

No. 676,184.

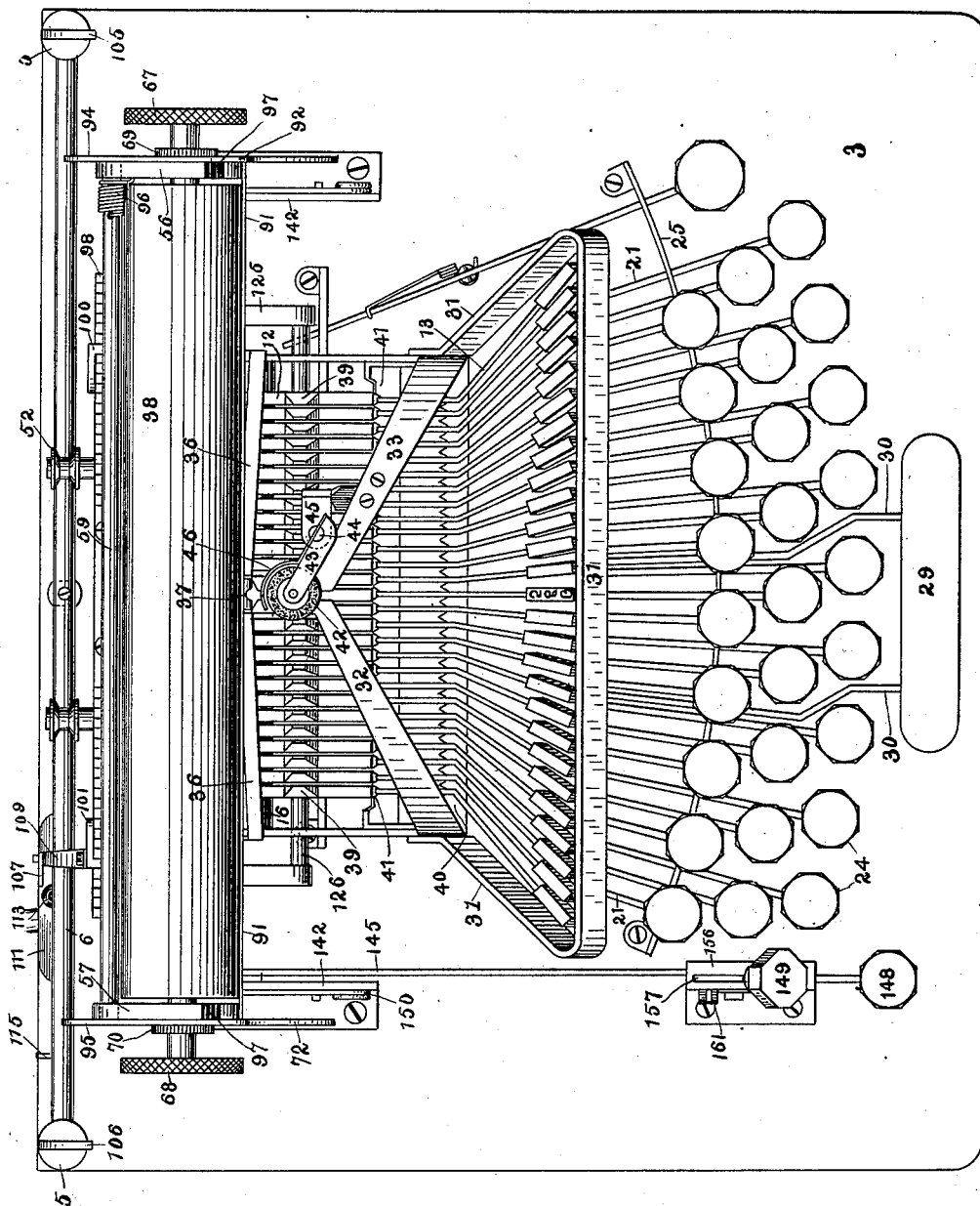
Patented June 11, 1901.

E. FITCH.
TYPE WRITING MACHINE.

(Application filed Apr. 3, 1899.)

(No Model.)

5 Sheets—Sheet 1.



WITNESSES:

H. H. Steele.

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Fig. 1.

