

(No Model.)

4 Sheets—Sheet 1.

A. W. HOUCHIN.  
TYPE WRITING MACHINE.

No. 363,896.

Patented May 31, 1887.

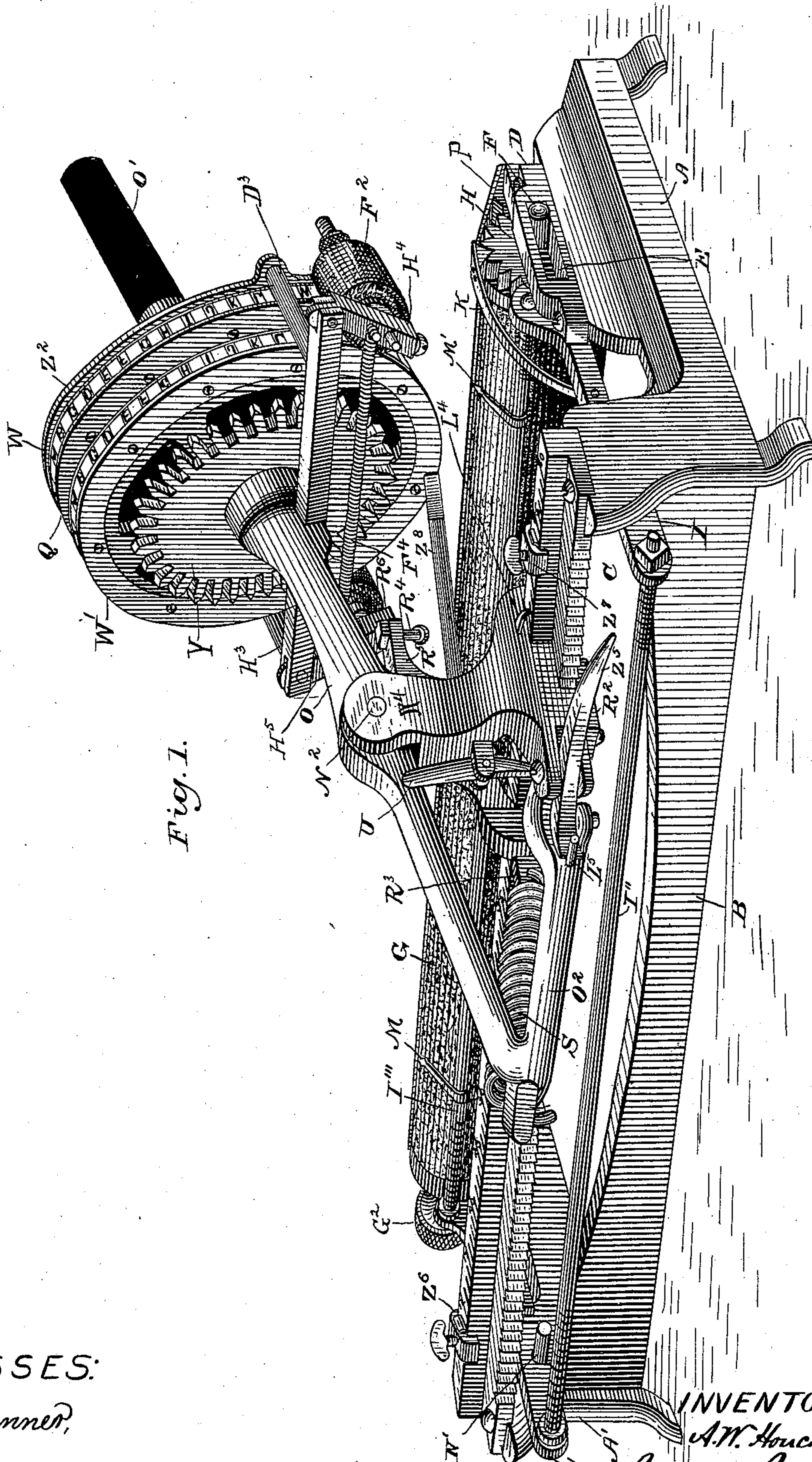


Fig. 1.

