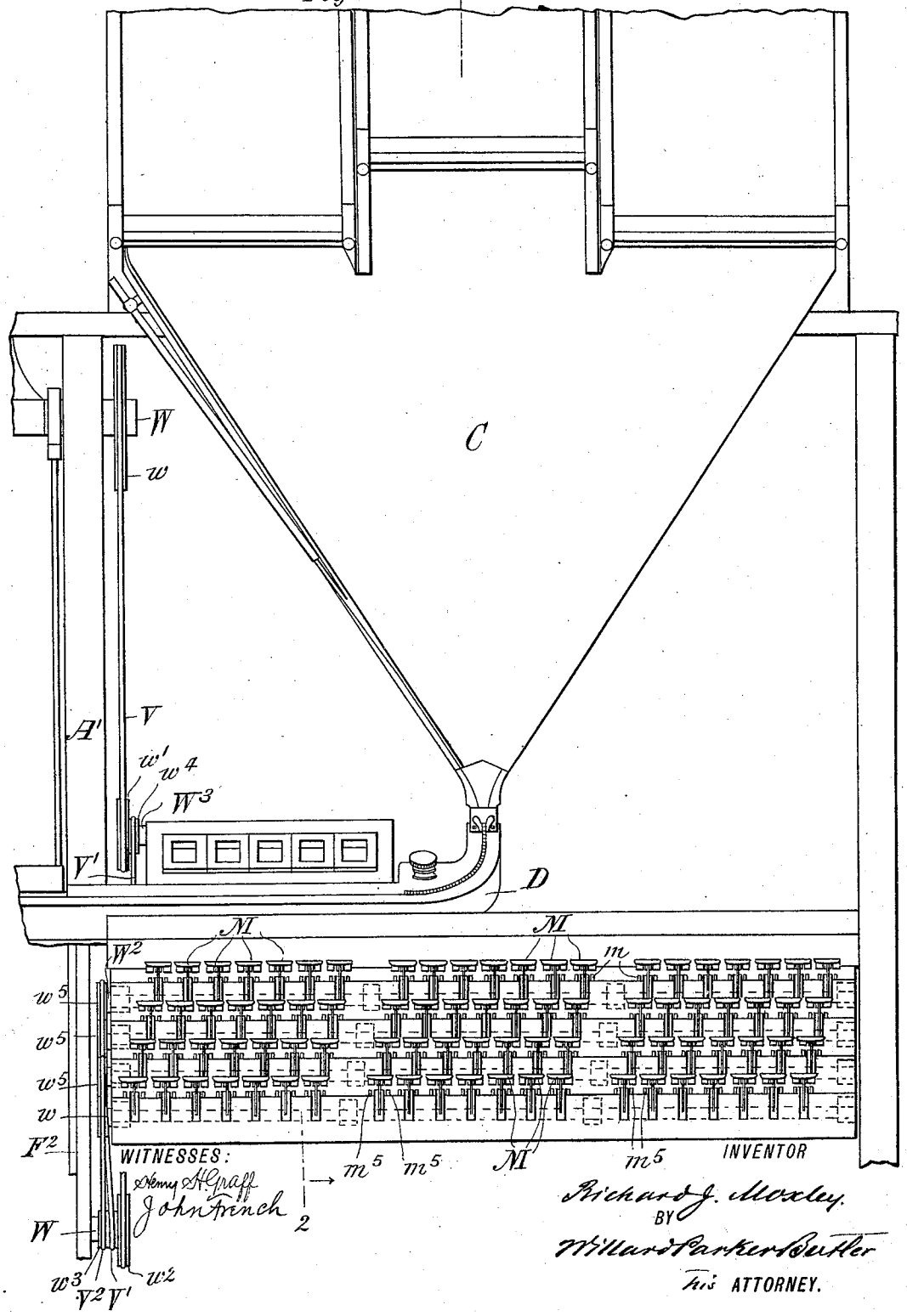
(No Model.) 5 Sheets—Sheet 1.

# R. J. MOXLEY.

## TYPE SETTING MACHINE.

No. 578,414. Patented Mar. 9, 1897.

Fig. 1.

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# R. J. MOXLEY.

