

No. 671,267.

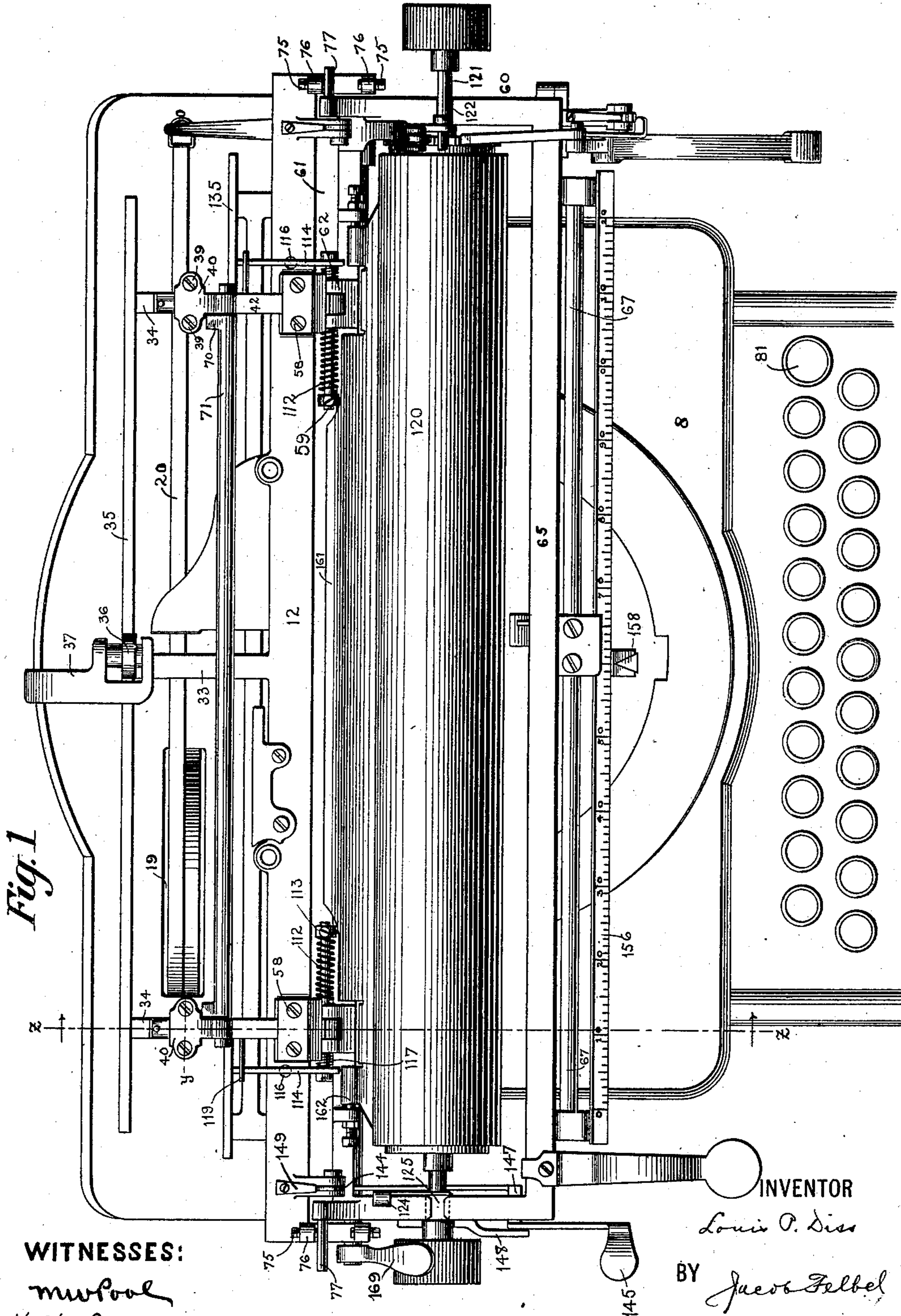
Patented Apr. 2, 1901.

L. P. DISS.
TYPE WRITING MACHINE.

(Application filed Sept. 30, 1897.)

(No Model.)

6 Sheets—Sheet 1.



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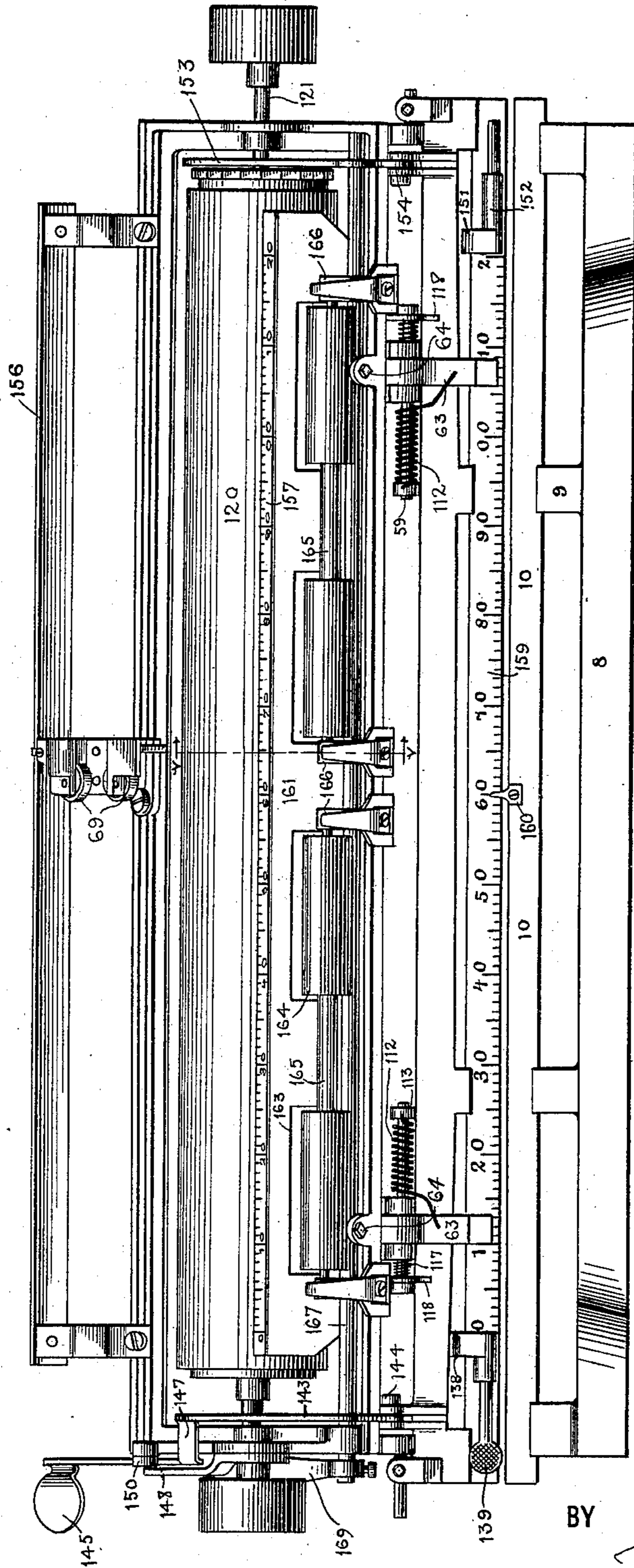
L. P. DISS.
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(No Model.)

6 Sheets—Sheet 2.

Fig. 2



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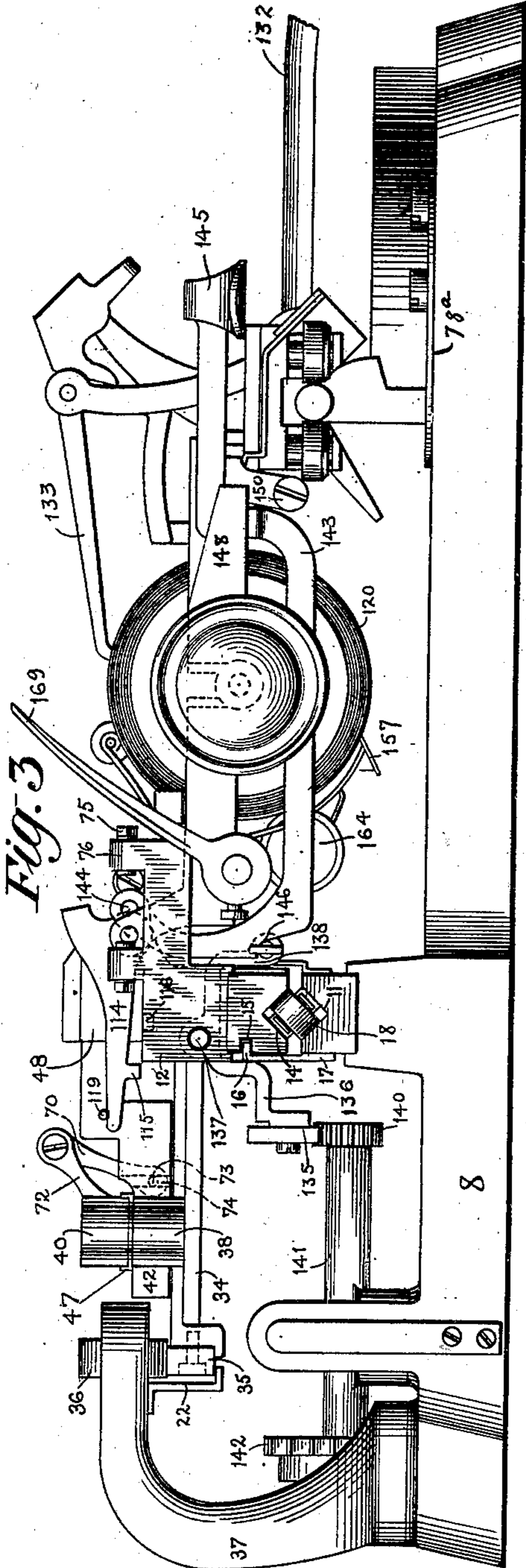


Fig. 3

WITNESSES:

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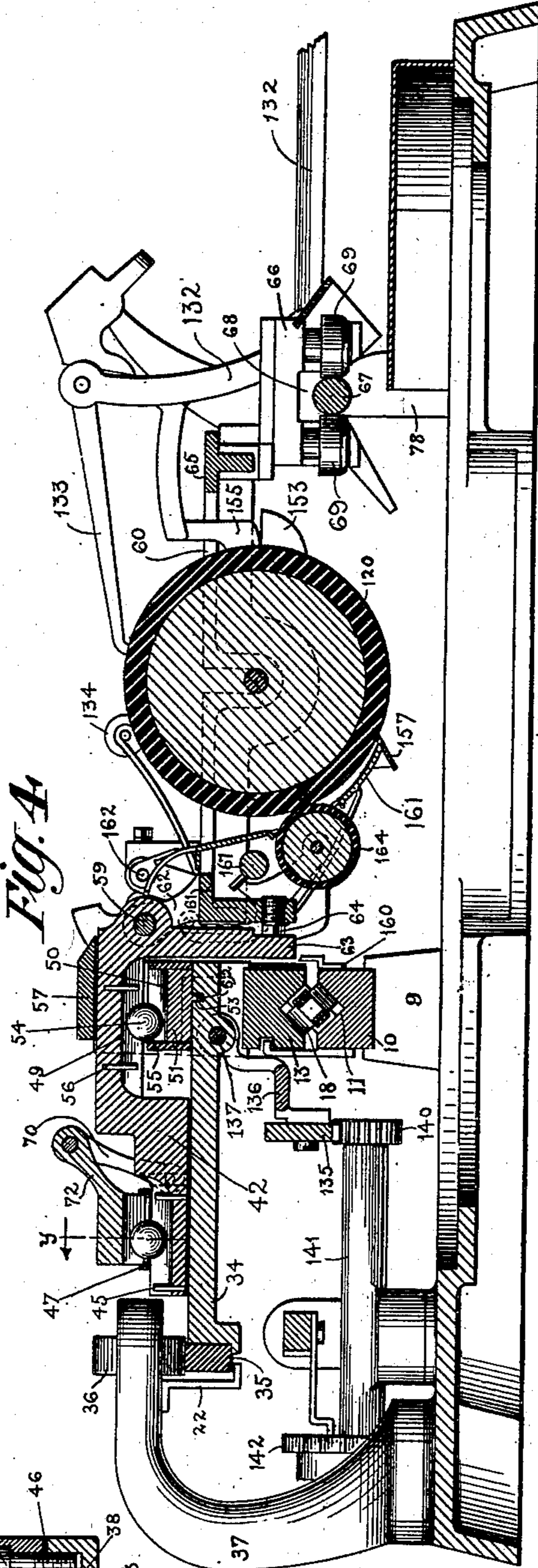
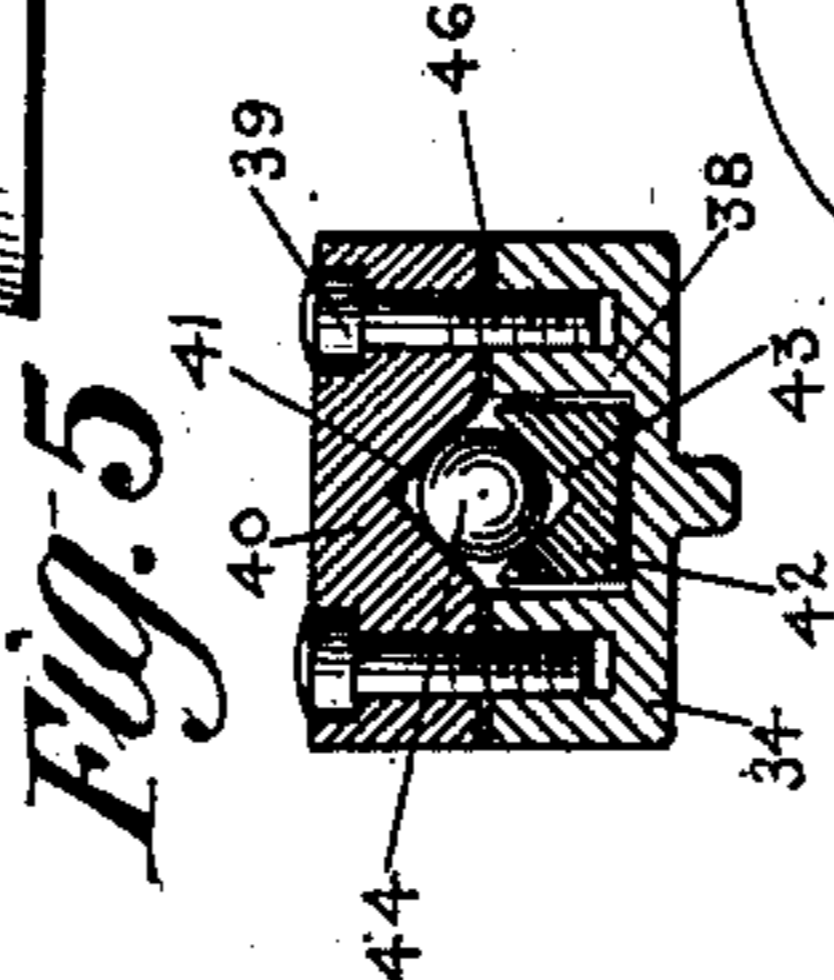


Fig. 4

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Fig. 6

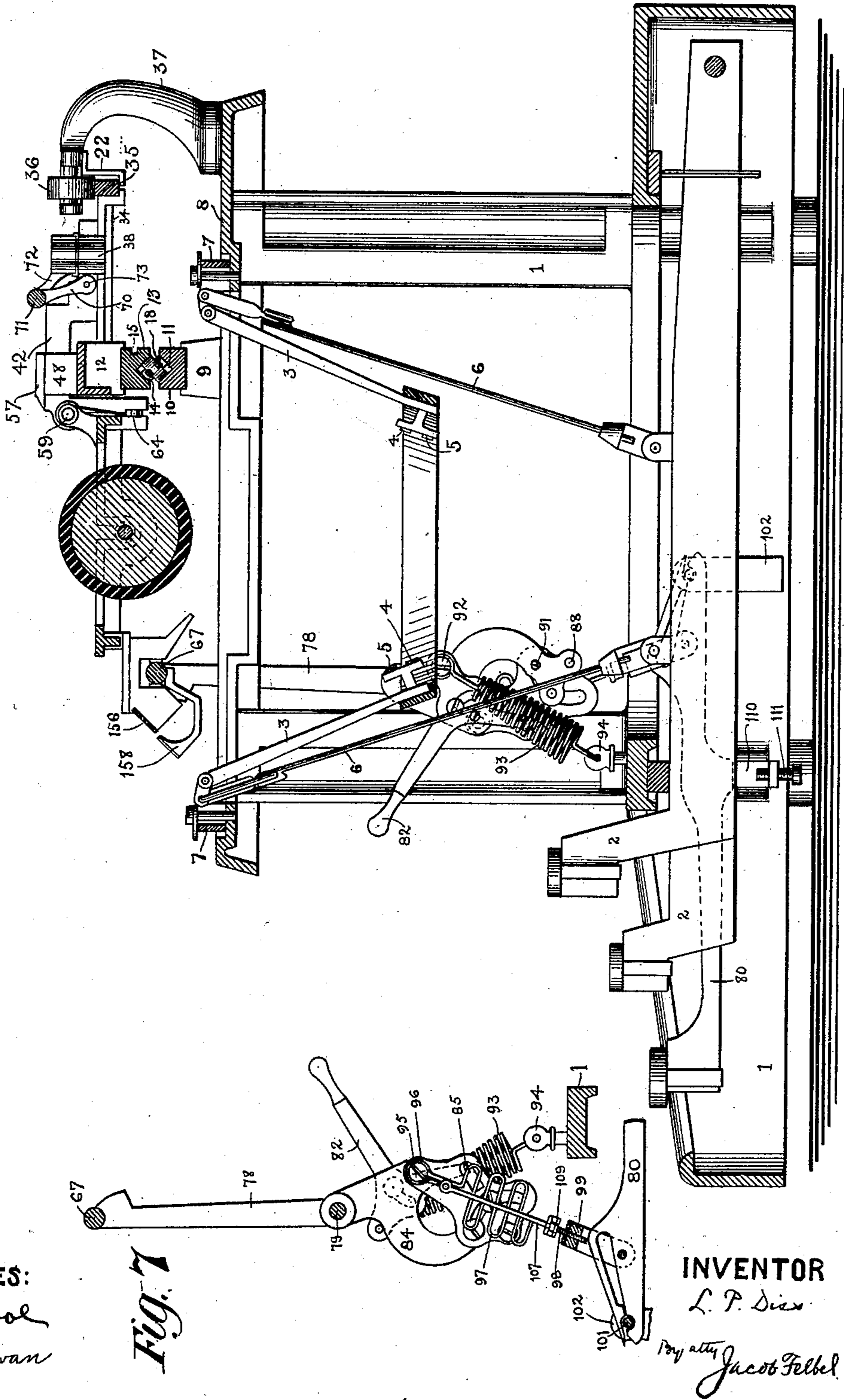


Fig. 7

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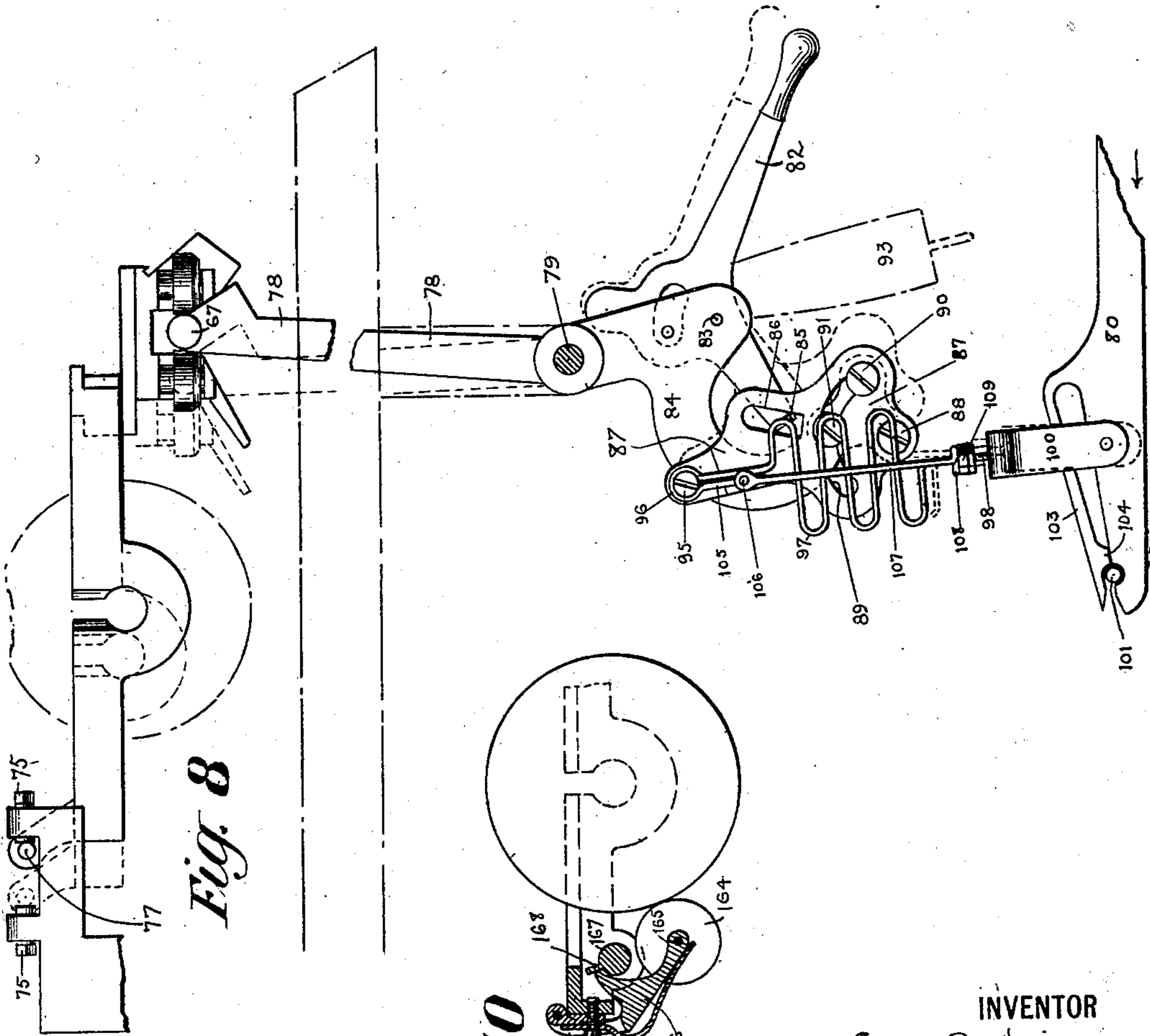
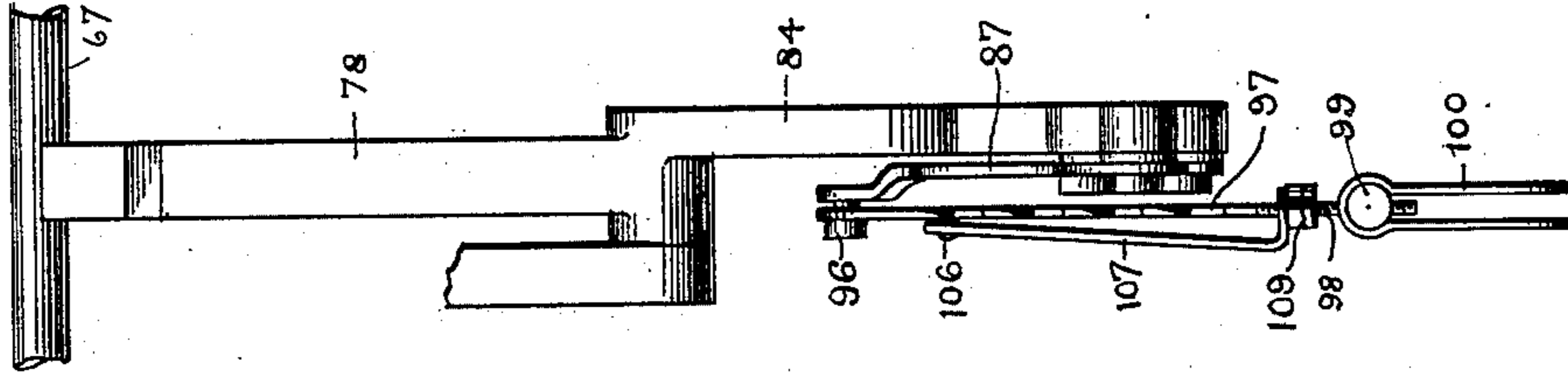
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Fig. 9