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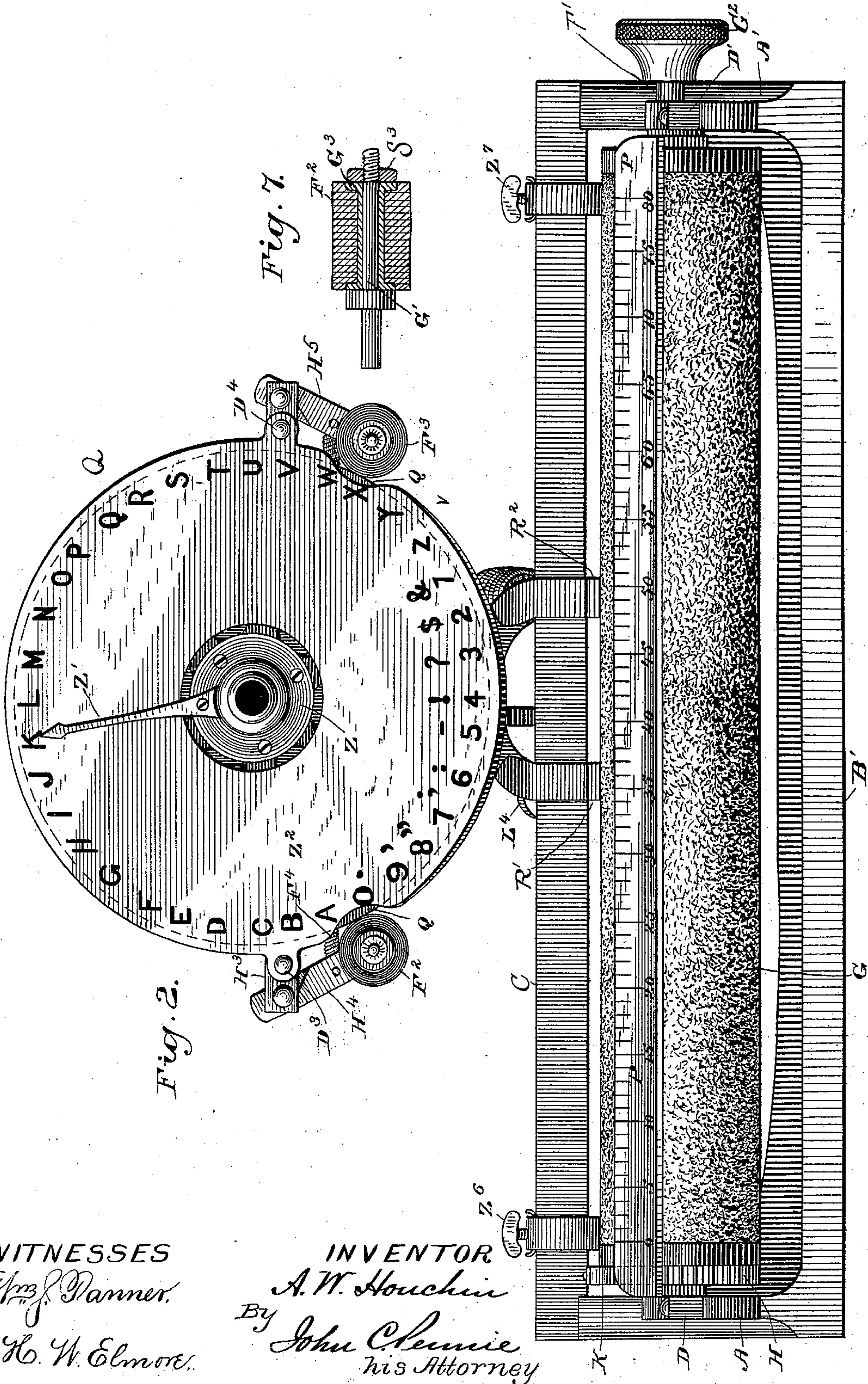
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