## TYPE SETTING MACHINE.

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Fig. 2

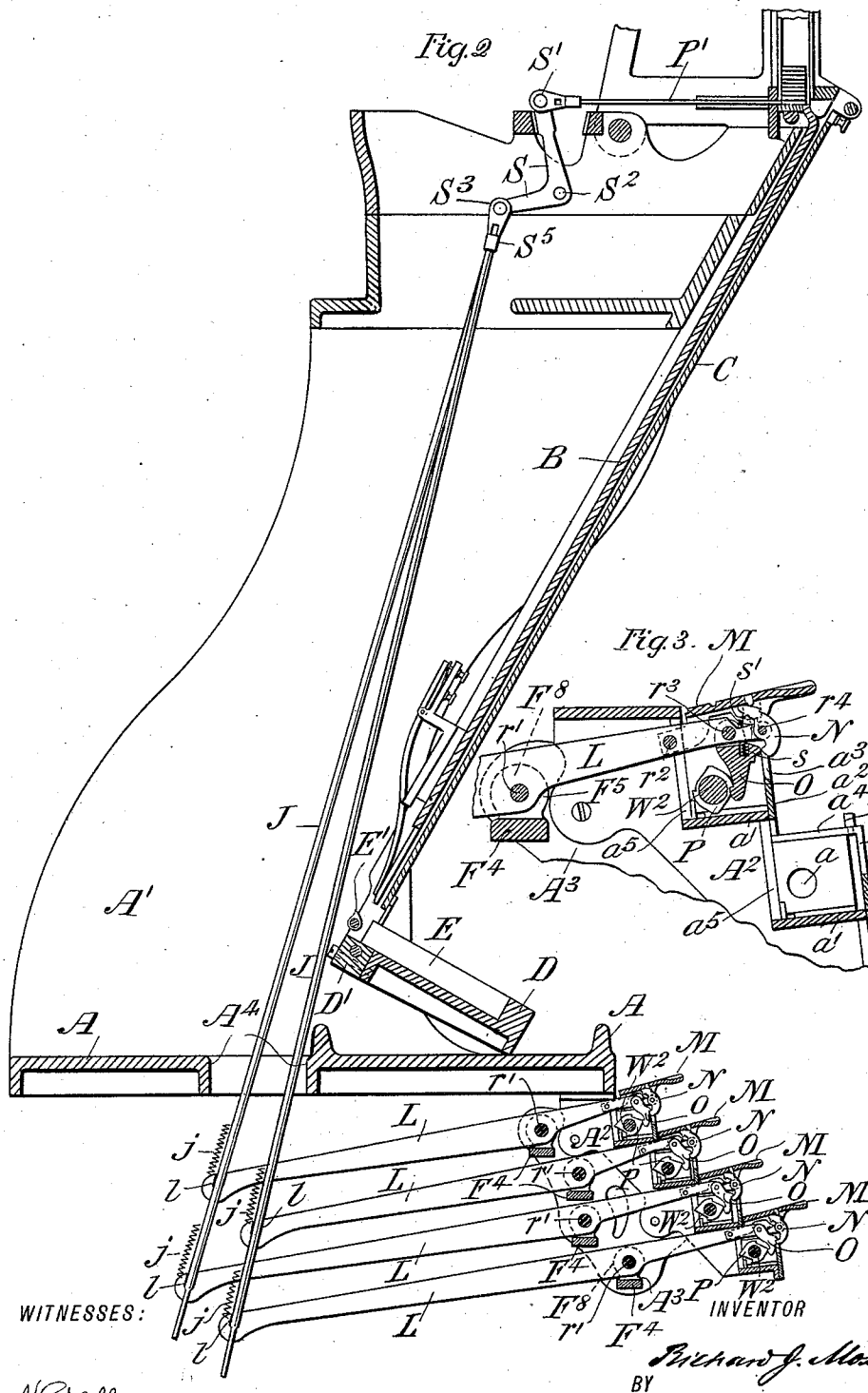
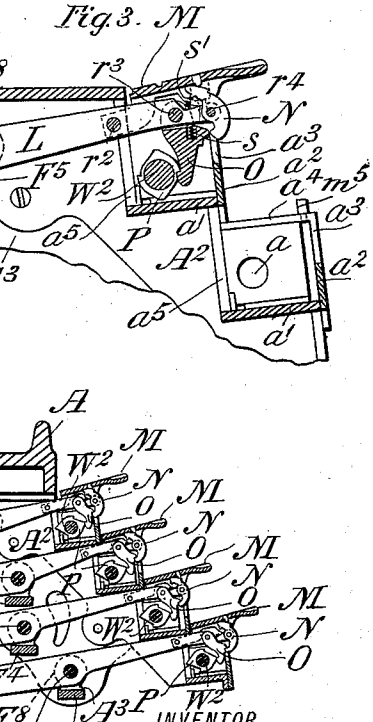



Fig. 3.




INVENTOR
Richard J. Moxley
BY
Willard Parker Butler
his ATTORNEY.