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by Jacob Felsch

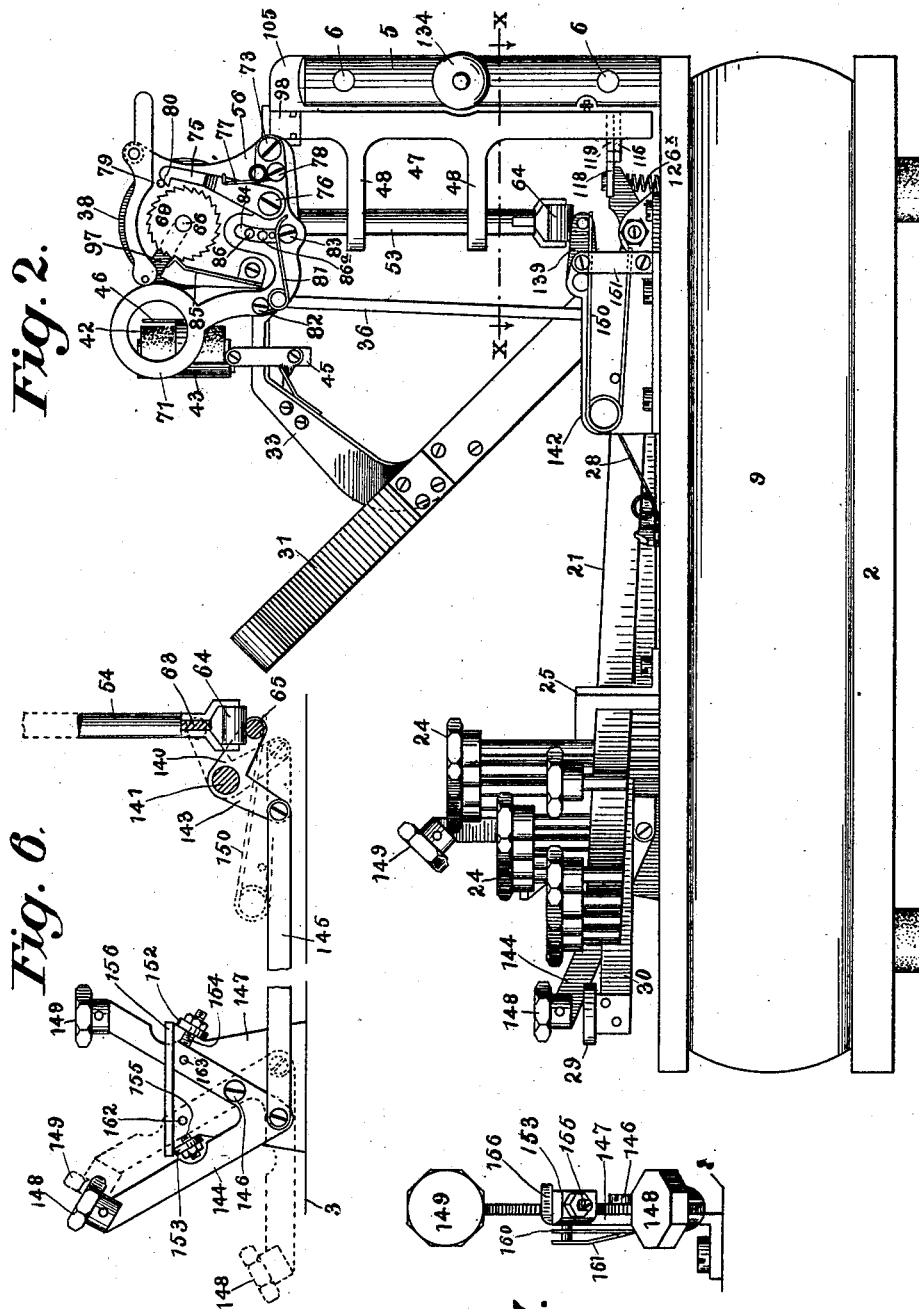
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E. FITCH.
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Fig. 7.

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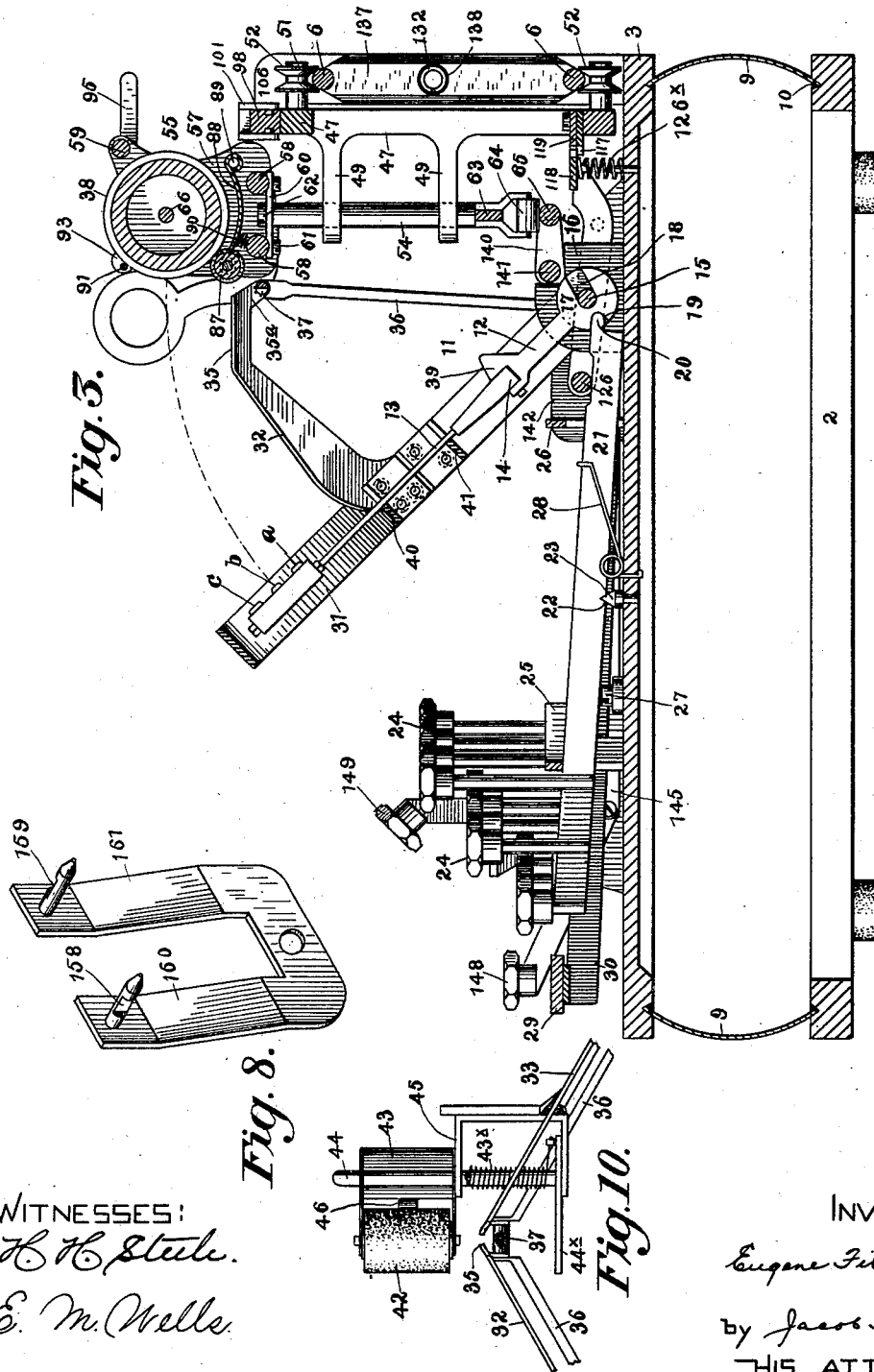
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E. FITCH.
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5 Sheets—Sheet 3.