A. W. HOUCHIN.  
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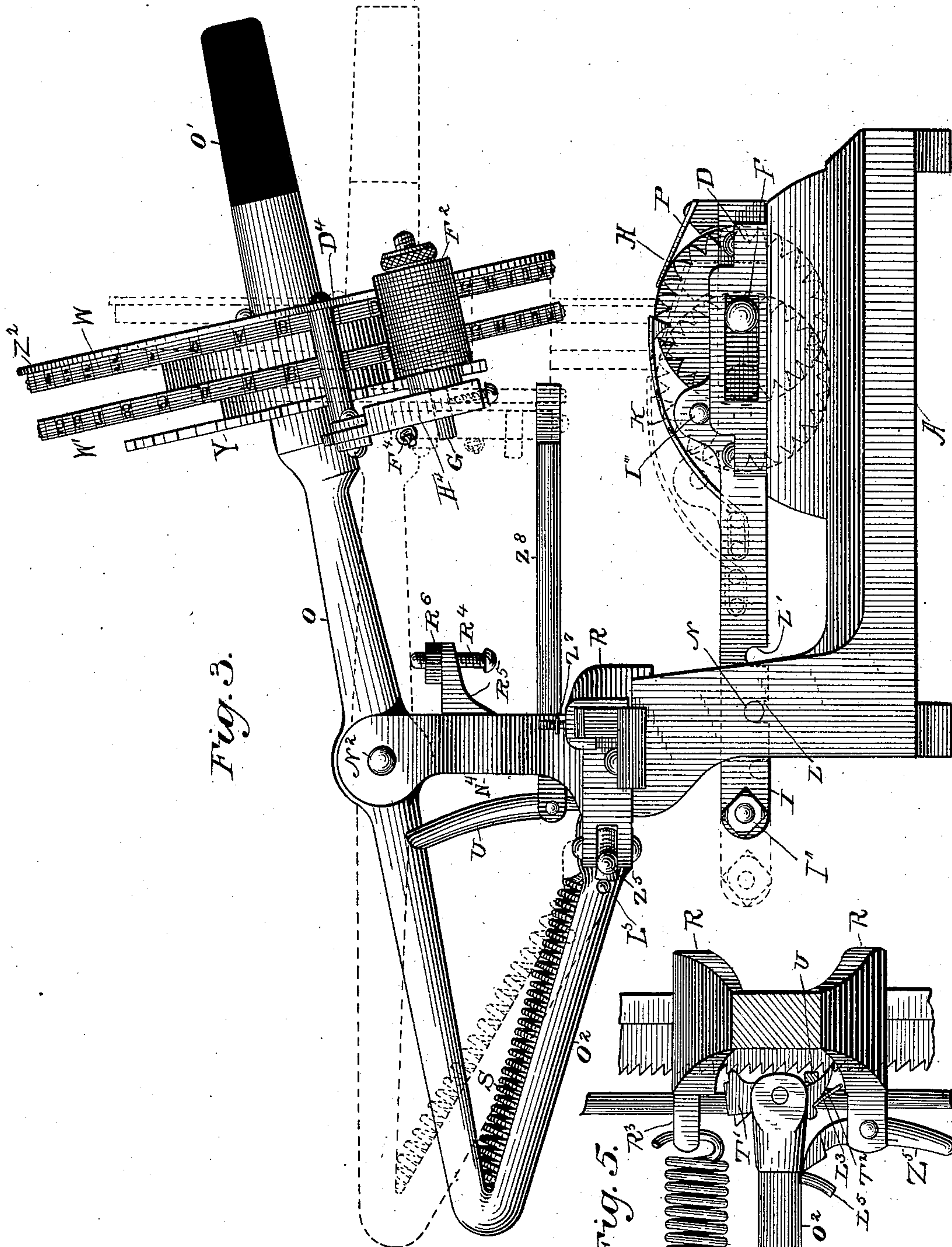
A. W. HOUCHIN.