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# R. J. MOXLEY.

## TYPE SETTING MACHINE.

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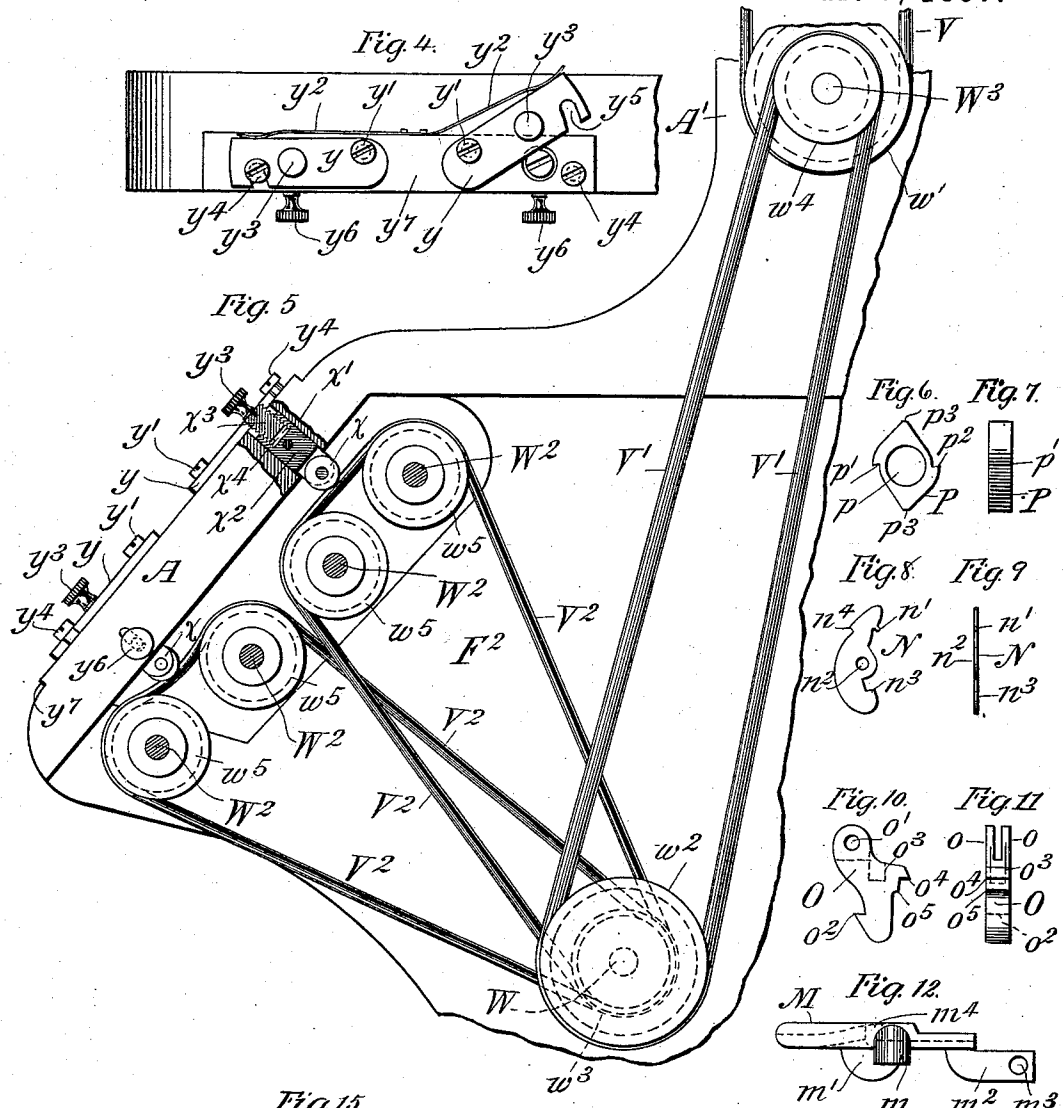


WITNESSES:

Henry H. Graff

John Franch

INVENTOR

Richard J. Moxley

BY

Willard Parker Butler

his ATTORNEY.