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Fig. 10

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Fig. 17

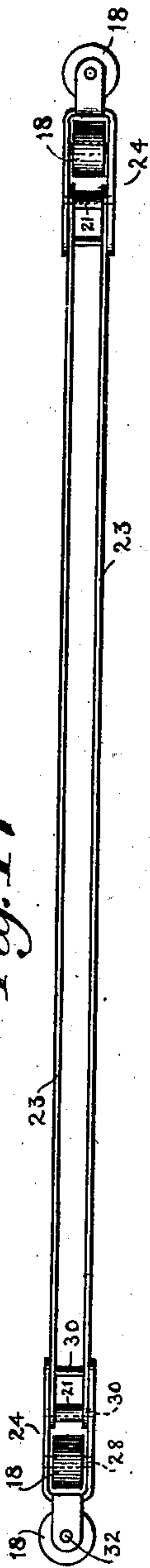


Fig. 18

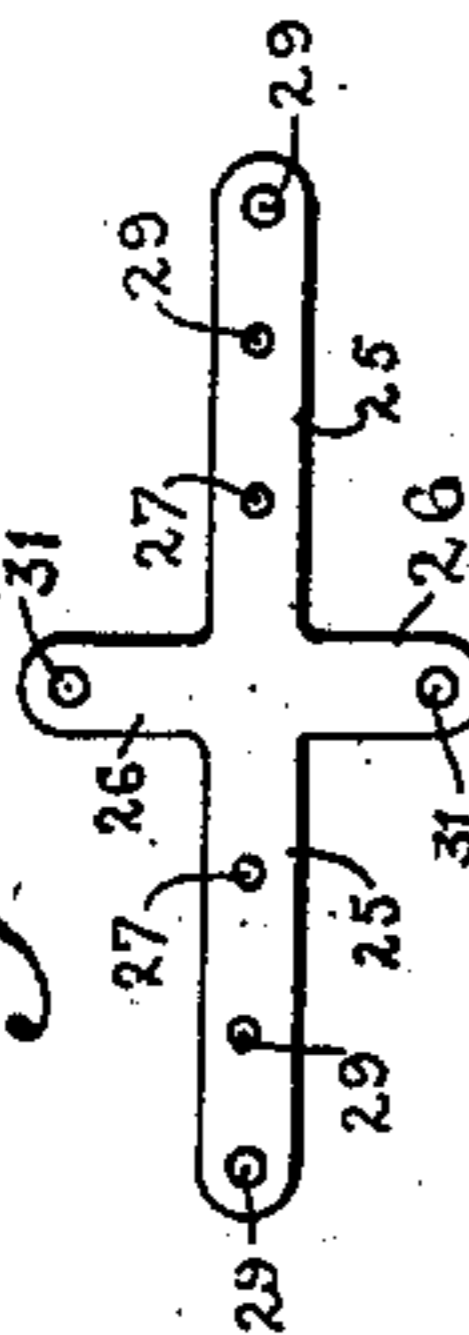


Fig. 19

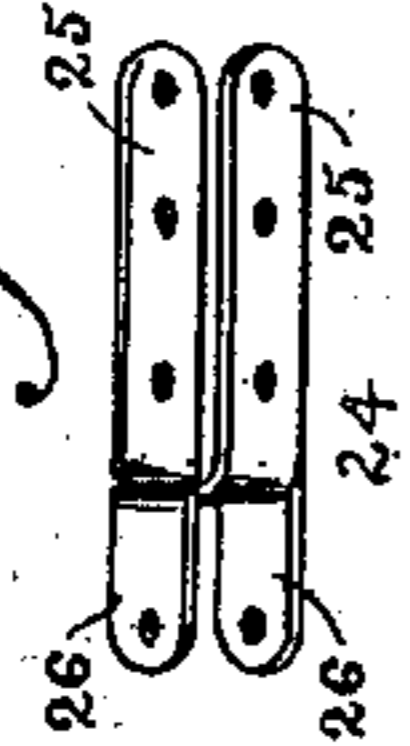


Fig. 12

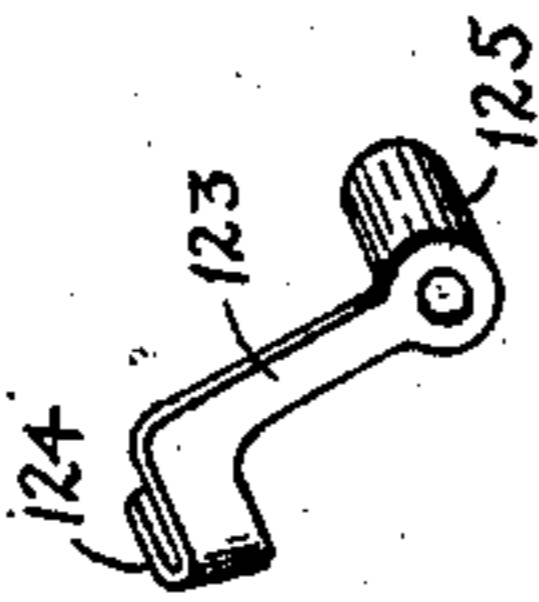


Fig. 11

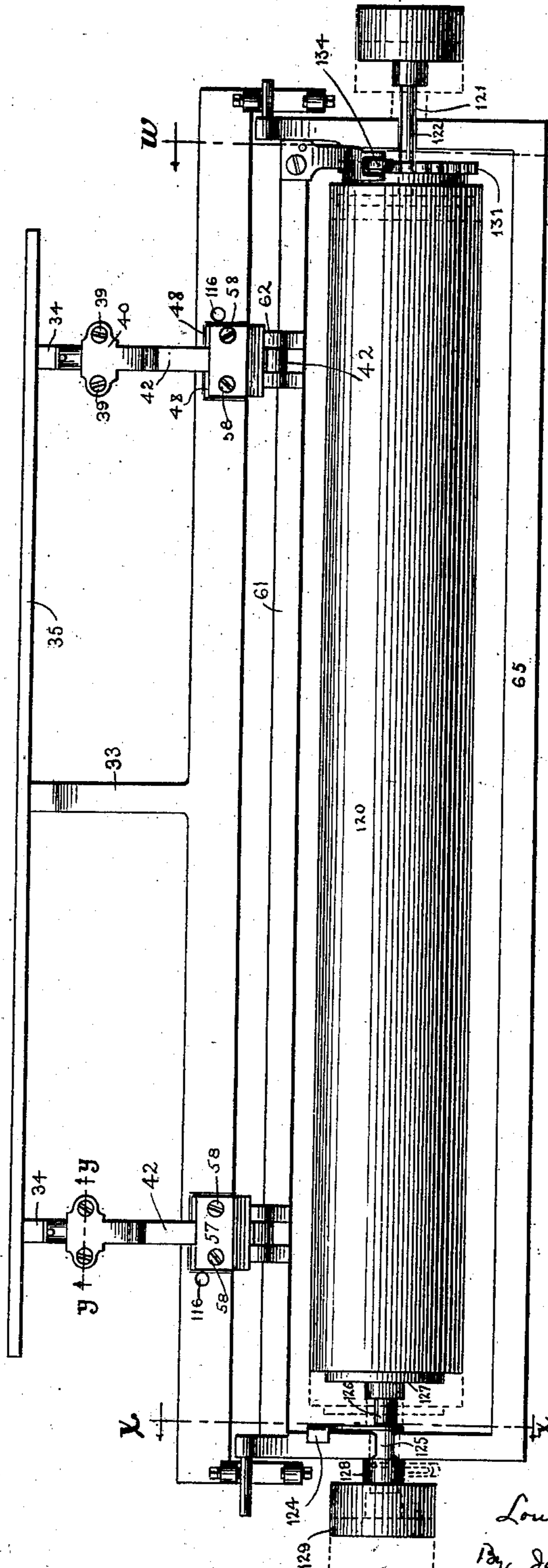


Fig. 13



Fig. 14

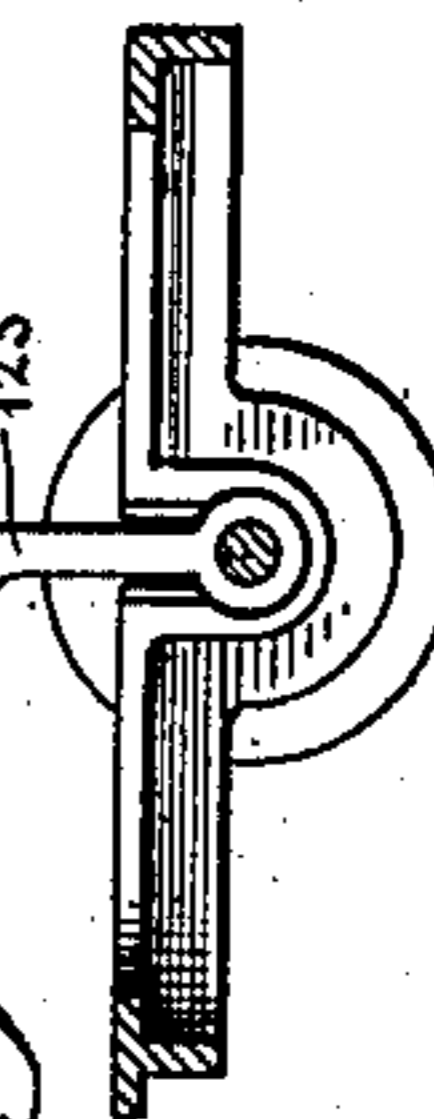
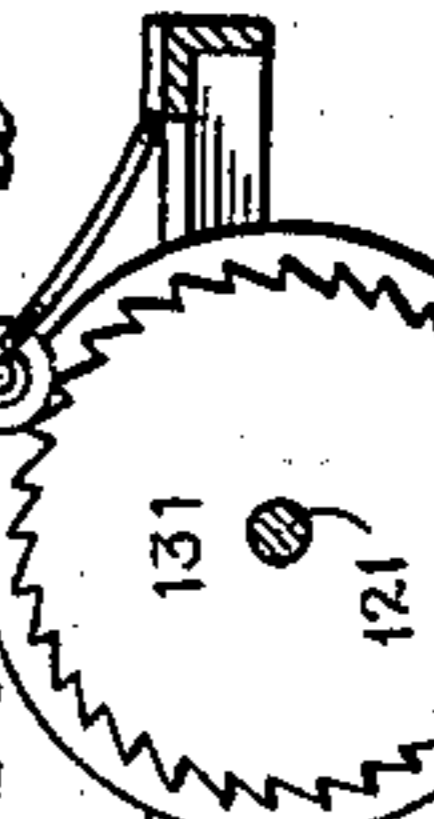


Fig. 15



Fig. 16



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UNITED STATES PATENT OFFICE.

LOUIS P. DISS, OF ILION, NEW YORK, ASSIGNOR TO WYCKOFF, SEAMANS & BENEDICT, OF SAME PLACE.

TYPE-WRITING MACHINE.

SPECIFICATION forming part of Letters Patent No. 671,267, dated April 2, 1901.

Application filed September 30, 1897. Serial No. 653,552. (No model.)

To all whom it may concern:

Be it known that I, LOUIS P. DISS, a citizen of the United States, and a resident of Ilion, in the county of Herkimer and State of New York, have invented certain new and useful Improvements in Type-Writing Machines, of which the following is a specification.

My improvements, in the main, concern more particularly the paper-carriages of that description of type-writing machines known as the "Remington No. 7" machine; but some of said improvements are applicable to other classes or types of machines.