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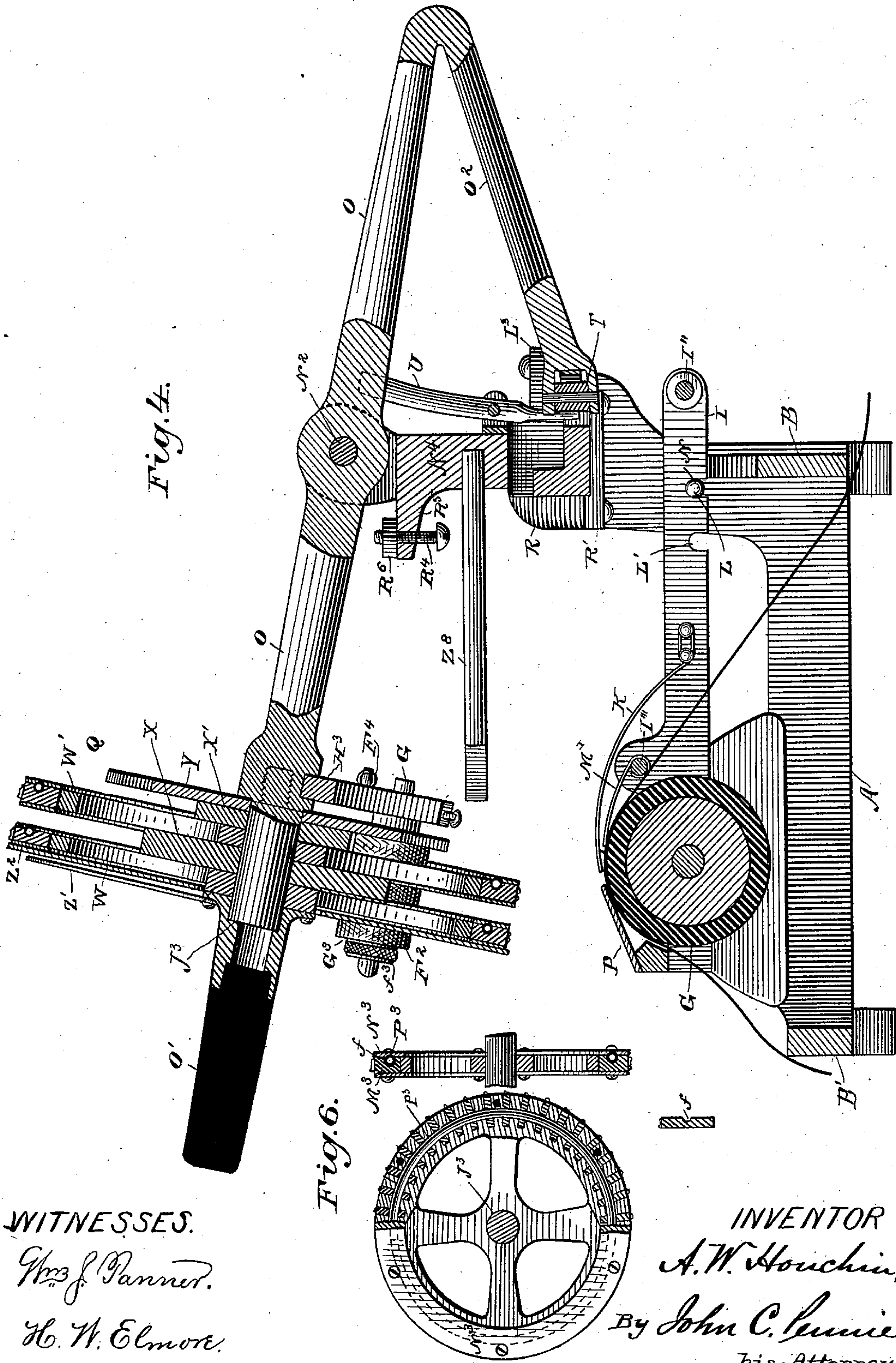
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# UNITED STATES PATENT OFFICE.