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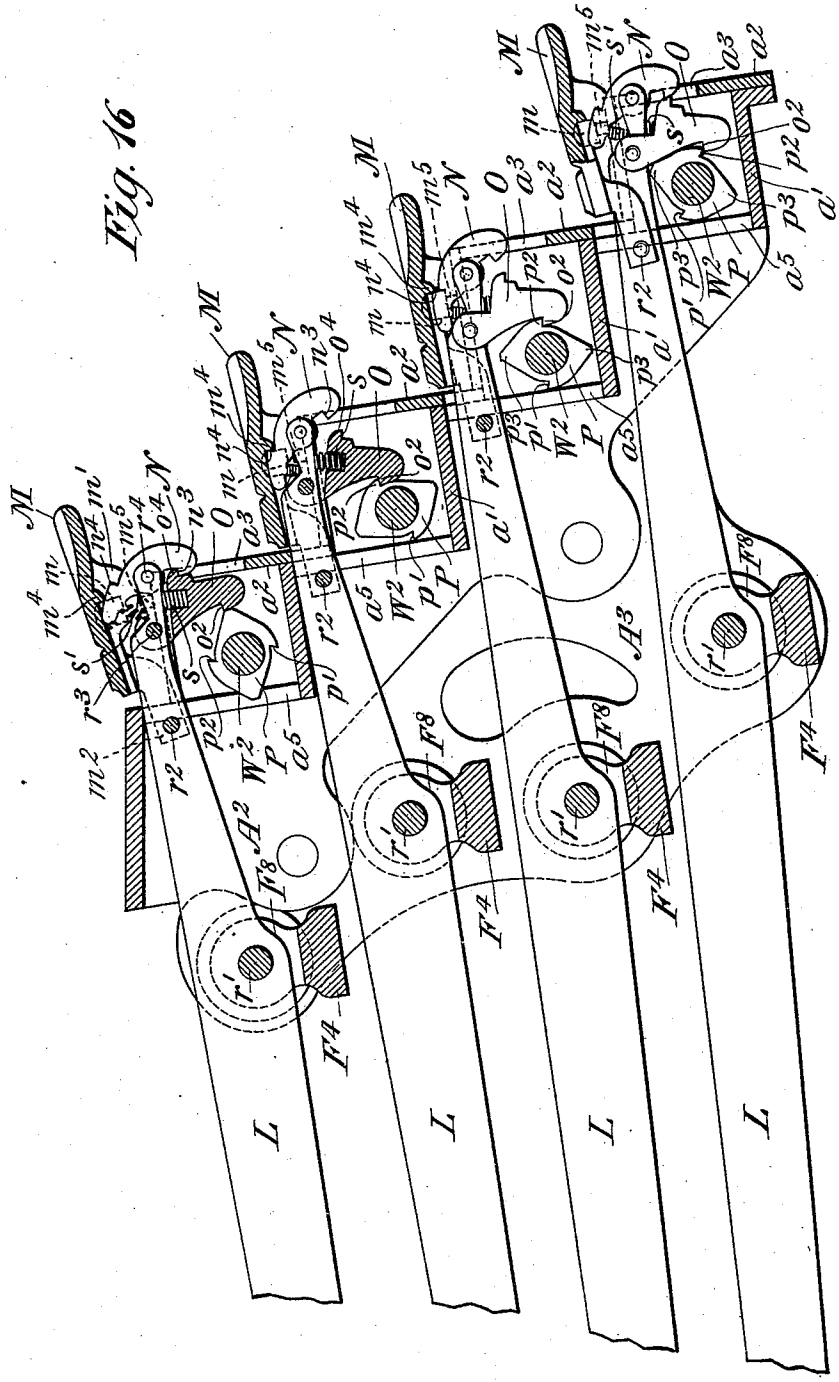
# R. J. MOXLEY.

## TYPE SETTING MACHINE.

No. 578,414. Patented Mar. 9, 1897.

Fig. 16



WITNESSES:

C. E. Ashley

H. W. Lloyd.

INVENTOR:

Richard J. Moxley

By his Attorney

Willard Parker Butler

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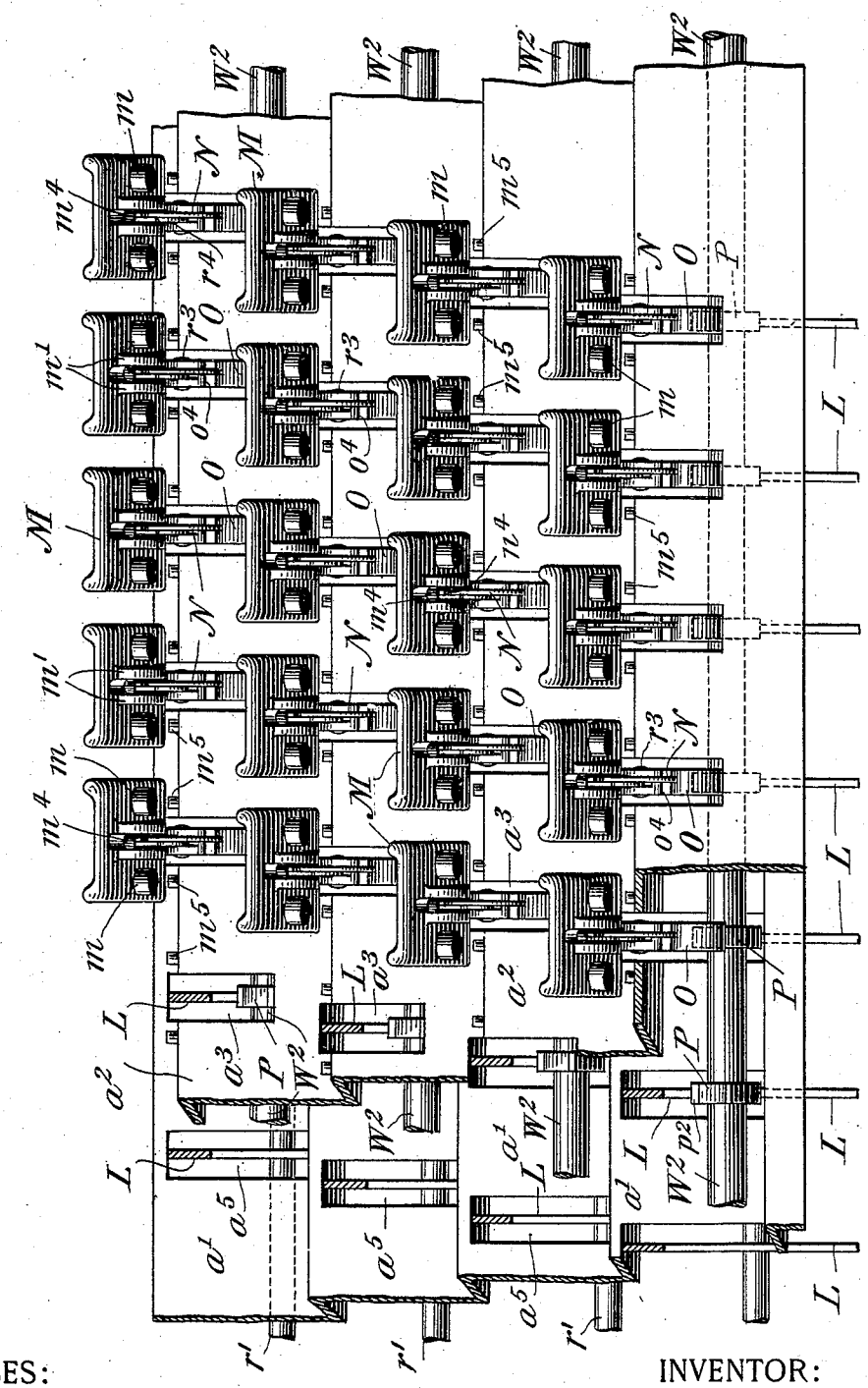
(No Model.) 5 Sheets—Sheet 5.

# R. J. MOXLEY.

## TYPE SETTING MACHINE.

No. 578,414. Patented Mar. 9, 1897.

Fig. 17.




WITNESSES:

C. E. Ashley

H. W. Lloyd

INVENTOR:

Richard J. Moxley

By his Attorney

Willard Parker Butler.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

# UNITED STATES PATENT OFFICE.

RICHARD J. MOXLEY, OF BROOKLYN, NEW YORK, ASSIGNOR TO THE EMPIRE TYPE SETTING MACHINE COMPANY, OF NEW YORK, N. Y.

## TYPE-SETTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 578,414, dated March 9, 1897.

Application filed May 28, 1896. Serial No. 593,385. (No model.)

*To all whom it may concern:*

Be it known that I, RICHARD J. MOXLEY, a citizen of the United States of America, and a resident of Brooklyn, county of Kings, and State of New York, have invented certain new and useful Improvements in Type-Setting Machines, of which the following is a specification.

My invention relates to improvements in type-setting machines, and particularly to improvements applicable to that class of type-setting machines in which a vertical case is used resting upon a cradle standing upon a supporting-bar and containing the type in channels, and from which the type is removed by means of the insertion of a type-plunger actuated by a lever operated by the depression of a key, which type-plunger forces the last letter in each channel of the case forward, whereupon it is allowed to drop by gravity through grooves in the back plate of the machine into the raceway, where the types are assembled and along which they are driven by suitable mechanism.