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TYPE WRITING MACHINE.

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(No Model.)

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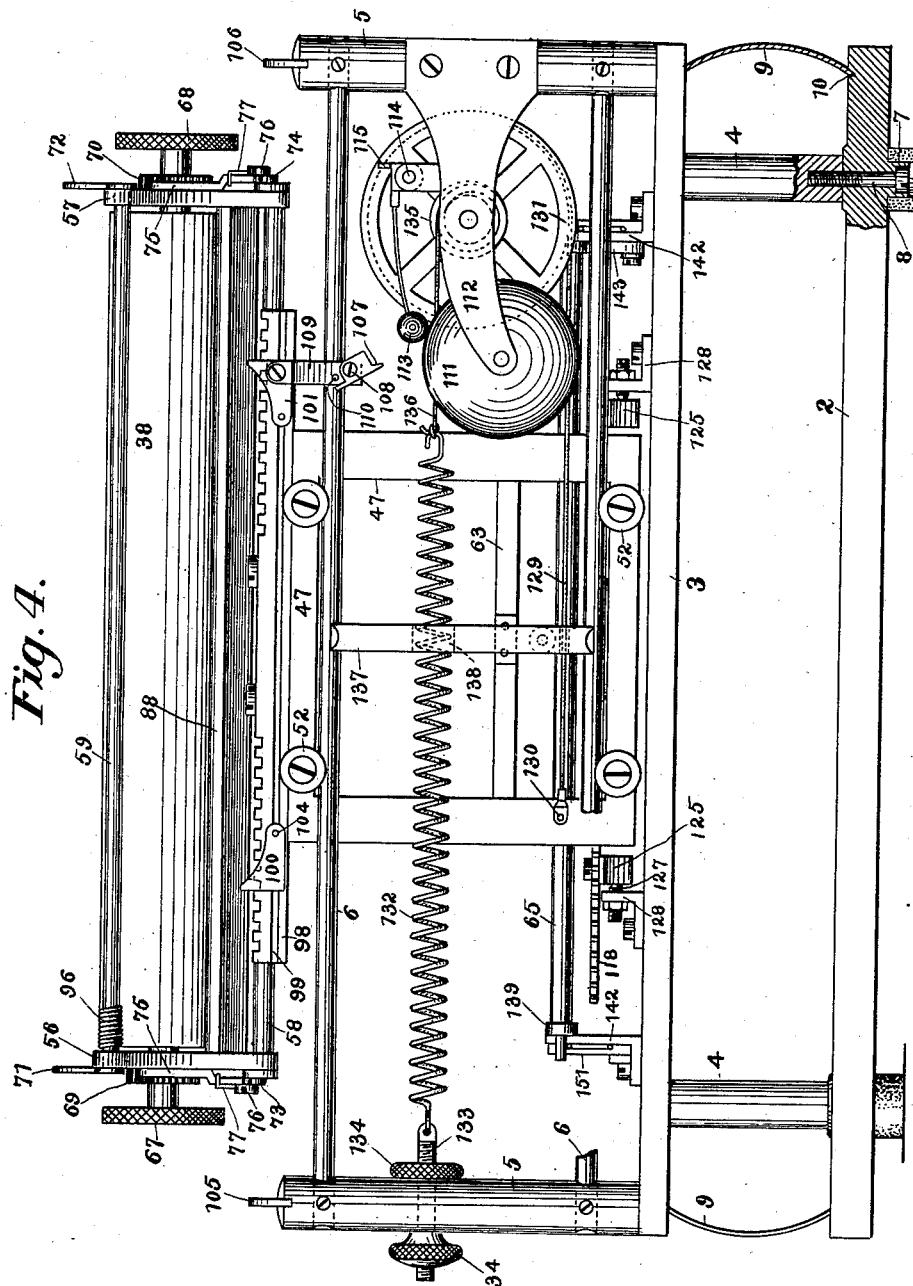
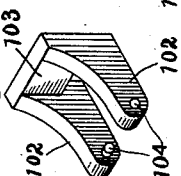


Fig. 4.