The said improvements relate, first, to means for firmly guiding the carriage in its lengthwise movements; second, to means for guiding the platen-carriage in its transverse or shifting movements; third, to means for effecting the shifting movement of both ends of the platen-carriages simultaneously; fourth, to means for preventing the platen-carriage from being pressed too hard against its stops while the finger-pressure is on the shift-key, so as to avoid shifting the platen too far for printing in alinement; fifth, to means for suspending the platen frame or carrier; sixth, to means for readily adjusting the platen to the plane of the alinement of the type; seventh, to means for partially counteracting the weight of the platen-carriage, and, eighth, to means for readily attaching and detaching the platen. These features of improvement and others will be hereinafter more fully described, and particularly pointed out in the appended claims.

In the accompanying drawings, Figure 1 is a plan view of the machine, omitting various devices employed therein in practice, but forming no part of the present improvements. Fig. 2 is a front elevation of the machine, taken above the keyboard and showing the platen-carrier in a raised or upright position. Fig. 3 is an end elevation of the upper part of the machine with the platen-carriage down in working position. Fig. 4 is an enlarged vertical section taken at the line *z z* of Fig. 1. Fig. 5 is an enlarged vertical section taken at the line *y y* of Figs. 11, 4, and 1. Fig. 6 is a vertical central section through the entire machine. Fig. 7 is an end view

taken from the left-hand side of the machine and showing the platen-shifting mechanism. Fig. 8 is an enlarged elevation similar to Fig. 7, but showing a portion of the platen-shifting mechanism. Fig. 9 is a front elevation of the parts shown at Fig. 8, but omitting the platen-frame, the shifting-finger-key, and the switching-handle. Fig. 10 is a section at *v v*, Fig. 2, with platen-carriage in normal position and paper-guide omitted. Fig. 11 is a top plan view of the carriage and the platen-frame and showing the means for enabling the detachment of the platen from the frame. Fig. 12 is a perspective view of the platen latch or locking device. Fig. 13 is a vertical section taken at the line *x x* of Fig. 11. Fig. 14 is a similar view, but showing the locking device turned to a vertical position, which will permit the detachment of the platen. Fig. 15 is an end view showing the detail construction of the platen axle-bearing in the frame. Fig. 16 is a vertical section taken at the line *w w* of Fig. 11. Fig. 17 is a plan view of the truck or carriage rollers and their holding-frame. Fig. 18 is a plan of the blank from which the bearings for the rolls are formed, and Fig. 19 is a perspective view of the roll-bearings or forks when formed.

In the various views the same parts are designated by the same numerals of reference.

1 designates the general framework of a Remington machine, which contains, as usual, a series of key-levers 2, a series of type-bars 3, having each an upper-case type 4 and a lower-case type 5, and a series of connecting-rods 6 between said key-levers and said type-bars. The type-bars are pivotally supported in brackets or hangers 7, mounted on the top plate 8 of the framework. The top plate 8 is cast with four lugs 9 on its upper side, upon which is firmly screwed a guide-rail 10, which has a V-shaped groove 11 on its upper side.

12 designates a narrow carriage, frame, or truck, which is provided on its lower side with a bar 13, having a V-shaped groove 14 on its under side and opposing the V-shaped groove in the fixed rail 10. The said bar 13 is provided on its rear side with a rectangular groove or slot 15, which receives a horizontal flange 16, formed at the upper edge of a lon-

longitudinally-arranged plate 17, secured by
 screws to the rear side of the fixed grooved
 rail 10, the said slot 15 and flange 16 operat-
 ing as a means for holding the truck or car-
 riage from rising and being lifted. Within
 the V-shaped groove in the fixed rail and the
 V-shaped groove in the carriage or truck are
 arranged two pairs of antifriction rolls or
 disks 18. The axes of each pair of rolls are
 arranged crosswise of or at right angles to
 each other, and hence the plane of revolution
 of one roll of a pair is at right angles to that
 of its associated roll. The bearings for the
 periphery of each roll are arranged parallel
 with the axis of the roll. By arranging the
 rolls or disks crosswise of each other and in
 pairs the carriage or truck is braced against
 any moderate transverse force and is firmly
 guided in a right line in its movements back
 and forth across the machine, thereby insur-
 ing perfect alinement of the printing, while
 at the same time the said rolls or disks reduce
 the friction to the minimum, making the
 movement of the carriage extremely easy un-
 der a comparatively light tension of the driv-
 ing-spring arranged within a drum or casing
 19, which by means of a strap, cord, or belt 20
 is connected to the carriage in the usual way.
 The two pairs of rolls or disks are preferably
 connected together and maintained a distance
 apart slightly in excess of one-half the en-
 tire amount of travel of the carriage. The
 roll-tie or connecting means may consist of
 two thin and narrow plates of sheet metal 23,
 Fig. 17, riveted or fastened together at suit-
 able points and provided at their ends with
 frame 24, having slots or openings at right
 angles to each other to receive the two pairs
 of angularly-arranged rolls or disks, which
 preferably have pivots. Each roll-frame is
 formed from a piece of sheet metal cut into
 the shape of a cross, Fig. 18, so as to provide
 two arms 25 25 and two shorter transverse
 arms 26 26. The arms 25 25 are bent parallel
 with each other, Fig. 19, and the arms 26 26
 are also bent parallel with each other and at
 right angles to the arms 25 25. The opening
 between the arms 25 25 receives one of a pair
 of rolls or disks 18, and the opening formed
 by the arms 26 26 receives the other of the
 pair of rolls or disks 18. The arms 25 are
 perforated at 27 to receive the pivot 28 of the
 roll 18, and the said arms are also perforated
 in two places 29 to receive the rivets 30, by
 which they are attached to the plates or bars
 23. A small sleeve or filler 21 may be placed
 on one of the rivets between the plates or
 strips 23 to prevent undue or excessive riv-
 eting. The arms 26 are perforated at 31 to
 receive the pivot 32 of the other roll 18.

At about the middle of the truck or car-
 riage is cast a rearwardly-projecting arm 33,
 and on each side thereof, near the ends of the
 carriage, is cast another rearwardly-project-
 ing arm 34. To the extremities of the said
 arms 33 and 34 is screwed a plain bar 35,
 which is arranged parallel with the carriage

and which in length exceeds slightly the
 length of travel of the latter. The upper side
 of the bar 35 bears against a vertically-ar-
 ranged antifriction-roller 36, whose axle or
 pivot is mounted in the forked end of a
 curved bracket 37, extending up from the
 top plate and projecting forwardly toward the
 carriage. The said bracket also supports a
 flanged arm 22, which prevents the bar 35
 from descending when the platen-carriage is
 turned up.

At near the rear end of each arm 34 and on
 the upper side thereof is cast a box or hous-
 ing 38, to which is secured by screws 39 a top
 or cap 40, which on its under side is formed
 with a V-shaped way or groove 41, Fig. 5.
 Within each box 38 is loosely arranged the
 rear end of a slide-bar or cantaliver 42, hav-
 ing on its upper side a V-shaped groove 43,
 opposing that in the cap-piece. A single anti-
 friction-ball 44 is arranged within the said
 V-shaped grooves 41 and 43 to form a ball-
 bearing for the rear end of the slide-bar or
 cantaliver 42, and which slide-bar at the ends
 of its groove 43 is provided with two pins 45
 for confining the ball within said groove. A
 thin sheet-metal plate 46 is arranged between
 the housing and its cap-piece and is formed
 with upturned flanges 47 at each end for the
 purpose of preventing the escape of the ball
 from the groove 41 in the cap-piece.

Each slide-bar or cantaliver 42 is stepped
 upwardly from its rearmost portion and is
 extended forwardly for connection with the
 platen frame or carrier, as will be presently
 described.

Cast on the upper side of the carriage-bar
 or truck at near each end are two lugs 48,
 between which the forward portion of the
 slide-bar is arranged, and the under side of
 the slide-bar at this locality is formed with a
 V-shaped groove 49, which opposes a like
 groove 50 in a small steel block 51, seated be-
 tween said lugs and having on its under side
 a pin 52, that is fitted into a hole 53 in the
 carriage-bar. Between the two V-shaped
 grooves 49 and 50 is a single antifriction-ball
 54, and at each end of the grooved block is
 provided a stop 55 to prevent the escape of
 the ball, while on the under side of the for-
 ward portion of the slide-bar are pins 56,
 which are also provided for the purpose of
 retaining the ball in position. The upright
 lugs 48 on opposite sides of the slide-bar do
 not contact therewith. A cap-piece 57 is se-
 cured by screws 58 to the upper ends of the
 lugs 48, but its under side does not touch the
 upper surface of the slide-bar. By means of
 the housing 38 and its cap-plate 40 and the
 pair of lugs 48 and its cap-plate 57 the slide-
 bar is confined loosely in working position
 both laterally and vertically and operates
 without sliding friction against these mem-
 bers, while reciprocating freely upon the ball-
 bearings provided.

At the forward end of each slide-bar is
 formed horizontally a perforation to receive

the pivot or hinge-pin 59 of the platen carrier or frame 60, and whereby the latter may be swung up and down about said pins for inspection and correction of the work, &c.

5 On the back bar 61 of the rectangular platen-frame at near each end and in line with the slide-bar is formed or provided a forked bracket 62, having eyes or perforations in its branches and through which and the perforations in the forward end of the slide-bar
10 passes the hinge-pin or pivot 59 of the platen-carrier. The pins 59 are fast to the forked brackets 62 of the platen-carrier and turn in the perforations in the forward ends of the
15 slide-bars as the platen frame or carrier is lifted and lowered.

The forward end of each slide-bar is formed with a downwardly-projecting arm or extension 63, and in line therewith on the back bar
20 of the platen-frame is a projecting screw 64, whose head is adapted to bear against said downwardly-projecting arm when the platen frame or carrier is down in working position.

Attached to the front bar 65 of the platen-frame is a yoke-block 66, which is adapted to embrace the shift-rail 67, arranged transversely of the machine and parallel with the truck or carriage. The said yoke-block is formed with a vertical slot or groove 68 and
25 with a pair of antifriction-rolls 69, which embrace the opposite sides of said shift-rail. The said rolls are arranged in horizontal plane, and hence have vertical pivots which are supported in the said yoke-block. No
30 portion of the yoke-block proper comes in contact with the shift-rail. The said pair of horizontal rolls run in contact with said shift-rail on diametrically opposite sides thereof and in connection with the two pairs of rolls
40 18, provided for the carriage or truck, operate to properly and firmly guide the carriages in their movements back and forth across the machine and conduce to more perfect alignment of the printing. The said pair of horizontally-arranged rolls 69 do not serve, however, in any manner nor does the yoke-block in which they are mounted operate to support the weight of the platen carriage or frame. The entire weight of the latter is
50 borne by the aforesaid pair of slide-bars or cantalivers and their bearings and also by the aforesaid plain back bar 35 and its antifriction-roller and bracket.

When the platen-carriage is brought down to working position and the projecting heads of the screws 64 bear against the downwardly-extending arms of the slide-bars, the weight of the platen-carriage and its accessories being unsupported at the front side causes the
60 back bar to press firmly against its overhanging roller. Thus when the platen-frame is fully down and in suspended condition it and the carriage or truck and its back bar 35 constitute or may be likened to a lever of the first order, the fulcrum for which is formed by the two pairs of truck-rolls 18, the power-arm of the lever being represented by the

platen-frame and the weight-arm by the rear part of the carriage or truck extending back to and including the plain bar 35. In other
70 words, when the carriages are in working condition the weight of the platen-frame tends to rock the carriage or truck about its supporting-rollers 18; but this tendency is met and resisted by the bracket 37 and its anti-
75 friction-roll bearing upon the upper side of the bar 35. As a result of the described principle of construction—to wit, rollers attached to neither the fixed nor the moving rail, but rolling on one and forming supports
80 for the other—the carriage moves twice as far as the rollers. From this and from the described construction and arrangement of the carriages, rollers 18, grooved guide-rails, plain rail, and fixed roller 36 over the plain
85 rail it will be seen that the carriages are firmly guided and are always supported at three points, one of which is fixed and in line with the printing-point substantially and the other two of which are movable, but are al-
90 ways situated one at each side of a line joining the printing-point and the fixed point of support 36. This provides a steady support for the platen and maintains it in proper alignment at all times at the printing-point with
95 respect to the type.