The special object of the improvements is to render the action of the levers actuating the plungers more delicate and capable of adaptation to the touch of any particular operator, and to utilize the presence of power in the machine for the purpose of facilitating the operation of the finger-keys.

The invention will be best understood by reference to the accompanying five sheets of drawings, forming a part of this specification, in which—

Figure 1 is a front elevation of that part of the type-setting machine to which the invention is applicable, showing the improvements attached. Fig. 2 is a vertical cross-section on the lines 2 2 of Fig. 1. Fig. 3 is a detail view showing the improved construction of one of the operating-levers on a large scale. Fig. 4 is a plan view of the details of mechanism for adjusting the amount of power applied to the machine. Fig. 5 is a sectional view of the driving mechanism. Figs. 6 to 15, inclusive, are detail views of various parts of the machine. Fig. 16 shows the finger-key mechanism in side elevation on a large scale in different positions; and Fig. 17 shows it in front elevation in actual size, having portions broken away at one end, so as to show the interior construction.

Similar letters refer to similar parts throughout the several views.

In the drawings, A represents the bed or framework of a type-setting machine; A′, the upright framework of the machine attached to the bed-frame A; B, the back plate containing the type-grooves attached to the upright framework A′ at its upper and lower ends; C, a glass plate fitting over the front of the back plate and inclosing the grooves therein against or on which the types slide; P′, the type-plungers, of which there are any desired number, each actuated by the bell-crank S, pivoted to it at the points S′ and turning upon the pivot $S^2$, to which the rod J is attached at the other end $S^3$, which rod connects with the lever L.

D′ is the throat into which the type first falls from the grooves in the back plate.

E is the raceway along which the line of type travels after composition.

E′ is the pusher, which is operated by a cam, which moves the type along the raceway.

Having described the main parts of a type-setting machine of the general class to which the present improvements are applicable, the improvements will now be described in detail.

$A^2$ $A^2$ are two vertical plates which are attached to the plate A at either side of the machine. Each plate $A^2$ has attached to it at either end a second vertical plate $A^3$, as shown in Figs. 2 and 16. Between the plates $A^3$ $A^3$ extend the horizontal plates $F^4$ $F^4$, each of which in turn carries a series of studs $F^8$, Fig. 3, each of which studs has an opening $r'$ in its center. In the openings $r'$ are pivoted the finger-levers L, which are all of similar construction. The form of one of these levers is shown in Fig. 15. It is provided with an indentation $l$ at its left-hand extremity, an opening $l'$, through which the rod L′ in the position shown passes, and three openings $l^2$, $l^3$, and $l^4$ at or near the other extremity. An indentation or nick is provided on the upper right-hand or outer extremity of the lever L, and a small stud $l^5$ is inserted therein, as shown in Fig. 15. The extreme right end of

the lever is cut away to half its thickness to permit the dog N to be attached, which, with the lever, makes the thickness of the rest of the lever. The construction of the levers and finger-keys being the same throughout, the description will be confined to a single one.

Fig. 16 shows a set of levers and the keys in a single vertical plane in four different positions in order to show the method of operation. The construction of the keyboard is shown in Figs. 16 and 17. Between the vertical plates A at either end of the machine a keyboard composed of the two plates $a'$ and $a^2$, which are bent to form a series of steps, as shown in these figures, and are attached to each other so as to form a hollow box extending the entire width of the machine under each step. These may be composed of a single plate bent as shown or of a series of plates joined together at right angles.

The inner plate $a'$ is provided with a series of vertical openings $a^5$, one for each of the levers L, and the outer plate $a^2$ is provided with a series of similar vertical and partly-horizontal openings $a^3$ for a similar purpose.

M is a finger-piece of the form shown in Figs. 12, 13, 14, 16, and 17. This finger-piece is pivoted to the lever L by the pin $r^2$ and passes through the opening $m^3$ in the parallel lugs $m^2$ $m^2$ on the under surface and fit directly over the extremity of the lever on either side and through the opening $l$ in the lever. The finger-piece M is provided on its lower surface with the two studs $m$ $m$, which rest upon the vertical lugs $m^5$ $m^5$ on the horizontal plates $a^2$ $a^2$, so that when the key is depressed the downward movement of the key is limited. The finger-piece M is also provided with two similar lugs $m'$ $m'$, which fit around a dog N, which is pivoted on the pin $r^4$ at the point $n^2$ in the opening $l^4$ at the extremity of the lever L. The shape of this dog is shown in Figs. 8, 9, and 16. It is provided with two teeth $n^3$ and $n^4$.