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Fig. 9.



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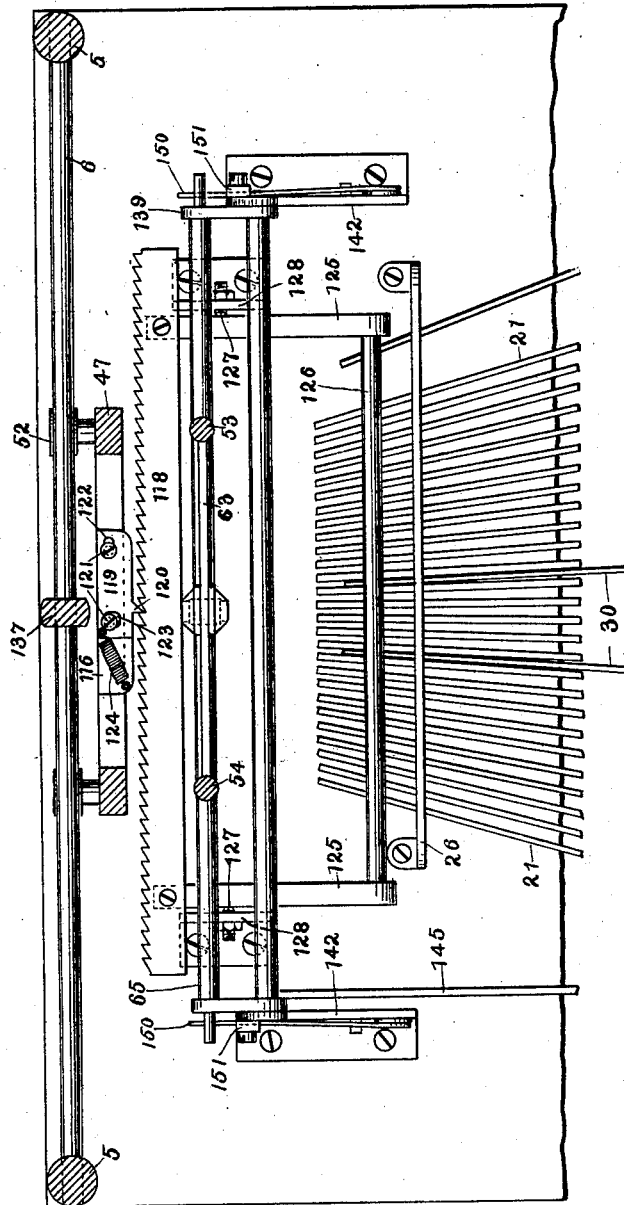
E. FITCH.
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(No Model.)

5 Sheets—Sheet 5.

Fig. 5.



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UNITED STATES PATENT OFFICE.

EUGENE FITCH, OF ASTORIA, NEW YORK, ASSIGNOR TO THE UNION TYPE-WRITER COMPANY, OF JERSEY CITY, NEW JERSEY.

TYPE-WRITING MACHINE.

SPECIFICATION forming part of Letters Patent No. 676,184, dated June 11, 1901.

Original application filed November 26, 1898, Serial No. 697,505. Divided and this application filed April 3, 1899. Serial No. 711,593. (No model.)

To all whom it may concern:

Be it known that I, EUGENE FITCH, a citizen of the United States, and a resident of Astoria, city of New York, in the county of Queens and State of New York, have invented certain new and useful Improvements in Type-Writing Machines, of which the following is a specification.

This application is a division of my application for Letters Patent filed on the 26th day of November, 1898, and serially numbered 697,505.

The present invention relates to type-writing machines in general, and more especially to that class of type-writing machines in which the matter written is in full view of the operator during the progress of writing, one object of the invention being the provision of a comparatively simple, practical, and effective "visible-writing" machine.

Another object is the provision of a simple and effective case-shift mechanism and means for locking the same in shifted position and for instantly releasing it when desired.

Another object of the invention is to provide for the spacing apart of lines at different intervals without adjustment of the line-spacing mechanism.

Another object of the invention is to regulate the right and left hand margins and to adjust the stops therefor expeditiously to new positions and to firmly hold them in such positions, and other objects as will hereinafter fully appear.

To these ends the invention includes features of construction and combinations of devices hereinafter described, and more particularly pointed out in the appended claims.