The slide-bars are purposely loosely fitted and mounted on ball-bearings in order that the platen-frame may be easily and freely shifted transversely for upper-case writing
100 and also for the purpose of enabling the weight of the platen-frame to hold the balls firmly between the grooves of the bars and the grooves of the truck or carriage. The weight of the platen-frame operates with a
105 downward force upon the forward pair of balls 54 and with an upward force on the rear pair of balls 44, thus maintaining the balls firmly in their V-shaped grooves or bearings. The result of this construction is the provi-
110 sion of desirable and efficient means for firmly guiding the platen-carriage in its shifting movements, while at the same time reducing the resistance to shifting to the minimum, thus making the action at once easy, light,
115 and accurate.

In order to effect a movement of both ends of the platen-frame simultaneously, the two slide-bars are connected together by means of two depending rocker-arms 70 and a lon-
120 gitudinally-arranged rock-shaft 71, pivoted at its ends in extensions 72, projecting forwardly and upwardly from the cap-plates 40. At the lower free end of each rocker-arm is a laterally-projecting pin 73, which engages
125 a vertically-disposed slot or groove 74 on the inner side of the slide-bar and has a slight up-and-down motion therein as the slide-bars are shifted back and forth. By reason of this connecting means between the two widely-
130 separated slide-bars the latter are caused to move in unison and to the same extent at all times. The platen-carrier being mounted or suspended from two independent cantaliver

members, it is found desirable to provide some such means as the oscillating connecting device just described to insure that the said members shall always move in unison, not only during the shifting action, but at other times, for if each one were permitted to move independently the pressure upon one end of the platen-frame would produce a cramping effect, or the platen-frame would be shifted or skewed to the extent permitted by its stops whenever the operator should take hold of the handle and move the carriage quickly to the right or should hold the handle while the carriage is permitted to travel down toward the left or when inserting paper or turning the platen for any purpose.

The shifting movements of the platen-frame rearwardly and forwardly are limited or defined by screw-stops 75, arranged in ears 76 in forward projections of the truck 12, the platen-frame having on each side or end bar a laterally-projecting pin 77, which plays between said stops. The front side of the platen-carrier by means of its yoke-block embracing the shift-rail 67 whenever the latter is vibrated the platen-carrier is caused to move therewith in a direction at right angles to the motion of the letter-feed of the carriage, and at such time the slide-bars reciprocate on their ball-bearings and the oscillator is rocked as the said slide-bars move back and forth.

The shift-rail, as heretofore in this class of machines, is mounted upon the upper ends of a pair of upright rocker-arms 78, having a pivot-shaft 79 in the frame of the machine below the top plate. These rocker-arms have extensions below their pivot-shaft, which are connected to shift key-levers 80 and 81 at each side of the machine. The connections at the shift-key 81 on the right-hand side do not involve any new construction, but those at the shift-key 80 embody novel features, which will be presently described. The lever mechanism at this side of the machine is identically the same in construction and mode of operation as heretofore used in Remington machines. This mechanism comprises a hand-lever 82, Figs. 5, 6, 7, and 8, pivoted at 83 to the curved arm 84, depending below the pivot-shaft 79 and formed integral with the rocker-arm 78. The said hand-lever is made angular, and on its inner shorter arm is provided with a stud 85, which plays in a vertical slot 86 in a plate 87, pivoted at its lower end at 88 to the lower extremity of the curved arm 84. This plate has an arc-shaped slot 89 struck from the pivot 88 as a center, and the ends of said slot serve to limit the vibration of the said plate, there being two screws 90 and 91, which cooperate with the ends of the slot in the limiting actions. The hand-lever is provided with a screw or pin 92, to which is attached the upper end of a coiled spring 93, whose lower end is attached at 94 to the framework of the machine. The said spring operates to return the platen to its normal posi-

tion when the shift-key is released, and it also serves, in connection with said hand-lever mechanism, to hold the platen temporarily in either of its two positions—that is to say, when the hand-lever is turned to the position shown at Figs. 6 and 7 and the platen is held in its upper-case or capital-letter position with the stop-pins 77 of the platen-carrier in contact with the back stop-screws 75 on the carriage or truck, and if the shift-key be pressed while the platen is in its rearmost or upper-case position the platen will be drawn forwardly until the stop-pins 77 strike against the forward pair of stop-screws 75, and as soon as the pressure upon the shift-key is removed the said spring 93 will restore the platen to its first position, and which platen in all of the views excepting Figs. 8 and 9 is in its upper-case position or that position at which the upper-case types will strike the paper at the printing-point. For lower-case work the hand-lever is turned to the position shown in full lines at Fig. 8, and when so turned the said spring 93 will act to hold the stop-pins 77 against the forward pair of stop-screws 75 and will return the platen to this position after the vibration and release of the shift-key 80; but, as before explained, this general construction and mode of operation are embodied in previously-made Remington machines. The novel features of construction in connection with this shifting mechanism will now be described.

At the uppermost end of the plate 87 is an outwardly-projecting screw or pin 95, surrounding which is an eye 96, formed at the upper end of a zigzag or snake-like wire 97, having half a dozen (more or less) folds or turns, and which at its lower end is formed with a straight threaded portion 98, which screws into a bushing or filler 99 in a strap 100, which is riveted or attached to the release-key lever 80, the fulcrum or pivot of which is a pin 101, fixed in a bracket or stand 102, attached to the base of the framework. The shifting key-lever 80 is made of sheet-steel and is cut out, as shown, to form a spring-tongue 103, having a tension at its free end toward the body of the lever and provided with a projection 104 to bear against the upper edge of the body of the lever to form a stop for said spring-tongue. The rear extremity of the body of the lever and also that of the spring-tongue are beveled outwardly to form between the two members a flaring mouth to facilitate the mounting of said lever as a whole upon its pivot. This is accomplished by bringing the flaring mouth in line with the pivot and then by pressing the lever endwise rearwardly or in the direction of the arrow at Fig. 8 until the pin enters the circular bearing formed by the curves or arcs in both the spring-tongue and the body of the lever. The throat or inner end of the flaring mouth being narrower than the diameter of the pivot, the spring is caused to expand in passing over said pin; but as soon as the lat-

ter comes to its bearing the spring snaps down, and thus the lever is locked or caught upon the pivot and cannot accidentally become detached therefrom. When, however, it may be desired to remove said lever, this may be accomplished by pulling it forward forcibly, thus forcing the spring member 103 outwardly, and thereby expanding the mouth.

From the eye 96 of the zigzag wire extends downwardly a straight portion or arm 105, which is formed or provided with a lateral pin 106, which is engaged at the upper perforated end of a rod 107, which at its lower end is formed with an eye or loop 108, that rests upon adjusting-nuts 109 on the screw-stem of the zigzag wire. The zigzag wire forms or constitutes a spring the tendency of which is always to lift the shifting key-lever; or, in other words, the coils or folds of this spring tend to approach each other and through the screw-stem and strap pull the lever 80 upwardly. This action, however, is resisted or checked by reason of the presence in the organism of the straight rod 107, against which the nuts 109 press in the line of the said rod and its connecting-pin 106, which pin sustains the thrust of said rod caused by the zigzag spring and prevents the latter from lifting the key-lever. At the same time the said zigzag spring operates as a connecting-rod or means of connection between the key-lever and the shifter-bar frame, or, more specifically, the means of connection between the said key-lever and the plate 87, which is mounted on the arm 84, that is connected through the arm 78 to the shifter-bar 67. Thus when the shift-key 80 is depressed the strap 100 causes the zigzag spring to descend bodily and through its connections to the plate 87 to rock the arms 84 and 78 and effect the vibration of the shifter-bar 67, and through this movement of the now practically rigid zigzag spring the thrust-rod 107 moves therewith and without any change of relationship between these two parts. The said zigzag spring, however, performs a function additional to that of a connecting means—namely, to prevent the platen-carriage from being pressed too hard against the stop-screws 75 by the finger-pressure on the shift-key and which might cause the platen to shift too far for printing in alinement. If while the platen is in its lower-case position the shift-rail were pressed back very hard for upper-case work it would be liable to cause the truck 12 to slide up on its bearing-rolls 18, and thus throw the line of print out of proper relation to the printing-point of the types. Therefore for the purpose of preventing such detrimental action the zigzag form of connection is provided, and under the circumstances of violent shifting action it operates elastically or has a yielding action between the keys and shift-frame and serves to prevent the excessive finger-pressure from being transmitted to the platen-frame and the truck or carriage. If the shift-key 80 should be pressed too hard

after the stop-pins 77 have come to a bearing against the stop-screws 75 in the shifting action represented at Fig. 8, the zigzag spring will yield to the increased pressure, the nuts 109 descending away from the thrust-rod and the folds of the spring separating or expanding to a limited but to a necessary extent. This expansion of the said spring, it will be understood, must necessarily take place before any excessive pressure can be applied to the stop-screws 75, since the force required to expand the said spring or overcome its normal tension is less than that required to cause the truck to slide on its bearing-rolls, and hence it follows that any excessive force or pressure applied to the key-lever 80 is expended in stretching the zigzag spring and cannot be transmitted to the truck or carriage 12. Thus the liability of producing improper alinement in the printing, which would otherwise result, is effectually obviated by reason of the presence in the shifting mechanism of the yielding connecting rod or zigzag spring. Of course when excessive pressure on the key is released the contractile power of the zigzag spring causes it to at once resume its normal condition and bring the nuts 109 up against the lower end of the thrust-rod again, thus restoring the shifting mechanism to its normal condition, in which the said zigzag spring operates simply as a rigid connecting-rod. This zigzag spring may be regulated by screwing up or down, as may be required, the adjusting-nuts 109. Adjusting the tension of the spring by means of the nuts effects also simultaneously an adjustment of the key-lever; but this lever may be independently adjusted to the proper height or position by screwing in or out of the bushing or filler 99, as may be needed, the screw-stem 98 of the zigzag wire, having first removed the screw 96. Underneath the key-lever, supported by the bracket 110, attached to the framework, Fig. 6, is a screw 111 to limit the descent of the said lever in a shifting action; but the said screw is so set or adjusted that the zigzag spring-wire is caused to yield or stretch before the under side of the key-lever can come in contact with said screw under a violent action of the keys, the said screw operating as a final dead-stop for the shift-key to prevent any undue or extraordinary depression of the shift-key. I prefer to make this adjustable, so that, if desired, it may be raised or lowered, so as to permit less or more tension of the spring 97, and hence enable the operator to cause the shifter-bar 67 to press the platen-frame against the carriage-stops with less or greater force. By adjusting this stop the pressure against the platen-frame may be so regulated that the latter will be held firmly against the carriage-stops, but without causing displacement of the carriage. It will be understood that such displacement would cause a disturbance of the alinement of the capital letters with the lower-case letters and would also be likely to cause a sluggish let-

ter-spacing movement of the carriage, owing to the disturbance of the rolling bearings of the latter. It will be observed that if the shift-key should be depressed with undue force the pressure thereon would be sustained partly by the said stop 111 and partly by the carriage through the described shifting mechanism. If it should be desired that the carriage sustain less of the force applied at the shift-key and that the stop should sustain more, the latter may be raised, and vice versa. It will also be noted that in carrying out this portion of my improvements the shift-key is arrested after the arrest of the platen-frame at the shifting operation, and, further, that during that portion of the shift-key movement which occurs subsequently to the arrest of the platen-frame the spring 97 is given sufficient tension to cause the platen-frame to be pressed against the carriage-stops firmly enough to insure good alinement, the engagement of the shifter-bar with a yoke that is arranged about midway of the platen-frame insuring that the latter shall be pressed against the stops at each end portion of the carriage with substantial uniformity. It will also be noted that the platen-frame shifts in a right line, so that the under surface thereof constantly coincides in height with the horizontal plane of the printing-point, and hence the limiting-screws 75 may be adjusted forwardly or backwardly without causing the platen to be correspondingly raised above or depressed below the said plane of the printing-point, as in some prior constructions. It will also be noted that inasmuch as there is constant pressure in one direction or the other between the platen-frame yoke and the shifter-bar the provision of the antifriction-rolls upon the yoke, which contributes materially to the easy-running qualities and durability of the mechanism, is a feature of importance.