$n'$ is a stud on the surface of the dog, which holds a spring which also rests upon the stud $l^5$ in the depression in the extremity of the lever L and which serves nominally to hold the dog N against a tripper or tooth O. The tripper or tooth O is the shape shown in Figs. 10, 11, and 16. It is pivoted by a pin $r^3$ in the opening $l^3$ of the lever L and is provided with a recess $o^3$ on its upper surface which contains a small spiral spring $s$, which serves to hold it down against a toothed cam P.

$W^2$ $W^2$ are continuously-rotating rods or shafts passing horizontally through each hollow box in the steps and under each set of lever-arms, as shown in Figs. 2, 3, 5, and 16, from end to end of the machine. These rods or shafts are continuously driven by pulleys $w^5$, over which pass belts $V^2$ $V^2$, passing over grooves on the surface of the pulleys $w^2$ $w^3$, attached to a shaft W'. Rotary motion is imparted to this shaft by the belt V' passing over a pulley $w^4$ on a shaft $W^3$, which shaft carries also a pulley $w$, driven by a belt V, connected with any convenient source of power. Under each lever the shaft or rod $W^2$ carries a toothed cam P, with the opening $p$ in its center, through which the rods pass. This cam is of the shape shown in Figs. 6, 7, and 16 and rotates with the shaft. It is provided with two engaging points $p'$ and $p^2$, as shown in Figs. 6, 7, and 16, which are arranged to engage with the projection $o^2$ upon the tripper O. The other extremity of the lever L is drawn up against the rods J by the springs $j$, as shown in Fig. 2. When the machine is at rest, the position of the levers is shown in Fig. 2. Here the springs $j$ hold the lever L close against the rods J in the groove $l$. The tripper O is held back from the cam P, and the cams rotate freely upon the rods $W^2$. The same condition of affairs is shown with the uppermost lever in the large-scale views, Fig. 16.

In order that the throw of the rods J actuating the plunger may be adjusted, as occasion may require, by screwing up or down in the heads, the lower parts of the rods are held firmly in the indentations $l$ of the levers by the springs $j$.

In order to regulate or, if necessary, to relieve the tension of the belts $V^2$ from time to time, as may be necessary, the device shown in Figs. 4 and 5 is provided.

$x$ $x$ are rollers which play upon the belts $V^2$ and are pivoted to the binders $x^2$, which slide easily up and down in the openings $x'$ of the plate A. These binders $x^2$ are provided with screws $x^3$, screwing into their upper parts in the threads $x^4$, cut in the head of the binders, thus rendering the binders adjustable in length. Finger-screws $y^6$, with suitable knobs, are also provided for controlling the same. The plate A is slightly raised above the binders, as shown at $y^7$, and to this portion are loosely fastened the plates $y$ by the screws $y'$. These plates are controlled by the knobs $y^3$ and are provided with openings $y^5$, fitting over the screws $y^4$ and are provided with springs $y^2$, attached to the edge of the raised portion of the plate A. The springs $y^2$ and the screws $y^4$ serve to hold the plate firmly over the adjusting-screws or binders when the same are pressed down against the belt V. In order to release the pressure on the belt $V^2$, the operator raises the plate $y$ by the knob $y^3$, when the pressure of the belt will force the binder up through the opening $a'$, as shown in the upper binder of Fig. 5, and the belt will run loosely without turning the shafts $W^2$. When the operator desires to tighten the belt again and start the shafts, it is only necessary to press the binder down by the knob $y^6$, whereupon the spring $y^2$ will force the plate $y$ over the binder until stopped by the screw $y^4$ and the parts will assume the position shown in the lower of the binders in Fig. 5. It will be evident that the amount of pressure exerted by the binder will

depend upon the length of the binder, which can be adjusted by screwing it up and down in its bed by turning the screw $x^3$.

The operation of the machine is as follows: When the finger-plate M is depressed by the operator, it depresses the upper end of the dog N until the lug $m^4$ on the finger-piece M catches and holds the tooth $n^4$ on the dog, thereby preventing the dog from flying back to its original position. At the same time the tooth $n^3$ of the dog N is released from the tripper O and the latter is forced down by the spring $s$ until its projection $o^2$ engages with the point $p'$ or $p^2$ on the cam P. This is the position shown by the second lever from the top in Fig. 16. Thereupon the revolution of the cam on the shaft W depresses the lever L the distance required for the type-plunger to eject a type from the type-case, carrying down with it the dog N, the finger-piece M, and the tripper O. The downward movement of the finger-piece M will be arrested when its lugs $m$ $m$, attached to its lower surface, rest upon the projection $m^5$ $m^5$ on the face of the plate, and the mechanism will assume the position shown by the second lever from the bottom in Fig. 16. The further depression of the lever will then tip or tilt the finger-piece M upon its point $r^2$ in the manner shown by the lowest mechanism in Fig. 16, thereby releasing the dog N, which will then be returned to its original position by the downward pressure of the spring $s'$. At the same time the projection $p^3$ on the cam P, as the cam revolves, will force the point $o^2$ on the tripper O free from the projection $p^2$ of the cam and the tooth $n^3$ on the dog N will again engage with and hold the tripper O away from the cam and the parts all be restored to their original position ready for use again.