The preferred form of the invention is illustrated in the accompanying drawings, forming part of this specification, in which—

Figure 1 is a plan view of the said form of the invention. Fig. 2 is a right-hand side elevation of the machine. Fig. 3 is a central vertical sectional view from front to back. Fig. 4 is a rear elevation, some parts being omitted and others being broken away or in section. Fig. 5 is a plan view, with some parts omitted, of the rear part of the machine

below the plane indicated by the line X X in Fig. 2. Fig. 6 is a side elevation of the platen-shift mechanism. Fig. 7 is a front view of the platen-shift keys and locks. Fig. 8 is a perspective view of spring-catches for locking the platen in its shifted position. Fig. 9 is a perspective view of a margin-stop. Fig. 10 is a view showing the inking-roller and parts connected therewith.

In the various views the same part will be referred to by the same reference numeral or character.

The framework comprises two parallel horizontal frames or plates 2 3, connected by uprights 4, and two standards 5, rising at the rear of the upper frame 3 and connected by parallel horizontal rods 6. Also the framework includes various brackets or studs, as will appear more fully hereinafter. The lower frame 2 is provided with downwardly-projecting feet 7, over which rubber sleeves are placed, said sleeves projecting below the feet, as shown. The uprights 4 are cast in one with the frame 3 and are connected with the frame 2 by means of screws 8, which pass through the feet 7 and whose threaded ends engage with threaded holes in the uprights 4, as shown in Fig. 4. Sheet-metal or hard-rubber plates 9 are sprung into grooves 10 in the upper side of frame 2 and the under side of frame 3, thus inclosing the space between these two frames.

The type-bars 11 are formed in two parts 12 13, which are hinged together at 14 in a direction at right angles to the axis 15 on which the type-bar is pivoted. The axis 15 is a straight shaft or bar pivoted or otherwise secured in brackets 16, secured to the top of frame or plate 3. Each piece 12 is provided with an enlarged circular end 17, which is formed with an open slot 18, whose bottom is formed to fit the round shaft 15. Each end 17 is also provided with a notch 19, which fits and receives the end 20 of the corresponding key-lever 21. Inasmuch as the slots 18 and 19 open in opposite directions and the rounded ends 20 of the key-levers engage the slots or notches 19 opposite the fulcrum or pivot-rod 15, it results that each type-bar is locked

to the rod 15 by its own key-lever and cannot move on said rod except to rotate and cannot be disengaged from the rod except by moving its key-lever forwardly or by flexing it aside. The preferred method of pivoting the type-bars is to fit each end 17 between lugs or brackets 16, forming part of or attached to the plate or frame 3, as shown in Fig. 1. The open slot 18 permits of the removal of any type-bar without disturbing any other type-bar. The key-levers 21 are made of flat metal bars provided with notches 22 in their under edges, which rest on knife-edges 23, secured to and projecting upwardly from the top of plate 3. The keys 21 are provided at their forward ends with suitable finger-pieces 24. The key-levers 21 are guided at each side of their pivots, as by the slotted guide-plates 25 26, secured to the top of plate 3, as by screws 27, and are thus prevented from displacement relatively to their pivot-pins 23. Each key-lever 21 is returned to its down or normal position by a spring 28, one end of each spring being inserted in a hole therefor in the top of plate 3 and the other end thereof hooking over its lever 21. The space-key 29 is carried by levers 30, which are or may be pivoted and be held down at their rear ends in the same manner as the key-levers 21.

The type-bars 11 are provided with three several type-faces *a b c*, of which the middle type *b* constitutes the "lower-case" and such other characters as may be provided for. The upper type characters *c* are the "upper-case" letters and other characters, as may be provided for. The lower type *a* on the type-blocks are the numerals and the punctuation and other marks. The type are secured to their respective bars in any suitable or known way, and hence this requires no specific description here. A guard or protective bar or frame 31 extends around the ends of the type-bars and also down the sides of the row of type-bars. At a point intermediate the pivots 14 and the type-blocks the type-bar guard 31 is secured to the bars 32 33, which form guides for the type-bars when moving to the printing-point. These guides 32 33 have rearwardly-projecting arms which are parallel to each other and which form a center-guide 35 at the printing-point for the type-bars. Depending from the inner or rear ends of the guide-arms 35 are arms 35^a, which are connected by oblique arms 36 with the frame of the machine, as to the outer lugs 16 of the row of lugs at the type-bar pivots. The head of the tie-rod 36 is notched at 37 to form a further guide or centering device for the type-bars. The flat or square bars 12, forming part of the type-bars, are provided with cams or inclines 39 adjacent or opposite the pivots 14. The function of these cams 39 is to guide the adjoining type-bar during its return to normal position, so that it will fall into its proper position within the inclosing guard or bar 31. It will be observed that those cams or wedges 39 to the right in Fig. 1 of the cen-

tral front to back line incline outwardly and downwardly, while those to the left of that line incline outwardly and downwardly, or in the opposite direction, (the white or non-shaded triangular spaces in Fig. 1 representing the cam-faces.) Hence each incline 39 to the right of said line acts upon the type-bar to its right to move it outwardly while it is returning to normal position and each incline to the left of said line acts upon the type-bar to its left to return it to normal position as it swings away from the platen after being operated. A couple of combs 40 41 extend across from guide 32 to guide 33 and provide rests and separators for the parts 13 of the type-bars 11.