Heretofore adjustable limiting-stops for the rocker-arms 78 have been arranged upon the top plate, said stops being adapted to positively arrest said rocker-arms and shifter-bar at the end of their movement in either direction; but in carrying out my present improvements I have made provision for the shifting movements of the rail or bar 67 to be limited by the carriage-stops 75, inasmuch as at the shifting operation the platen-frame is firmly pressed by said shifter-bar against said carriage-stops. For this reason it is necessary that the rocker-arms should not at the shifting operation be arrested prior to the arrest of the platen-frame, and the rocker-arm stops (indicated at 78^a, Fig. 3) should be employed only for the purpose of preventing undue vibration of the rocker-arms by reason of the tension of the shift-spring 93 whenever the shifter-bar 67 is disengaged from the platen-frame yoke at the operation of swinging up the platen-frame to exhibit the writing. These stops 78^a should therefore be so adjusted that they will not intercept the rocker-arms in their shifting movements. In

practice a clearance of one thirty-second of an inch or perhaps less between the stops 78^a and the rocker-arms in each shift position thereof is found to be sufficient. The stops 78^a do not require to be so delicately adjusted as heretofore, as they do not determine directly or indirectly the position of the platen-frame, and the adjustment of the carriage-stops may from time to time be altered slightly, as may be required, without the necessity of making a corresponding delicate readjustment of the said stops 78^a.

The square heads of the screws 64 are provided for the application of a wrench whereby said screws may be turned to adjust the platen to the plane of the alinement of the types. The presence of such an adjusting-screw in the platen-frame near each of its ends arranged to bear against the depending arms of the cantalivers enables each end of the platen-frame to be readily raised or lowered independent of the other, so that both ends of the platen may be readily brought into the plane in which the types are alined.

The pivots 59 of the platen-carrier are preferably elongated, and extended inwardly and about the elongated portion of each said pivot is arranged a coiled spring 112, one end of which may be fastened to a collar 113 at the inner end of the pivot and the other end of which spring may bear against the front side of the vertically-disposed arm or extension 63. The collar may be turned to put any desired tension in the spring, and said collar may be affixed by means of a set-screw. The tension of these springs 112 is opposed to the weight of the platen carriage or frame. The platen carriage or frame, especially in machines intended for wide paper, as is the machine illustrated, is necessarily of considerable weight, and inasmuch as it has to be lifted by the operator many times a day it is desirable to make it as light as possible. At the same time enough weight must be provided in all parts of the platen and frame to get the full benefit of the impact of the types. Even when the weight of the platen-frame and its accessories is reduced to the minimum there is yet considerable weight to be lifted by the operator, and it is for the purpose of reducing this load to some extent that the springs 112 are employed. The said springs may have a tension equal to about one-half of the weight of the platen-carrier, thus reducing the load to be lifted by the hand of the operator about one-half.

The platen-carrier pivots 59 may each be provided with a latch 114, pivoted thereto and having on its under side a lug 115, adapted to a hole 116 in the top of the truck or carriage 12 for the purpose of preventing the platen-carrier from accidentally shifting when it is turned up for inspection of the work, the arrangement being such that when the platen-carrier is thus swung up the lug 115, which normally slides above the top of the truck, drops into the said hole and prevents any

rearward shifting action of the platen-carrier, assuming that the platen-carrier is arranged in its normal or lower-case position. When the platen-carrier is locked or latched for the time being in its upper-case position and the upper-case types alone are being used the said lug will stand normally just back of the rear upper edge of the truck 12, as shown at Fig. 3, so that when the platen-carrier is lifted said lug will be caused to drop behind said edge and prevent any accidental shifting of the platen-carrier forward. The said latch 114 is preferably pressed against the head of the pivot 59 by a coiled spring 117, so that the said latch is carried up and down by reason of its frictional contact or engagement with the head of said pivot. On lifting the platen-carrier and turning it about the pins 59 the latch or latches 114 are carried down by the described frictional connection with the pins 59 until they are stopped by the bar 12 of the carriage, after which the latches remain stationary during the further upturning of the platen. On turning the platen and its carrier down again the aforesaid frictional connections first raise the latches 114 up against the stops 119, after which the latches remain stationary, pivoting on the pins 59, while the platen and carrier continue their motion to normal position. On lifting and on turning down the platen-carrier, as just described, the pins 59 are rotated, as will be understood from the described construction and arrangement of the parts 42, 59, 62, 63, 112, and 113. The latch is provided with a downwardly-extending tang or finger 118, Fig. 2, against which part of the platen-carrier strikes when it is turned down, so as to positively vibrate the latch upwardly and cause its lock to stand always normally above the top of the truck and its upper end to bear against a stop-pin 119 on the slide-bar in case the frictional connections aforesaid should not lift the latches, as above set forth.

120 designates the platen or printing-roller, and 121 its axle, which has a bearing at its right-hand end in a plain vertical slot 122 in the right-hand end bar of the platen-frame. The opposite end of the platen-axle is provided with a device for latching or locking the platen within its frame. The said device consists of an arm 123, which is provided at its free end with a hook-shaped finger-piece 124 and at its opposite end with a sleeve or bearing 125, loosely encircling the platen-axle, so that the device as a whole may be readily turned thereupon. The said locking device, while free, to turn is prevented from moving endwise toward the platen by means of a collar 126, extending from the left-hand platen-head 127, and from moving outwardly or toward the left by a collar 128, extending in from the knurled hand-wheel 129, fixed to the left-hand extremity of the platen-axle.

The left-hand end bar of the platen-carrier has a keyhole-shaped slot 130, or one which is circular in form at its lower end and straight

or parallel-sided at its upper end, the width of the latter being less than that of the former. The sleeve 125 of the latch is adapted to pass through the circular portion of the keyhole-slot and the arm or shank 123 to pass through the straight portion of said slot in the operations of attaching and detaching the platen from its carrier.

By referring to Figs. 1 and 11 it will be observed that the right-hand end of the platen-axle, which also bears a hand-wheel, is prolonged beyond the platen-carrier end bar, and owing to this fact the said platen-axle of the platen may be slid endwise toward the left for the purpose of detaching the platen; but before this detachment can be accomplished the shaft or arm 123 of the latching device, which in the normal locked position of the platen occupies a substantially horizontal position, as shown at Fig. 13, and the free end of the hooked portion bearing down upon the top of the platen carrier and bar, must be turned up to a vertical position, as shown at Fig. 14, whereupon the platen and its axle may be pushed or pulled endwise toward the left, the sleeve 125 passing out through the circular portion of the keyhole-slot and the shank passing out through the straight portion of said slot and beyond same up to the outside of the platen-carrier end bar, as shown in dotted lines at Fig. 11. When the platen has been shifted endwise to this position, it may be removed from its frame by simply lifting the same therefrom. This affords a ready and convenient means for removing the platen from the machine for the purpose of making repairs or exchanging the platen. It will of course be understood that when it may be desired to replace the platen or insert a new one similarly constructed the reverse of the operation described is performed. After the platen has been restored to its proper position the latch is turned down to the horizontal position shown at Fig. 13, with the arm or shank 123 lying substantially parallel with and against the inner face of the side bar, so that there is no liability of accidental derangement or detachment of the platen. When the platen is in working position, the sleeve 125 rests at the bottom of the keyhole-slot and the platen-axle turns within the same during the rotative movements of the platen. The platen, as usual, is provided at its right-hand end with a line-spacing ratchet-wheel 131, which is adapted to be rotated step-by-step by a line-spacing lever 132, having a driving-pawl 133 of the usual construction and which need not be further described. The platen may also have a spring-pressed detent-roller 134, as usual.

135 designates the feed-rack, which by arms 136, pivoted at 137, is connected to the truck 12. The arm 138 extends forwardly from said pivot at the left-hand end of the machine, and to said arm is secured a horizontally-arranged finger-piece 139, which when pressed

upon operates to raise the feed-rack from out of engagement with its pinion 140 on the inner end of a shaft mounted in a suitable bearing 141, and provided at its rearmost end with an escapement-wheel 142, adapted to the usual letter-spacing dogs. (Not shown.) This finger-piece 139 may be pressed upon either directly by the thumb of the operator when the platen-frame is in an upturned position, as shown at Fig. 2, to release the carriage for rapid movement in either direction, or it may be acted upon by a finger key-lever 143, pivoted at 144 at the left-hand end of the main non-shifting carriage and extending outwardly at the front side thereof, where it is provided with a finger-piece 145, which when depressed causes the rear beveled or inclined portion 146 of said lever to press against the said finger-piece 139, and thus therethrough lift the rack from its pinion, so as to release the carriage for rapid movement. The said release key-lever 143, while pivoted on the main carriage or truck, has its forward end or finger-piece carried or brought to the outer side of the left-hand end bar of the platen-frame, as shown at Figs. 1 and 2, by reason of a lateral outwardly-extended bend 147 in said lever. In order to prevent any accidental bending outwardly or to the left of the outer or forward end of the release key-lever, an arm 148, parallel with the end bar, is provided, and which, together with said end bar, forms a slot for the working of said release-key and for its guidance and protection. The release-key has a small projection just back of the line of its pivot 144, upon which bears the free end of a flat spring 149 for the purpose of holding the front or finger-piece end of the release-key normally in a raised position and for restoring it thereto after the said release-key has been depressed and the pressure removed. The downward movement of the release-key may be limited by a stop in the form of a screw 150.

At the right hand of the truck is another arm 151, similar to that marked 138, which has a horizontal outwardly-projecting integral portion 152 to cooperate with another release-key 153, generally similar to that marked 143, but unprovided with a finger-piece. Said release-key is pivoted at 154 and at its free forward end terminates under the footpiece 155, extending in from one arm of the line-spacing lever 132, so that when said lever is vibrated to rotate the platen and at the same time to return the carriage to the right for the beginning of a new line said release-key, operating on the extensions 152 of the arm 151, connected to the rack, operates to simultaneously lift the rack from engagement with its pinion, and thus obviate the wear which would otherwise take place on said rack and pinion.

On the front side of the platen-carrier is mounted a scale-bar 156, which in the present long-carriage machine for wide paper is marked and graduated for one hundred and

twenty (120) letter-spaces, and on the under side of the platen, in the vicinity of the printing-place, is arranged another scale 157 of equal length and, like the scale 156, marked to read from left to right. For the scale 156 is provided a pointer or index 158, which may be attached to the shifter-bar 67. This scale and pointer indicate the progress of the platen-frame when it is down in working position. When the platen-frame is in its turned-up position, as shown at Fig. 2, the scale 157 is brought to view, and said scale, as heretofore, serves to locate an error which is to be corrected when the platen is turned down to working position. In addition to the said two scales 156 and 157 there is provided a third scale 159, of equal length and similarly graduated to read from left to right. This last-mentioned scale 159 is on the front of bar 13 and is designed to cooperate more particularly with the platen-scale 157 to facilitate the correction of errors. In a machine of this class, where the type strike on the under side of the platen, the platen must be turned up to the position shown at Fig. 2 when the paper is reinserted or fed backward for the correction of an error in order to bring the place or places to be corrected to the line or plane at which the types strike. Supposing while the platen is in its upturned position the scale 157 shows that a correction must be made at, say, the point marked "50" on its scale, the carriage may now be moved at once either to the right or to the left, as may be required and as rapidly as may be desired, by means of the release-key 139, so that the graduation marked "50" on the scale 159 is brought into register with the stationary pointer 160, preferably fixed on the guide-rail 10. This action brings the point to be corrected in the vertical plane of the printing-center, and hence the platen-carrier may now be turned down to working position and the type immediately struck without any further adjustment of the carriage. This combination of the two scales 157 and 159, both showing in the upturned position of the carriage, greatly facilitates the work of correction and has been found in practice to be a desideratum.

The platen-scale 157 is preferably mounted at the lower forward end of a paper guide or deflector 161, pivotally mounted at 162 on the back bar of the platen-carriage and spring-pressed toward the platen. The said guide or deflector is cut away at 163 for the protrusion of sectional feed-rollers 164, arranged in pairs on two separate axles 165, which axles are mounted in spring-pressed arms or hangers 166.