ALFRED W. HOUCHIN, OF BROOKLYN, NEW YORK.

## TYPE-WRITING MACHINE.

SPECIFICATION forming part of Letters Patent No. 363,896, dated May 31, 1887.

Application filed June 4, 1885. Serial No. 167,634. (No model.)

*To all whom it may concern:*

Be it known that I, ALFRED W. HOUCHIN, a citizen of the United States, residing at Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Type-Writing Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates to that class of printing-machines known as "type-writers;" and it consists in certain novel organizations of parts, as hereinafter more fully described and claimed, whereby the construction is simplified and cheapened, its durability enhanced, and a better and more uniform alignment secured for the printed characters. I attain these results by means of the mechanism shown in the accompanying drawings, illustrative of my invention, and wherein similar letters of reference designate similar parts throughout the several views.

Figure 1 represents a rear perspective view of the complete machine. Fig. 2 represents a front elevation thereof. Fig. 3 represents a side elevation of the machine, and in dotted lines its position when making an imprint and the mode of adjustment of the platen. Fig. 4 represents a central transverse section through the working parts. Fig. 5 represents a detail view of the feed mechanism. Fig. 6 represents in detail the construction of the type-wheel, and Fig. 7 represents in detail the construction of the inking-roller.

The working parts of the machine are mounted upon a stout frame-work, preferably of metal, to insure its stability, and consisting of two end stanchions, A A', joined by cross-pieces B B' and supported upon bearing-feet, as shown. The stanchions are also connected by the feed-rack C of the machine, which imparts additional strength to the frame-work. To the stanchions are bolted or otherwise secured opposite journal-boxes, D D', having longitudinally-slotted bearings E E' for the reception of the gudgeons F F' of the platen G. This platen is in the form of a roller, which serves as a support for the paper beneath the type-wheel, is of sufficient size to afford a good bearing surface to the type, and is formed of or coated with any of the well-known substances—such as hard rubber, vulcanite, and

the like—familiarily used for type-writer rollers of similar character. At one end it is provided with a turning-button, G<sup>2</sup>, having a milled head, and attached to the end of the gudgeon F'. At its other extremity it bears the line-spacing wheel H, having V-shaped teeth upon its periphery. The roller is contained within a sliding frame consisting of the arms I I', connected at the rear of the machine by the tie-bolt I'', and immediately back of the platen by the bolt I''', and in front by the graduated scale P. The arm I bears the spring-pawl K, engaging with the teeth of the wheel H. Both arms I I' are provided with slots or notches L L', of width equal to the diameter of studs or pins N N', projecting from the inner side of the stanchions A A', above and in advance of the cross-piece B, and adapted to engage with the said slots, so as to lock the platen at either one extremity or the other of the slotted journal-boxes, at the will of the operator, and for the purpose of bringing the bearing-surface of said platen below either one or the other of the sets of type upon the type-wheel of the machine.

The shifting of the platen is readily effected from one of its positions of adjustment to the other by raising the bar I'' until the particular set of notches upon the arms I I' is out of engagement with the pins N N', and then moving the entire frame outwardly or inwardly, as the case may be, until the other set of notches is over the pins, whereupon the bar I'' is released and the pins N N', entering the notches, lock the frame in the new position.

The cross-rod I''' bears two index-fingers, M M', of spring metal, whose free extremities extend to points upon the platen just in the rear of the path of imprint of the type-wheel. These fingers or pointers serve the purpose of guides to the operator in the alignment of his paper to receive the impression. As more fully detailed hereinafter, the paper is passed beneath the fingers M M' and bar I''' during the operation of the machine. The type-wheel Q, whose particular construction will be hereafter set forth, is mounted upon the operating-lever O, having a suitable projecting hand-grasp, O', and pivoted at N<sup>2</sup> to the upright arm N<sup>4</sup> of a sliding standard, R.

The latter is mounted upon the feed-rack C, which may be right-angled in cross section, as



shown, bearing ratchet-teeth upon its rear edge. The feet of the standard are joined beneath the rack by plates  $R'$   $R^2$ , holding the standard in place thereon, while permitting its longitudinal movement.

The operating-lever  $O$  is prolonged beyond the pivotal point, as shown, and at its rear extremity is bent in  $V$  shape, having a forwardly-extending auxiliary arm,  $O^2$ .

A coiled spring,  $S$ , extends from a lug,  $R^3$ , upon the standard to a like lug at the angle of the  $V$ -shaped projection of the lever, and serves to hold the latter, together with the type-wheel, normally in the position shown in full lines in Fig. 3.

At its inner extremity, opposite the ratchet-teeth of the feed-rack, the arm  $O^2$  is bifurcated, as shown, and between the two forks or branches is pivoted the shoe shaped pawl, having a locking-heel,  $T'$ , and toe  $T^2$ . To one side of the arm  $O^2$  is attached the flat spring  $L^3$ , which, passing between the branches of the arm, bears upon the toe part of the pawl, forcing said toe constantly toward the rack-teeth.

A releasing-lever,  $U$ , pivoted between lugs upon the standard, extends downwardly between the pawl-toe and rack-bar and serves to separate the two when it is desired to slide the standard backward by hand in a direction contrary to the line of feed.

The type-wheel is of a composite character, consisting of a number of disks (in the present instance two) bearing upon their peripheries the printing-type.