The type are inked as they move toward the platen by means of a roller 42, journaled on a vertical axis in arms of a holder 43, which is in turn journaled at 44 in arms or brackets 45 from the guide-arm 33. The holder 43 is provided with a shield or guard 46 for preventing contact between the ink-roller and the platen or the substance on the platen. A spring 43^x tends to keep the roller 42 in the position shown in Fig. 1. The above-described construction and the operation thereof are similar to the construction shown in my patents dated July 20, 1886, numbered 345,836, and July 12, 1887, numbered 366,577, and to the operation of the same. In order that the entire force of the blow of the type-block may not be taken by the roller 42, the holder 43 is provided with an arm 44^x in the path of the part 13 and so disposed that it is struck thereby simultaneously with the contact of the type-block and the roller 42, said arm being of a length such that the part 13 will not become disengaged therefrom or will not pass the end thereof, thus preventing the roller 42 from returning to normal position in advance of the beginning of the return of the type-bars to normal position.

The paper-carriage comprises a rectangular frame 47, which is provided with two pairs of forwardly-projecting arms 48 49 and with one member of the escapement mechanism, as the dogs or pawls. The carriage 47 is also provided with rearwardly-extending studs or shafts 51, on which rollers 52 are journaled, said rollers being shaped to fit the rods 6, (shown as round rods in this instance.) By reference to Figs. 3 and 4 it will be seen that one pair of rollers 52 rides on the upper rod 6 and that another pair runs underneath the lower rod 6, and thus act as guide-rollers only. The pairs of arms 48 49 are perforated vertically to receive and guide the vertical rods 53 54, forming part of the platen-carrier 55. The platen-carrier 55 includes end pieces 56 57 and tie-rods 58. The upright rods 53 54 are attached to the rods 58, as by plates 60 and screws 61 62, the screws 61 passing through the plates and engaging with threaded holes in the rods 58 and the screws 62 passing through the plates and engaging threaded holes in the rods 53 54. The rods 53 54 are connected at their lower ends by a tie-bar 63,

which is provided with an antifriction-roller 64, running on top of a rod 65 of the platen-shifting mechanism. The platen 38 is fast to a shaft 66, which is journaled in the end pieces 56 57 of the platen-carrier 55. The ends of the shaft 66 are provided with hand-wheels 67 68, by means of which the platen may be turned in either direction. The shaft 66 is provided just outside the end pieces 56 57 of the platen-carrier 55 with ratchet-wheels 69 70, and the end pieces 56 57 are provided with levers 71 72, pivoted thereto at 73 74. The lever 71 is provided with a pawl 75, pivoted thereto at 76 and adapted to engage with and rotate the ratchet 69 and platen 38. Normally the pawl 75 is pressed toward the ratchet by a spring 77, secured to the end piece 56 by a screw 78 and bearing against the rear side of the pawl, and is normally held out of engagement with the ratchet 69 by means of the pin 79 projecting outwardly from the end piece 56 and engaging with the beveled face 80 of the pawl-piece, since the spring 81, which holds the lever 71 in its upper or normal position, is of a strength sufficient to overcome the resistance offered by the other parts to such action. The spring 81 has one end secured to the lever 71 by a screw 82 and has its other end bearing on the top of a screw 83, which projects from the end piece 56 through a curved slot 84 in the lever 71. The reaction of spring 81 against the screw or stop 83 tends to lift the lever 71. The center of the arc of slot 84 is the pivot 73, as will be understood. A spring-detent 85, secured at one end to the end piece 56, acts to prevent accidental rotation of the ratchet 69 and platen 38, while it permits of their rotation in either direction at will by means of force applied to either hand-wheel 67 68. A similar detent may be used at the other end of the platen. The end piece 56 is provided with one or more holes 86 opposite the slot 84 for the reception of a pin or stop 86^a for engagement with the upper end of the slot 84 for the purpose of limiting the rotation of the platen to one or more spaces corresponding to the distance between the teeth of ratchet-wheel 69, according to the number of holes 86 and that one of them in which the pin may be placed. The end of lever 71 is formed into a ring for convenience of getting a hold upon it to depress it for line-spacing. The lever 72 is or may be connected with its ratchet 70 in precisely the same way to rotate it and the platen for line-spacing. If the slots 84 be of sufficient length to permit of at least two different widths of line-spacing, the line-space lever at one end may be set to give, say, one width and the line-space-lever regulator at the other end of the platen may be set to give a different width of line-spacing, whence it results that an operator may write matter of either or both of such widths of spacing without having to set or reset a line-space regulator. This feature is of great convenience in writing briefs and the like, where many quota-

tions are made and are put in half-space or solid, while the remainder is put in with wider spacing between the lines.

The paper is held against the platen by means of a roller 87. I prefer to journal the roller 87 in lugs or projections on the paper-guide 88, which is pivoted to the ends 56 57 at 89. One or more springs 90 between said guide 88 and one of the rods 58 serves to press the roller yieldingly against the platen. A paper-holder is provided for coaction with the platen above the line of printing or writing, said holder consisting of a small rod 91, borne by pivoted arms 92 93 at the ends of the platen or platen-carrier. The arms 92 93 are provided with extensions or handles 94 95, whereby the frame formed by said arms, journaled shaft 59, and rod 91 may be rocked to move the rod away from the surface of the platen, as in inserting paper. A spring 96, coiled about the rod 59, has one end connected with the rod 59 and the other secured to some fixed part of the platen-carrier, as end 56, and tends to keep the said shaft or rod 59, arms 92 93, and rod 91 in the positions shown in Figs. 1, 2, and 3.