A release-shaft 167 extends the entire length of the platen-frame, and each feed-roller, hanger, or arm is provided with a wing 168, Fig. 10, by which when the said shaft is rocked by means of the hand-lever 169 all of the feed-roller hangers or arms may be simultaneously vibrated outwardly from the platen,

and thus cause the feed-roller sections to move away from contact with the platen to facilitate the insertion and removal of the paper.

5 Some of the improvements herein shown and described are the invention of George B. Webb and of course will not be claimed herein by me, and also some of the improvements set forth in this application are predicated on other inventions of Webb's, which
10 inventions will be made the subject-matter of an application which will be filed shortly in the name of Webb. The improvements invented by me will be particularly set forth in
15 the appended claims.

What I claim as new, and desire to secure by Letters Patent, is—

1. In a type-writing machine, the combination of a fixed grooved guide-rail, a carriage having a groove opposing that in the
20 fixed guide-rail, the two pairs of crossed rolls or disks 18, each pair being mounted in a frame comprising the arms 25 and 26, said frames being each formed from a cross-shaped
25 plate of sheet metal by bending, and the said frames being connected together by the longitudinal parallel strips or plates 23; substantially as set forth.

2. In a type-writing machine, the combination of a carriage mounted on roller-bearings and provided with a back bar, means for preventing said back bar from rising and the carriage from rocking about said roller-bearings, and a platen-carrier hinged to parts
30 on said carriage and suspended therefrom in a manner such that it may be shifted transversely independently of any movement of said carriage; substantially as set forth.

3. In a type-writing machine, the combination of a carriage having a back bar, means for preventing said bar from rising, a platen-carrier adapted to shift back and forth transversely and independently of said carriage, and so hung that its entire weight is suspended from said carriage, whereby when the
40 platen-carrier is down in working position the main carriage and the platen-carrier constitute in effect a lever of the first order; substantially as set forth.

4. In a type-writing machine, the combination of a carriage having a back bar, an overhanging bracket to resist any upward motion of said bar, and a transversely-shifting platen-carrier pivotally suspended at the
45 front side of said carriage and wholly supported thereby; substantially as set forth.

5. In a type-writing machine, the combination of a carriage having a back bar, an overhanging abutment therefor, means wholly
50 supported on said carriage and adapted to slide back and forth transversely of the same, and a platen-carrier hinged to said sliding means; substantially as set forth.

6. In a type-writing machine, the combination of a carriage having only a rectilinear motion, a pair of slide-bars wholly supported
65 thereon and adapted to move transversely

thereof, and a shifting platen-carrier pivotally connected to said slide-bars; substantially as described. 70

7. In a type-writing machine, the combination of a carriage having a to-and-fro rectilinear motion only, a pair of slide-bars wholly supported on said carriage and adapted to move transversely thereof, and a shifting
75 platen-carrier pivotally connected to and wholly suspended from said slide-bars at their front ends; substantially as described.

8. In a type-writing machine, the combination of a carriage, a sliding frame thereon
80 adapted for movement transversely of said carriage, and a platen-carrier pivotally suspended from the front side of said sliding frame; substantially as set forth.

9. In a type-writing machine, the combination of a carriage, a pair of slide-bars mounted on and adapted to move transversely of
85 said carriage, and a platen-carrier attached to the forward ends of said slide-bars; substantially as set forth. 90

10. In a type-writing machine, the combination of a carriage, a pair of slide-bars mounted to move transversely thereof, and a platen-carrier pivotally suspended from and in front of
95 said slide-bars; substantially as set forth. 95

11. In a type-writing machine, the combination of a carriage having a pair of transversely-movable slide-bars, means for connecting the same together, and a platen-carrier pivotally suspended from the front of
100 said slide-bars; substantially as set forth. 100

12. In a type-writing machine, the combination of a carriage, a pair of transversely-movable slide-bars thereon, a rock-shaft and rocker-arms connecting said slide-bars together, so as to cause them to move in unison,
105 and a platen-carrier attached to the forward ends of said slide-bars; substantially as set forth. 105

13. In a type-writing machine, the combination of a carriage, a pair of slide-bars mounted to move transversely thereon on ball-bearings, and connected together to move in unison, and a platen-carrier pivotally suspended
110 from the front of said slide-bars; substantially as set forth. 115

14. In a type-writing machine, the combination of a carriage having a back bar, means for resisting the upward tendency of said bar, a pair of slide-bars adapted to move transversely on said carriage and provided with
120 downward extensions, and a platen-carrier hinged or pivoted to said slide-bars and provided with parts which bear against the said downward projections when the said platen-carrier is down in working position; substantially as set forth. 125

15. In a type-writing machine, the combination of a carriage having a back bar, an overhanging bracket, a slide-bar, and a platen-carrier pivotally suspended from said slide-bar;
130 substantially as set forth. 130

16. In a type-writing machine, the combination of a carriage having a back bar, an

overhanging bracket, a lower ball-bearing groove on said carriage, an upper ball-bearing groove also on said carriage, a slide-bar having on its under side a ball-bearing groove, adapted to the lower ball-bearing groove on the carriage, and having also a ball-bearing groove on its upper side, adapted to the upper ball-bearing groove on the carriage, anti-friction-balls arranged in said grooves, a platen-carrier attached to said slide-bar, and means for shifting said carriage and said slide-bar transversely; substantially as set forth.

17. In a type-writing machine, the combination of a carriage, a slide-bar thereon having a ball-bearing on its under side, and a ball-bearing on its upper side, and a platen-carrier suspended from said slide-bar, so that its weight holds the balls firmly in their grooves; substantially as set forth.

18. In a type-writing machine, the combination of a non-shifting carriage arranged to run on a guide at its front, means at the rear of the carriage for preventing tilting or tipping thereof, a platen, a platen-carrier adapted to shift to and fro transversely and independently of said carriage, and having its weight suspended from said carriage, so that when the platen-carrier is in its working position the main carriage and the platen-carrier form a rigid system tending to turn on said front guide; substantially as set forth.

19. In a type-writing machine, the combination of a carriage, a platen frame or carrier suspended therefrom, means for shifting said platen-carrier, and means for adjusting the platen frame or carrier in the plane of the alinement of the types, which consists of an adjusting-screw situated in the shifting platen-frame at or near each of its ends and arranged to bear against the means by which the platen-frame is suspended, whereby each end of the platen-frame may be raised or lowered independently of the other, and both ends of the platen-frame brought into the plane in which the types are alined; substantially as described.

20. In a type-writing machine, the combination of a carriage, a shifting platen-carrier suspended therefrom and provided with means for enabling the ends of the platen-frame to be independently adjusted in order that the platen may be brought into the plane of the alinement of the types; substantially as set forth.

21. In a type-writing machine, the combination of a carriage, a shifting platen-frame suspended therefrom and having adjusting devices at or near each end which, when the platen-frame is down, bear against said carriage or against portions thereon, the said adjusting devices enabling the ends of the platen-frame to be independently adjusted for the purpose of bringing the platen in the plane in which the types are alined; substantially as set forth.

22. In a type-writing machine, the combi-

nation of a carriage provided with the downwardly-extending shifting arms 63, a shifting platen-frame pivotally suspended from the upper ends of said arms and provided at or near each end with the adjusting-screw 64; substantially as set forth.

23. In a type-writing machine, the combination of a longitudinally-moving carriage, a platen-frame shiftable transversely thereof, stops upon said carriage for limiting the movements of said platen-frame, and a key-operated shifting mechanism for pressing said platen-frame against said stops, whereby the carriage is required to sustain pressure in a direction transversely of its longitudinal movements, said shifting mechanism including automatically-operating means for preventing transverse displacement of said carriage by reason of pressure applied at said key, substantially as set forth.

24. In a type-writing machine, the combination of a longitudinally-moving carriage, a platen-frame shiftable transversely thereof, stops arranged at each end portion of the carriage for limiting the shifting movements of the platen-frame, a key-operated spring-pressed shifter-bar arranged parallel with the carriage travel and mounted upon the frame of the machine, a yoke arranged about midway of said platen-frame and adapted to engage said shifter-bar, the construction and arrangement being such that said shifter-bar is adapted to press said platen-frame in either direction against the carriage-stops, and means for absorbing any excessive pressure applied at said key, substantially as set forth.

25. In a type-writing machine, the combination of a longitudinally-moving carriage, a platen-frame suspended thereon and shiftable transversely thereof, stops upon said carriage for limiting the shifting movements of the platen-frame, a key-operated spring-pressed shifter-bar arranged parallel with the carriage travel and mounted upon the frame of the machine, and a yoke comprising anti-friction-rolls and arranged about centrally of the said platen-frame, and adapted to engage said shifter-bar upon both sides thereof, the construction and arrangement being such that said shifter-bar is adapted to press said platen-frame in either direction against said stops; substantially as set forth.

26. In a type-writing machine, the combination of a longitudinally-moving carriage, a platen-frame mounted thereon so as to shift transversely thereof, the construction and arrangement being such that said platen-frame shifts in a right line, stops upon said carriage for limiting the movements of said platen-frame in either direction, said stops being independently adjustable so that the platen may be brought accurately to the printing-center at each shifting movement thereof, and a key-operated spring-pressed shifting mechanism for pressing said platen-frame yieldingly in either direction against said carriage-stops, said shifting mechanism compris-

ing a yielding connection between said key and said platen-frame; substantially as set forth.

27. In a type-writing machine, the combination of a shiftable platen-frame, a carriage upon which is arranged a stop for said platen-frame, a shift-key, and mechanism for enabling said key to press said platen-frame against said stop, said key mechanism including a yielding connection between said key and said platen-frame for preventing the platen-frame from being pressed too hard against said stop; substantially as set forth.

28. In a type-writing machine, the combination of a carriage, having a stop, shiftable platen-frame, and mechanism, including a key, a spring and a shifter-bar, for pressing said platen-frame against said stop, said spring serving as a connecting medium between the key and the shifter-bar, and preventing the platen from being pressed by the key beyond the proper position for printing in alinement; substantially as set forth.

29. In a type-writing machine, the combination of a carriage having a stop, a shiftable platen-frame, mechanism for pressing said platen-frame against said stop, said pressing mechanism including a shifter-bar, a key-lever, a connecting-spring between said shifter-bar and key-lever, and means for holding said spring normally under tension; substantially as set forth.

30. In a type-writing machine, the combination of a shifting platen-frame, a carriage having a limiting-stop therefor, a shifter-bar, a shifting key-lever, a spring interposed between said shifter-bar and said key-lever and having a normal contractile tendency, and a rod or abutment for normally resisting said tendency, the construction and arrangement being such that said carriage-stop serves also to arrest said shifter-bar, so that said platen-frame may be pressed against said stop by force applied to said key through said shifter-bar, and such that said spring may act to relieve the platen-frame and carriage from undue pressure or action; substantially as set forth.

31. In a type-writing machine, the combination of a shifting platen-frame, a carriage having a limiting-stop therefor, a shifter-bar, a shifting key-lever, an interposed spring operating as described, a rod normally acting against said spring, and means for adjusting the tension of said spring, the construction and arrangement being such that said carriage-stop serves also to arrest said shifter-bar, so that said platen-frame may be pressed against said stop by force applied to said key through said shifter-bar, and being also such that said spring may act to relieve the platen-frame and carriage from undue pressure or action; substantially as set forth.

32. In a type-writing machine, the combination of a shifting platen-carrier, a carriage having a limiting-stop therefor, a shifter-bar, a shifting key-lever, a vibratory plate at-

tached to one end of the supporting-arms of the shifter-bar, means for vibrating said plate, a spring attached at one end to the upper end of said plate and at its lower end connected to the shifting key-lever, a rod for resisting the action of said spring, and a nut for adjusting the tension thereof, the construction and arrangement being such that said carriage-stop serves also to arrest said shifter-bar, so that said platen-frame may be pressed against said stop by force applied to said key through said shifter-bar, and being also such that said spring may act to relieve the platen-frame and carriage from undue pressure or action; substantially as set forth.

33. In a type-writing machine, the combination of a carriage, a shiftable platen-carrier supported thereon, a key-lever, shift mechanism, a spring connecting said key-lever to said shift mechanism, and a stop on said carriage for arresting said platen-carrier and said shift mechanism, said spring serving to transmit power from said key-lever to said shift mechanism and also being constructed to yield when the key-lever is operated violently and thereby prevent violent motion of the platen-carrier and consequent displacement of the carriage.

