal vertical section showing a detail. Fig. 5 is a longitudinal vertical section through another detail, hereinafter explained. Figs. 6, 7, and 8 are cross-sections on correspondingly-numbered lines of Figs. 1, 2, and 3. Fig. 9 is a front elevation illustrating the manner in which the mold and the trimming-knife interact to insure their corresponding adjustment. Fig. 10 is a cross-section of the same on the line 10 10.

Referring to the various drawings, *a* represents the mold slot or cell in which the slug is cast. This cell extends through the mold from front to rear and is open on both sides, so that matrices may be presented thereto on one side and molten metal delivered therein from the other side, as usual in linotype-machines.

The lower side of the mold slot or chamber is formed by a stationary body portion A of the mold, having a suitable flat surface on the top. The upper side of the mold is formed by a mold-cap B, which overlies the body and which is adjustable both longitudinally and vertically for a purpose to be presently explained.

The vertical movement of the cap B determines the height of the slot and the thickness of the slug formed therein. The left end of the mold-slot is formed by the end of a block C, which is dovetailed to the top of the body portion A in order that it may slide lengthwise thereon to vary the length of the mold-slot. The upper side of the block C is grooved or channeled longitudinally to receive and hold the reduced end of the mold-cap B, extending beyond the mold-slot.

The right end of the mold-slot is formed by the end of a vertically-movable block D. This block is slotted or recessed longitudinally to fit over the body portion A, which is reduced to receive and guide it. The block D, which is without end motion, is also connected at its upper side by a longitudinal dovetail joint *d* to the cap B, so that it may rise and fall therewith.

The length of the mold-slot and of the slug is varied by shifting the cap B and the block C longitudinally. Fig. 1 shows them adjusted to produce a long slug and Fig. 2 shows them in position to produce a shorter slug.

The height of the slot and the consequent thickness of the slug are changed by raising or lowering the block D and the mold-cap B. In Figs. 1 and 2 they are shown in position to produce a comparatively thin slug, while in Fig. 3 they are shown raised to produce a thicker slug.

The cap B and the end block D are urged constantly downward by a spring E, seated within the lower part of the block D and bearing upward against the under side of the mold-body. The cap and block are raised to increase the height of the slot by two horizontally-moving wedges F and F′, the former within the member C and acting against

an inclined surface on the under side of the mold-cap and the latter seated on an inclined surface in the body and acting beneath the upper part of the end block D. The simultaneous and equal movement of the two wedges to raise the cap B and the block D or permit their descent is effected by a hand-lever G, pivoted between its ends to the body of the mold and jointed at its upper end to a bar or latch H, which is in turn pivoted at *h* to a horizontal bar I, guided in the body of the mold. This bar is provided at one end with a slot *i* to receive a projection on the wedge F′ and at the opposite end is provided with a latch i^2 to engage a projection *f* on the under side of the wedge F, this projection being also engaged when the parts are in normal position by the end of the latch H, as shown in Fig. 3. When the lever G is moved in one direction, it carries the bar I to the right, thereby retracting the two wedges and permitting the mold-cap to descend, thus reducing the height of the slot. When the lever is moved in the reverse direction, the wedges are advanced and the cap and end section D raised to increase the height of the slot and the thickness of the slug cast therein.

A sector-plate J is secured to the mold-body and provided with graduations representing the various thicknesses of the slug—as agate, nonpareil, &c.—so that the operator guided thereby may instantly set the lever and adjust the mold for any body demanded. The lever G is provided with a sliding latch *g*, one end of which is adapted to enter holes in the sector-plate for locking the lever in its various positions.

The length of the mold-slot is varied by moving the mold-cap B and the sleeve or member C lengthwise in order to change the distance between the members C and D. This longitudinal movement may be effected by hand or mechanically.

To prevent the movement of the wedge F and the consequent disturbance of the vertical adjustment during the longitudinal movement, I mount on one edge of the wedge F, as shown in Figs. 2, 5, &c., a vertically-movable latch K, having toothed edges to engage corresponding teeth *k* in the sides of the part C. This latch is urged downward by a spring *k′*, Fig. 5, and is held normally in engagement. When the vertical adjustment of the cap is to be effected, it is moved back to its extreme position at the left, as shown in Fig. 1, and as the first step in effecting adjustment the latch K is lifted out of engagement by the arm or lever H, connected to the vertically-movable latch *g* on the hand-lever G. When this latch is depressed to engage the hand-lever, it draws down the adjacent end of the lever or arm H, causing its opposite end to act beneath the latch K and disengage the same, as shown in Fig. 3, thereby leaving the wedge F free for longitudinal adjustment.