The end pieces 56 57 of the platen-carrier may be provided with open-ended oblique slots 97 for the reception of the pivot rod or shaft 66, thus allowing of the ready removal of the platen from the carrier. It will be noted that detent 85 tends to prevent removal of the platen, being between the bearing in slot 97 and the open end of the slot.

The carriage is provided with a toothed bar 98, fast to the top of frame 47, which bar is provided with longitudinal grooves 99 at its front and rear sides. Upon this bar 98 are mounted two margin-regulators or carriage-stops 100 101, one of which is shown in perspective in Fig. 9. These stops are each formed of two parallel arms 102, united at one end by a cross-tie 103, which is adapted to enter or fit in between the teeth of the bar 98, as indicated in dotted lines in Fig. 4. The arms 102 are provided with inwardly-projecting pins 104 for engagement with the grooves 99, thus providing pivots about which the stops 100 101 are swung to engage and disengage them from the teeth of the bar 98 when adjusting them along the same. The stops 100 101 respectively coact with fixed abutments 105 106, respectively affixed to the tops of the end standards 5. (Shown in Fig. 4.) The stop 101 also carries the bell-trip 107, which is pivoted at 108 to an arm 109, rigidly attached to the stop 101. A pin 110 on the arm 109 acts as a stop to limit the motion of the trip 107 in one direction. The bell 111 is carried by an arm or bracket 112 on one of the uprights 5, and the bell-hammer 113 is pivoted at 114 to an arm or branch of bracket 112 and is provided with an arm 115 for coaction with the trip 107, as will be understood.

The letter-feed mechanism will now be described.

The carriage has fixed thereto a plate 116, which is provided with a tooth 117, adapted to engage with the teeth of a rack 118. Lying on top of plate 116 is a second plate 119, which is provided with a tooth 120, also adapted to engage with the teeth of the rack 118. The plate 119 has a limited movement relatively to the plate 116, as by means of the screws 121 and slots 122 123. The screws 121 pass loosely through the slots 122 123 and engage with threaded holes in plate 116, (and lower bar of the carriage 47.) Preferably the slot 123 is larger in every direction than the body of the screw which passes through it, thus permitting of the retraction of the carriage toward the right without having to disengage the rack from the escapement-pawls, or vice versa. A spring 124, fast at one end to the plate 116 and at the other end to a pin on the plate 119, acts to draw the tooth 120 toward the rack 118 and also to slide the plate 119 toward the left-hand side of the machine whenever the tooth 120 is released from engagement with the rack 118. The rack-bar 118 is borne by arms 125, which also carry the universal bar 126, and is normally lifted by a spring 126^x. The levers or arms 125 are pivoted at 127 in brackets 128, fast to the top of plate 3. The carriage is drawn to the left by means of the cord or strap 129, which is secured thereto at one end, as 130, and to the grooved periphery of a wheel 131, which is journaled to the bracket 112, and by means of the coiled or spiral spring 132, which has one end connected to the fixed framework, as a standard 5, and the other end connected to a lever or cam on the wheel 131. By preference the spring 132 is adjustably connected to the standard 5, as by the threaded rod 133, passing loosely through the standard and the adjusting-nuts 134 on said rod 133 at each side of the standard 5. Also the other end of spring 132 is preferably connected with the sheave 135 on wheel 131 by means of a cord or strap 136. A strut or brace 137 is shown between the rods 6, the function of which is to prevent bending or distortion of the same. This strut is perforated at 138 to allow the spring 132 to pass freely through it.

The platen-shifting mechanism will next be described.

The platen-carrier 55 is supported independently of the carriage by means of the rods 53 54 and bar 63 and roller 64, as above described, and the rod 65, on which the roller 64 traverses during the operation of the machine. The rod 65 is borne by arms 139 140, fast on a shaft 141, which is journaled in brackets 142, rising from the top of frame 3. An extension 143 of the arm 140 is connected with the V-shaped lever 144 by a pitman or link 145, Fig. 6, which is pivoted to the end of the arm 143 and at or near the point of the V of lever 144. The lever 144 is pivoted at 146 to a bracket 147, rising from the top frame or plate 3. One branch of the lever 144 is provided with the "cap-key" 148 and the other