The type are preferably made removable by the means illustrated in Fig. 6. Each one is provided with the retaining-notch  $f$  of semi-circular contour. The periphery of the main portion  $V$  of the disk is constructed with a series of equally-spaced cavities, within which fit the type. The latter are held in place by means of two annular plates,  $M^3$  and  $N^3$ , removably secured to the circumference of the main disk. The plate  $N^3$  is provided with a groove, within which is soldered the wire- $P^3$ . The notches  $f$  of the type engage with this retaining-wire, preventing the type from falling out and locking them securely in position.

It is evident that the character or arrangement of the type may be readily varied by removing the holding-plates, the substitution being quickly effected.

The disks  $W$   $W'$  are identical in construction. The former carries, in the machine illustrated in the drawings, the capital letters, arranged in alphabetical order, and the numerals 1, 2, 3, . . . . . 0 in sequence. The wheel  $W'$  carries the small letters, also arranged in alphabetical order, the punctuation-marks, dollar-sign, and character &. The arrangement of type may, however, be different—for instance, that of a printer's case.

The two wheels are separated by a metallic washer,  $X$ , and in the rear of the wheel  $W$  is a second metallic washer,  $X'$ , separating such wheel from the radially-toothed wheel  $Y$ ,

whose teeth have pointed or deflecting ends. The wheels  $W$   $W'$ , washers  $X$   $X'$ , and wheel  $Y$  are joined together by uniting-screws, and are adapted to revolve as a whole upon an axle-pin,  $J^3$ , which passes through their centers and screws into the end of the lever  $O$ , as shown.

The hand grasp  $O'$  is hollowed out for the reception of the screw, and is secured to the outer wheel,  $W'$ . It is provided with an annular end flange,  $Z$ , bearing an index-hand,  $Z'$ .

In the rear of the toothed wheel  $Y$  there is attached to lever  $O$  a cross-piece,  $H^3$ . From opposite ends of this cross-piece project the studs  $D^3$  and  $D^4$ , which at their free ends are internally screw-threaded. A fixed index-plate,  $Z^2$ , is attached to these studs by means of suitable screws passing through side lugs upon the plate and entering the screw-threads of the studs.

The ends of the cross-piece  $H^3$  are provided with swinging dependent arms  $H^4$   $H^5$ , bearing horizontal inking-rollers  $F^2$   $F^3$  and connected by means of a coiled spring,  $F^4$ , which serves to hold the rollers under constant pressure against the type-disks. These rollers consist, preferably, of a number of disks of felt slipped over a sleeve,  $G^3$ , upon the shaft  $G'$ , the sleeve being retained upon the shaft by the limiting milled nut  $S^3$ , but free to revolve thereon.

In the operation of the machine, the paper to be printed upon is passed between the index-scale  $P$  and the platen  $G$ , the roller being revolved by means of the turning button  $G^2$ , in order to draw the paper in. Alignment of the paper is then secured by means of the pointers  $M$   $M'$ . Supposing, now, the standard  $R$  to be at the right-hand side of the rack  $C$ , and that it is desired to print one of the letters or numerals upon the wheel  $W'$ , the frame carrying the platen is tilted by raising the cross-piece  $I''$  until the notches  $L$   $L$  are disengaged from the pins  $N$   $N'$ . It is then slid back until the rear set of notches,  $L'$   $L'$ , slip over the pins, locking the platen in such manner that its bearing-surface will be located directly beneath the type of the wheel  $W'$  when such wheel descends. The handle  $O'$  is then revolved axially by the operator, carrying with it the disk system until the index-finger  $Z'$  is brought opposite the character upon the dial corresponding to the one which it is desired to print. The lever  $O$  is then tilted toward the operator until the lowermost type, which, by a prearranged location, is the same as that indicated on the dial, is brought down upon the paper, thereby making the imprint. As the lever  $O$  is tilted forward it swings upon its pivot  $N^2$  upon the standard  $R$ . Its rear projection beyond that point is accordingly elevated against the tension of the spring  $S$  and the inner extremity of the branch arm is drawn away from the rack-bar. The spring  $L^3$ , bearing upon the toe  $T^2$  of the pivoted pawl, now comes into play, forcing the latter toward the left the distance of one tooth of the rack-bar, the heel of the pawl receding in the meantime



from the same. The handle and lever O are now allowed to tilt back to their original positions under the influence of the spring S. During this movement the resiliency of the spring S transmitted through the arm O<sup>2</sup> forces the toe T<sup>2</sup> against the rack-bar tooth said toe has just passed. The pawl can therefore only regain its original position of parallelism with the rack-bar by a movement of the pawl-support to the right. The arm O<sup>2</sup>, which is the pawl-support, being, however, in a fixed relation to the standard, the latter is moved with it toward the right until the heel of the pawl again comes in contact with the rack-bar at the completion of the backward tilting. It is evident that the distance traveled by the standard until equilibrium is thus established is equal to one tooth of the rack-bar. The wheel is then ready for a second impression.