The cap B may be held in its adjusted position against longitudinal movement by the application of any suitable locking device. It may be provided, for example, with a vertical locking-pin L, extending through one of the series of holes in the cap to the member D.

The entire mold is mounted to slide endwise horizontally on the main frame, so that after the casting action it may be presented in front of the ejector-blade N, by which the slug is expelled from the mold between the trimming-knives, as shown.

O and P represent the two knives between which the slug is delivered. The lower knife O is secured firmly to the frame, while the upper knife P is secured to a vertically-movable support *p*, guided at its ends in the frame and urged downward by springs *p′*. The upper surface of the mold-cap B is inclined from the horizontal, and the under side of the knife-support *p* has a like inclination, so that as the mold advances to the ejecting position it underrides the support *p* and raises the same, together with the knife P, until the distance between the knives corresponds with the thickness of the slug in the mold whatever it may be.

It will be observed that the mold acts automatically and positively to effect the retraction of the movable knife, so that the distance between the knives will correspond with the thickness of the slug produced in the mold.

The essence of my invention as regards the mold lies in so connecting and arranging the members which form the four sides of the mold cell or slot that they are relatively movable in order to permit the dimensions of the slot to be varied both in height and in length, so that the length and thickness of the slug produced may be changed without the substitution of liners or other parts of the mold. It will be manifest to the skilled mechanic that the parts may be widely modified in form, and the details of the connections and the adjusting devices may be modified without passing beyond the scope of my invention.

Having described my invention, what I claim is—

1. A linotype-mold comprising four permanently-connected members forming the four walls of the slot, their relations being variable, substantially as described and shown, to change the length or the thickness of the slots; whereby the outcoming slugs may be varied as to length and thickness, or either, without removing parts from or applying parts to the mold.

2. In a linotype-mold, the combination of a body member, the longitudinally-movable end member C, the vertically-movable end

member D, and the vertically and longitudinally adjustable cap B.

3. In a slotted linotype-mold, the combination of a body portion, a cap portion movable both vertically and longitudinally, and means for closing the two ends of the slot under the various adjustments of the cap.

4. In combination with the mold-body A, the vertically-movable member D, a mold-cap connected to the member D, by a longitudinal sliding joint, and the member C, connected to the body by a longitudinally-sliding joint and also connected to the cap by a vertical joint.

5. In a linotype-mold, the combination of a body member, a rising and falling cap, a spring tending to depress the cap, wedges to effect the elevation of the same, and means for adjusting and locking the wedges in predetermined positions, whereby the mold may be adjusted to produce linotypes of standard thicknesses.

6. In combination with the body member A, and cap B, the relatively movable end members C, and D, the adjusting-wedges, means for moving the wedges simultaneously, and means for locking the wedges in predetermined positions.

7. In a linotype-mold, in combination with the body and members forming the ends of the mold-slot, the vertically-movable cap, a hand-lever, means connected therewith to effect the vertical adjustment of the cap, and means for locking the lever in predetermined positions.

8. In a linotype-machine, a mold adjustable as to the thickness of its slot and movable bodily from the casting to the ejecting position, in combination with an adjustable slug-trimming knife acted upon and adjusted by the mold as the latter advances to the ejecting position.

9. In a linotype-machine, a reciprocating mold having an inclined surface, and a movable knife-support having a corresponding surface acted upon by the mold to determine the adjustment of the knife.

10. In a linotype-machine, a fixed knife, an opposing knife movable to and from the first, springs tending to advance the movable knife toward its companion, and a movable mold acting to effect the separation of the knives.

11. In a linotype-machine, a slotted longitudinally-reciprocating mold including a vertically-movable member to vary the height of the slot, in combination with a movable slug-trimming knife controlled as to its position by the movable member of the mold.

In testimony whereof I hereunto set my hand, this 13th day of March, 1906, in the presence of two attesting witnesses.

W. G. MIDDLETON.

Witnesses:

ARNOLD SPRING,

F. S. MORENO.