branch is provided with the "figure-key" 149. The arms 139 140 are normally held in a central position by the weight of the platen-carrier, platen, and appurtenances and the springs 150 and stops 151 for the springs. The strength of the springs 150 is such that they lift the platen-carrier and the parts supported thereby until the springs 150 are stopped by the stops 151. This brings the platen in such relation to the type on the type-bars that the middle types *b* thereof coact with the platen. When the key 149 is depressed, the rod 65 is moved downward and carries with it the springs 150, as in Fig. 6. This allows the platen-carrier and parts carried thereby to fall or move downward, and thus brings the platen in such position that the lower types *a* on the type-bars coact with the platen to print the figures and other characters shown at the front of the keys 24. When the key 148 is depressed, the parts take the position shown in Fig. 6 in dotted lines, (except that springs 150 rest against stops 151,) and the platen-carrier and parts supported thereby are raised into position to coact with the upper types *c* on the type-bars, thus printing capital letters and such other characters as may be employed in addition thereto on such upper ends of the type-blocks. The bracket 147 is provided with two lugs or ears 152 153, and these are provided with adjustable stops 154 155 for the lever 144. These stops may be conveniently made by screws which engage threaded perforations in the lugs and lie in the path of the lever, as of that arm thereof which carries the key 149. The upper part of the bracket 147 may be bent over to form a flange 156, and this flange may be provided with a guide-slot 157 for the lever 144. It is sometimes desirable that the cap or figure key be held down while the writing progresses. For the purpose of automatically holding the lever 144 in either of its extreme limits of motion there are provided two catches 158 159, which are carried, respectively, by spring-arms 160 161. The catches are in the form of notched pins secured to the spring-arms and adapted to pass through a perforation in that branch of lever 144 carrying the key 149 and the notch in each pin being adapted to catch over the edge of said perforation, so as to prevent the pin from being withdrawn. Preferably the arms 160 161 are secured to the bracket 147 on the side thereof opposite that on which the lever 144 is placed, and the tension of the spring-arms 160 161 is such that they stand away from the bracket, with their pins 158 159 opposite or entering perforations 162 in the bracket. The perforations in the bracket 147 are so placed that the perforation 163 in the lever 144 will register or be in line with one or the other of the perforations 162 whenever that lever is in its extreme positions or against the stops 153 155. Whenever it is desired to hold the platen in either of its extreme upper or lower positions, the corre-

sponding one of keys 148 149 is depressed until stopped by one or the other of the stops 154 155, whereupon the corresponding catch 158 or 159 is pushed in until its side notch 5 has passed through the perforation 163 so far that it will catch against the side of the lever 144 when that lever is released, whereupon the lever is let go and is caught. In order to release the lever 144 when it has been 10 locked, as above described, it is only necessary to push down the depressed key 148 or 149, whereupon the spring-arm carrying the corresponding catch will be freed from the lever 144 and will spring out and carry its catch 15 out of the path of the lever 144, which can then be returned when released to normal position through the power of springs 150 or the weight of the platen-carrier and parts supported thereby.

20 The operation of the foregoing devices has been given in substance during the description of the parts and need not be repeated.

For the purpose of adapting the type-writer to the use of bookkeepers or others who have 25 to make out statements or bills there is provided adding mechanism which can be thrown out of and into operation at will.

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

30 1. The combination of a carriage, a platen-carrier adapted to move up and down relatively to said carriage from a central normal position, a shift-bar engaging and supporting said platen-carrier, a spring supporting said shift-bar, a stop for said spring, two shift-keys, 35 and connections whereby one key raises said shift-bar independently of said spring and the other key depresses said shift-bar against the tension of said spring.

40 2. In a type-writing machine, a double shift-key lever V-shaped and pivoted intermediate the point of the V and the end of one of the arms thereof, a platen-shift connected with said lever at or near the point of the V, a perforation in one of said arms of the lever, two 45 spring-arms normally tending away out of the path of said shift-key lever and provided each with pins notched on the side and adapted to pass through and engage said perforation to lock the said lever in each of two positions. 50

3. The combination of a shift-key provided with a perforation, a fixed plate alongside which said key moves and provided with a perforation adapted to register with that in the

key, a spring at the inner side of said plate 55 tending away therefrom, a pin secured to said spring and provided with a notch and adapted to pass through said perforations and retain the shift-key.

4. The combination of a fixed plate, a V- 60 shaped shift-key pivoted thereto and provided with a perforation adapted to register with two perforations in said plate, two springs on the other side of said plate tending away therefrom and provided each with notched pins 65 adapted to pass through the perforations in said plate and in said lever to lock the same in each of two positions.

5. A series of jointed type-bars journaled on a common axis, a platen, a guide for bringing each bar to the printing-point, and cams 70 on the parts of said bar journaled on said axis for aiding in or returning the outer or other parts of said bars to normal position, substantially as described. 75

6. A type-bar composed of two sections or parts hinged or jointed together, a type on one and a cam on the other of said sections, and the second section having a pivot at right angles to said hinge or joint, substantially as 80 described.

7. A type-bar composed of parts 12, 13, jointed together at 14, and a cam 39 on part 12 opposite hinge 14, substantially as described. 85

8. A type-bar provided with an open-ended slot 16, a pivot 15 engaging said slot, a notch 19 in said bar opposite said slot, and a lever provided with an end 20 engaging said notch and opposite said bar and retaining the type-bar in place on said pivot, substantially as described. 90

9. The combination with a series of type-bars, of ink-roller 42 adapted to be struck by the type-faces, a pivoted frame therefor, and 95 arm 44^x connected to said frame and adapted to be struck by the type-bars and operating to prevent said roller from returning to normal position in advance of the beginning of the return of the type-bars to normal position, 100 substantially as described.

Signed at the borough of Manhattan, in the city, county, and State of New York, this 30th day of March, 1899.

EUGENE FITCH.

Witnesses:

K. V. DONOVAN,

E. M. WELLS.