Spacing between the words is effected by means of the lever Z<sup>5</sup> which forces back the branch arm from the rack-bar by striking the stud-pin L<sup>5</sup>. The spacing may, however, be effected by the skilled operator by the forward tilting of the wheel, inasmuch as the toe of the pawl T reaches the succeeding tooth slightly in advance of the contact of the type with the paper.

The margins left upon each side of the paper are regulated by means of the sliding stop-pieces Z<sup>6</sup> Z<sup>7</sup>, as is well understood.

If the index-finger Z<sup>1</sup> for any reason does not come exactly opposite the character to be printed, and in consequence the type is not exactly over the space to be printed upon, the required rotation of the wheel to effect such purpose is automatically effected by means of the stationary arm Z<sup>8</sup>, projecting from the forward part of the standard and the toothed wheel.

The arm, as the wheel system is tilted, striking the inclined side of the tooth next to the character indicated by the index-finger, revolves the disk slightly to the proper position to bring the particular type directly above the bearing-surface of the platen.

If the operator makes a mistake in printing during the working of the machine, it may be readily corrected by erasing the wrong character and moving the standard backward until the index-finger L<sup>4</sup> upon the side of the standard is opposite the same figure upon the scale of the rack-bar which corresponds to the figure on the platen-scale opposite the erased space. The numbering upon the rack-bar scale is for this purpose so arranged as to begin with the figure corresponding to the number of scale-divisions between the point of the index finger L<sup>4</sup> and the center of the standard R. Thus, if the number of scale-divisions between the point of the index-finger and the center of the standard, as measured on the rack-bar scale, is seven, the first division of the said scale will be numbered seven, the first division of the other scale being numbered one. Consequently the number of the rack-bar scale upon which the index-finger

rests will be the same as that directly underneath the lowermost type of the printing-wheel, thereby affording a means of adjusting the wheel with precision with respect to the platen and the paper resting thereon.

When it is desired to print a character contained upon the forward disk, W, the frame carrying the roller is shifted forward and locked in position beneath said disk, the notches L L engaging with the pins N N'. The backward sliding movement of the standard is secured by releasing the pawl from the rack-bar by means of the lever U and drawing the standard backward by hand. Spacing between the lines is effected by revolving the platen by means of the turn-button G<sup>2</sup>.

In front of the standard R is located a lug, R<sup>5</sup>, through which passes a screw, R<sup>4</sup>, the end of said screw being in the path of the tilting lever O. The screw is adjusted in such manner through the screw-threaded perforation of the lug as to permit the lever to descend far enough to allow the type upon the wheel to make imprint upon but not to perforate the paper. The screw is locked in position by means of the nut R<sup>6</sup>.

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

1. In a type-writer, the combination, with a platen, of means, substantially as described, for rotating the same, a pivoted lever located at right angles with respect to said platen, a type-wheel revolving on said lever and rotating in a vertical plane parallel with the axis of said platen, and devices, substantially as described, for intermittently moving said lever in a direction parallel with the platen, substantially as set forth.

2. The combination, in a type-writer, of a platen, a frame or carriage therefor adapted to be shifted in a direction at right angles to said platen, a pivoted lever located above said carriage, and a vertical type-disk loosely mounted on said lever and provided peripherally with a double series of type, and means, substantially as described, for intermittently moving said lever in a direction parallel with the platen, substantially as set forth.

3. In a type-writer, the combination, with a paper supporting platen, of a type-wheel mounted above said platen and adapted to rotate, as described, a feed-rack and traveling standard mounted thereon, a lever-arm bearing the type-wheel and pivoted to the standard, said arm having a V-shaped rear extension, and pawl mechanism, substantially as described, located at the free end of the extension and engaging with the feed-rack, substantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

ALFRED W. HOUCHIN.

Witnesses:

JOHN C. PENNIE,  
EDGAR T. GADDIS.