34. In a type-writing machine, the combination of a carriage mounted on roller-bearings 18, a shiftable platen-frame attached to said carriage, a shift mechanism connected to said platen-frame, a stop on said carriage for arresting the said platen-frame and said shift mechanism, a key, and a yielding device between said key and said shift mechanism, said yielding device being constructed to transmit power from said key to said shift mechanism and also to yield when said key is actuated violently, so that a violent movement cannot be imparted to said platen-frame and the carriage consequently cannot be caused to slide transversely on said roller-bearings.

35. In a type-writing machine, the combination of a carriage mounted on roller-bearings, a shiftable platen, a shifter-bar, spring 97, rod 107, and a shift key-lever connected to operate through said spring and said shifter-bar to press said platen-frame against a stop arranged upon said carriage.

36. In a type-writing machine, the combination of a carriage having a stop and mounted on roller-bearings 18, a platen-frame attached to said carriage and adapted to be shifted transversely thereof, and a key-operated shifting mechanism, including a yielding device which operates to prevent the carriage from sliding on said roller-bearings when the shifting mechanism is actuated too violently by said key; substantially as set forth.

37. In a type-writing machine, the combination of a carriage mounted on roller-bearings, a platen mounted to move transversely of said carriage against stops thereon, a shifter-bar, a shifting key-lever, the construction

and arrangement being such that said carriage-stops serve also to arrest said shifter-bar, so that said platen-frame may be pressed by said shifter-bar against said stops by means of force applied to said key-lever, and the interposed spring 97 and rod 107, operating substantially as set forth.

38. In a type-writing machine, the combination of a carriage, a platen-frame shiftable thereon, mechanism including a key for shifting said platen-frame and also including a yielding device operated by said key and arranged between said key and the platen-frame, stops arranged upon said carriage for limiting the shifting movements of said platen-frame, and a stop constructed to arrest said key at the shifting operation, the construction and arrangement being such that pressure applied to the key may be sustained partly by the carriage and partly by the key-stop; substantially as set forth.

39. In a type-writing machine, the combination of a longitudinally-traveling platen-frame, mechanism including a key for shifting said platen-frame transversely, said shift mechanism also including a yielding connection between said key and said platen-frame, stops for limiting the shifting movements of said platen-frame, and means for arresting said key after the arrest of said platen at the shifting operation; substantially as set forth.

40. In a type-writing machine, the combination of a carriage, a platen-frame shiftable thereon, a shifter-bar mounted upon the framework of the machine and connected to said platen-frame, stops upon the carriage for limiting the movements of both said platen-frame and said shifter-bar, a key provided with a yielding connection to said shifter-bar, and means for arresting said key after the arrest of said platen-frame and shifter-bar at the shifting operation; substantially as set forth.

41. In a type-writing machine, the combination of a shifting key-lever provided with a strap, a zigzag spring having a threaded stem engaging with said strap, a thrust-rod 107, and an adjusting-nut 109; substantially as set forth.

42. In a type-writing machine, the combination of a pivot and a key-lever formed or provided with a spring 103, whose free end and that of the body of the lever are beveled to form a flaring mouth by which the said key-lever may be fulcrumed on and removed from said pivot by endwise movements; substantially as set forth.

43. In a type-writing machine, the combination of a pivot, a key-lever having a seat or bearing for the pivot and a beveled end and formed with an integral spring 103 provided also with a partial bearing and with a beveled extremity; substantially as shown and described.

44. In a type-writing machine, the combination of a platen-frame having open bearings at each end for the platen axle or shaft,

one of said open bearings being narrower at its upper end than at its lower end, and a sleeve or enlargement on the platen axle or shaft occupying the enlarged portion of said bearing, and being incapable of passing out through the contracted upper portion of said bearing, said sleeve or enlargement being shorter than the portion of the axle or shaft projecting beyond the end of the platen and said projecting axle or shaft contiguous to the said sleeve being capable of passing out through the contracted upper portion of said bearing, whereby when it may be desired to detach the platen, it and its axle or shaft must be slid endwise a short distance to carry the said sleeve or enlargement past or beyond the said contracted portion, whereupon the platen and its axle or shaft may be lifted from its bearing at this end and also from the bearing at its opposite end; substantially as set forth.

45. In a type-writing machine, the combination of a platen-frame having open bearings at each end, one of said bearings being in the form of a keyhole-slot with its contracted portion uppermost, a platen, a platen-axle, a sleeve on one end thereof of greater diameter than the width of said contracted portion, and an arm attached to said sleeve adapted to prevent the platen from moving endwise excepting when said arm is turned to a position where it may pass through the said open bearing on an endwise movement of the platen and its shaft or axle; substantially as set forth.

46. In a type-writing machine, the combination of a platen-frame having an open bearing at each end, one of said bearings being contracted on its upper portion, the arm 123 and the sleeve 125 on said shaft or axle, and operating in the manner described upon endwise movements of the platen when it may be desired to either detach or restore the same; substantially as set forth.

47. In a type-writing machine, the combination of a carriage, a platen-frame suspended therefrom, and a spring or springs for partially counteracting the weight of the suspended platen-frame for the purpose of reducing the load to be lifted when the platen-frame is swung upward and it may be desired to inspect the work on the under side of the platen; substantially as set forth.

48. In a type-writing machine, the combination of a carriage, a platen-frame pivotally suspended therefrom whereby said frame may be swung upwardly to expose the work at the under side of the platen, and a spring or springs mounted on the pivots of the platen-frame and adapted to act in a direction opposite to that of the weight of the suspended platen, so as to reduce the load to be lifted when it may be desired to expose the print at the under side of the platen; substantially as set forth.

49. In a type-writing machine, the combination of a carriage having slide-bars, a platen-

frame pivoted to said slide-bars and having its weight supported by said carriage, and a spring or springs for acting in opposition to the weight of the platen-frame, whereby when the platen-frame is swung upwardly to expose the print on the under side of the platen the said spring or springs will act in the direction of the lift and so reduce the manual labor which would otherwise be required of the operator; substantially as set forth.

50. In a type-writing machine, the combination of a carriage, and a platen-frame pivotally connected thereto and having position always in a given horizontal plane for both upper and lower case printing, and provided with one or more springs partially counterbalancing the weight of the platen and its carrier or frame and reducing the load to be lifted when it may be desired to turn the platen up to inspect the work done at the under side thereof; substantially as set forth.

51. In a type-writing machine, the combination of a carriage having slide-bars, a platen-frame pivoted to said slide-bars and suspended therefrom and having its weight supported by said carriage, and a spring or springs mounted on the pivots of the platen-frame and acting against the said frame and the said bars to partially counterbalance the weight of the platen and its carrier or frame and reduce the load to be lifted when it may be desired to turn the platen up to inspect the work done on the under side thereof.

52. In a type-writing machine in which the types strike on the under side of the platen, the combination with a carriage, of a hinged platen-carrier, whereby the platen-carrier may be turned up for inspection of the work on the under side of the platen, and a spring or springs for partially counterbalancing the weight of the platen-carrier, the platen and accessories, and adapted thus to reduce the load or weight to be lifted when the said platen-carrier is to be turned up so as to expose the printing on the under side of the platen; substantially as described.

53. In a type-writing machine, the combination of a rail, a carriage adapted to have longitudinal movements upon said rail, a platen-carrying frame pivoted to said carriage and adapted to turn up about said pivotal connection to exhibit the writing, a support for said platen-carrying frame independent of said pivot, said support acting in opposition to the weight of the platen when it is down in working position, and an underbalancing-spring arranged at said platen-carrying-frame pivot and connected at one end to said platen-carrying frame and at the other end to said longitudinally-moving carriage, said spring being adapted to act, at the upward movements of said platen-carrying frame about its pivot, not to cause the lifting of said platen-frame, but only in connection with the operator's hand to assist the latter in raising said

platen-frame about said pivot to bring the writing into view; substantially as set forth.

54. In a type-writing machine, the combination of a carriage, slide-bars mounted thereon, a platen pivoted on said slide-bars and carrying the friction-latches 114 adapted to the holes 116 and to the rear edge of the carriage-bar; substantially as set forth.

55. In a type-writing machine, the combination of a carriage, a platen-frame shiftable transversely thereof, means for enabling said platen-frame to be lifted to exhibit the writing, and a latch frictionally connected to said platen-frame, said frictional connection operating, when the platen-frame is lifted, to cause said latch to be moved by said platen-frame to a position for locking the latter against shifting movement, and said frictional connection being also adapted to permit further upward movement of the platen-frame after the locking operation without corresponding movement of the latch; substantially as set forth.

56. In a type-writing machine, the combination of a carriage, a platen-frame shiftable transversely thereof, means for enabling said platen-frame to be lifted to exhibit the writing, latch 114 having pin 115 adapted to engage the carriage to prevent a shifting movement of said platen-frame, friction-spring 117 arranged between said latch and said frame and adapted to cause said engagement at the lifting movement of the platen-frame, tang 118 formed on said latch and adapted to be engaged by a portion of the platen-frame upon the return thereof to working position, whereby the return of the latch to non-working position is assured, and stop 119, for limiting said return movement of the latch.

57. In a type-writing machine, the combination of a carriage having a hinged or pivoted portion of the feed mechanism provided with a key or finger-piece 139 arranged substantially as shown and described, a platen-frame pivotally connected to said carriage, so that it may be turned to an upright position, and a release key-lever pivoted at its rear end to the said carriage; the construction and arrangement being such that when the platen-frame is down in working position the carriage may be released from its feed mechanism by means of the release-key acting upon the key or finger-piece 139 and such that when the platen-frame is in an upright position said carriage may be released by finger-pressure applied directly upon the said key or finger-piece 139; substantially as set forth.

58. In a type-writing machine, the combination of a carriage, a platen-frame hinged thereto so as to be turned to an upright position, a scale-bar 157 arranged underneath the platen when down and in proximity to the line of print, and another scale 159 arranged on the front side of the carriage and having a pointer or index; the arrangement being

such that when the platen-frame is down in working position neither of said scales is visible, but when said platen-frame is turned to an upright position both of said scales are brought to view, and while the platen-frame is in this condition the operator may use the platen-scale 157 to locate the place to be corrected and may then use the carriage-scale 159 and its pointer or index to at once conveniently and accurately bring such place to the printing-plane by a movement of the carriage and without first turning down the platen-frame; substantially as set forth.

59. In a type-writing machine, the means for firmly guiding the carriage in its lengthwise movements and for preventing displacement of the platen at the printing-point, which consists of a pair of grooved rails, one of which is fastened to the main frame and the other to the truck or carriage, antifriction guide-rolls in said grooves arranged to travel on the fixed rail while the movable rail travels on the rolls, a bracket on the framework opposite the printing-point and provided with a roll, a plain rail fastened to the back of the truck or carriage and arranged to bear against the under side of said roll in said bracket, the said rolls in said grooves being so placed that the line through the said roll in said bracket and through the printing-point always lies between the said rolls in said grooves, and a platen-carrier pivotally connected with the truck or carriage and wholly supported

thereby and so mounted that its weight will hold the rear plain rail firmly against the roll of the bracket, substantially as described. 35

60. In a type-writing machine, the means for preserving alinement of the platen at the printing-point in the lengthwise movements of the platen which consists of a rail fixed to the main frame, a rail fixed to the truck or carriage, antifriction-rolls between said rails, arranged to travel on the fixed rail while the carriage-rail travels on them, a plain rail fastened to the back of the truck or carriage, a bracket on the framework substantially opposite the printing-point and provided with a roll against the under side of which said plain rail bears, and a platen-carrier pivotally connected with the carriage and wholly supported thereby and so mounted as that its weight will hold the rear plain rail firmly against the roll, and the said traveling rolls between the fixed and movable rails being so placed that a line joining the guide-roll for the plain rail with the printing-point will always lie between them; substantially as described. 40 45 50 55

Signed at Ilion, in the county of Herkimer and State of New York, this 27th day of September, A. D. 1897. 60

LOUIS P. DISS.

Witnesses:

W. K. JENNE,
CHAS. E. MAURICE.