I claim as my invention—

1. The combination of a lever, a finger-key pivoted to the lever, a rotating shaft and devices attached to the lever, and actuated by the finger-key, engaging with devices on the shaft, whereby the latter are caused to move the former during part of a revolution.

2. The combination of a finger-lever, a finger-key pivoted to the lever, a rotating shaft and devices attached to the lever and actuated by the finger-key, engaging with devices on the shaft, whereby the latter are caused to move forward during a part of a revolution, and devices substantially as described for releasing and restoring the engaging devices to their normal position at the end of the partial revolution of the shaft.

3. The combination of a finger-lever, a pivoted finger-key and devices on the front plate of the machine for limiting the movement of the finger-key.

4. The combination of a finger-lever, a finger-key pivoted thereto, a dog pivoted to the end of the lever actuated by the finger-key, a tooth pivoted to the lever with which the dog engages, and a cam rotating on a shaft engaging with the tooth.

5. The combination of a finger-lever, a finger-key pivoted thereto, a dog pivoted to the end of the lever actuated by the finger-key, a tooth pivoted to the lever, with which the dog engages, a spring for keeping the dog and tooth in engagement, except when depressed by the finger-key, a cam rotating on a shaft actuated from a suitable source of power engaging with the tooth, and a spring for forcing the tooth into engagement with the cam when released by the dog.

6. The combination of a finger-lever, a rotating shaft carrying a cam, a tripper and a dog attached to the lever substantially as described.

7. The combination of a binder, sliding up and down in a slot on the frame of the machine, means for regulating the longitudinal movement of the binder when desired, and a plate fitting over the opening of the slot in which the binder slides, and holding the binder after adjustment, in a fixed position.

8. The combination of a binder sliding up and down on slots on the frame of the machine, provided with a friction-pulley on the surface of which runs a driving-belt, devices for regulating the length of the binder at will, and a clamp for holding the binder in a fixed position after adjustment.

9. The combination of a binder provided with a friction-pulley in an opening in the frame of the machine, and a clamp sliding on the frame over the opening in which the binder slides.

10. The combination of the pivoted lever, the finger-key, the hanging tooth, and the dog N pivoted upon the lever provided with the shoulders $n^3$ and $n^4$ and the stud $n'$ for carrying a spring.

11. The combination of the pivoted lever, the finger-key, the dog pivoted upon the lever, the hanging tooth and the rotating shaft carrying the cam P, provided with the shoulders $p'$ and $p^2$ and the points $p^3$ $p^3$ arranged to engage with the hanging tooth.

12. The combination of the pivoted lever, the finger-key, the rotating shaft carrying a suitable cam, the dog pivoted upon the lever and the hanging tooth O also pivoted on the lever, provided with the shoulders $o^2$, $o^4$ and $o^5$ arranged to engage with the cam and the dog, and provided with a suitable spring device for holding it when released from the dog against the cam.

13. The combination of the pivoted lever, the rotating shaft carrying a cam, the hanging tooth, the dog pivoted upon the lever, and the finger-key M pivoted on the lever, and provided with the stud $m^5$, for limiting its movement, and the catch $m^4$ for engaging with the shoulder upon the dog.

14. The combination of the pivoted lever L, the rotating shaft carrying the cam P, provided with the shoulders $p'$, $p^2$, the hanging

tooth O pivoted on the lever, provided with the shoulders $o^2$, $o^4$ and $o^5$, and the countersunk opening $o^3$ containing a spring, the dog N also pivoted upon the lever, provided with the shoulder $n^3$ engaging with the shoulder $o^4$ of the tooth O, and a finger-key M pivoted on the lever, provided with the stud $m^5$ for limiting its movement, and the catch $m^4$ for engaging with the shoulder upon the dog.

In testimony that I claim the foregoing as my invention I have signed my name, in presence of two witnesses, this 9th day of May, 1896.

RICHARD J. MOXLEY.

Witnesses:
HENRY THRUSH,
JOHN FRENCH.